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EdSpace

Having recently read an online article about changes the COVID-19 pandemic has effected on our nightscapes, I did some research. It appears that images of earth taken at night are revolutionising our ability to measure and understand nearly every dimension of human activity and allow us to get a glimpse into human-earth interactions in close to real time. COVID-19 has exemplified how night-time lights can help understand the impact of shocks on populations, economies and markets.

In mid-December 2019, COVID-19 emerged in Wuhan, China and rapidly spread, significantly impacting people's health, the entire economy, the job market, and daily life across the country. Within several weeks the disease was spreading globally, with millions of confirmed cases recorded around the world and significant implications for the global economy.

The need to track and predict outbreaks, as well as understand the impact of COVID-19 on economies, has led to the utilisation of unique sources of data that could help track the spread of the pandemic in close to real time. Satellite observations – including those taken at night – are becoming a primary source of data for tracking the progress of the pandemic and its impact on energy consumption, transportation, social interactions, the functionality of critical infrastructure, tourism, trade emissions, etc. These images provide a compelling and striking picture of the large-scale impact of COVID-19 on earth; from businesses and transportation networks to monitoring the gradual recovery of cities around the world.

It seems, however, that the idea of using night-time lights to understand pandemics is not new, and previous studies have already shown, for example, how night-time lights can be used to estimate seasonal measles epidemics, which are directly linked to spatio-temporal changes in population density as measured by anthropogenic light emissions.

These observations – measurements of the intensity of light emitted from earth at night – provide a unique glimpse into human behaviour and socioeconomic patterns as well as into the nature of human-Earth interactions. These observations are especially vital in countries where timely, accurate, and reliable statistical or administrative data is poor. Here, night-time light measurements can provide important insights into where people are and how they move; they can also help us understand patterns of economic development or evaluate the economic impact of investments in infrastructure.

While in some cases, night-time light observations may carry inherent measurement errors especially when compared across space and time, there is general consensus that night-time lights are able to represent many dimensions of human presence and activity on Earth.

Moreover, by looking at the relation between the distribution of the population on earth and the occurrence of different types of hazards, night-time light measurements can be used to evaluate how humans adapt and respond to these hazards. This makes them useful as an instrument to guide resilience planning. For example, the City Resilience Program utilises night-time light data in its City Scan product to highlight where hotspots of economic activity may be developing in flood-prone areas.

While COVID-19 is creating a new demand for what these observations can tell us, the insights they enable will also be important inputs into many aspects of countries' recoveries when the health emergency subsides. And lighting is right in the middle of it.

Gregg

Editor: Gregg Cocking (lighting@crown.co.za) • Advertising manager: Carin Hannay (carinh@crown.co.za)
Layout: Katlego Montsho • Circulation: Karen Smith

PO Box 140, Bedfordview, 2008 - Tel: +27 (0)11 622 4770 Fax: +27 (0)11 615 6108 - Website: www.crown.co.za
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RADIANT LIGHTING

A unique application

In the heart of Sandton lies a stylish complex with something for everyone. It is a place where work meets play, from business meetings to evening entertainment. Regent Lighting Solutions (RLS) supplied a striking architectural lighting solution for the revamp of the atrium.

24 Central is located in the heart of Sandton's financial and media industry hub. The landmark precinct is home to News Cafe, Taboo Nightclub, Cocoon Bar, Koi Restaurant, 74 Restaurant, Allora Restaurant, Vida e Caffe and the ever-popular Baron.

The interior perforated façades with aluminium composite material were part of an entire revamp for this complex. Visitors to the main reception area are met with a multifaceted façade that illustrates a crowd scene, moving within the atrium with a sense of purpose. This multi-level 17 m façade, with a sculptural and 3-dimensional element within the atrium section of the building, was backlit through the cladding with Niche RGB. Using DMX protocol, the Niche RGB façade is able to cycle automatically through a host of colour schemes or be controlled manually via a touch pad, when a specific mood is required.

The conceptual façade provides a unique screen application that combines timeless messaging through a modern design application.

Entrance and circulation spaces

RLS supplied Linear Mini recessed X-shaped at 19.29 W per metre, giving both entrances and the circulation spaces a modern and exciting lighting solution. bluTECH Mesh was used to enable time scheduling and manual override of the X-shaped Mini Linear fittings. At the lift lobbies, RLS supplied its Malta wall mounted luminaires with a custom mounting to accommodate the wall cladding. The downlighters used were Elux 72 12W 4000 K.

Atrium bulkhead

17x15 surface mounted linears at 4000 K and 10 W per metre were installed into the wooden cladding of the atrium bulkhead, creating consistent linear lighting in the bulkhead on each floor. All of these follow the lines of a skylight above, giving visitors a sense of form and function.

Reception canopy

Linear 17x15 (4000 K) were recessed into the floating reception canopies to highlight their architectural form.

Columns

RLS also supplied Linear 17x15; these were installed on three faces of the columns and had to wrap the column seamlessly, with each angle being different. This called for Regent's expertise in providing on-site installation. LiD

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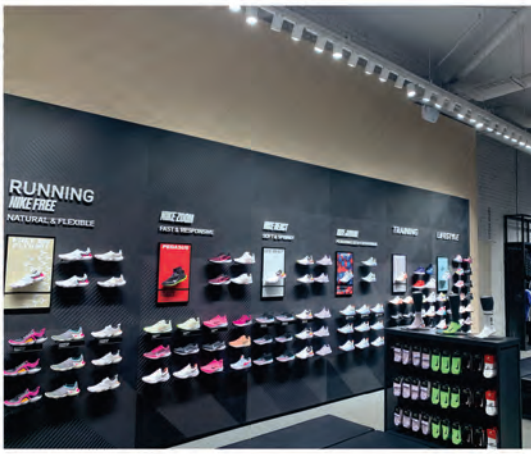

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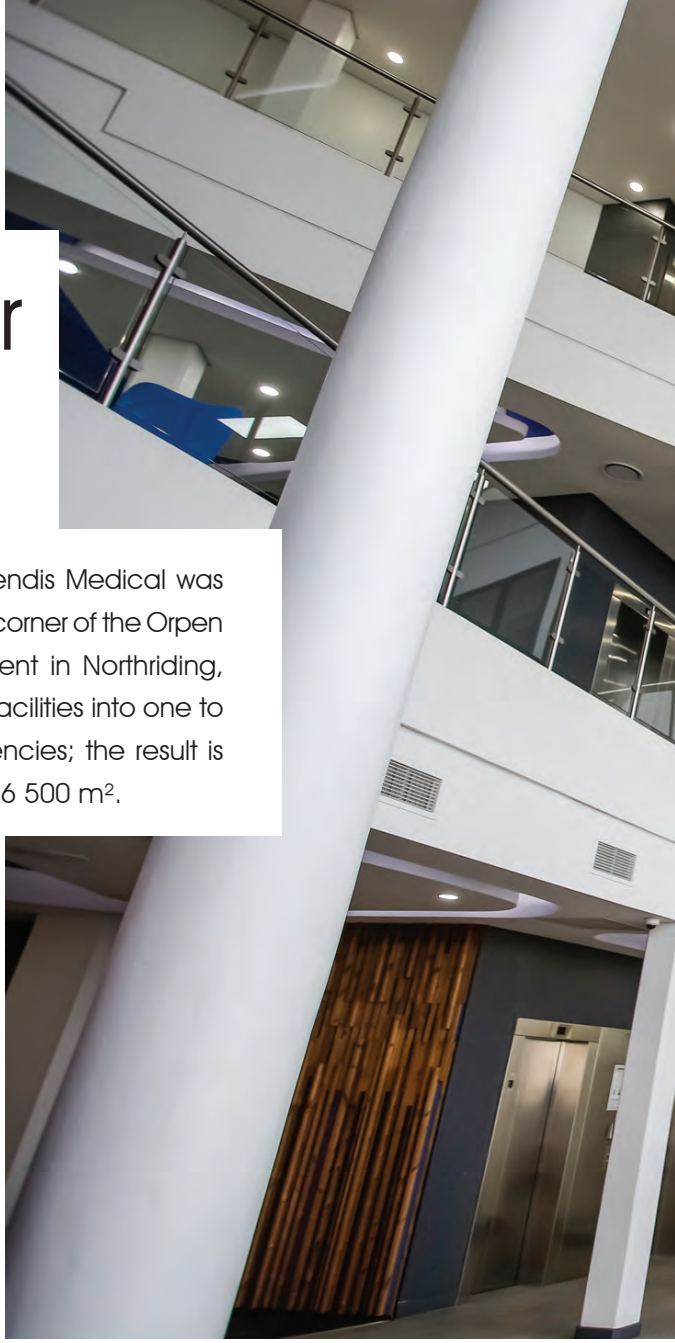
Enhancing user experience



A landmark head office and warehouse for Ascendis Medical was designed by Architects Of Justice (AOJ) on a prime corner of the Orpen Group's Boundary Park Industrial Park development in Northriding, Johannesburg. Ascendis has consolidated three facilities into one to optimise operations and improve business efficiencies; the result is three floors of P-Grade equivalent offices totalling 6 500 m^2.

In the design of the building, the office footprint was shaped around an irregular open courtyard to increase the perimeter façade. This maximises the building's presence from the adjacent street intersection, increases the amount of natural daylight entering the building and enhances the external views from within the building. The highly intricate and impressive glass corner entrance is the most striking architectural element of the building; shaped to improve passive solar control of the triple volume entrance foyer.

"The design of lighting for projects we are involved in always comes as an internal consideration for lighting to enhance the user experience of the building and reduce operating costs," explains Mike Rassmann from AOJ. "It was no different on this project where natural lighting has been maximised as a primary consideration, providing the greatest occupant satisfaction and operational cost reduction."

The lighting was designed in accordance with SANS requirements for offices with levels of around 500 lux for general areas and 300-500 lux for computer work-stations. Particular attention was paid to selecting light fittings that provided diffused lighting, allowing for the light to be evenly distributed and preventing shadows. "Diffused lighting is also easier on the eyes when working for an extended period of time," notes Rassman.

In addition to this, the choice of light fittings throughout the building complements the language of the ceilings, which gives users direct feedback as to what space they are in – meeting rooms, executive offices, regular offices, circulation spaces or break-away spaces – all of which have a unique design associated with them. The main reception, executive areas and meeting rooms share a

language of recessed elliptical flush plastered bulkhead ceilings with recessed LED downlights and LED strip lighting, while passages have long rectangular surface mounted LED lighting, guiding the direction of travel. Regular office areas are lit with more conventional 1200 x 600mm LED ceiling lighting panels. Elsewhere, dedicated task lighting above workbenches in the workshop areas is provided as the work being done in there is with small components for surgical equipment.

A challenge the architects encountered was finding fittings that would be around for a while. "Unfortunately, the fittings available today generally do not have lamps that get replaced, which means the entire lighting unit needs to be replaced when a light no longer works," says Rassmann. "Much of what is on the market arrives in South Africa in a limited quantity which means that finding a matching replacement – even in as little as a year – can often prove to be difficult. Using established and reliable lighting suppliers can mitigate this problem to some extent," he says.

Architectural language

When entering the building, you transition from the outside to the interior through a triangular plaza where, if you look up, you can see a reflection of yourself as a result of a tilt in the glass façade. There is a sense of grandeur as you pass through the 3m high entrance portal and into the immense triple volume of the reception space. "As you stand there and you look up, you get a sense of the size of the building," says Alessio Lacovig of AOJ.

A timber clad feature wall, with acoustic panelling that helps disperse the noise in the space, adds a different texture and a sense of warmth to contrast with the 'high tech' nature of the interiors.

In line with Ascendis' brand and business, the interior can be described as clean and minimalist. The architects used white as a base colour to work from, and along with muted grey tones, the rest of the colour palette, chiefly blue, red and green, is pulled from the Ascendis logo to reinforce brand identity within the interiors.

"Ascendis recognised the trend to work from home – even prior to COVID-19 – thus for many of the departments, hot desking is included," explains Rassmann. "There are also breakaway meeting pods, essentially less formal versions of meeting spaces, so the offices have built in flexibility and people don't have to work at the same desk every day; they can work from home if they want to, and if they need to be in the office, they can come in

and sit anywhere. From early we wanted open spaces that could be adapted as needed."

The courtyard was an integral part of AOJ's design from the outset. "A courtyard in an office building gives you the ability to have a wider office floorplate, because you can have natural light entering the workspace from two sides," Lacovig points out. "While the courtyard does create a social space, it also makes the building energy efficient and more comfortable for users," he says.

The courtyard is directly linked to the main foyer reception of the building on one side and the staff canteen on the other. The proximity allows this social space to be used for informal meetings between staff and visitors alike. A covered glass structure creates a walkway that ensures moving to the canteen from the reception is comfortable even in bad weather and also provides sheltered seating space. Large north facing stacking doors can be used to open the canteen space onto the courtyard on more temperate days, and makes this space appropriate for larger gatherings

The third floor consists of additional office space for growth and a 100-seater auditorium with meeting rooms as part of a training centre, allowing the company to expand without relocating. On the west corner of the same floor, a bar and outdoor terrace offers a place for staff and visitors to socialise while taking in the surrounding views and setting sun.

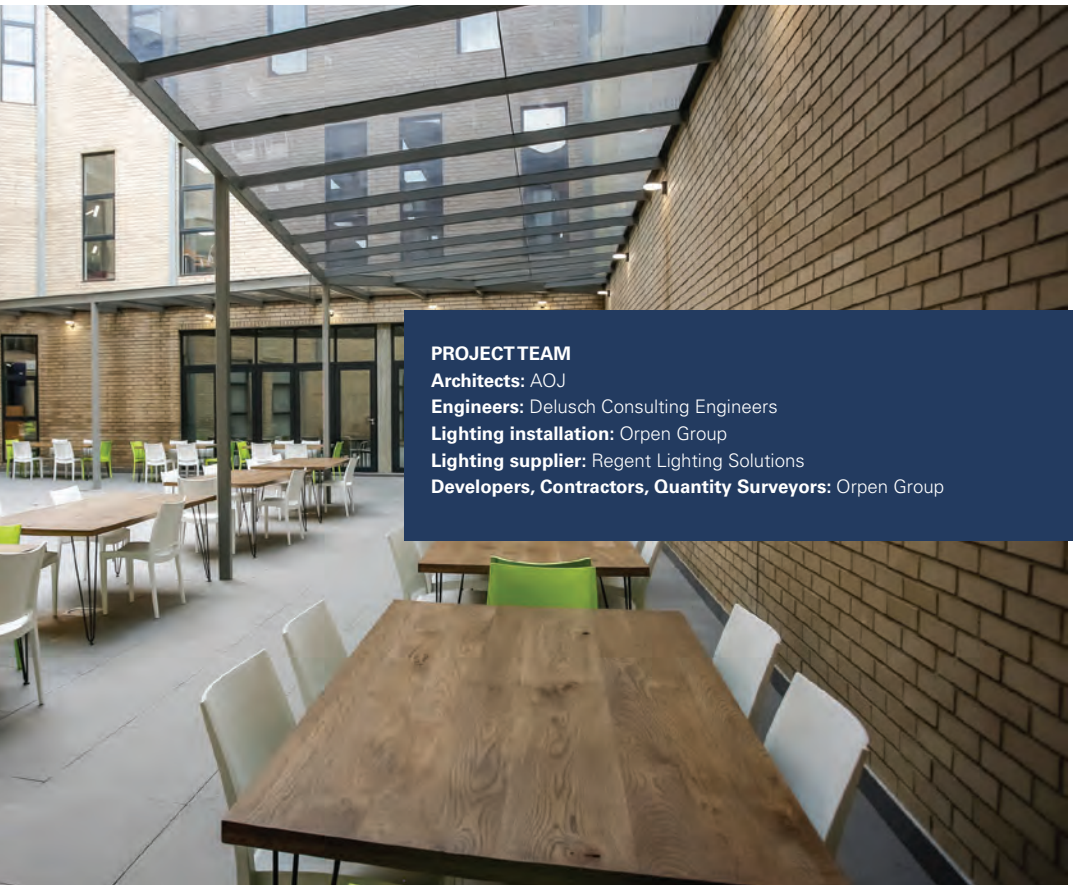
The importance of light

"So much of our world is perceived through our eyes, which makes them our primary contact point with our surroundings," says Rassmann. "Good quality of light, coupled with a reduction of glare within any space, has a huge impact on user experience and can go a long way to improving productivity and user comfort, and decreasing fatigue during the workday."

Reflecting on the project, although AOJ would have liked to incorporate the use of sensor switches mounted in the ceiling in the different office areas, sensor switches were ruled out fairly early on by the developer.

"In past experiences, they have not functioned as expected or promised. Unfortunately, as much as we are advocates of sensor-based switching, we too have had similar experiences where the switches do not function as promised by the manufacturers. Our hope is that sometime in the future these switches will become better overall, or that we will find a switch which already functions 100% the way we need it to, and we can start specifying it on all of our office projects," says Rassmann.

AOJ, which was responsible for the architectural and the interior design of the building, has – through marrying elements of the exterior with the interior – created a building which speaks the same design language inside and out. LiD



PROJECT TEAM
Architects: AOJ
Engineers: Delusch Consulting Engineers
Lighting installation: Orpen Group
Lighting supplier: Regent Lighting Solutions
Developers, Contractors, Quantity Surveyors: Orpen Group

South African designers shine light on Canadian home

This summer house is set on the banks of Lake Huron in a small, remote Canadian town about an hour's drive from London, Ontario. While the architectural context might be characterised as somewhat conservative 'cabin country', this house attempts to extend the possibilities of the traditional lakeside family retreat through a contemporary architectural approach.

Lighting in Design spoke to Mark Bullivant, Director at SAOTA and Thomas Paterson, Director at Lux Populi, to find out the details behind the lighting of the project.

What was the brief for the lighting?

Lighting a home is all about how one will live in it. With the dramatic differences between summer and winter, we wanted to create an intimate, cosy, romantic atmosphere in winter, with views to the exterior, but an emphasis on the interior. In summer, we wanted something more like we would do in South Africa – encouraging life to spill out to the landscape, with no line between interior and exterior.

Were there different lighting requirements for the different zones/areas in the home?

We wanted the life of the kitchen to extend out to the terrace and pool, so the whole architectural element that slides from inside to outside carries a single approach – accent light for the cooking, dining and socialising elements, and soft landscape lighting to surround it. As the element slides inside, one's eye is drawn up by pendants and a dramatically uplit wall element. Similarly, the stairs carry you up to more intimate space, so lighting from below carries the eye while suiting a late-night sense of almost being fire-lit. Using these traditional flows of light in a contemporary house took sensitivity – and good technique.

What challenges did you encounter on the project in terms of lighting and how were they overcome?

One of our biggest issues was how to have ceilings feel clean while actually including quite a lot of light. Our architecture expresses in the way the masses of the building engage with each other and peppering them with downlights wouldn't help. Clean ceilings represent the masses best where possible. Organising the lighting into tight arrangements and neat details is key. It's always a mistake to think light should be located directly over the thing it is illuminating – modern lighting can often be shooting 30° across from where it's mounted without creating any glare. This allows the

graphic of the ceiling to be somewhat independent of the lit effect.

Which products were installed, and were any specialised fittings commissioned?

We used a wide range of products to achieve the variety of desired effects for the various zones, including; Aculux, BK lighting, Indy, Lite Lab, MP Lighting, Vista, Hydrel and Lithonia. We also developed our own custom light fixtures and recessed slots to light up the vertical timber screens that punch through all three levels of the interior.

More than the specific models, the hardest part of a scheme like this, especially in the age of LED, is a deft touch with colour temperature. This house is dominantly warm, but cooler notes are used in landscapes and pools to emphasise the values of those elements.

How do you believe the lighting used in the project adds to the design?

Ultimately, I hope the owner will be the one to answer this – but we hope we've created the space he wants to live in – different throughout the day and the year. During the day, daylighting is mostly sufficient, but a little bit of accent helps on the grey days to make it feel awake, alive and warm. At night, I hope our client and his family gather in the warm social spaces and see and feel each other, far more than they do the house – it's a beautiful container for the life that will happen within.

This is emphasised in the decorative lighting elements created by our collaborators at ARRCC and OKHA – their beautiful decorative lighting was visioned coherently with the overall home design. Decorative lighting can create richness and experience as well as being a jewel in the overall jewellery box.

We did only the slightest exterior lighting, taking the contrast off the building here and there, but otherwise drawing the eye inwards through the windows – set in a private location, the inner life expresses outwards to the arriving family as a welcome and a sense of home.

In your opinion, how important is lighting in a residential environment?

The most important thing is that we remember it is someone's home, not a Pinterest page. How people will live in a house and find joy in it matters most. Fortunately, that often aligns with beauty!

Lighting is an editing tool, of emphasis and de-emphasis, of revealing and concealing, so visually, key questions are around what we want to see and experience. But it is also a psychological tool, giving access to emotions and perception. For example, people want to gather around a psychological fireplace – lighting in the centre of a room draws people to gather, intensifies the social experience. We want light at night that is physically low level, high contrast and very warm colour temperatures. Especially in northern winters.

These are values of technical performance – glare management, dimming, contrast control, optics and many other technological values. At SAOTA we collaborate with specialists, because we understand our clients and their lives, and value the knowledge that helps us deliver the best.

If we can help our clients and their friends gather

and talk, laugh and love, then that is a great ambition for lighting – delivered in cold, technical thought!

SAOTA has collaborated with Lux Populi on over 25 projects, some complete, many in-flight. Learning to collaborate as a team takes time and attention, but the result is that we were able to deliver this project with SAOTA taking the lead and doing all the legwork, and a little bit of advice and support from Lux Populi. That is a very conscious working relationship. We'd always encourage architects to seek specialist help, but also to have the confidence to learn and deliver – after all, lighting is about expressing architecture and supporting the way people will live in a home – exactly the things we consider as architects. Collaboration isn't about having a second layer wrapped over our work, but about making all design thinking a fundamental part of our work.

Looking back at the completed project, what are your thoughts?

This project was great fun – a chance to collaborate and imagine, and I look forward to sharing a drink with our client there someday soon.

The design of the home

While the aesthetic approach that Cape Town-based architecture firm SAOTA took might seem like a radical departure from traditional regional architecture, the architects have taken great care to keep the design unobtrusive and sensitive to its setting, while still making an architectural statement.

The site is a bluff occupying the transitional space

between water and forest, rising 3.5 m from road level and then dropping down to the water to create a grassy embankment. The building is set back on the property towards the street to preserve the natural bluff. On approach, the house is largely concealed by the surrounding mature fir trees, appearing as a simple light-coloured stone box floating effortlessly between the tree trunks. The rear of the house, facing Lake Huron, dissolves into a two-storey wall of glass, washing natural light deep into the interiors.

Conceptually, the design consists of a series of stacked and suspended rectangular boxes, one embedding the building into the ground plane, the other suspended overhead to allow the living level to exist between the volumes. An indoor/outdoor volume to the south anchors the building and maximises the site's lakeside views while allowing the living spaces to occupy the foreground. A bank of bedrooms projects backwards above the garage.

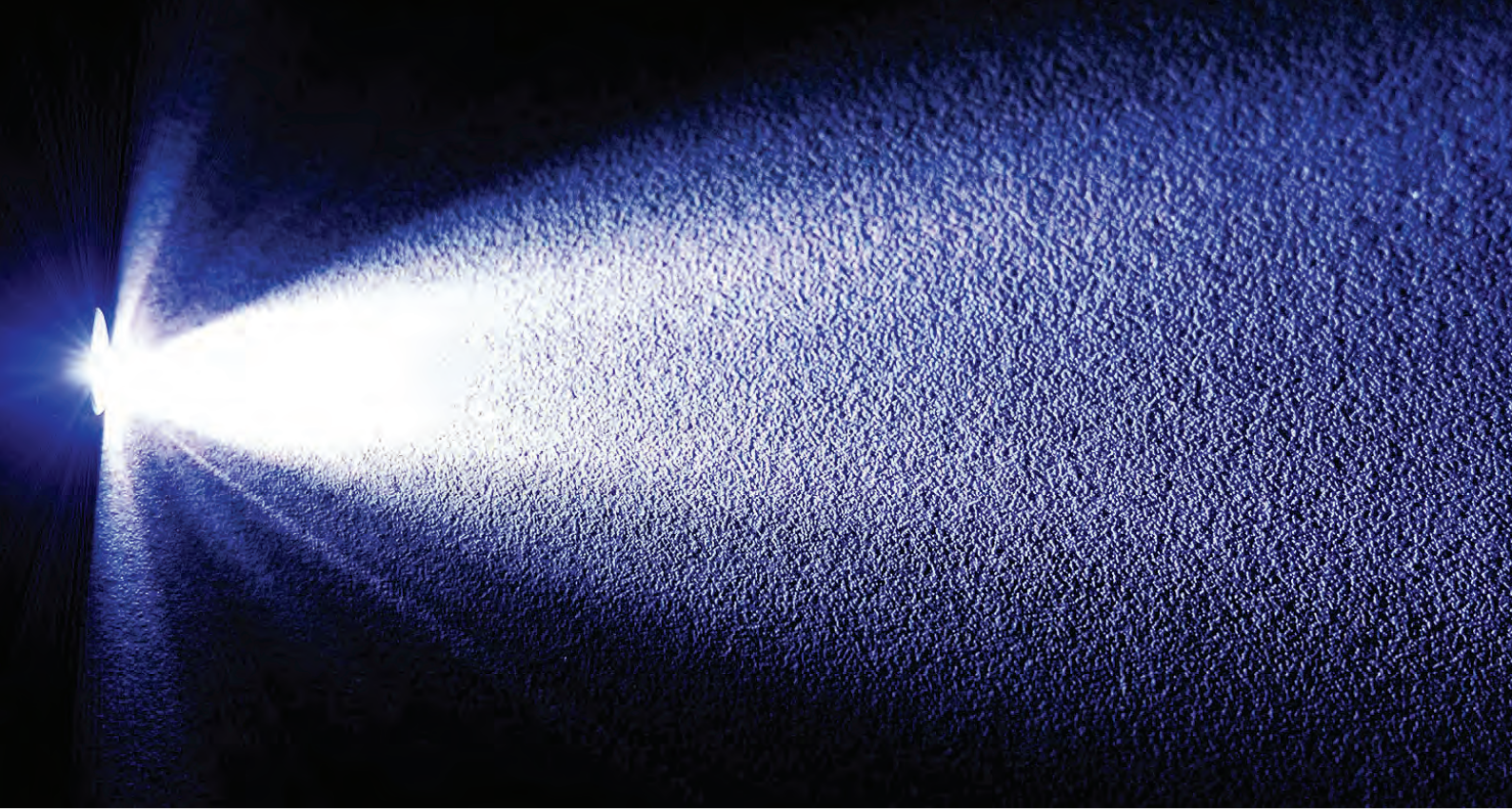
The way in which the building is largely obscured from the street and, in turn, screens views of the lake helps build suspense on arrival, only to satisfy the sense of anticipation on entry via the large pivot door. From the threshold, a dramatic triple-volume atrium lets in natural light and draws the eye outwards towards the view.

Programmatically, in keeping with the client brief, the spaces are fluid, the levels easy to navigate and the layout simple and well-structured, allowing for a casual atmosphere. The vast central volume is subtly contrasted with more intimate and contained volumes in the kitchen and other living spaces for a varied and articulated spatial experience.

The upper-level, housing the master bedroom, is devoted entirely to the owners' private space, including an office and a gym. To the front of the house, a covered outdoor entertainment area flanks a swimming pool. A boardwalk and staircase descend to a refurbished cabin that predated the house, and now houses a guest suite and additional outdoor entertainment area to facilitate long summer days playing on the lake.

The finishes, externally and internally, favour a ceramic panelled system robust and hard-wearing enough to prove long-lasting in the extremes of the Canadian climate, which together with the home's energy efficiency and the general longevity of the project and its materials, components and fittings contribute to its sustainability. LiD

PROJECT TEAM
Project location: Ontario, Canada
Lead designers: SAOTA
SAOTA project team: Mark Bullivant, Johan Basson & Paulina Paz
Architect of Record: Matter Architectural Studio Inc.
Electrical engineer: Capson Electrical
Contractor: MCI Design-Build Corporation
Lighting design: SAOTA with assistance from Lux Populi
Interior designer: ARRCC
Photographer: Adam Letch



Furthering the use of UV-C

Described by some as 'lighting's next big thing', UV-C lighting has, in fact, been around for over a century. A recent breakthrough, however, by a local company, looks set to multiply its potential uses.

In 1878, Arthur Downes and Thomas P. Blunt published a paper describing the sterilisation of bacteria exposed to short-wavelength light. UV has been a known mutagen at the cellular level for over 100 years.

UV light is electromagnetic radiation with wavelengths shorter than visible light but longer than X-rays. UV is categorised into several wavelength ranges, with short-wavelength UV (UV-C) considered 'germicidal UV'. Wavelengths between about 200 nm and 300 nm are strongly absorbed by nucleic acids. The absorbed energy can result in defects including pyrimidine dimers. These dimers can prevent replication or can prevent the expression of necessary proteins, resulting in the death or inactivation of the organism.

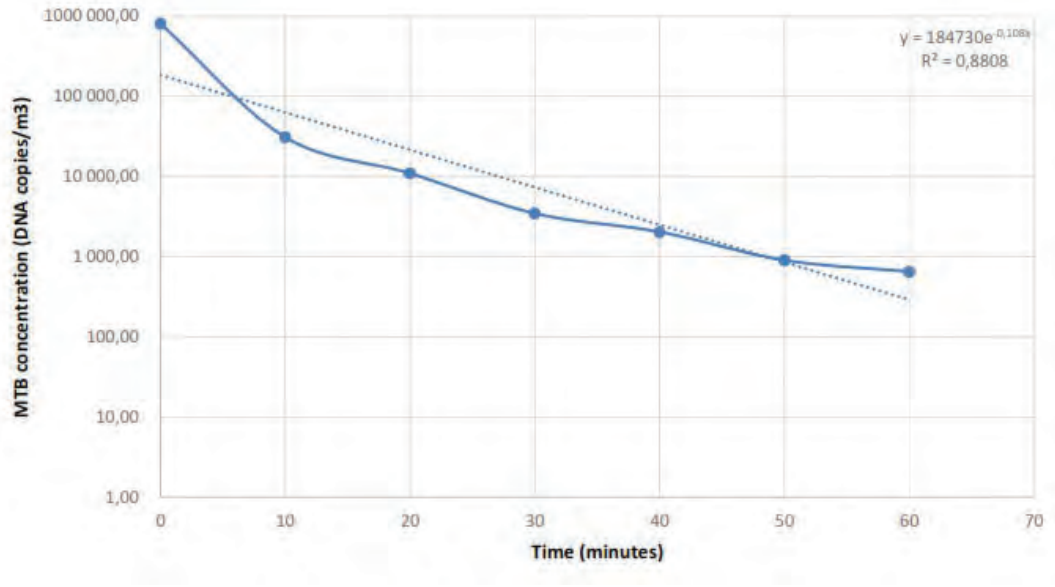
Germicidal UV for disinfection is most typically generated by a mercury-vapour lamp. Low-pressure mercury vapour has a strong emission line at 254 nm, which is within the range of wavelengths that demonstrate strong disinfection effect. The optimal wavelengths for disinfection are close to 260 nm. This process is similar to the effect of longer wavelengths (UV-B) producing sunburn in humans. Microorganisms have less protection against UV and cannot survive prolonged exposure to it.

- Mercury-based lamps operating at low vapour pressure emit UV light at the 253.7 nm line.
- Ultraviolet light-emitting diode (UV-C LED) lamps emit UV light at selectable wavelengths between 255 and 280 nm.

Ultraviolet light explained

Ultraviolet light is split into UV-A, UV-B and UV-C:

- UV-A measures between 315 and 400 nanometres. This causes mild tanning
- UV-B measures between 200 and 315 nanometres. It is more aggressive and causes sunburn (which in excess will cause melanomas)
- UV-C is the killer – UVC breaks down your DNA structure, and it does not allow your DNA to multiply. It measures from 100 to 280 nanometres. Most germicidal lamps produce 254 nanometres. "This is a dangerous product; extended exposure will give you lots of problems," explains Horlacher. "You'll literally start to burn and develop conjunctivitis." Fortunately, the ozone layer filters out almost all UV-C – and a lot of UVB, which is why it is critical that we look after the ozone layer.



MTB concentration decay curve when the Pedestal mount UV-C germicidal device was on. The solid line shows the decay of MTB concentration when the device was operational.

- Pulsed-xenon lamps emit UV light across the entire UV spectrum with a peak emission near 230 nm.

"When we started in the field of horticultural lighting, there was a need to disinfect plant crops, which are susceptible to mould, spores and fungi," explains Giantlight's Otto Horlacher. "Most professional growers have a disinfecting mechanism, and it is typically UV-C. So, having worked in the field – long before COVID-19 – we had an inside line and realised that UV-C was a viable mechanism for combatting the disease."

The company pivoted quickly and started generating products for its Jaeger range (German for hunter) three during the first month of lockdown.

Fogging is one way used currently to disinfect a space and, although it does work to a degree, the downsides to fogging include cost and the fact that the fog tends to linger in a space. The other method is to spray and rub surfaces by hand, but human nature dictates some spots are likely to be missed, not to mention transmission of bacteria through furniture, fabrics and electronics. These, unlike UV-C are not repeatable, long-term solutions.

Two local solutions

"We have developed products that use UV-C to disinfect in two ways; to clean the air and to clean surfaces," notes Horlacher. An 'air scrubber' is essentially a device where UV-C lamps are hidden within a chamber. The air is sucked in, blown over the chamber and extracted back out into the room. 'Dirty' air goes in, bacteria is killed, and clean, sterile air, is blown out. With an air scrubber, you protect all living organisms, other than pathogens that have been sucked in, as the UV-C is hidden inside an enclosed chamber.

Giantlight then designed a surface cleaner, which has to be operated in isolation. "It does have a safety passive infrared sensor, however, which works in reverse," explains Horlacher. "When you are in the room, it switches the light off, as opposed to a passive infrared, which senses you and turns it on."

A practical example of where this could be used would be a cinema, where there are typically five shows a day. "When you leave after watching a movie, the staff come in and clean-up the popcorn and spilled Coke," he says. "They have about 10 minutes to do that and there are 45 minutes between shows. Having cleaned, the staff can walk out, close the door and hit the UV-C light switch. Within 15 minutes, every inch of the cinema is sterilised."

The company has stuck to old-fashioned tube technology as it has found that no LED product produces the same quantity of UV-C at the same

Giantlight's study of the characteristics of UV-C

Giantlight began studying the waveform of UV-C and its characteristics and tried to draw parallels between it and lighting, "Because, if it behaves in the same way as light, then why can't we apply lighting principles to it?" asks Horlacher. "The first thing we established, is that UV-C decreases by the square of the distance, thus the inverse law applies, the same as white light."

"We then thought, why can we not put a UV-C fixture in a photogoniometer, and instead of using a Lux meter use a UV-C meter and generate the entire photometric file to produce UV-C? We imported the UV-C file into Relux, and clients can now give us the room size, and we can position UV-C fixtures in the room and tell them exactly, to a decimal place, how much UV-C they will get at every point in the room. What we don't know about UV-C is reflection, so we take our results from the photogoniometer and when we go to Relux, we eliminate all reflection factors. We assume the room is painted matte black; the furniture is matte blank. Why do we do this? To be safe. Whatever results we get, we know that in real world applications, the results will be better, because reflection will come into play. If we state a light fitting will clean a particular room in eight minutes, that's the worst-case scenario.

"The target market for these products is anyone dealing with the public – schools, gyms, churches, casinos, cinemas, restaurants, hospitals, commercial bodies ...They can run air scrubbers during the day, and when everyone leaves, blitz the space for a few minutes with the surface disinfectant."

price. Because UV-C is very aggressive (glass filled plastic is used, and the rest of the casing is metallic), specific types of plastics are used. For the tubes, as normal glass has metal elements in it that filter out UV-C, quartz is used. Quartz glass does allow UV-C to travel through it, but it is a lot more expensive.

The air scrubbers can be fitted with an hour meter so users can register how long the lamps have burnt. The lamps have an effective life of between 8000 and 9000 hours, so operators can measure accurately when the lamp needs to be changed to maintain the efficacy of the product as a germicidal unit.

The new products come with a number of new operational instructions, and a warning sticker. The air scrubbers can be hung, suspended or even mounted on a tripod to be moved around. The only downsides of the products are the UV-C will, over time, attack plastics and materials – much like items being left out in the sun – and the added cost of electricity.

The future for UV-C

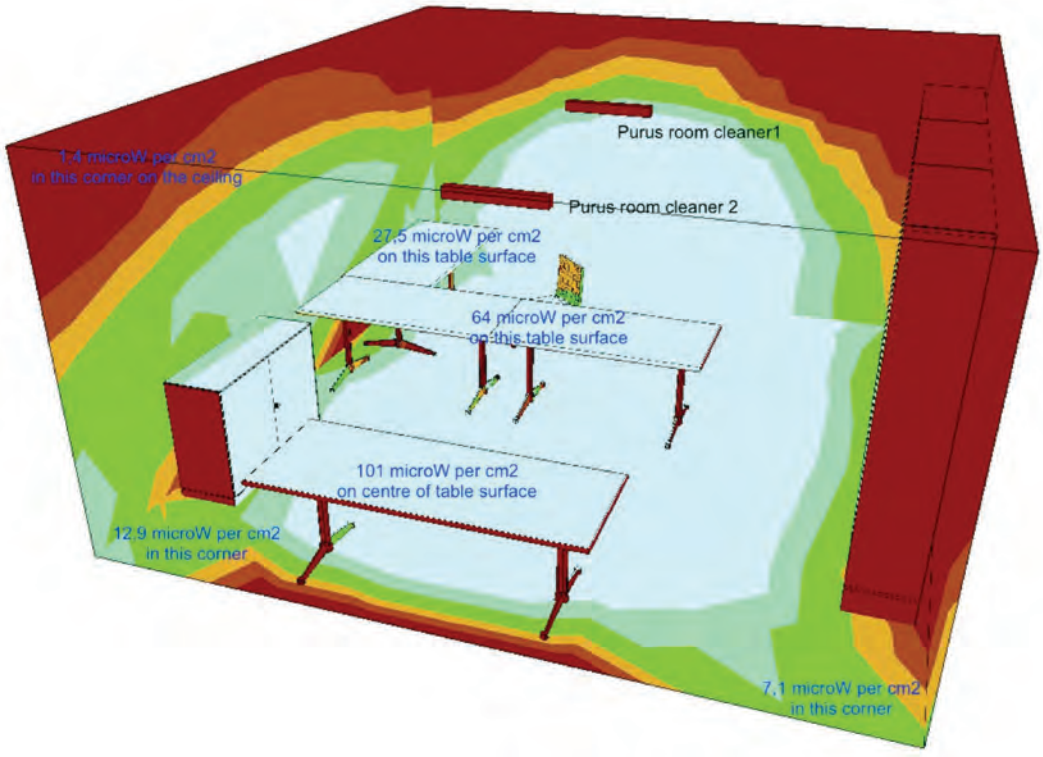
"Even if we find a vaccine, I don't think any of us will ever again think the same way," says Horlacher. "The science is there; the public just needs to be educated about it. UV-C is a form of PPE, and from a commercial aspect, the maths works. Instead of having to close production for hours or days for a deep clean – which means a loss of revenue – UV-C can be used." LiD

www.giantlight.co.za

Three tests a UV-G manufacturer must abide by

As the current pandemic is a medical situation, the testing criteria and the measuring methodology is complex. "Both of our Air Scrubbers have National Institute of Occupational Health (NIOH) test reports, which talk to their efficacy," says Horlacher. UV-G manufacturers need to submit products for testing to:

- NIOH – National Institute of Occupational Health
- SANS 60958 (general appliances)
- SANS 1706 (UVG products specifically)



Example of a room with two surface cleaners installed at ceiling height. If you were to take TB as an example – 6200µW per second per cm² is required to render these bacteria inactive. Then if you take the lowest level achieved in the room – 1,4µW in the top left ceiling corner – divide 6200 by 1,4 = 4428 seconds. Therefore, it would take 73 minutes to render any TB in the far top left corner of the ceiling inactive. Yet, if you take the work surfaces – such as the main table in the centre of the room at 64µW per second per cm² – TB would be rendered inactive in 1,6 minutes.

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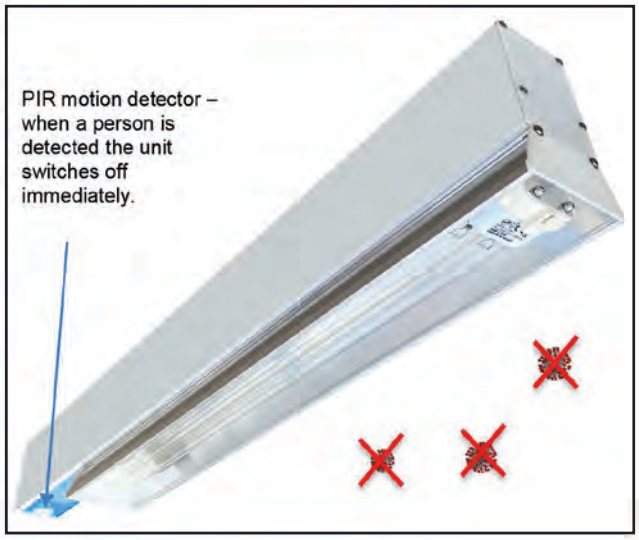
Giantlight (PTY) Ltd
EFFECT LIGHTING

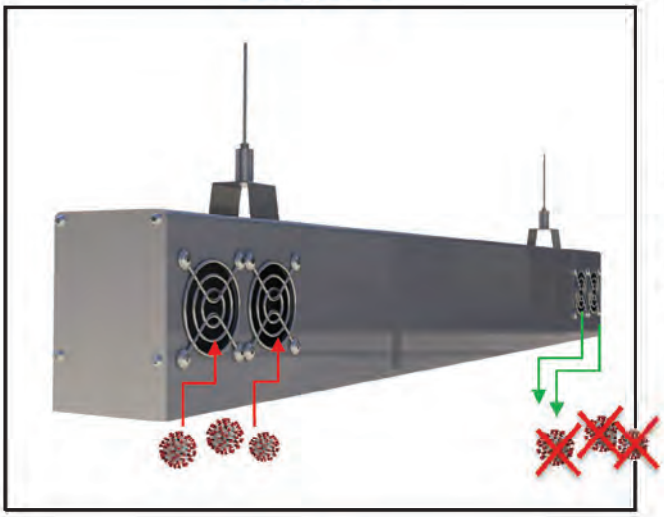
Introducing the JAEGER range of germicidal UV-C lights

Jaeger 1



Pendant or surface mount or recessed mount UVC - germicidal unit.
For surface cleaning of pathogens.

Jaeger 2

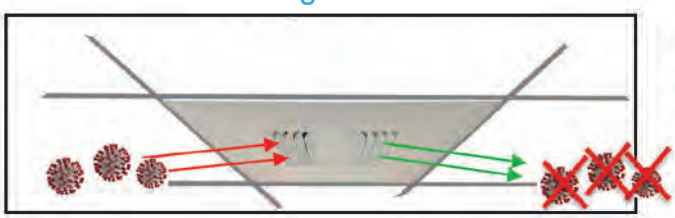


Jaeger 2 and 3 can be used with people present as the UV-C lamps are hidden within the cleansing chamber

Dirty pathogens are sucked in – destroyed by the UVC (254nm) light within – and the clean air is expelled.

Pendant or surface mount or recessed mount UVC - germicidal unit.
For scrubbing the air clean of pathogens.

Jaeger 3



Lay in 595 x 595 mm air purification unit
Simply drops into ceiling grid – like a panel light.
For scrubbing the air clean of pathogens

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Address: 169 Bush Telegraph Rd, Northlands Business Park, North Riding Gauteng South Africa
Website: www.giantlight.co.za Email: otto@giantlight.co.za / wolfgang@giantlight.co.za

Lighting the road to smart cities and sustainability

LEDs need less energy; that is a fact. When updated to LED, street lighting bills go down by 50%-70% and, as the price and quality of LED lighting continues to improve, costs will lower. At the same time, smart lighting has been recognised as one of the most actionable and ready-to-implement technologies for cities to transition to a low-carbon economy and peak emissions in the next decade.

Lamp posts are the ideal infrastructure for mounting smart city systems. When used for networking and monitoring, they become a sensor platform, growing efficiency even further and providing vital data for myriad urban solutions.

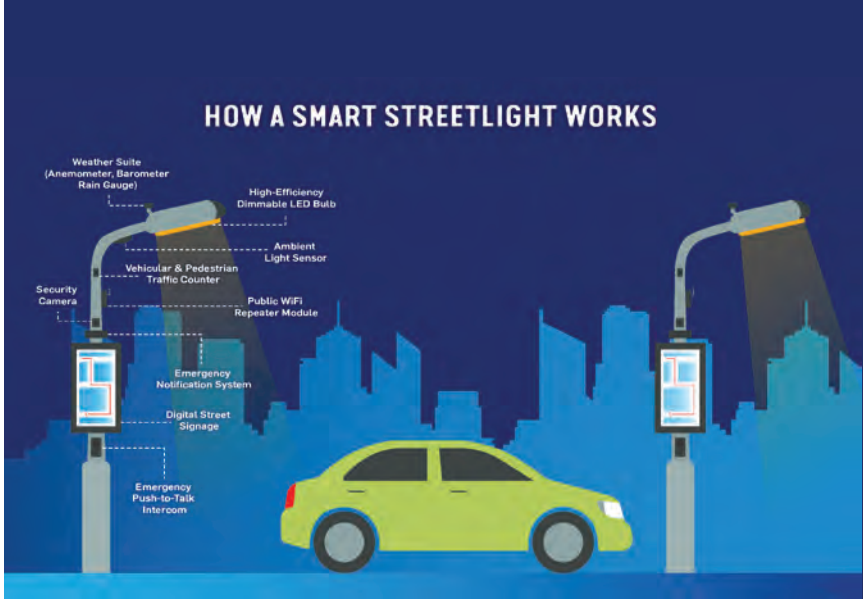
Remote on-off control, dimming, and scheduling functions are quick wins of connected street lighting, with a massive impact on energy savings and maintenance, and can be achieved through low-cost connectivity such as PLC or RF Mesh. More advanced lighting features, such as colour controls, adaptive lighting, and emergency response, require faster and more secure cellular networks.

Cellular networks allow for more robust and faster connections with lower latency, which would be needed for more critical smart city solutions. Smart street lighting with 4G LTE and 5G can provide a platform for Wi-Fi, HD Video streaming, gunshot detection, air quality monitoring, traffic management, and smart parking.

Smart street lighting as a platform

Public lighting represents one of the most commendable powered grids spread across towns and cities throughout the globe. It is the nervous system of a city, connecting over 360 million streetlights worldwide with access to power.

No wonder it is becoming a sought-after asset of the city, enabling an IoT platform that can serve many current and future urban solutions – investing now in LED lighting makes a sound move for any



city aspiring to become smart. The implementation pays for itself thanks to energy and efficiency savings the new lamps generate and the benefits for increasing citizens' security, efficiency, reductions in GHG emissions, and general well-being.

Some of the solutions that can currently be deployed together with smart street lighting upgrade include:

- Broadband connectivity.
- Traffic light controls.
- Traffic management.
- Smart parking.
- Electric vehicle charging stations.
- Air quality and noise monitoring.
- Public safety through HD video.
- Pedestrian footfall sensing.

Cities with smart street lighting

Barcelona: Barcelona published its first Lighting Masterplan in 2012, which included the use of smart LED lamp posts. The city is currently undertaking the installation of 10 000 LED streetlights across all districts. The lights contain sensors that detect movement and dim to save energy when no one is around. The smart lamp posts are remotely managed, provide free Wi-Fi across the city, and collect air and noise pollution data.

Copenhagen: The city's lighting master plan was approved in 2014 and has implemented 20 000 LED streetlights through which it has improved energy efficiency with savings of approximately 65%. Through remote lighting management and control, the lights are dimmed when not needed and increase their strength, providing added safety when cyclists or pedestrians pass by.

Chicago: This city launched its smart lighting program in 2017 and is projected to install 270 000 LED streetlights over four years. Chicago estimates that it will save around $10 million each year. The higher quality light provided by LED technology will improve visibility and safety. The project includes a monitoring and control system that will improve maintenance, with real-time updates when outages occur.

London: The City of London, known as the Square Mile, is in the heart of Greater London UK. It is a world-leading centre for business yet its narrow streets and tall buildings make it difficult to have connectivity. The city chose to create a low spectrum RF mesh network, where each lamp post is connected through an IP and acts as a node. The conversion of around 12 500 streetlights to LED by the end of 2020 is expected to result in energy savings of at least 70% and reduced CO_2 emissions and maintenance costs.

In summary, with energy usage is expected to grow by 35% in 2030, and with lighting accounting for 19% of total global usage and 30-50% of a city's energy bill, smart street lighting represents an excellent opportunity for improvement. By reducing the need for energy, we lower our impact over the environment and climate change.

By having efficient management and maintenance of street lighting, and together with security applications, such as noise, pedestrian, gunshot detection, and HD video, streets become safer, and cities can lower their crime rates.

Applications such as traffic management and smart parking can lower congestion, adding even more to a city's sustainability. All and all, smart street lighting offers advantages from day one, and we will see more of these networks deployed in cities around the world. LiD

Vans Fourways – Regent Lighting Solutions.

Better lighting for retail spaces

Lighting in Design approached Eurolux and Regent Lighting Solutions (RLS) to get their views on retail lighting best practices

Do you believe lighting is an area that most tend to neglect when designing a retail space?

Eurolux: In the past yes, but retailers are beginning to realise just how significantly lighting impacts the customer's shopping experience in their store.

RLS: Lighting is often overlooked or left as the last element in the design. It is overlooked in terms of the initial overall cost of the project, the positioning of the lighting in the correct areas within a retail space and emphasis on placement of merchandise. This is often due to a lack of understanding of the benefits of a well thought out lighting system.

What are some of the biggest misconceptions when it comes to successfully lighting a retail space?

Eurolux: 'The brighter the light, the better' is a common misconception – some retailers think that brighter lighting will attract customers and show off their merchandise clearly, but such harsh lighting actually has the opposite effect. It is uncomfortable on the customer's eyes, it doesn't create a welcoming ambience, and it makes the store look flat and uninteresting.

RLS: Colour temperature and below the black body COBs to emphasise colour saturation is most often not clearly understood nor selected to enhance merchandise in the retail space. For example: 5000 K looks bright yet creates a sterile environment in a retail space so this should ideally be avoided.

Also, it is believed that a good lighting system costs a lot. This is often not the case; a well thought out lighting system can often achieve the desired effect at a reasonable price. A well-designed lighting solution will increase sales and return on investment. Another misconception is that natural light plays a big role in store lighting – this is not the case as it is unreliable.

How does the mood of a space affect the spending power of consumers? Does the way something is lit affect whether or not consumers will buy the product?

Eurolux: Absolutely. Quality lighting is key in enhancing the look of a product so that customers are enticed to purchase it. Poor quality lighting makes products look dull or unappealing. Think about change rooms with poor lighting design. When you try on clothes, you are less inclined to buy them if the lighting is unflattering. Lighting can also be used to highlight certain products in a store. For example, spotlights focused on a display stand of newly unboxed merchandise which the retailer is trying to promote.

RLS: The mood created by the lighting system plays a vital role as this affects consumer's emotions and behaviour. Appropriate lighting in combination with the correct placement of products adds immense value. Lighting styles can create a different shopping experience for customers and can increase sales. Lighting creates a welcoming environment and mood that will ultimately encourage shoppers to purchase items that they otherwise would not have purchased. The benefits of good lighting mean that the customer will shop for a longer period of time, increasing the potential of buying more.

Do you think having either good or bad lighting can affect your brand identity?

Eurolux: Yes. People will always associate brighter lighting with a budget-friendly store, while high-end stores tend to lower their ambient lighting and use accent lighting to create a luxury look. It is also important to note that a younger demographic prefers shopping in stores with lighting in a cooler colour temperature, while an older demographic prefers warmer retail lighting. Retailers are encouraged to think about their target market and what they're selling, and light their stores accordingly.

Spar Bassonia – Regent Lighting Solutions.

they're selling, and light their stores accordingly.

RLS: Lighting has an influence on how individuals perceive a particular brand; bad lighting can definitely damage the brand identity. For example, a space that uses open channel fluorescents may be associated with being a cheaper brand. A space that uses more contrast lighting, more light on the products and less light on the floor would be seen as a more premium brand. Having the right light makes a difference on the first impression a customer has of the products.

Lighting can help the brand tell a story about its store and products. It can create a brand experience customers will remember, and this will encourage them to return to the store.

What type of lighting tends to get the best response from consumers?

Eurolux: Lighting that gets the best response from customers is lighting that is in line with the brand's target market. Retailers should consider who they are trying to attract when lighting their space and then go from there. A combination of ambient and accent lighting works well in all retail spaces.

Ambient lighting will provide the store with general illumination so customers and staff can move about comfortably and safely, while accent lighting will showcase and highlight specific merchandise and displays. The ambient lighting in a store should always be low enough to be an obvious contrast to the accent lighting. This allows the merchandise to stand out.

RLS: A well thought out lighting system will get the best response from consumers. Every application is different; each brand requires its own look and feel to differentiate itself from the next brand. By ensuring that the lighting designer or sales consultant understands the design intent of the interior designer and brand, the appropriate selection of a lighting solution will likely follow.

If you were to recommend one thing interior designers and architects should be careful not to overlook about lighting for retail projects, what would it be, and why?

RLS: Quality of the lighting not the quantity of light. Lighting is a key design element that, if used correctly, will complement the architecture, by ensuring reduced glare without compromising

Belgravia Jewellers – Regent Lighting Solutions.

the required lighting levels. RLS often customises fittings to allow architects or interior designers to illuminate their project with their own style and bring their vision for the store alive. LiD

More information
Eurolux: www.eurolux.co.za
K. Light: www.klight.co.za
Regent Lighting Solutions: www.regentlight.co.za

Retail lighting solutions from K. Light

Adjustable Beam 30 W LED Spotlight for 3-Wire Tracks

Available in black and white, these stylish slatted 30 W LED Spotlights are suitable for any commercial or domestic interior. The adjustable beam option is versatile allowing for different effects depending on the beam angle.

Dimmable LED SMD Downlights with Indirect Light

One of the first of its kind, K. Light's LED SMD Downlights with indirect light prevent the glare of the COB chip. The light is directed up and reflects evenly back down with no shadow. Available in three different sizes, this eco-friendly fitting will suit any commercial or domestic interior.

GU10 Surface Mounted Downlights

K. Light's range of GU10 surface mounted downlights is available in two designs – round and square – and in two colours, black and white. With their eye-catching contours these fittings are perfect for concrete ceilings where there is no access through the ceiling. With the GU10 bulb you will have a choice of cool white, warm white and dimmable options.

Floodlighting for Parel Vallei High School's hockey field

Parel Vallei High School is situated in the beautiful winelands at the foot of the Helderberg in the Western Cape. Hockey is one of the strongest sports in the school's sporting portfolio. Both girls' and boys' hockey has been offered at Parel Vallei since the school's inception in 1986 and within a few years developed to accommodate 26 teams. The school built the Astroturf field in 2012, becoming the first school in the Helderberg Basin to boast one.

With so many teams, the school struggled to accommodate them all for practice. Now, with the hockey field illuminated, they have more hours at their disposal for training, and to accommodate outside clubs and host prestigious hockey events. OMNIblast-2-E Maxi LED floodlights were chosen for their high performance, high energy saving capabilities, and long lifetime. In addition, the OMNIblast-E guarantees perfect glare control and a high colour rendering index (CRI).

Furthermore, a 3-stage DALI dimming system was installed. Three switching stages were set: Stage 1 at 100 Lux, Stage 2 at 200 Lux, and Stage 3 at 350 Lux. The biggest advantage of using DALI for dimming in this application is that the high uniformity level remains at dimming stages, as opposed to switching luminaires off to reduce light levels but compromising uniformity. In addition, using DALI dimmable control gear results in the even further energy savings that this technology already provides when compared to traditional light sources.

Locally manufactured, the OMNIblast-E is ideal for sports venues and other very large area applications that require a lighting solution with the highest efficiency and flexibility to adapt to different lighting needs. Available in a Midi and Maxi variant, this LED solution offers an alternative with proven benefits for traditional fixtures fitted with 250 W to 2000 W HID lamps. The OMNIblast-E meets various lighting applications, from general area lighting to recreational sports lighting up to professional broadcasting requirements, matching the horizontal and vertical lighting levels respectively. A modular concept of optical units means that 1, 2 or 3 modules can be mounted on a similar bracket arrangement to offer utmost versatility, providing light distributions and lumen packages perfectly adapted to the specifications of the area to be lit.

BEKA Schréder is proud to be associated with Parel Vallei High School, Eimac Consulting Engineers and Unathi-Group in the provision of a successful floodlighting solution for this prestigious project. LiD

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