Great Convent Revival

195-RP-001 Rev00 11/04/2024

Lighting Design Concept Report

dark source

This project was assisted by Mayo LCDC (Mayo Lag) , Mayo North East LEADER Partnership Company/Moy Valley Resources/ and Mayo County Council through the Rural Development Programme which is part-financed by the European Union and the Department of Rural and Community Development.

Comhairle Contae Mhaigh Eo
Mayo County Council

NDP
National Development Plan 2007 - 2013

LCDC
Coiste um Fhorbairt Pobail Áitiúil na hIarmhí
Westmeath Local Community Development Committee

Ár dTodhchaí Tuaithe
Our Rural Future

Oirthuaisceart Mhaigh Eo
Mayo North East

Moy Valley

LEADER

Department of Rural and Community Development

An Roinn Forbartha Tuaithe agus Pobail

Rialtas na hÉireann
Government of Ireland

Tionscadal Éireann
Project Ireland 2040

Arna chomhchistiú ag an Roinn Forbatha Tuaithe agus Pobail
Co-funded by the Department of Rural and Community Development

The European Agricultural Fund for Rural Development:
Europe investing in rural areas

INTRODUCTION

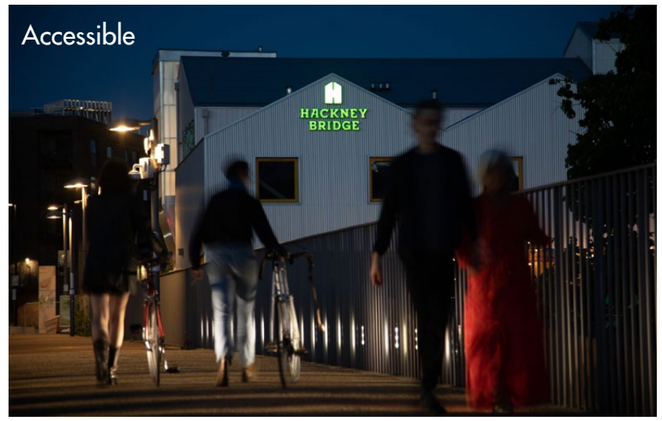
This document is developed by ***Dark Source*** Lighting Design Studio for River Moy Search & Rescue in order to provide information on the lighting scheme proposed for the Convent Regeneration project in Ballina, County Mayo.

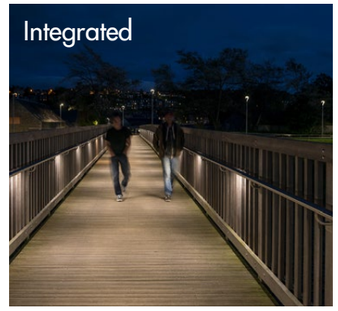
Dark Source is a lighting design studio driven by social & environmental values based in London & Gorey. Specialised in dark sky and environmentally friendly lighting, Dark Source develops unique lighting concepts which enhance the night-time experience of all earthlings.

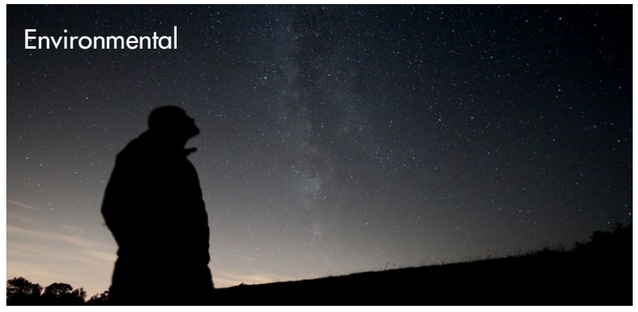
info@dark-source.com
website
instagram

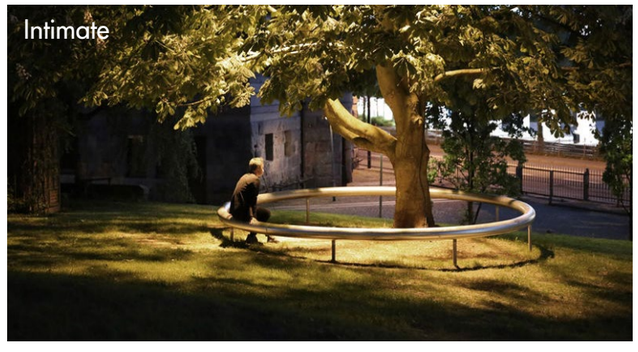
Designed light & dark...

- enhance the visual experience of the architecture & environment.
- create a unique character & atmosphere.
- integrate in the architecture seamlessly without causing visual clutter.
- generate artistic value through theatrical and atmospheric effects.
- extend the social hours by encouraging activity after dark.
- enhance the perception of safety & security.
- improve wayfinding & legibility.
- discourage anti-social behaviour.
- generate night-time economy.
- help reduce energy consumption & running costs.
- create a visual sense of identity & branding.
- improve visual ergonomy.
- reduce light pollution & the impact on biodiversity and environment.









1.0 CONTEXT

A 30,000 sq ft Convent, built in 1867 by the Sister of Mercy has laid vacant and in a state of dereliction since its closure 14 years ago. The ambition to find the new use of the building and the site has led to the regeneration project which is the main focus of the new lighting proposals.

The project consists of the convent building, a gate lodge, graveyard and three adjoining new buildings. Most importantly, the site accommodates a large hard and soft landscaping area which offers a substantial potential for improving the visitor experience.

The project is being supported by University College Dublin, who are leading a master planning exercise for the campus with the aim of understanding how to best repurpose a building of significant heritage value to meet the needs of today's society.

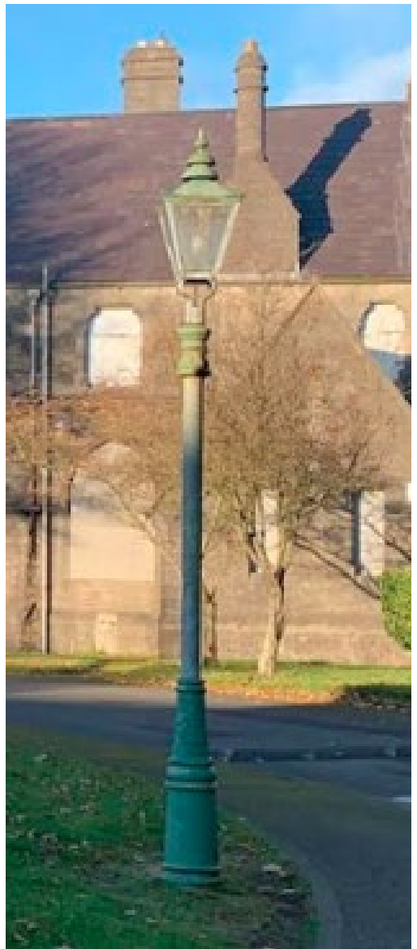
The project team is working to identify areas of potential alignment and opportunities for knowledge sharing with the University of Notre Dame's Church Property Initiative.

DAY

There are several modern interventions & additions were made to the building such as cabling, CCTV and floodlights mounted onto the facade. The lighting project will aim to utilise & improve the existing cabling & luminaire fixing positions as much as possible to minimise further impact on the heritage facade.

The existing heritage light columns on site should be refurbished and new columns should match the heritage style and colour of the previous column to ensure visual consistency across the site.

Internal light source or the post-top lantern head may need to be replaced in order to reinstate the latest LED technology which can project light on the floor plane by minimising light pollution. The exposed bulb style source of the existing lantern is wasteful as it scatters light in every direction.



NIGHT

The current lighting condition of the site is intermittent. There is a mixture of different types of old lighting technologies and colour temperatures. Most of them are quite glary which is rendering the site illegible and hard to navigate whilst throwing light uncontrollably in every direction.

The new design will aim to reinstate a visual consistency & night-time character through eliminating glare and using a consistent colour temperature across the site.
It was also observed that the lighting of the McDermott Street is trespassing & illuminating a large area within the site due to the tall & unshielded nature of the street columns. Implementation of baffles would reduce the back spill and should be explored in liaison with the council.

2.0 CONCEPT

PLAN

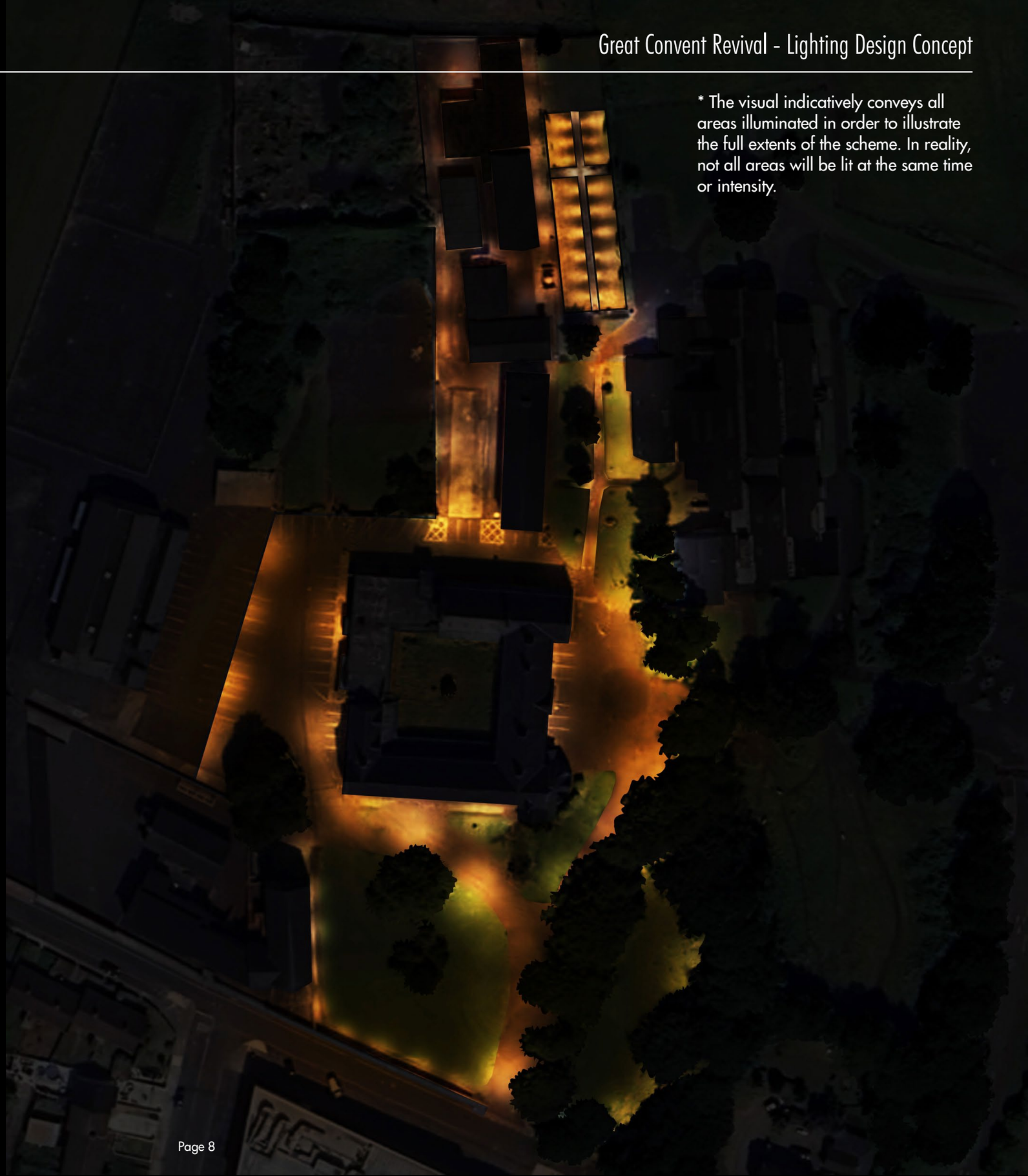
Ireland is a country with a substantial dark skies potential which is yet to be fully explored. It would be wonderful to see the Great Convent Revival Project as an important precedent of responsible exterior illumination in Ballina which is one of the most light-polluted towns in County Mayo along with Castlebar.

Considering that the Artificial Light at Night 2025 Conference will be taking place in Westport, this project offers a tremendous potential for inspiring a wider community about the value and importance of dark skies ethos by setting a flagship example of environmentally responsible lighting.

This effort also represents a rare design collaboration opportunity in developing lighting precedents with a strong environmental protection focus from the beginning, not as an afterthought.

Dark Source wholeheartedly supports the development of such projects where designers, local authorities and communities work together to preserve their dark night skies; an important opportunity which offers residents and visitors to see the real night sky and perhaps encourage them to work towards an even better night-time environment for all humans, animals and insects.

Finding solutions to light pollution with resulting energy savings not only makes a contribution to the well-being of our planet, it also restores our



* The visual indicatively conveys all areas illuminated in order to illustrate the full extents of the scheme. In reality, not all areas will be lit at the same time or intensity.

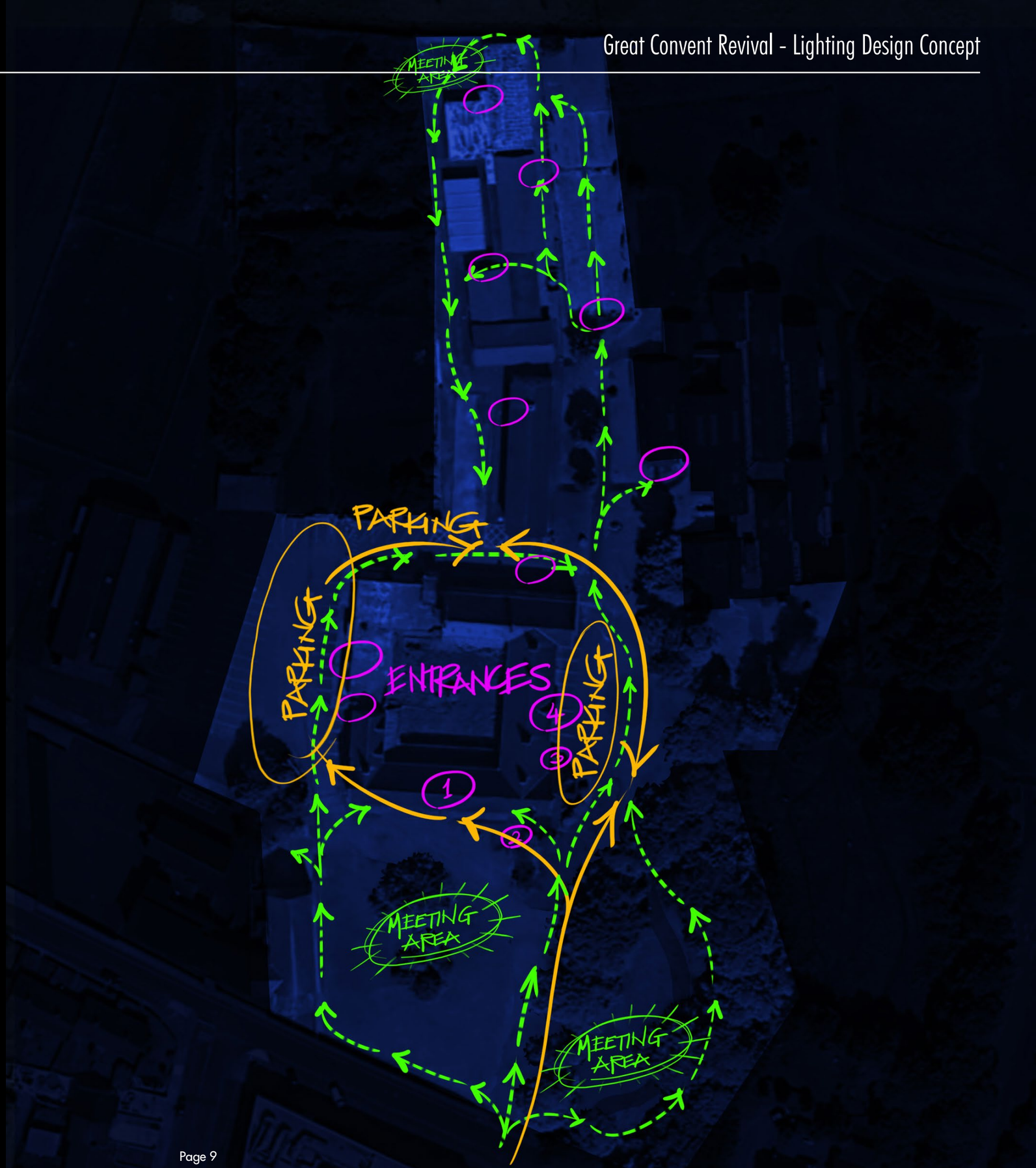
CIRCULATION

The diagram on the right aims to convey the circulation & access flow of the site. Whilst the future of the vehicular access is not yet fully confirmed at this time, the visual retains the existing drive routes & parking areas in combination with the envisaged pedestrian circulation. The ambition is to create a full cycle pedestrian circulation which is also facilitated with the necessary means of illumination after dark.

Green represents pedestrian experience & potentials.

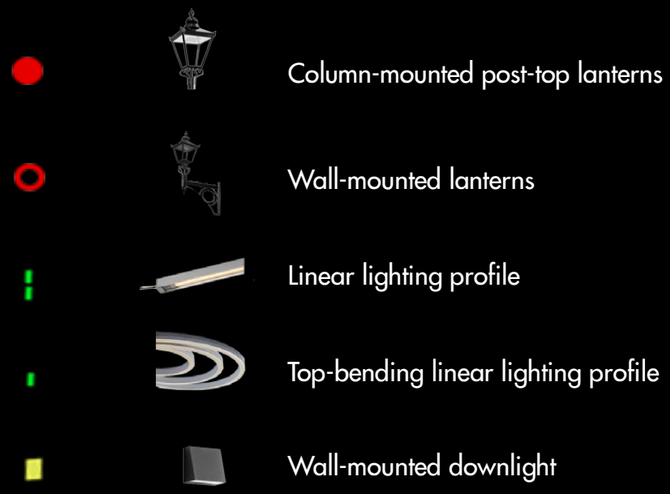
Yellow represents vehicular access & parking.

Magenta represents building entrances.



LUMINAIRE TYPES & LOCATIONS

This diagram conveys the luminaire locations & types proposed in order to achieve the intended lighting effect across the site.



Column-mounted post-top lanterns

Wall-mounted lanterns

Linear lighting profile

Top-bending linear lighting profile

Wall-mounted downlight

Spike-mounted adjustable spotlight

Floor-mounted uplights

Wall-mounted adjustable spotlight

Floor-mounted low level lantern

Directional bollard light

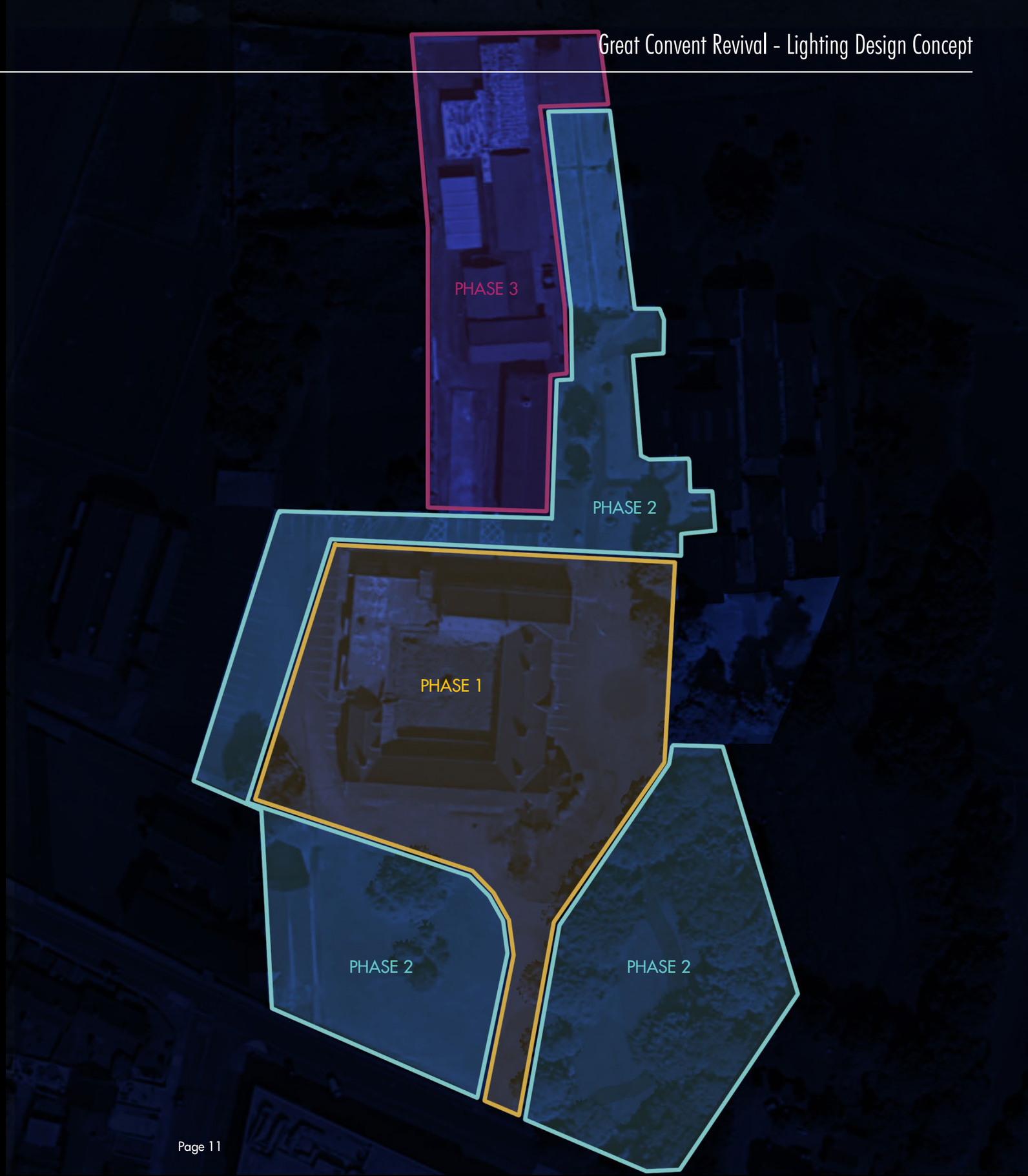
Directional bollard light

Wall-mounted adjustable gobo projector

Handrail-integrated mini downlight

PHASING

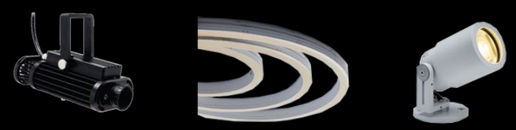
It is likely that the lighting will be delivered in phases in order to enhance the feasibility & deliverability of the project. The lighting-specific diagram shown here is indicative. Where possible, the project will aim to deliver the majority of the groundworks, cabling and trenching during the first phase which will eventually pave the road to the completion of the lighting masterplan.



The lighting design was developed with a judicious approach to avoid excessive levels of illumination and intervention. The aim was to highlight selected features of the architecture without causing light pollution & impact on the heritage architecture. The luminaires and the cable trays will match the colour of the stonework and will be integrated in the mortar joints or follow building perimeter in order to avoid visual and structural impact on the heritage fabric. Where possible, luminaires on the heritage building will be concealed from direct view. On occasions where the lights are visible on the facade, heritage-style luminaires will be used to match & enhance the historic fabric.

Where possible, existing luminaire positions and cabling will be utilised in order to avoid new fixing and minimise the quantity of new lighting points. All luminaires and cabling will need to be made accessible for potential maintenance purposes.

All integration details will be developed with an ethos allowing the new intervention to be reversed & removed when required.



The design strategy employed the following core principles to create a holistic environmental approach to lighting:

1. Don't light unless it's necessary.
Illumination that is not meant for any particular reason or purpose is excluded.

2. Angle it downwards.
The scheme avoids over lighting and clutter by directing light downwards and using the correct beam distribution.

3. Light should be no brighter than necessary.
Our vision is harmed when intense light glares. The design uses lighting sensitively & judiciously to ensure it's comfortable on the eye.

4. Use warm colour temperatures.
2,200 Kelvins or lower are utilised throughout the project as warm colour temperature is least harmful for both the wildlife & the night sky.

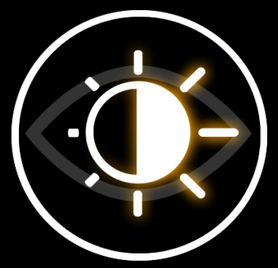
5. Use switch off, dimming or PIR sensors.
By employing remote control, dimming and PIR technology, lights are only on when needed in order to reduce carbon emissions and electricity bills.

6. Use lower mounting height where possible.
Lower mounting height contains light more effectively which is utilised in the large majority of the project.

7. Keep light away from wildlife.
Nature needs darkness to function and be healthy. The scheme avoids illumination of trees, water bodies and potential nesting areas.


1.


2.


3.

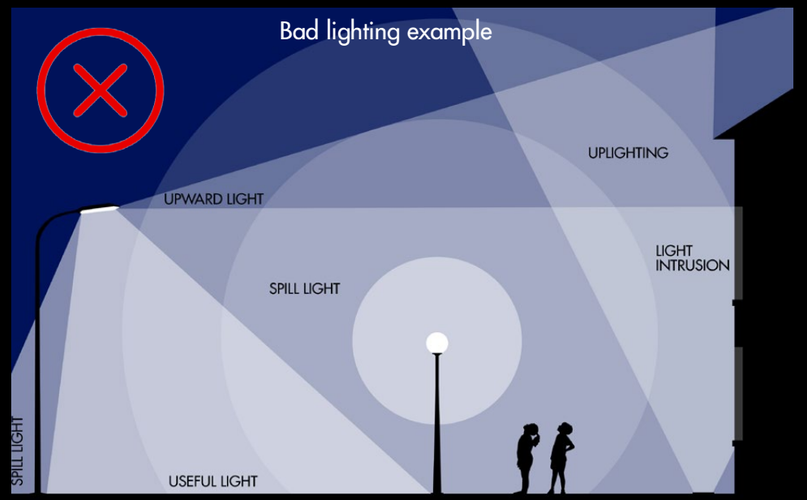

4.

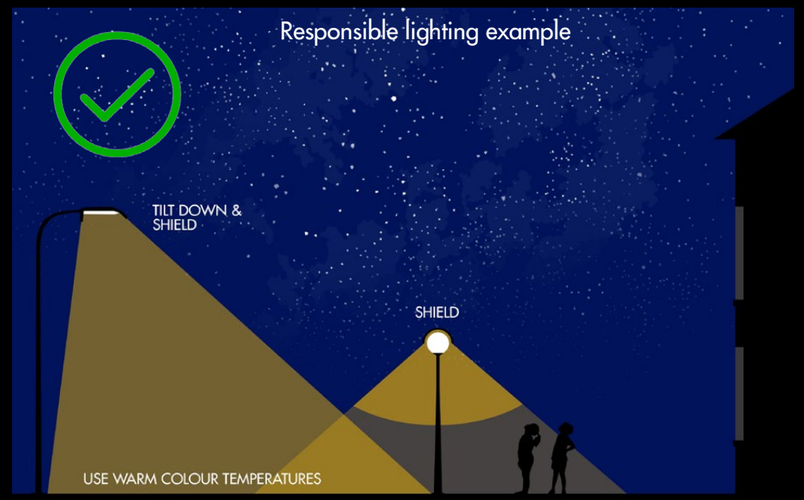

5.


6.

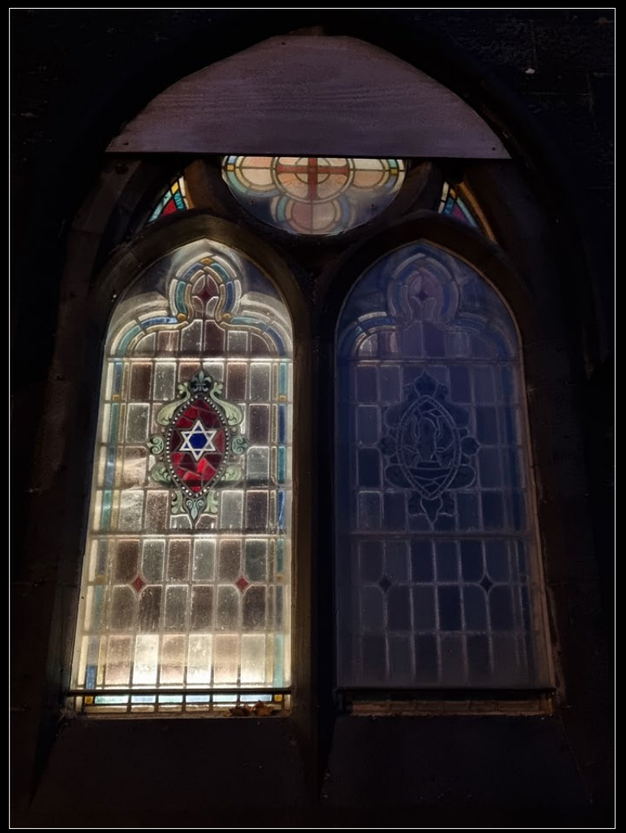

7.

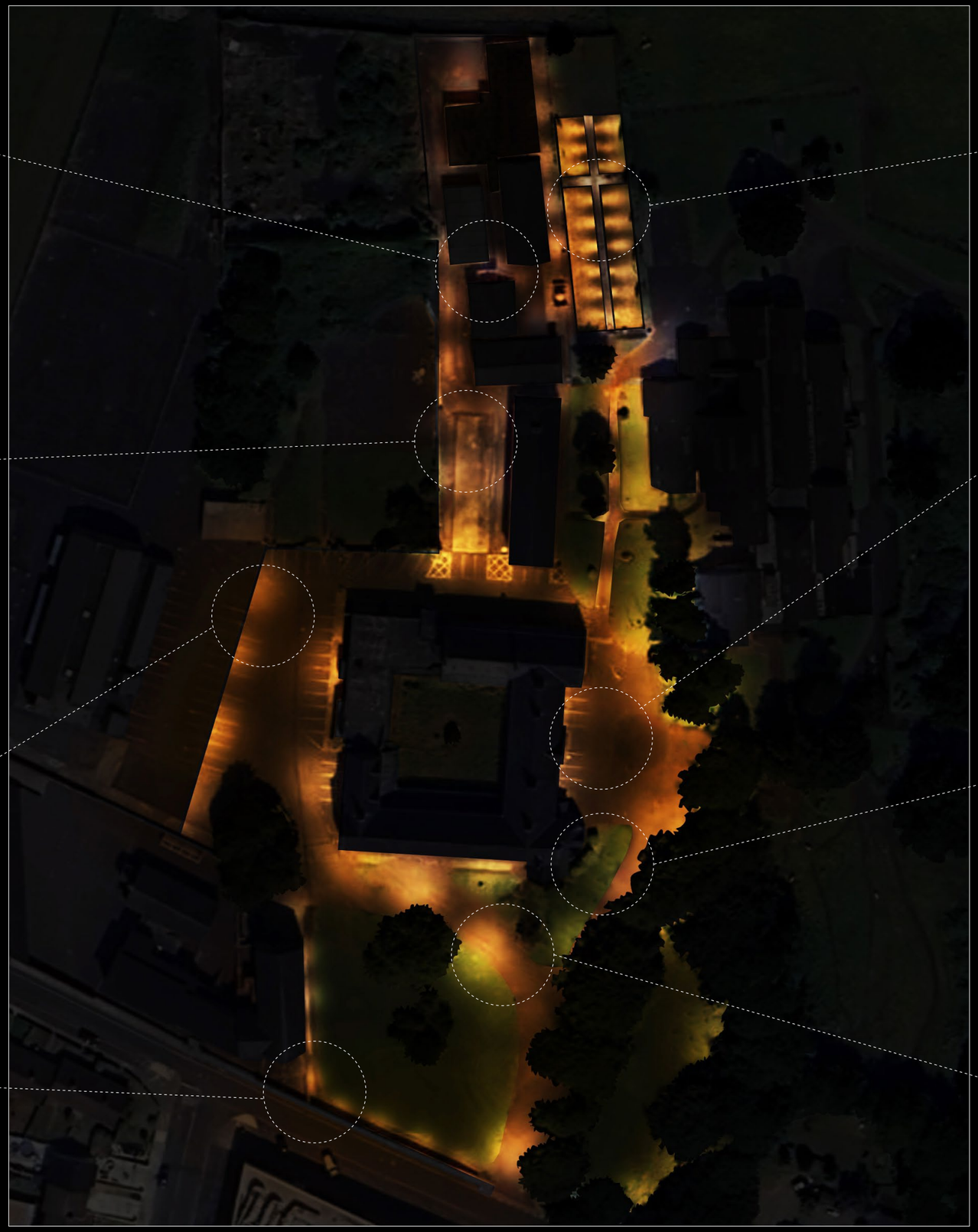
THE RIGHT LIGHT,
IN THE RIGHT PLACE,
AT THE RIGHT TIME.





Mock-ups were carried on site to identify best ways to illuminate the architecture whilst minimising the impact on the heritage fabric. Based on the results achieved on site, it is proposed that the large majority of the integration details for the convent's facade illumination are achieved through locating the luminaires internally. Where possible, existing luminaire positions and cabling will be utilised in order to avoid new fixing.





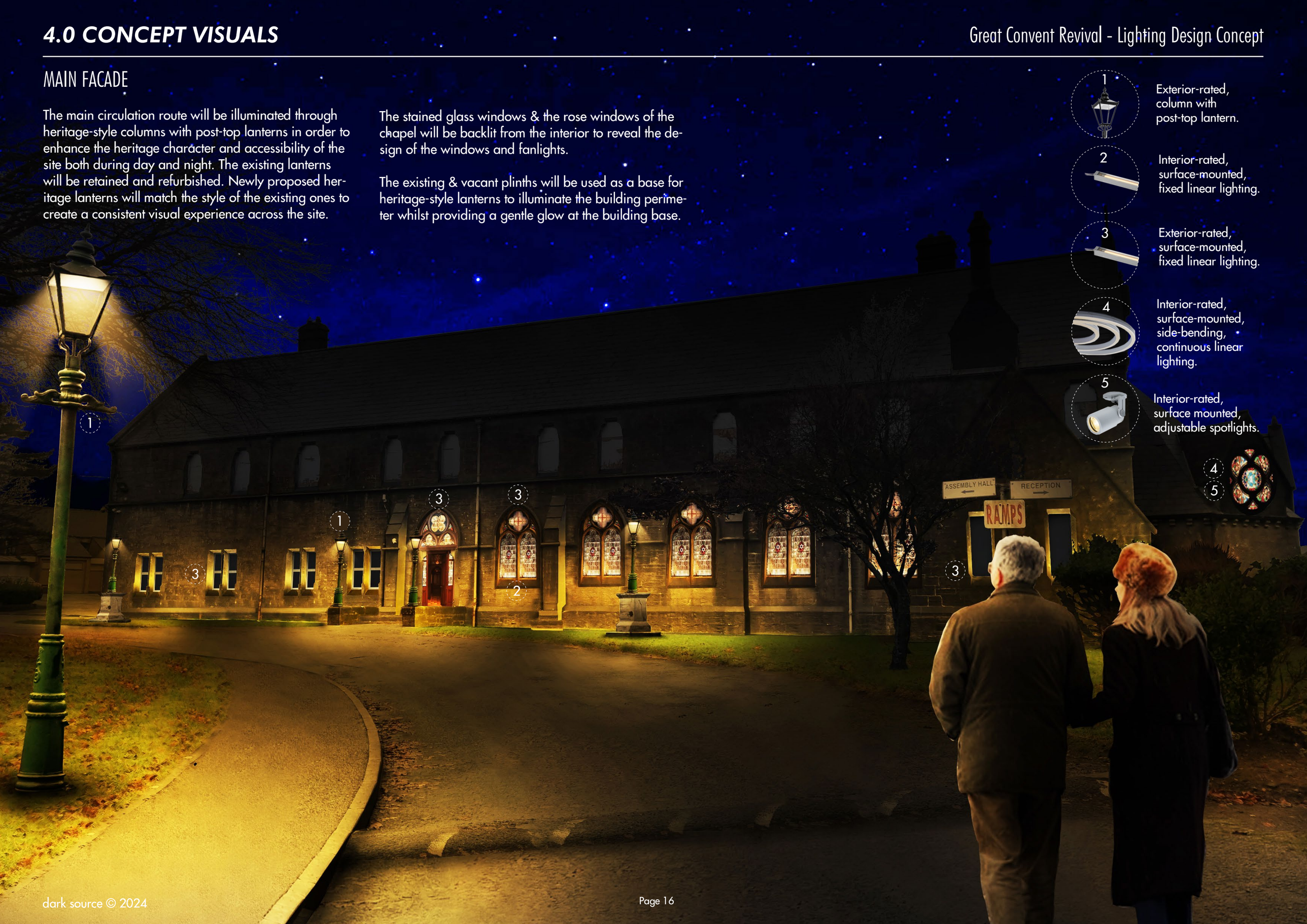
4.0 CONCEPT VISUALS

MAIN FACADE

The main circulation route will be illuminated through heritage-style columns with post-top lanterns in order to enhance the heritage character and accessibility of the site both during day and night. The existing lanterns will be retained and refurbished. Newly proposed heritage lanterns will match the style of the existing ones to create a consistent visual experience across the site.

The stained glass windows & the rose windows of the chapel will be backlit from the interior to reveal the design of the windows and fanlights.

The existing & vacant plinths will be used as a base for heritage-style lanterns to illuminate the building perimeter whilst providing a gentle glow at the building base.



1 Exterior-rated, column with post-top lantern.

2 Interior-rated, surface-mounted, fixed linear lighting.

3 Exterior-rated, surface-mounted, fixed linear lighting.

4 Interior-rated, surface-mounted, side-bending, continuous linear lighting.

5 Interior-rated, surface mounted, adjustable spotlights.

NEW PATHS

It is envisaged that there will be a new path led through the lawn area starting from the gate entrance. The path will be illuminated with bollards which only emit light on one side in order to avoid back spill into the site. The bollards will be in a staggered arrangement to follow the organic flow of the path.

Creating this alternative lit route for the pedestrians will also increase safety by keeping them away from the vehicular traffic.

Exterior-rated, surface-mounted, fixed downlight.

EXISTING PATHS

The paths located adjacent to the site periphery will be illuminated with bollards located in the planter area. It is envisaged that the bounced light from the pavement will gently illuminate the vertical surfaces whilst revealing the texture of the perimeter walls.

Exterior-rated, floor-mounted, bollard lighting.

The old road leading to the reception and the drop-off area may be closed to vehicular access at a later stage but it is proposed that the heritage column lighting from the periphery should continue here to reinforce visual consistency and legibility.

The columns style & colour of the proposed columns have been inspired by the existing lanterns on site in order to match and enhance the heritage aesthetic of the site.

The new walk path (on the right side) which is illuminated with low level bollards in a staggered arrangement will be connected back to the main road here.

1 Exterior-rated, column with post-top lantern.

2 Exterior-rated, surface-mounted, fixed downlight.

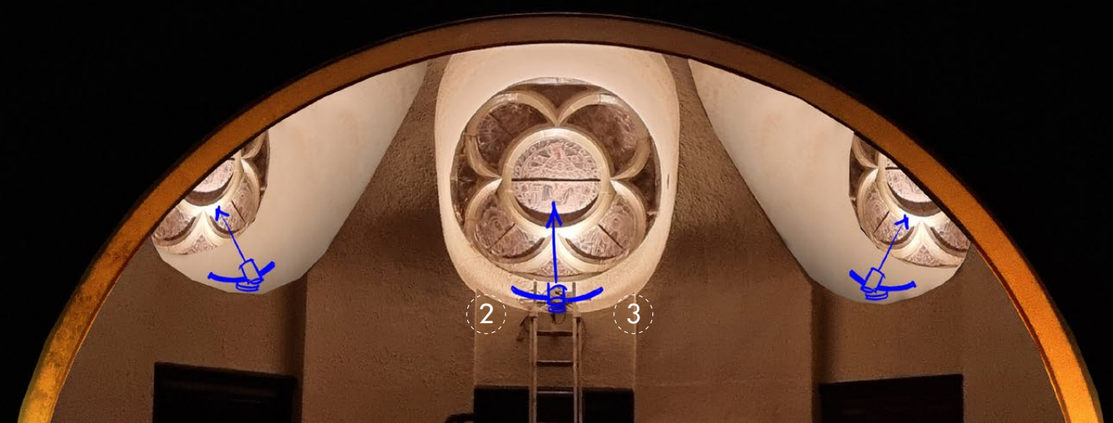
CHAPEL EXTERIOR

The three rose windows will be backlit from the chapel interior to reveal the rich & colourful composition of the design whilst concealing all luminaires from outside view. The shrine of Mary on the facade will be carefully spotlit from the pitched roof level with a narrow beam luminaire to reveal the sculpture whilst framing the light spill within the facade.

1 Exterior-rated, surface-mounted, adjustable spotlights.

2 Interior-rated, surface-mounted, adjustable spotlights.

3 Interior-rated, surface-mounted, top-bending, continuous linear lighting.



CENTRAL FACADE

The central facade informs a very important vista for the architecture as it will be experienced by all visitors accessing the site or using the entrances on this side. Ground floor and central windows on both floors will be illuminated with linear uplights mounted at the base of the window sills and concealed with the help of L-profiles matching the colour of the stonework.

The existing light fitting and cabling over the main entrance door will be replaced with a heritage style lantern which will be mirrored on the other side in order to reinforce the sense of centrality whilst spreading the illumination further over the facade and the adjacent car parking area underneath.

1 Exterior-rated, wall-mounted lantern.

2 Exterior-rated, surface-mounted, fixed linear lighting.

3 Exterior-rated, surface-mounted, fixed, custom uplights.

4 Exterior-rated, surface-mounted, adjustable spotlights.

5 Interior-rated, surface-mounted, adjustable spotlights.

6 Exterior-rated, handrail-integrated, fixed downlight.

Uplighting of the entrance door from both sides will emphasise the door and fanlight design above it. Uplighting effect will be contained within the arch of the architrave.

Fanlights and the high level circular window will be backlit with spotlights to reveal the design of the glasswork.

The side entrance will be illuminated with a mini downlight integrated within the existing handrail.

The lighting for the northern site predominantly consists of the refurbishment of existing luminaires. The light fitting over the convent's side entrance and the two standard columns adjacent to the car park will be replaced with heritage-style lanterns to match the native fabric.

Wall-mounted contemporary downlights will be mounted on the new buildings to reinforce a consistent visual experience. There is an opportunity to commission a mural or gobo (static image) projection on the adjacent facade to enhance wayfinding and character of the site. The illumination for this is envisaged to be achieved by clamping the project on the drainage pipe to avoid fixing on to the facade.

The back side of the building complex mostly consists of a car park and the neighbouring new (non-heritage) building facade. Cancelling out the high level floodlights, it is envisaged that the facade & the site perimeter can be consistently illuminated with downlights at a more reasonable height. This can be mirrored with the downlighting of the new boundary wall which will be built facing the rear facade.

In addition, both ends of the site periphery will be illuminated with heritage style columns in order to provide sufficient illumination for the mixed traffic.

The well-landscaped nature of the graveyard and the plans to connect it to the site-wide circulation offers a great opportunity for providing a special illumination for this area. Spike-mounted spotlights can be placed in the planter adjacent to the paths to illuminate the flanking walls whilst revealing the inscriptions on the gravestones.

The sculpture of the Christ at the end of the path can be gently illuminated to create a focal emphasis and a lit boundary which can inform a sense of distance and legibility.

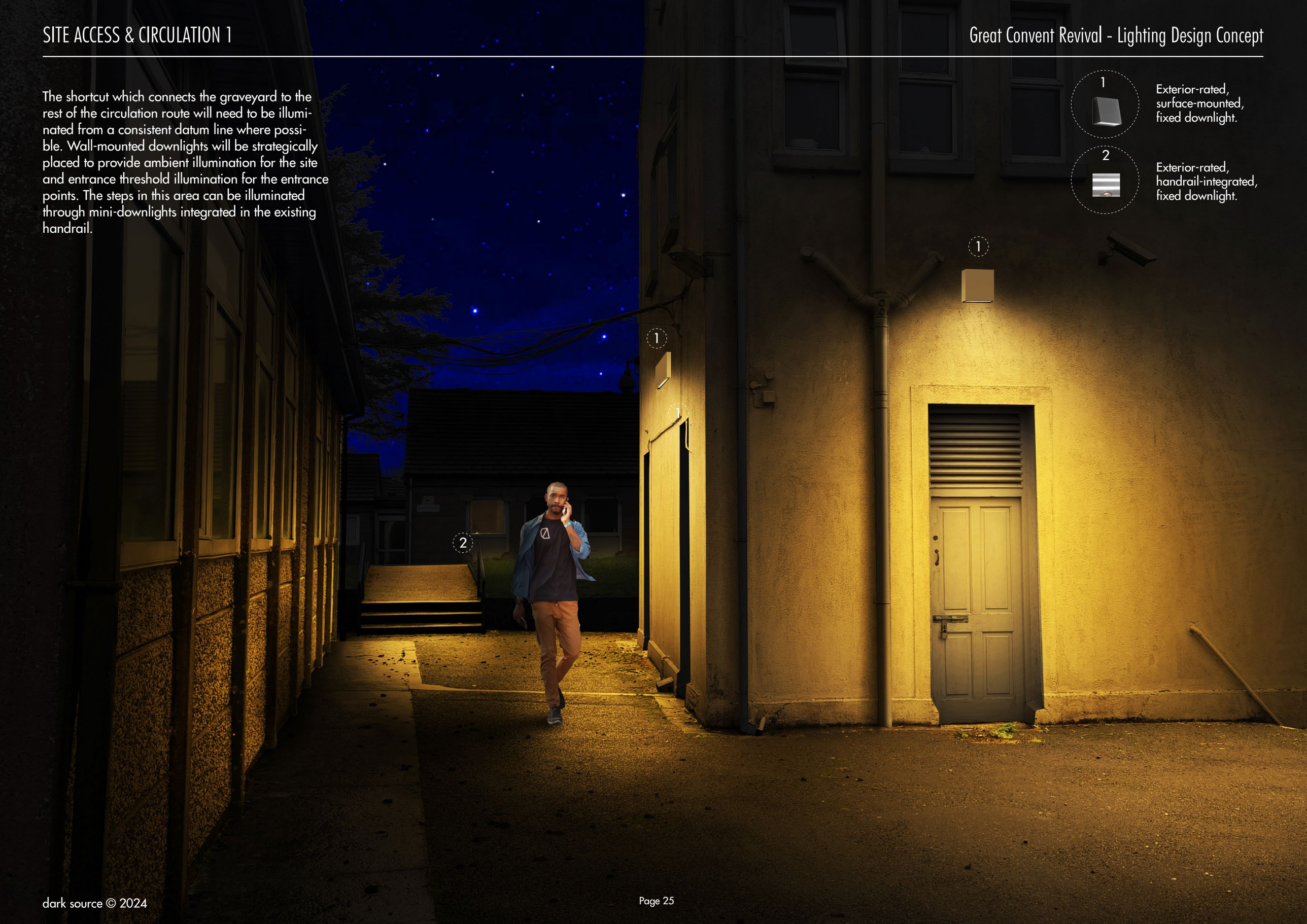
The steps are to be illuminated with floor-mounted lanterns on top of the existing plinths to improve visibility and aid safe access to the site.

1 Exterior-rated, spike-mounted, adjustable spotlights.

2 Exterior-rated, surface-mounted, fixed linear lighting.

3 Exterior-rated, floor-mounted, fixed lantern.

The shortcut which connects the graveyard to the rest of the circulation route will need to be illuminated from a consistent datum line where possible. Wall-mounted downlights will be strategically placed to provide ambient illumination for the site and entrance threshold illumination for the entrance points. The steps in this area can be illuminated through mini-downlights integrated in the existing handrail.



1

Exterior-rated, surface-mounted, fixed downlight.

2

Exterior-rated, handrail-integrated, fixed downlight.

The circulation route is envisaged to extend the pedestrian experience all around site through a consistently illuminated corridor. The walls will be downgraded with surface-mounted down-lights to boost visibility through illuminating both the vertical and horizontal surfaces. The grazing effect will reveal the texture of the wall whilst creating visual interest for the views from the neighbouring interior spaces.

1

1

Exterior-rated, surface-mounted, fixed downlight.

SITE ACCESS & CIRCULATION 3

The return path back to the main building can benefit from both downlighting placed above entrance thresholds and lanterns located on the perimeter wall with columns. This would allow sufficient illumination for the widening path but also aid wayfinding by revealing the site boundaries. The lanterns will need to have back shields in order to block off the lights going into the neighbouring site.

1 Exterior-rated, column with post-top lantern.

2 Exterior-rated, surface-mounted, fixed downlight.

LIGHTING CONTROLS

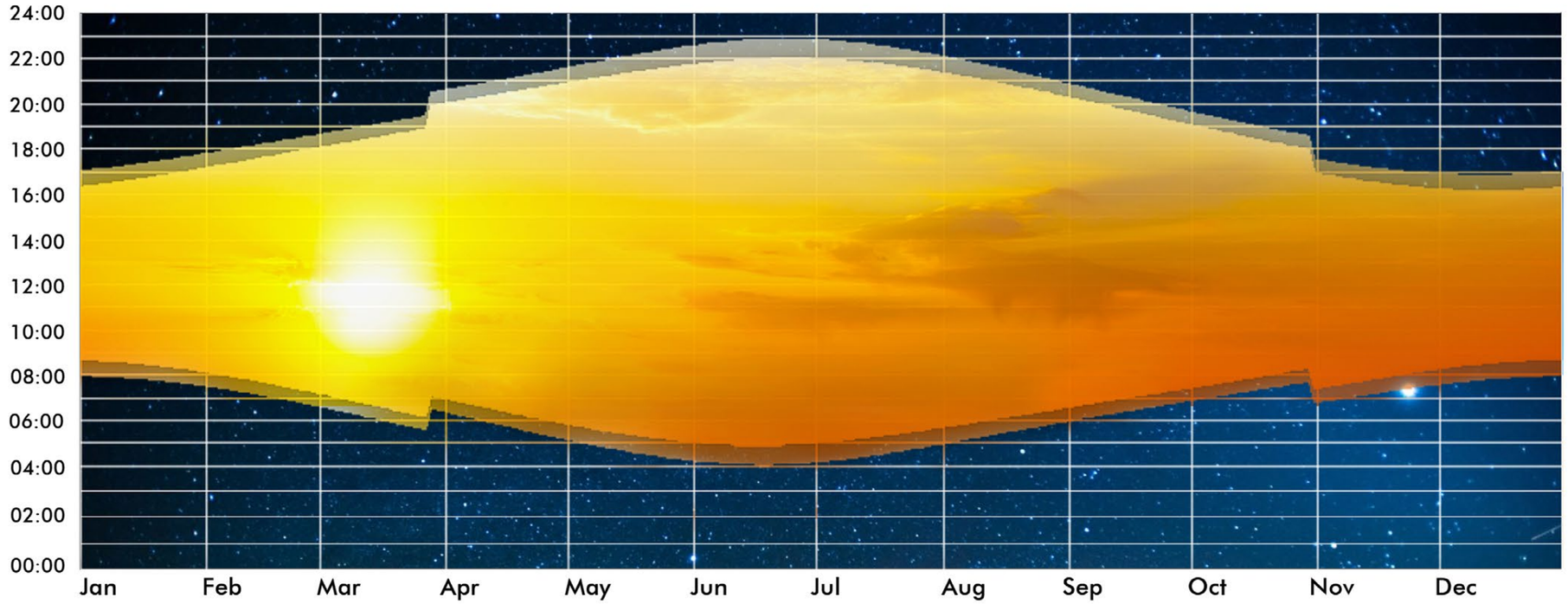
The project aims to utilise the latest lighting control technology to ensure that energy waste and the adverse impact of illumination are eliminated when the visitor footfall is minimal.

Dimming is one of the key features which LED technology offers. When used correctly, dimming can help reduce skyglow, energy usage and the impact on flora and fauna whilst prolonging the lamplife. Therefore, it is important that the project implements key dimming parameters which respond to different times of the day such as the early evening, late night and the curfew:

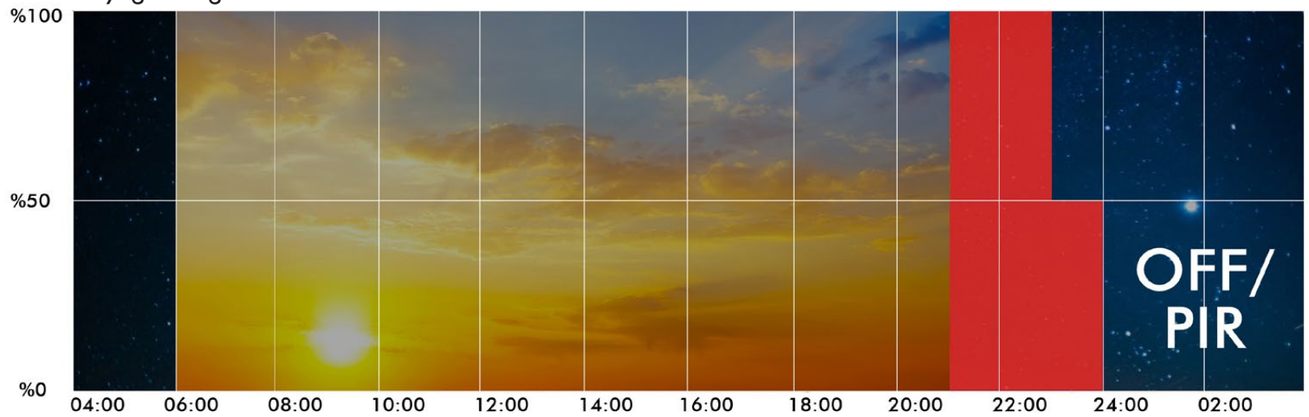
Sunset: Detect the lack of daylight to come ON
Evening: 100% until 10:30pm.
Night: 50% until midnight.
Curfew: PIR or OFF until dawn.

Movement sensors can be used as a secondary control measure to dim the lights down or switch them completely off when no activity can be detected in a given area.

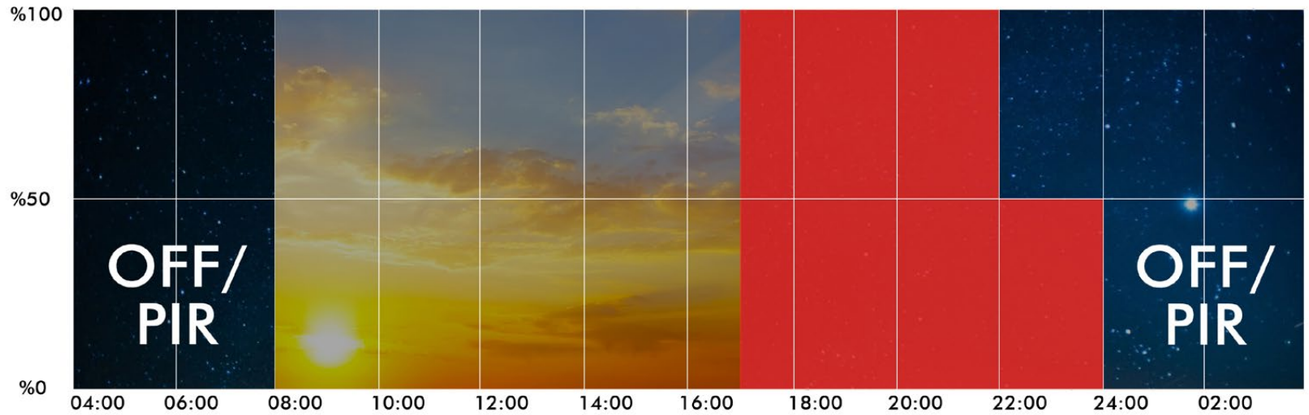
Exact details of the controls strategy are to be confirmed.



Daylight diagram



Summer operation hours



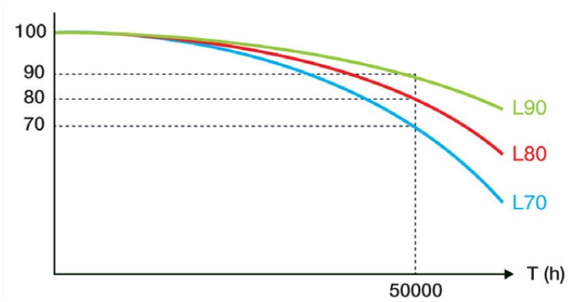
Winter operation hours

Passive Infrared Sensor (PIR) Example

The design is developed with an ethos which focused on the longevity, durability and environmental sustainability of the lighting equipment as well as the lighting design. These principles can be found summarised below:

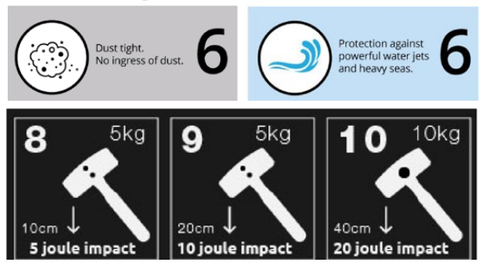
1) ***Energy Efficiency*** should not drop below 40 lumens per watt to avoid waste & to maximise the efficiency which LEDs can offer.

2) ***Lamplife*** should not drop below LM70 to ensure longevity. This means that the luminaire will still be able to produce 70% of its original output even after 50,000 hours of operation.



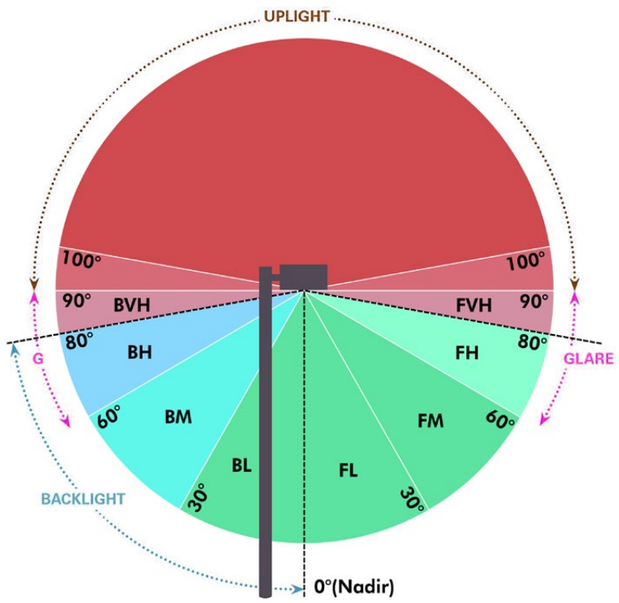
3) ***Build Quality*** To ensure durability of the specified equipment, it is advised to select luminaires with appropriate IP (Dust & water resistance) and IK (impact resistance) ratings.

Ingress Protection



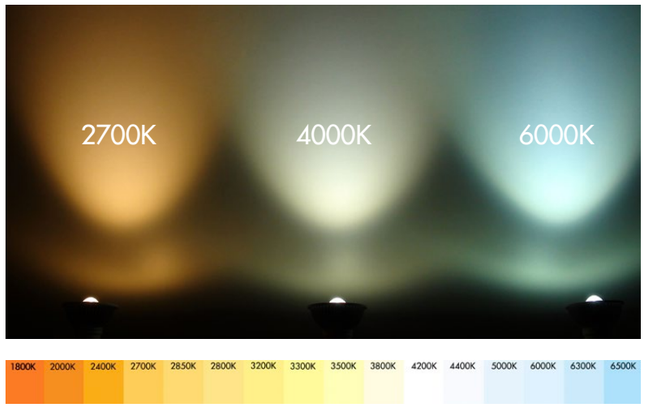
Impact Protection - IK 08, 09, 10

Light Distribution is a very important feature of a dark sky friendly luminaire. Light should only be projected downwards and luminaire's beam **should not exceed 80°**. Narrower the beam, lesser the glare. If backspill is not acceptable, the beam should be narrow & asymmetric. Zero ULOR (Upward Light Output Ratio) and Full Cut-Off means that the luminaire does not emit any light above the horizon line.



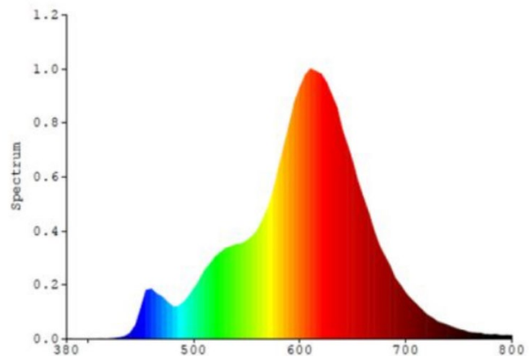
BUG Rating - Bead Distribution Diagram

Colour Temperature is often referred to as the CCT of the source. Cool white (or the blue-rich) lighting is the most harmful to wildlife and humans. There is a substantial growing body of evidence that shows that the colour temperature, CCT of the lights can be particularly disruptive to circadian rhythms, sleep patterns and the production of melatonin. Only 2200K and warmer will be utilised in the project..



CCT range

Colour Rendering Index (CRI or Ra) is a quantitative measure of the ability of a light source to reveal the actual colours of an object or space. Broad spectrum should be avoided to eliminate the spill of harmful wavelengths, particularly in the Ultra-Violet which affects wildlife. Exterior lighting CRI **should not exceed Ra90.**



Example of a 2200K Ra80 CRI Spectrum

Great Convent Revival

195-RP-001 Rev00 11/04/2024

Lighting Design Concept Report

dark source