



Les éclairéurs
angers ~ l'atoll, an eco-commercial parc

les éclaireurs

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the lighting: a signature

Atoll is an eco-commercial parc which regroups different brands, for house equipment and decoration, in a unique and beautiful building. The pure perforated skin is illuminated to create a unique night signature that values the business of the commercial center.

White everyday, changing color according to certain evenings and events, the programming of this equipment is part of our architectural lighting activity where we control all elements of the lighting engineering : from design to execution studies, from adjustments to the commissioning and programming.

All exterior and interior spaces of the Atoll were concerned with our design while maintaining similar implementation costs to standard projects.





Context

An eco shopping centre, an innovative programme

Compagnie de Phalsbourg, the project contractor, is a specialist in developing shopping centres located on the outskirts of cities. The complete opposite of «metallic box» shopping centre architecture, this company implements innovative projects based on high-end architecture, to make city outskirts new urban spaces.

To address the typical issues raised by suburban shopping centres - highly visible logistics and service areas, ever-present car parks and excessive occurrence of signs in the surrounding landscape - l'Atoll is much more than just another building with an elegant shape. l'Atoll represents a new shopping centre concept that addresses all the issues and constraints of these vast logistics zones in a circular, inward-facing form.

l'Atoll is a radical departure from the approach adopted by certain shopping centre developers who build low-quality box shapes, with only the centre's signage as the distinguishing feature. In this case, the architecture itself is what defines the shopping centre, with no signage on the outside of the site.

An ambitious and innovative project, l'Atoll offers developers the opportunity to improve their public image, positioning themselves as being ecologically responsible, and mindful of their changes to the urban landscape. This project would not have been possible without extensive collaboration between developers and Compagnie de Phalsbourg.

A solution incorporating architecture, light and the landscape

l'Atoll is a ring-shaped structure, with an outer layer void of any signs. You need to enter this ring in order to see the businesses and their signage. In this way, l'Atoll is designed, above all, as an object integrated with its surrounding landscape, a pure architectural form nestled in the middle of cow pastures. At night, this landscape becomes a primary defining feature. Once they have entered the ring, visitors can, amongst other things, move around in a green space allowing them to park their car, access various businesses, enjoy something to eat, and appreciate truly high-end public spaces. The centre of the site has been designed to offer «enclosed landscaped grounds», where nature lends itself to strolling around, extending the shopping experience. The quality of the setting and light ambiance at the centre of the site is a key factor contributing to the shopping experience at l'Atoll.

The ring's inner layer acts as the element housing the shops' signs: Maison du Monde, Linéa, amongst others. This layer, providing a complete background for l'Atoll's whole inner landscape is a key point of reference, displaying shops' names.

In essence, a shopping centre is a massive logistics platform attempting to portray a «human» element. It is a site where ongoing deliveries take place, where there is high waste output... Rather than positioning this waste «behind the scenes», never truly able to hide it, l'Atoll incorporates these services at the centre of the architectural structure, by integrating it behind the outer layer of the building. This serves to conceal all heavy goods vehicles, shop backyards, areas for skips and bins, etc. The elegant metallic mesh conceals the entire back



inside view : the ambulatory gives shops access © picture by Eric HERANVAL

office and all operational movements in a very measured, fluid manner.

A construction site already in operation, efficient methodology

The construction site was already in operation, when, at the architect's suggestion, we met with the developer, and were awarded the lighting project. The lighting grids were already partially in place. Only four months remained for finalisation of orders for lighting equipment before the grand opening. The flexibility afforded by a private construction site, where all decisions are made quickly, and where all stakeholders are highly responsive, enabled us to meet the deadline which would have been impossible with a government contract.

To respond to the urgency, we implemented a very efficient work methodology, based on on-site testing – a multitude of tests, conducted rapidly. The construction site's structural works were already well advanced, with many sample boards in place: cladding, flooring, samples in the 1,000m² car park installed for the finalised project. This opportunity allowed us to validate, almost simultaneously, the implementation of the lighting concept on the final materials and architectural structures. As a result, we were able to work on a project with no hidden surprises, approved by the contractor during its actual development.

Changing the contractor's habits

Over the course of the many different projects executed by Compagnie de Phalsbourg, certain habits had been formed, including the routine illumination of trees through built-in ground light fixtures, the use of halogen wall lamps, spotlights on poles in the car parks, and LED light strips to accentuate a multitude of details. There was a strong desire on the part of the client to illuminate the structure, fully understandable when wanting to showcase an investment totalling over 180 million Euros, an innovative project, eagerly anticipated by the entire professional industry.

We therefore had to put forward a number of strong arguments in favour of exercising a certain level of restraint for the project, in terms of lighting as well as setting - to achieve a soft, simple, calm ambiance for l'Atoll's interior and exterior. We also had to impart our culture of consideration for maintenance, the durability of installations, and overall maintenance costs in order to render the project more sustainable: achieved by doing away with halogen lights, positioning fittings out of public reach to avoid vandalism, limiting upward-facing light sources with the intention of eliminating them entirely and doing away with installations that are hard to reach for the purpose of maintenance.

We also adopted an approach of limiting energy consumption by managing the switching on of lights, choosing more economical light sources, etc.



Outside view of the site and one of the three access. The outer-skin is lighted in white © picture by Eric HERANVAL





the outer-skin : a 600m large building, with 2 kilometers of circumference © picture by Eric HERANVAL





project concepts

Viewed from the outside, illumination of the building's outer layer

Responding to the Company's desire to have the building appear as a beacon in the broader landscape, visible from both the A11 highway and the D323, we suggested illuminating the building's outer layer. Comprised of white, perforated sheets, 15mm thick, the mesh posed a true challenge in terms of illumination. What should be highlighted? The structure of the servicing area, lying between the mesh and the buildings' back wall, where skips, trucks and emergency exits lie? Or the mesh itself, constituted only of holes?

Tests carried out by the contractor proved inconclusive: asymmetrical 150W MH spotlights directed towards the mesh, spaced every 7m, and then 400W every 7m didn't have any effect; they served to display the covered walkway structure and waste areas. High-power output LED spotlights directed towards the mesh from the foot of the rear parts of the building did not do much to showcase the mesh...

From tests conducted by Compagnie de Phalsbourg, we understand that the visible portion of the layer is its thickness, 15mm surrounding each hole. This thickness is only seen from a slanted angle, never straight on, and is therefore always present in the position offered by the road traffic circulating around the site. With this in mind, there is no use in working at a perpendicular angle to the mesh - it is more effective to work diagonally across the structure of the covered logistics walkway, in order to contain the light and expose the mesh's thickness. We carried out testing with 575W MH MARTIN Exterior 600 spotlights, to good effect. We changed over from an installed power output of 5 x MH 400W for 35m to 1x MH 575W for 35m. This represents 72% in energy savings on the initial solution, with a total of 30kW installed. Sales negotiations led to GRIVEN Everest MH 900W spotlights, revising our proposal to 45% in energy savings and 46kW installed, but at a lower cost.

This interior tilted light positioning enabled us to control wasted upward light emissions. If any light leakage occurs, it is minimal and well controlled. To accentuate contrasts in order to showcase the building, we agreed on a shaded area at the foot of the façade, keeping the fire control service road surrounding the site dark. This ensures that darkness of the surrounding landscape is maintained with the building nestling discreetly within the site.

Viewed from the outside, dynamic lighting to enhance the building's visibility

In this case, we are confronted with a very large, circular building, almost 600m wide at its largest side and more than two kilometres in circumference. From a distance, the building appears to be a straight structure, without perceived roundness. Programming the lighting is therefore essential in order to give the building its night-time form. We programmed rotating light effects: streaks of a single colour along the white mesh, streaks of black along the white mesh, complete switching off, with the passing of rapid white light across the structure of the mesh, etc. Overall, the rhythm is slow out of respect for the seasonality of the site's landscape, with a few more rapid dots at random locations, in order to retain visitors' attention. The programme runs entirely in DMX, with signal transmission in HF-DMX via an antenna situated at the centre of the site. The development was done entirely in-house.

Illuminating the inner mesh

Inside the site, the architecture reveals a mesh that echoes that of the outer layer. The dithering is more intricate, with the pattern slightly differentiated as members of the public are in closer proximity to the façades. The outer layer of the building is stretched outwards to form a large canopy for strolling around in front of the shops. In order to provide the site with a boundary, and render the placement of the shops more visible, this layer has been illuminated with a continual, static lighting effect. We chose to bathe the entire layer in light. The mesh is illuminated as a solid backdrop and not as a floating layer (as has been done on the outside). Two HO 49w 3,000K simple, fluorescent light sources housed in inexpensive, waterproof light fittings were used. Affixed to the structure's i-beams, they are positioned in the canopy structure, constituting a 935m strip, amounting to 610 wall lamps. In total, this represents 65kW of installed power for this circumference «kilometre». Maintenance is carried out from inside the structure where a qualified worker is able to move around.

This display lighting allows for the functional lighting of a covered walkway where members of the public are able to move around, providing an average output of 20 lux. In addition, an LED strip surrounds the canopy's circumference. This 5,600K cool, white lighting is easily accessible for maintenance purposes.

The arches between the interior and the exterior of the site

The four arches providing access to the centre of the site are illuminated. In these complex structures, where the layer turns in on itself to become a pillar, a soft, white 3,000K light is emitted from the foot of the arches, to create a visual link to the canopy. Waterproof 150W MH light fittings with broad, symmetrical optics are affixed to the structural i-beams at the foot of the arches, requiring a new bulb every three months. 12,000-hour lights are used to reduce maintenance. Access is afforded by means of service doors facilitating cleaning of the area. The light fittings are readily accessible, not requiring any particular access strategy.

Car parks in cool tones to reduce their visibility

The centre of the site has been designed as «green» enclosed landscape grounds. Trees between 15 and 25 years old have been planted to provide the immediate impression of a green space - a shaded islet. Expansive lawned areas cover the site. Even the tarred parking spaces have been dug out to make space for a strip of median lawn.

The car parks represent 70% of the indoor surface area. This predominance moved us to underplay the car parks through the use of cool 5,600K lighting that reduces the visibility of the road surface and cars, while highlighting the colour of the lawns and other green spaces. Executed using functional 42 x 350mA LEDs in the form of tree leaves, this lighting was tested on-site on the 1,000m² sample board. Through an integrated light dot management system, the nominal power output is reduced by 30% at full light emission, in order to balance the ambiance with the rest of the site and limit wear and tear of the LEDs. Further reduction is seen in the latter part of the night, increasing the light consumption reduction to 35%.

The installed power is 10kW for the car park surface area and traffic flows of 58.500m². This equates to approximately 0.16w/m². Lights are set flat, to achieve a ULOR lower than 2%. The light's height is 7m, providing a good balance between the wide spacing, limiting emissions and maintaining a respectful height of the structure, which does not interrupt the view of the building.

Showcasing the central green landscape area

At the developer's request, some of the trees are illuminated through low-angle projections. We completed this request while avoiding, as best possible, the blinding of visitors.

The site is also «scattered with large pebbles», housing 300 to 2,000m² retail outlets. Covered with very high performance white concrete leaves, six pebbles inhabit the site's indoor setting, emphasised through a dash of light that lifts them off the ground, whereas profile spots affixed to poles highlight their round shape in the same way as sculptures are set off in museums: with their size highlighted by layering the light into shade. No fewer than 17 MH 150W profile spots affixed to poles in the car park were required, equating to 3kW installed. Pedestrian pathways are accentuated by a strip of 3,000K white lighting. They indicate the movement of pedestrians to motorists, and allow for an elegant warm/cool contrast to be created across the car park area. Simple MH 35W spotlights with elliptical glass affixed onto the car park poles achieve this effect.

At the centre of the site, an eating area bathed in warm tones

The eating area has been assigned 3,000K warm tones to accentuate the wooden decking and façade coverings. The ensemble produces a bright, warm radiance that marks the centre of the site as a main meeting point. To achieve this, spotlights have been affixed onto top of the façade.

Global lighting quality

The light created offers visitors a demarcated area, in which the vertical angles surrounding the site are clearly defined. The site's shape is clearly visible through the design of the façades and visibility of the exit points. This perception of boundaries serves to heighten the sense of safety and comfort within the site.

Particular attention has been paid to controlling the aspect of light blinding with all the light fittings, particularly in the car park areas. There, light uniformity goes hand in hand with adjusting the level of light to be suitable for the comfort and setting of the particular area (light blinding is not only an optical issue, but also an issue of spacing between the light sources). Apart from a few coloured pathways in the outer layer, the entire project has been designed in white lighting tones: ranging from 2,800K to 6,500K. This project choice provides a solution to very white architecture when viewed in daylight, which we wanted to recreate for night vision, without colouring it.







The inner-skin creates a background to the «shops pebbles». They are lit with a direction of light © picture by Eric HERANVAL





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Parking spaces are lighted with LED fixtures. The lighting level is globally dimmed to 70%, and 35% in standby mode © picture by Lucas GOY



Illumination of the remarkable trees by 20W MH fixtures placed in special metal tubes © picture by Eric HERANVAL

project technical specifications

Sustainable development

L'Atoll is a low energy consumption building (French «BBC» building) with objectives based on the RT 2012. Even though the outside areas are not included in the regulatory calculations, specific attention has been paid to these areas in an attempt to limit energy consumption through differentiated lighting and shading of light sources.

The site's lighting is achieved through a low, but uniform level of overall lighting (5 to 15 lux in the car parks, 20 lux in pedestrian traffic zones, etc.). Many dark areas have been preserved in order to create a site setting offering an interplay of darkness and light.

The outside of the site is totally dark, with only the public entrance access roads illuminated. L'Atoll's light resides inside its outlying mesh. Overall, the project has a very low impact on the site's night environment.

For the most part, the material used is aluminium, because of its recycling properties (poles, lanterns). The issue of maintenance has been addressed by our company, through encouraging the developer to take this aspect into account by choosing long-lasting bulbs, ease of access to light sources for changing bulbs, using light fittings from leading manufacturers who ensure ongoing monitoring of their product ranges, etc.

Light sources used

The aim of the project was to use the lowest possible number of light sources, thereby simplifying maintenance and the changing of bulbs: 350mA LEDs for the car parks with a 60,000-hour life duration (which we extended further through additional gradation on the basis of full light at 70% lighting), high power output MH 900w light sources for illuminating the outer mesh, MH 20W light sources for built-in ground fixtures, and HO 49W light sources with a 60,000-hour life duration for the inner mesh.

Maintenance strategies

In our view, a sustainable project is one in which the changing of bulbs is an easy task, with light fittings easy to maintain, through the simple implementation of products that are supported by suppliers in the long term. We therefore aimed to raise our client's awareness on this point, in some instances having to deny their requests, emphasising the fragility of the installations or lack of reliability on the part of suppliers.

As an example, we designed ironwork to protect the light fittings from theft and vandalism. This is particularly the case for light fixtures lying at the foot of trees. Not keen on this type of blinding directional light, we suggested deflecting the optics through a built-in ground fixture, placing it in a galvanised steel tube. This tilted tube is directed towards the tree to be illuminated. Positioned at the surface, we avoid leaf coverage and mud submersion, with the set-up allowing for other recurring water seepage issues common to built-in ground fixtures to be avoided. This light fitting is sealed by a block of thin cement which can be dislodged if



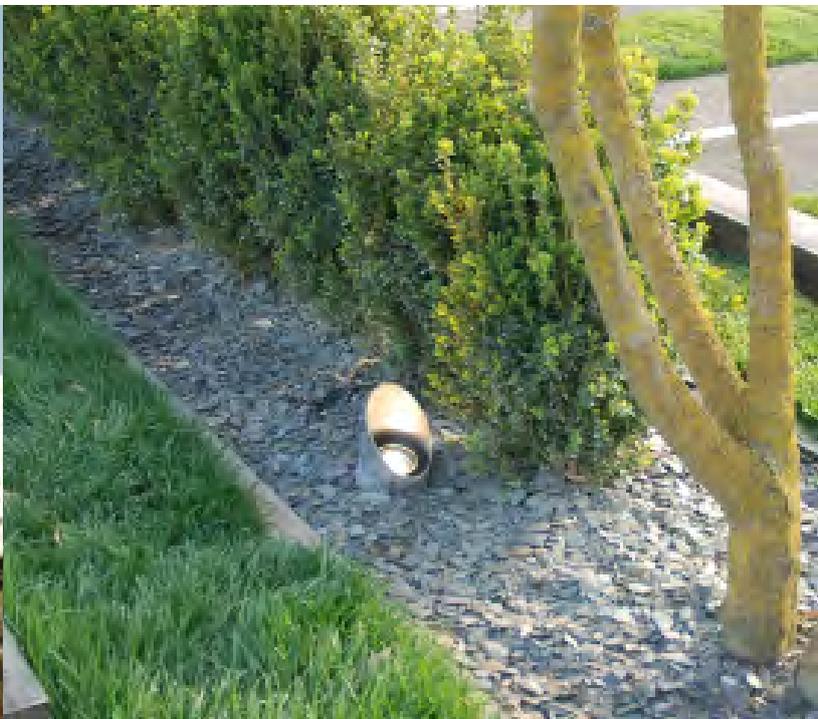
↑ Inground projectors in special steel tubes



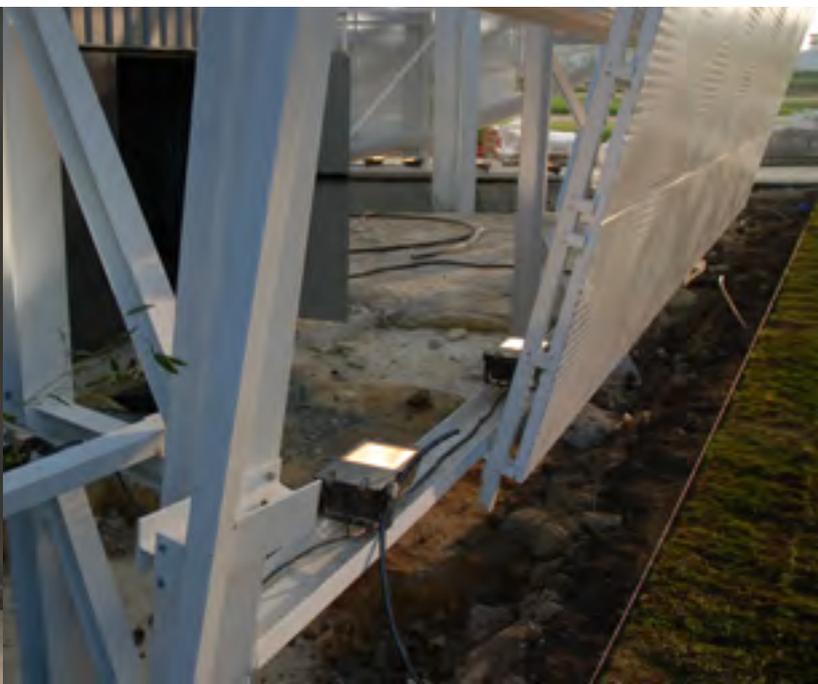
↑ Indoor parking space



↑ Underline of the main paths with projectors placed on parking poles.
↓ Color changer fixtures in the inner-skin, protected by steel tubes



↑ Inground projectors in special steel tubes to protect from leaves
↓ Affordable fixtures in the inner-skin of the accesses.



need be. The light fitting is easy to maintain through removal from the front part of the tube, with only three screws fastening it.

For the outside mesh, the choice of high-power output bulbs was imposed due to financial considerations. 750 hours MSR bulbs were used. We programmed the lighting of the outer layer in such a way as to produce 1,500 hours of lighting per year, requiring bulb changing every six months. Bulb changing allows for checking the light installations in the logistics-related traffic area, which is particularly exposed to the passing of trucks.

Lighting management

Lighting of the outer layer is managed with DMX by means of a reinsertion circuit. As the network was already in place by the time we began working on the project, we had to create HF-DMX connections via a central aerial placed in the roof of one of the buildings at the centre of the site. Sensors affixed to the roofing every 500m emit a signal transmitted through wire connections, reaching the dynamic spotlights in the outer layer.

The lighting has been produced based on an astronomical clock fitted internally in the DMX control box. The lights are switched off between 23h00 and midnight, depending on the weekday evening. For specific events, more dynamic, colourful programmes can be activated. Automatic mode is resumed through a reset occurring at 6:00 in the morning in the event of the caretaker forgetting to switch off the lights.

For the other circuits, the lighting is differentiated depending on its effect: trees on one circuit, fluorescent lighting for the mesh on another (several different circuits were necessary due to the power output required), etc. Switching on and off is managed by the building's centralised lighting management system and monitored by caretakers who are always present on site (the building is never left without surveillance).

Power output

The power output for a building of this magnitude is significant; it is aligned with the building's size: almost two kilometres in circumference. The power requirement can be compared to other, simpler buildings: l'Atoll's power requirement per m² for outdoor lighting including switching on is 0.25w/m², which is a relatively low value compared to other installations (0.35w/m²).

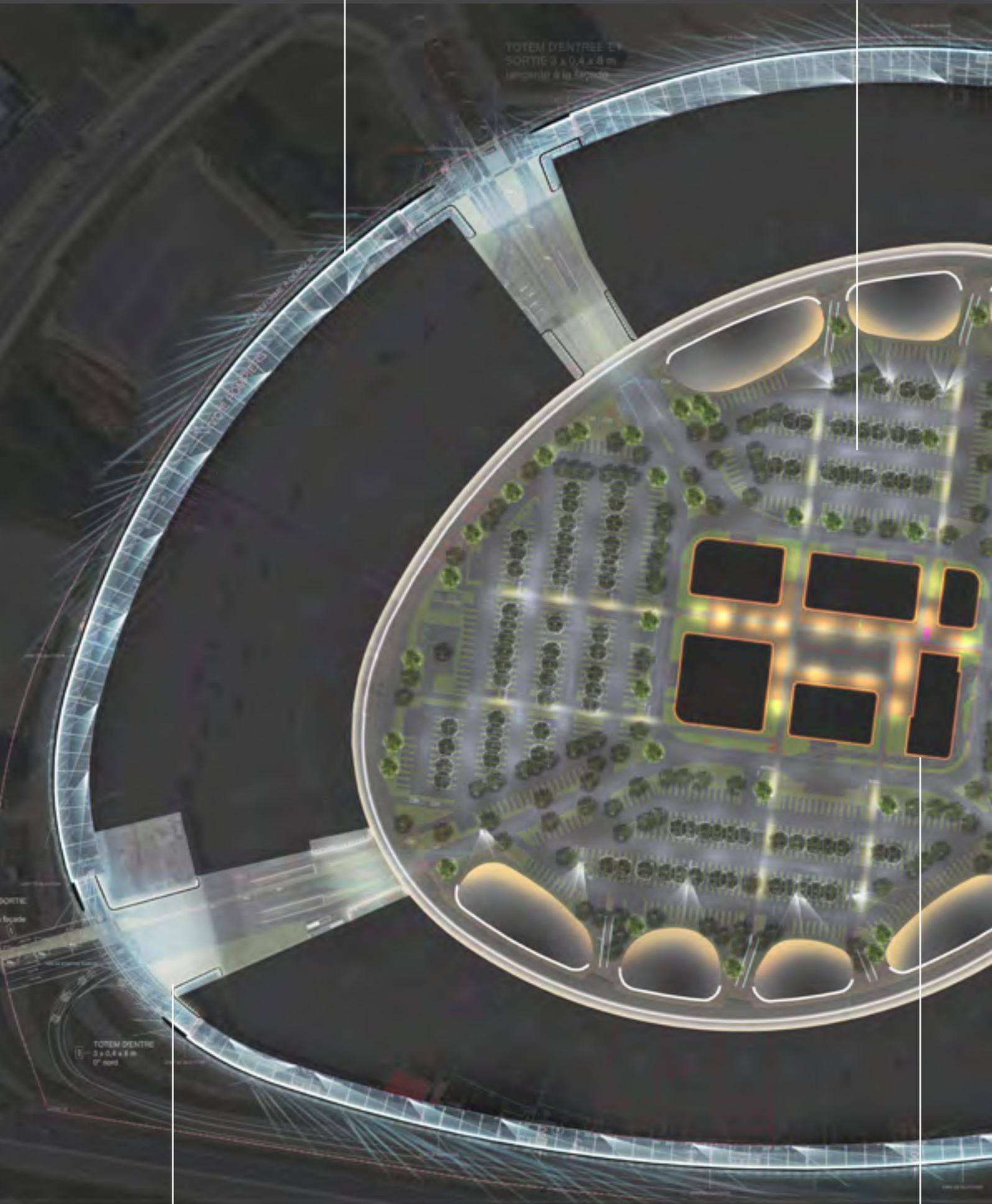
Envisaged maintenance

A maintenance plan has been compiled by the company, overviewed by our company. It incorporates ongoing maintenance tasks as well as a schedule for key maintenance phases:

- twice yearly cleaning of light bowls built in to the ground and spotlights serving the outer layer. Changing light bulbs for these fittings.
- replacement of bulbs in built-in ground fixtures, profile spots and spotlights on the arches every year, with cleaning of light bowls.
- cleaning of light bowls on poles every three years.
- replacing fluorescent light sources and cleaning every 15 years.
- monitoring of the centralised lighting management system every year for five years.

The outside skin is lighted by bias directions of light

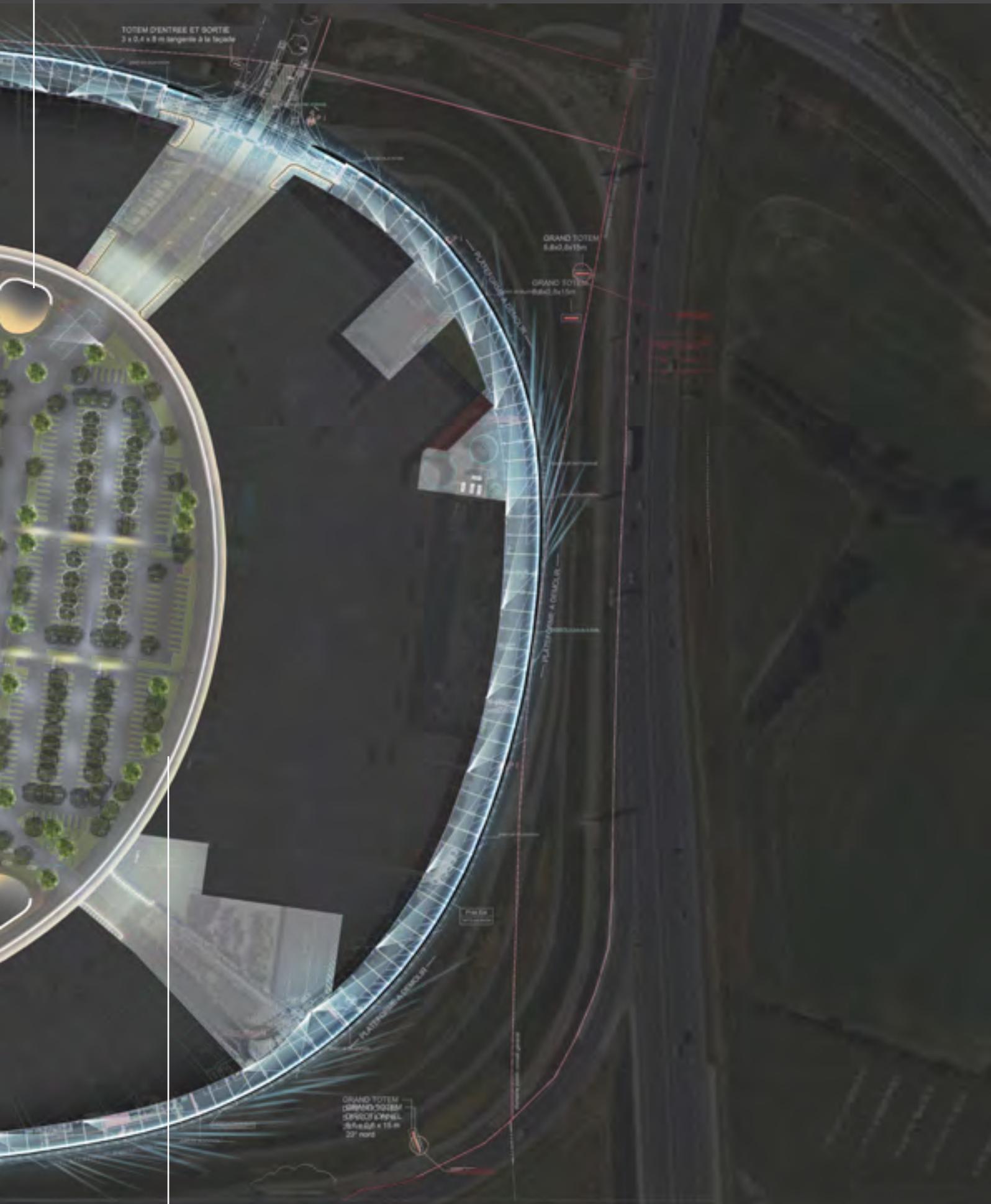
The Parking spaces are lit in cold tones, the paths are strengthened in contrast of hot tint. Here and there, some trees are lighted in low angle shot.



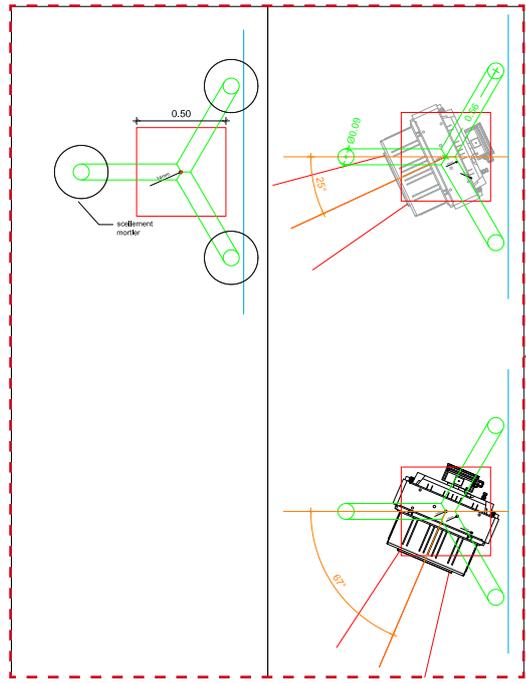
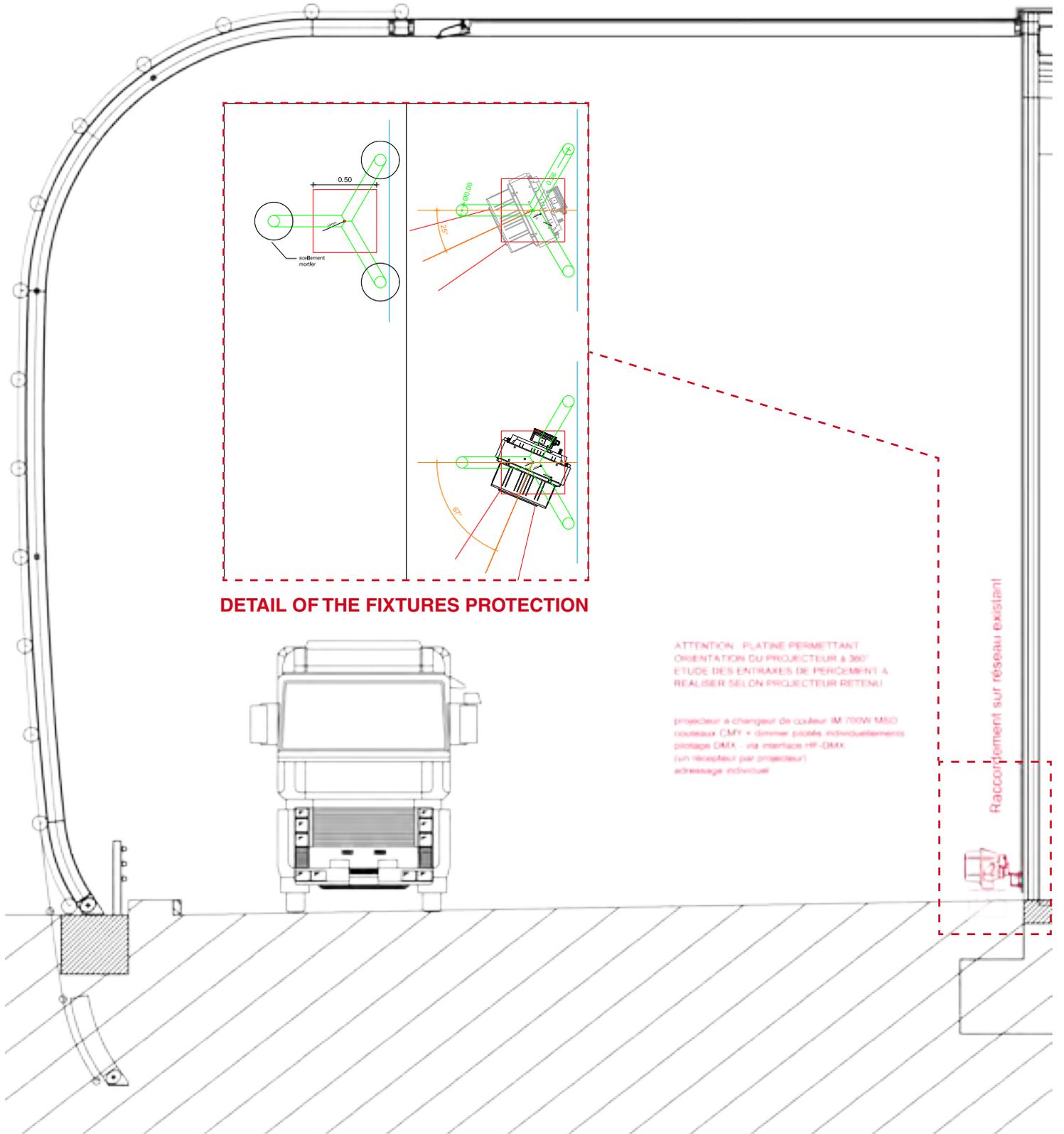
The pillars which mark the entrances are backlit, in soft white tint.

The heart of the site and its wooden platelages are revealed by hot tints

The shape of the «shops pebbles» is revealed by directions of light from the poles of the car park.



The internal skin is underlined by fluorescents which backlight the perforated skin. A cold white ribbon marks the edge of the awning.



DETAIL OF THE FIXTURES PROTECTION

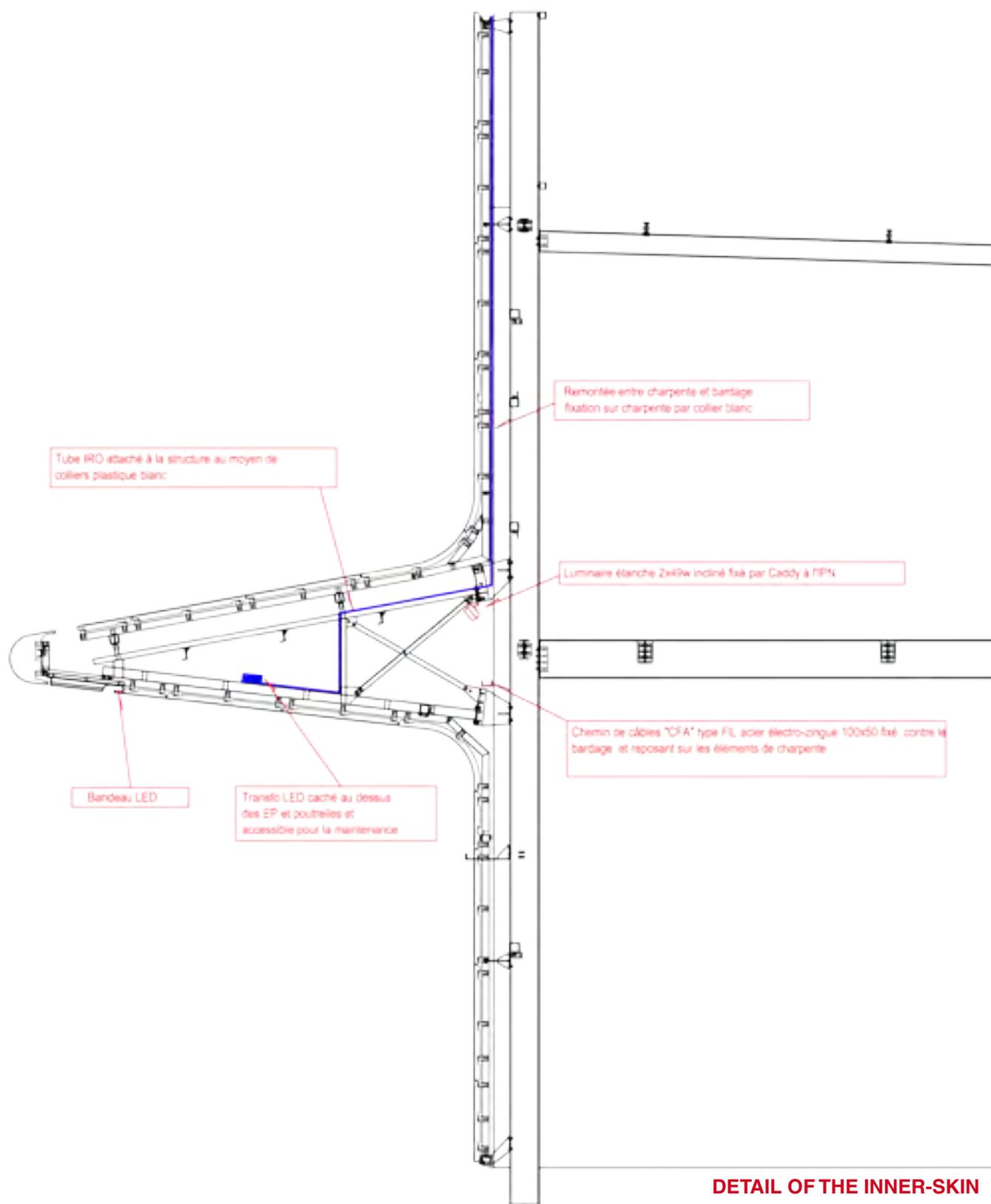


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Aménagement du centre commercial l'Atoll à Beaucozéz

Surface area: 91.000 m² SHON (71.000 m² vente)

Total ground surface: 22 hectares

Amount of parking space : 2700 cars

Global Cost: 180 000 000 \$ eVAT

Client: Compagnie de Phalsbourg

Total outdoor power installed: 189.5 kW

Annual lighting energy cost: 1950 € HT (hors abonnement)

Power installed per surface unit: 0.23 W/m²

Project Management Team

Main architect: A. VIRGA & AAVP V. PARREIRA

Landscape designer: Atelier Paul ARENE

Lighting designer: les éclairieurs

Global engineering: GIREC

Electrical engineering: BFI

Main products and devices:

Lighting fixtures: Eclatec GHM, Platek, Griven,
Iguzzini, Sammode

Lighting Management: Nicolaudie, Wireless solutions



our office

Les éclairieurs is a young, dynamic, driven office, operating in France and internationally. With an annual turnover of \$ 800,000 and a solid team offering a skills set ranging from civil engineering to architecture, we are currently focusing on English-speaking countries and China, while continuing to grow our core business activity in France and Europe.

Today, our office is recognised for its expertise and ability to deliver construction projects to exacting standards while maintaining high attention to detail and future maintenance of the installations. The loyalty of our architect partners and clients bears witness to this.

Growing the network and home automation domains of our light solutions, we are constantly researching innovative solutions, and are able to realise precise, ambitious projects rooted in the technical expertise of our creations.

Our creativity has been crafted through training as well as experience gained from many different partnerships formed with artists, designers and set designers - the drivers of new architecture and civil engineering projects.

les éclairieurs are members of :



les éclairés

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