

Water Eaton

PR6a : Land East of Oxford Road

Environmental Statement Appendix 12.2:
Lighting Parameters

Bellway


STRATEGIC
LAND



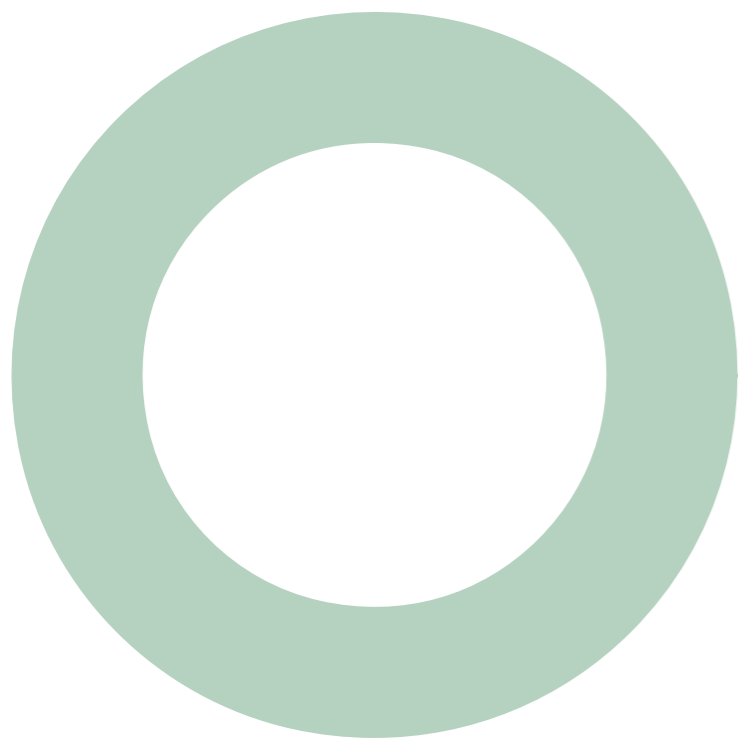
WE / LIG2/ P01

PR6A - Land east of Oxford. Savills.

16-16913

LIGHTING PARAMETER PLAN
PR6A - LAND EAST OF OXFORD.
JULY 2022

DOC-16-16913-5A-20220705-PR6A-JB-PP-01

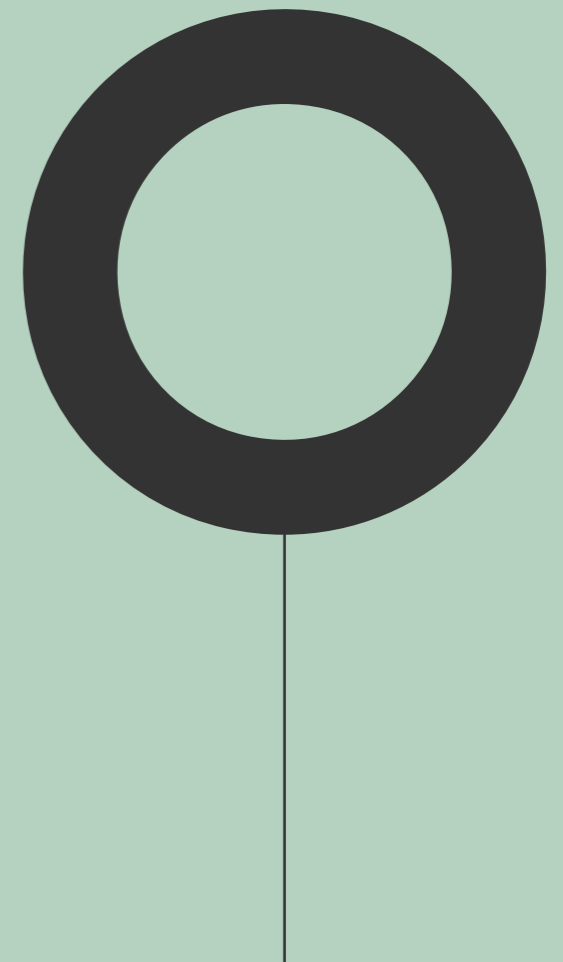


Audit sheet.

Rev	Date	Description	Prepared	Verified
01	05/07/2022	Preliminary Issue	JB	DDM

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Introduction.



Introduction.

This document is intended to provide guidance on the illuminance levels required for safe and comfortable operation of the site, the typical types of luminaire and nominal mounting heights.

It does not provide specific details on equipment suppliers but serves to give generic guidance on a strategy suitable for the environmental zone advised and gives recommendations on strategies which may be utilised to satisfy relevant legislation and guidelines.

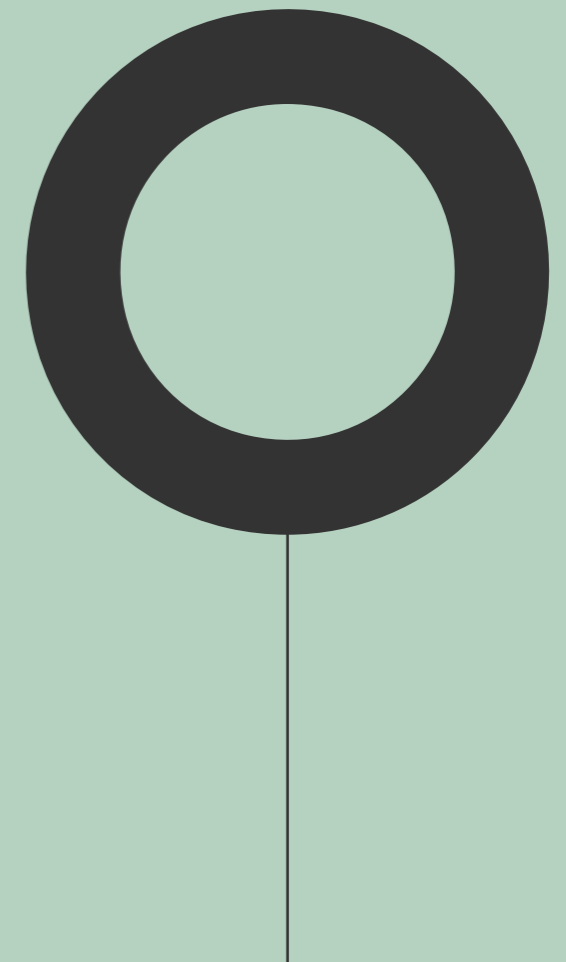


1.0 Proposed development summary.

Shown below is a plan view of the site, the proposal for planning is for residential purposes.



Lighting design considerations.



Lighting Design Considerations.

Approach & Objectives

The purpose of landscape lighting is to create external realm spaces which are inviting, safe and can be enjoyed at appropriate hours. For spaces such as this, it is also important to make an environment which is visually interesting as it forms a vital interaction point for visitors to the development.

A textured approach to the lighting is proposed with a background illuminance, for safety and interaction, balanced with illumination to key landscape features.

The creation of exciting lighting environments can enhance the specification and commercial success of a space by creating a vibrant visual identity for the development within the nightscape.

The above approach will develop a scheme that is safe, secure and accessible via a sustainable approach while minimising light pollution to residents and on an ecology basis.



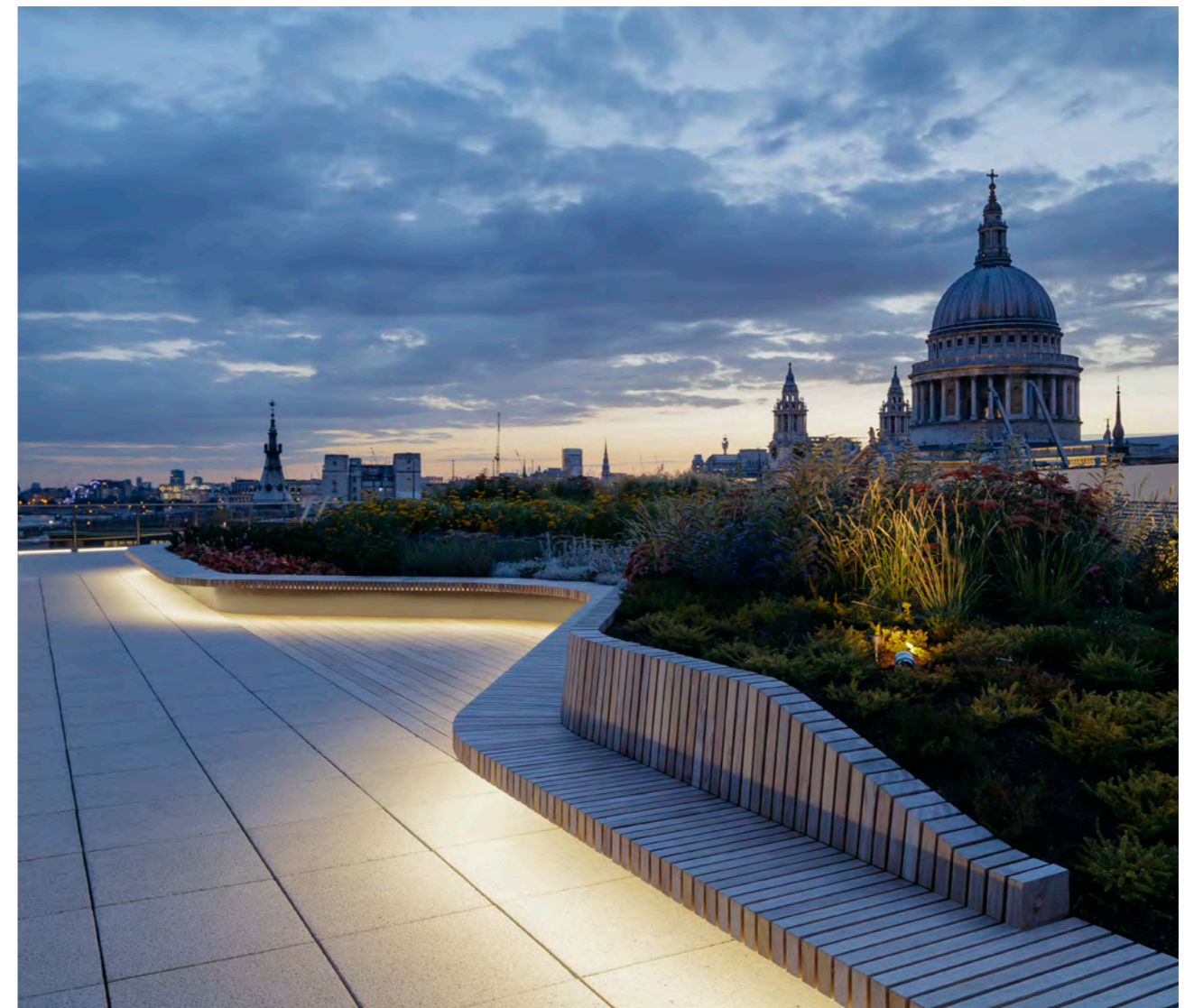
Lighting Design Considerations.

External Lighting

The first question people ask regarding exterior lighting is "why light at all?". Excluding street lighting, most unplanned exterior lighting installations appear as a decorative indulgence which consume valuable energy resources and result in potential glare and light pollution.

By contrast, good exterior lighting can play a positive role in the way people feel about their environment; it can reveal and enhance our buildings aesthetically, improve our sense of local identity, safety and civic pride and make people more willing to use the streets, squares and parks after dark. Used correctly exterior lighting can thus boost an area's night-time use and commercial viability. For all these reasons it is generally accepted that effective, varied lighting of buildings and townscapes, both public and private, is a sound investment, that well justifies the relatively small capital and energy costs involved.

A badly-designed lighting scheme distributes light where it is not wanted, causing light pollution, while wasting energy unnecessarily and creating poor visual environments. Designed lighting solutions create better exterior schemes and give a new dimension to the urban environment at night rather than, the all too often, so called 'functional' lighting approach which adds little to the night scene.



Lighting Design Considerations.

Safety & orientation

The amount of lighting required for obstacle avoidance and visual orientation is minimal. For example, emergency lighting standards suggest a value of between 0.5 and 1 lux for a person, in a high stress situation, to safely negotiate a safe passage. Often these low levels of illumination are provided by existing light spill and moonlight alone.

In reality the purpose of urban realm pedestrian lighting is not one of obstacle avoidance, but of human subjectivity. Research has shown that the ability to read a persons facial features in external realm environments is a key function in reducing "fear of crime".

Appropriately illuminated pedestrian areas can reduce fear of crime, which is known to encourage footfall – this in turn can increase natural and community surveillance and further deter criminal acts.

A pleasing and visually interesting exterior environment can be further enhanced by creating spaces and zones of interaction which encourage residence to utilise spaces in the evening.



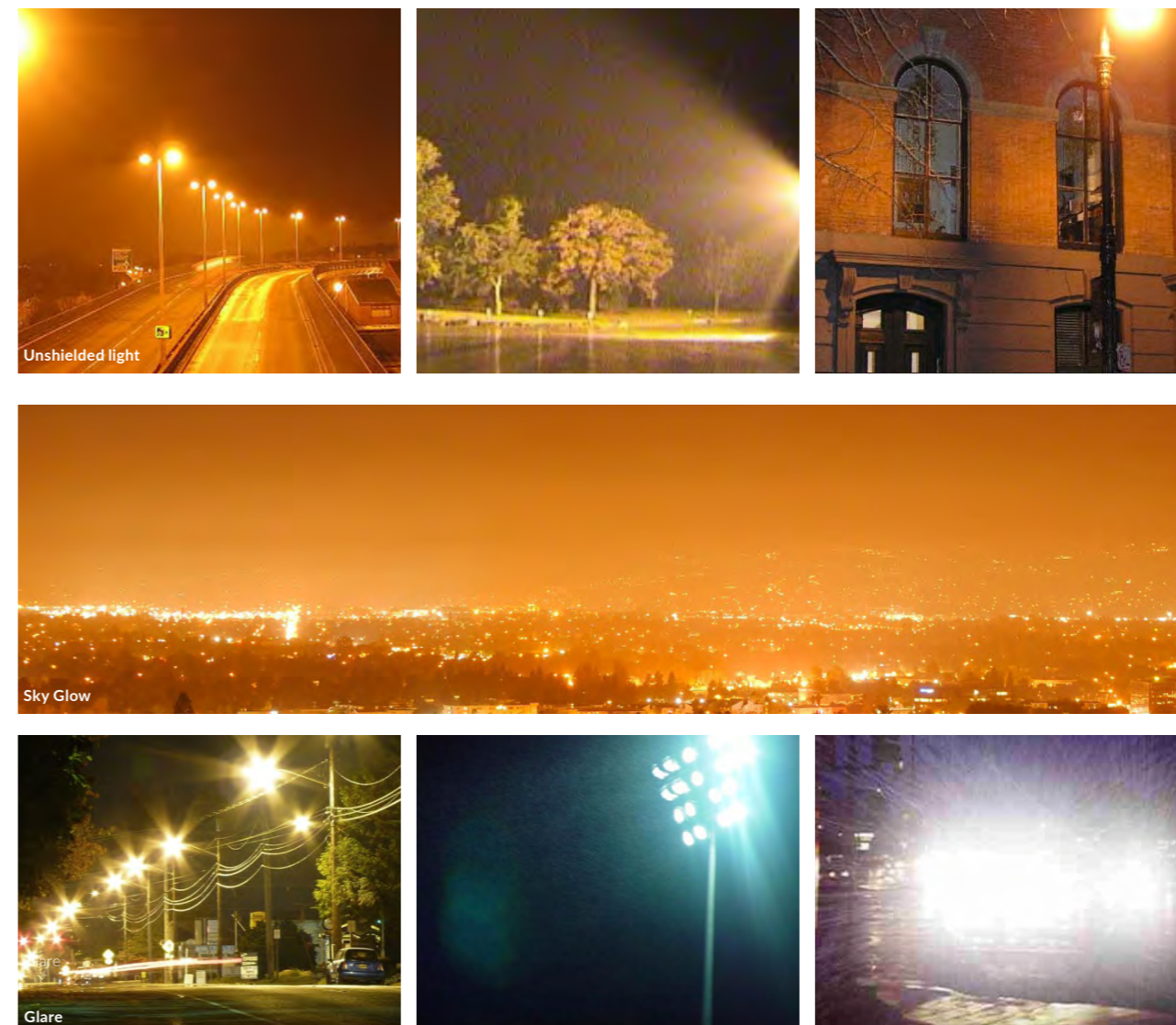
Lighting Design Considerations.

Light Pollution

The general heading for the negative effects of light at night is Light Pollution but this heading actually covers four key factors. These are:

- Glare occurs when the site user sees light directly from the fixture (or lamp) and contrast ratios are high.
- Light spill/intrusion: Poor outdoor lighting shines onto neighbourhood properties and into bedroom windows, reducing privacy and hindering sleep. Consideration needs to be paid to areas of sensitive ecological areas, including waterways, as to not hinder wildlife.
- Sky Glow: A large fraction of poor lighting shines directly upwards, creating the adverse sky glow above towns and cities that washes out views of the dark night sky, taking away an important natural resource.
- Energy Waste: Much outdoor lighting wastes energy because it is not well-designed with light not directed where it is required.

There is legislation as part of the 'Clean Neighbourhoods and Environment Bill' which covers lighting as a social nuisance, although there are many exclusions, it does start to highlight the importance of well designed external lighting as a integral part of the modern urban landscape.



Lighting Design Considerations.

Colour Temperature and Colour Rendering

When one considers colour in light it is important to consider the colour of white lighting. Like daylight and sunlight, the range of colours available within the white spectrum.

Changes in white colour temperature are often an intuitive experience for people, as it relates to the natural rhythms of daylight.

Different colours of white light will provide different impressions and have differing properties when it comes to rendering surface finish.

Impressions of character and impact can be expressed through the appropriate use of colour.

The visual impact of coloured light changes in relation to illumination levels, be that through daylight or artificial light sources.

By understanding the eye's sensitivity to colour one can utilise coloured light to create a strong visual impression that would have required a greater amount of energy to achieve in white light.

Hoare Lea recommend using a warmer white light colour temperature of 3000K in order to create a balance between the two spaces. Warmer colour temperature of light is also recommended in areas where ecological considerations need to be made.



Lighting Design Considerations.

Feature Elements

Providing certain lighting treatments to landscape details and illuminating key vertical surfaces will make all spaces feel inviting and comfortable to use.

Please note that the above statement does not give us as lighting designers the freedom to do as we please or desire. There will need to be design rationale which will be focused towards providing a cohesive layered approach. Hoare Lea Lighting feel that a layered approach to feature landscape elements should be low level with close attention paid to light distribution to these feature elements. Also, providing focused illumination to key vertical elements can provide perspective recognition which is required when persons travel through any space.



Lighting Design Considerations.

Ecology

In conjunction with ecology reports and the proposed site development plans a lighting strategy can be formed to eliminate or mitigate the potential effects of lighting onto surrounding light sensitive areas.

For further information on the lighting impact to the site please refer to the Hoare Lea Lighting Impact Assessment.



Lighting Design Considerations.

Lighting Controls

The use of lighting controls is something to consider. It can enable variation and can ensure the scheme is used efficiently dependant on usage, through the control of grouped fittings and their lighting output.

Different lighting treatments shown throughout this document could be utilised to be kept on for alternative lengths of time/brightness dependant on the needs or requirements of the given area.

Things to consider:

- Astronomical time clocks
- Photocells
- Dimming
- Curfew times



Lighting Design Considerations.

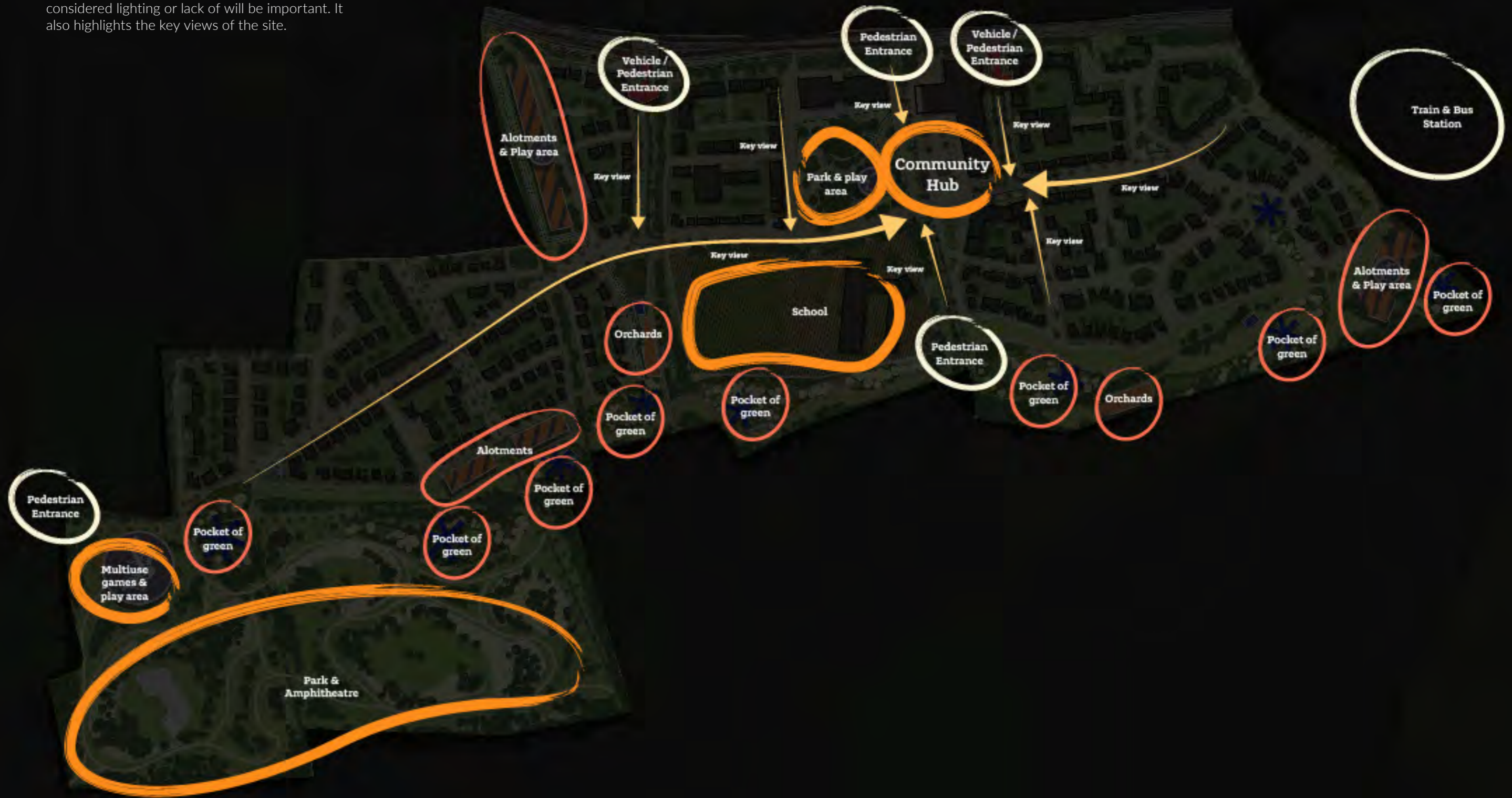
Solar energy

If appropriate from a cost/energy perspective, then hybrid solar powered luminaire solutions could be utilised on the development. Due to the climate of the area the luminaires can harvest energy when the conditions are right and then rely on power from the grid when required. Solar solutions are more effective in warmer climates however the potential to save energy use should at least be explored.

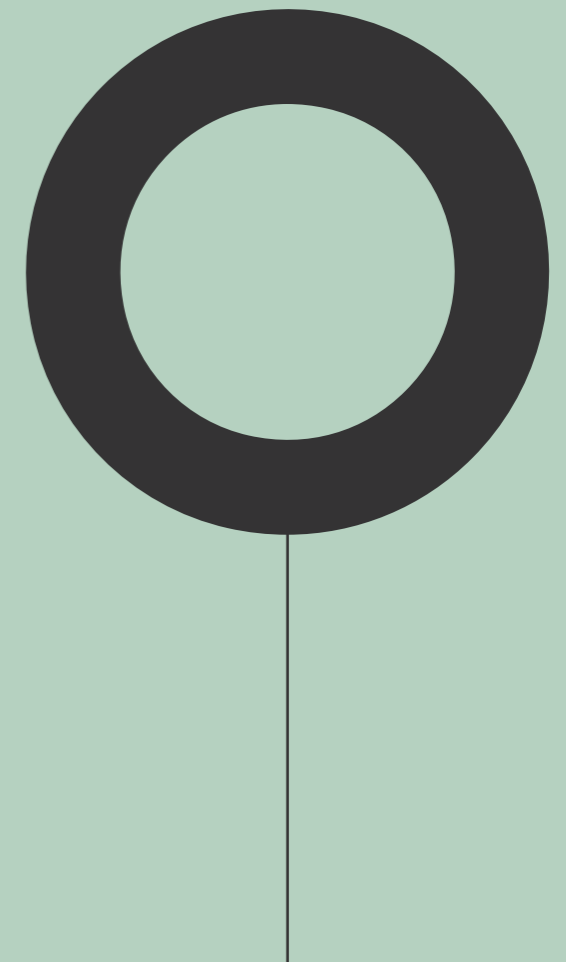


Key interactions and views

This page illustrates the key interaction points of the site, from the community spaces to the parks, where considered lighting or lack of will be important. It also highlights the key views of the site.



Lighting criteria.



Lighting criteria.

External realm lighting

A number of documents lay down the best practice and guidance on providing sufficient and appropriate lighting for vehicular thoroughfares, pedestrians passage and visual interest.

These are:

- BS 5489-1:2020
- BS EN 13201-2:2015
- CIE 136:2000
- ILP Lighting for cycling infrastructure (PLG 23)

And if appropriate:

- CIBSE Lighting Guide 6: The Outdoor Environment 1992
- CIBSE Lighting the Environment: A guide to good urban design
- Secure by Design - Lighting Against Crime

It should be noted that where the scope line of the site ends, HL assume that the ambient lighting is sufficient and meets the required lighting criteria beyond the boundary line. It is not the responsibility of HL to provide the lighting for these areas.

Light pollution

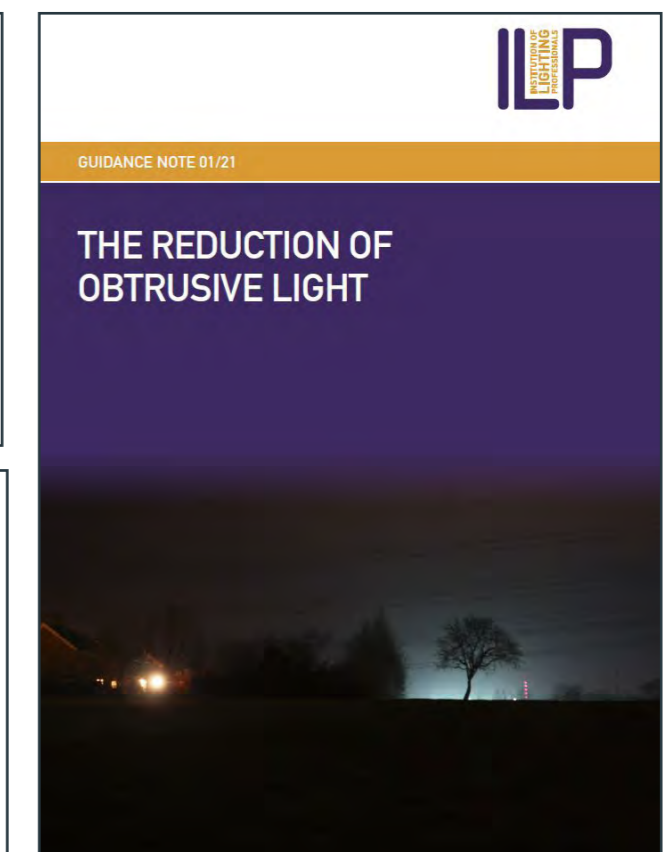
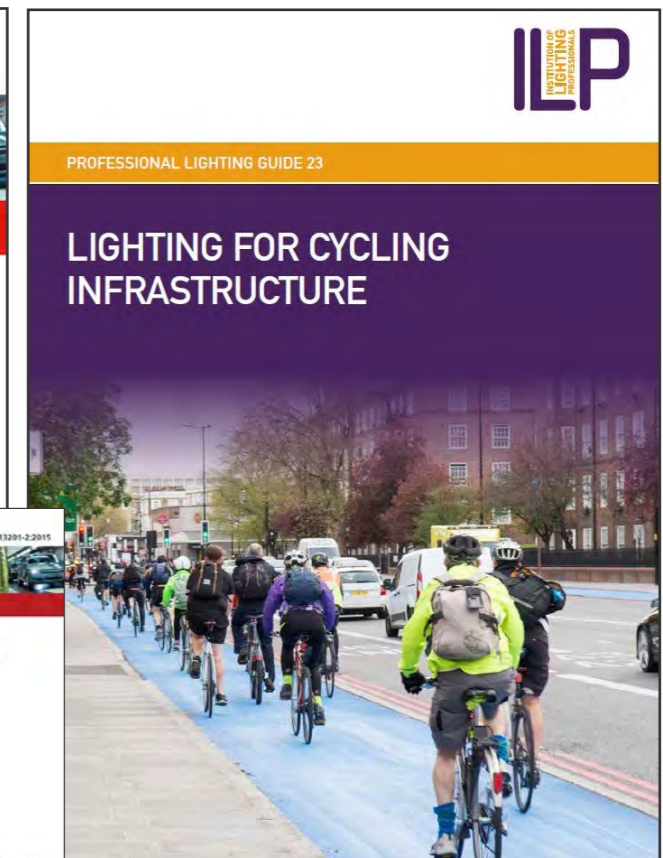
A number of documents lay down the best practise and guidance on reducing the visual and environmental impact of external lighting in relation to light pollution.

These are:

- CIE Technical Report - CIE 150: 2017
- ILP Guidance Notes for the Reduction of Obtrusive Light 2021 (GN01/21)
- Bat Conservation Trust (BCT)
- Institution of Lighting Professionals (ILP) Guidance Note 08/18 "Bats and artificial lighting in the UK" ILP, Rugby

The implementation of these standards is vital because of "The Clean Neighbourhoods and Environment Act, 2005" which makes light a statutory nuisance.

It should be noted that, based on the current ecological conditions of the site and the proposed changes to the site, any lighting proposed to the site shall be considerate of any wildlife or potential new wildlife by ensuring that where possible light is directed into the site and any luminaires that are in close proximity to wildlife have good optical control and/or back spill shielding to minimize the impact on these areas.



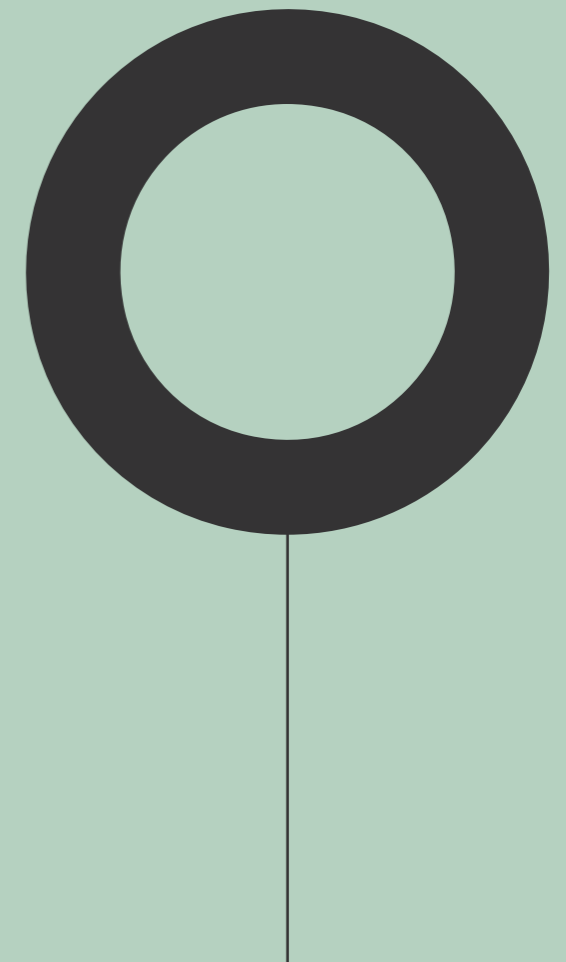
Lighting criteria - map

External realm lighting

A number of documents lay down the best practice and guidance on providing sufficient and appropriate lighting for vehicular thoroughfares, pedestrians passage and visual interest.



Lighting aspiration.



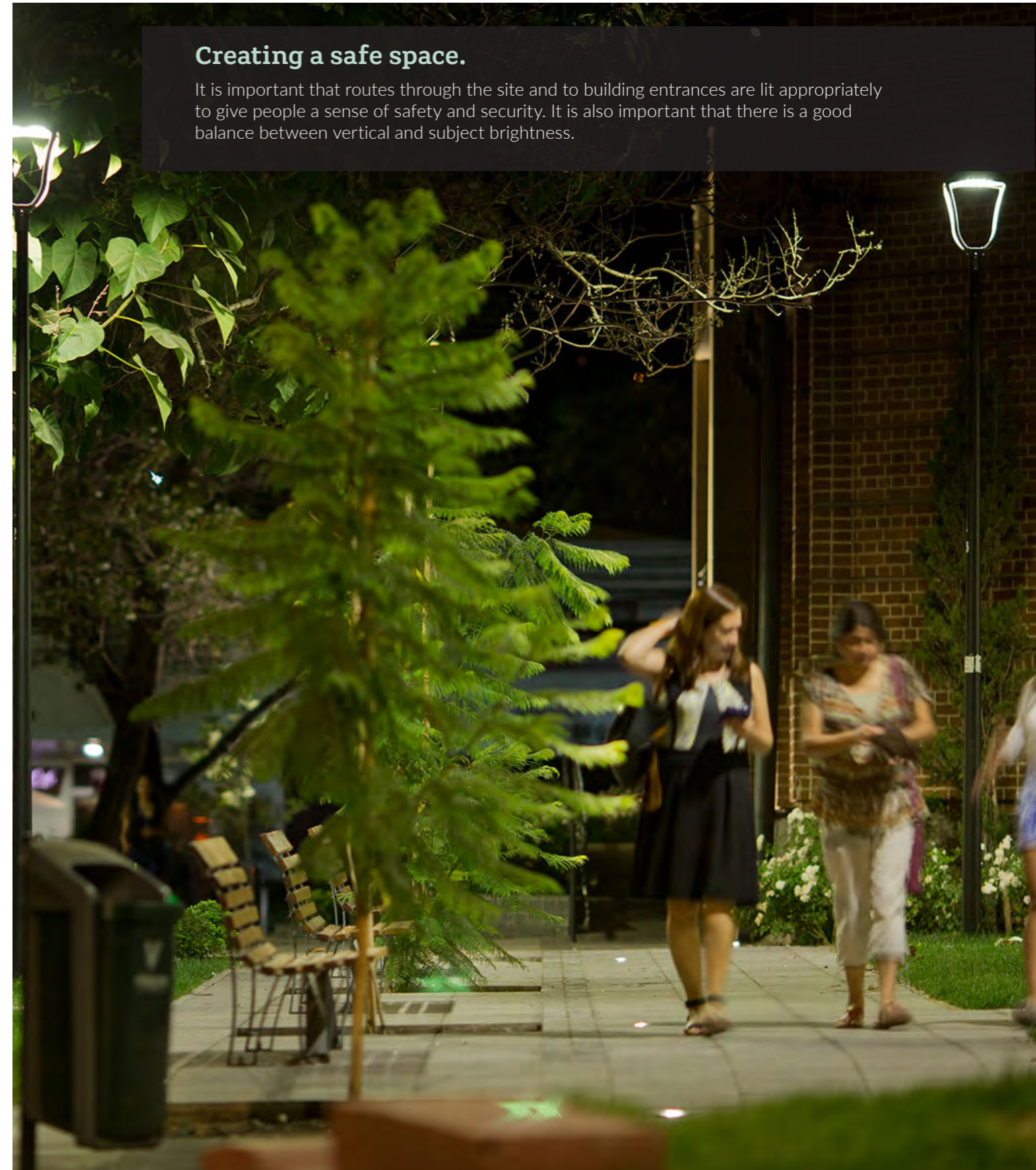
Welcoming entrances.

The lighting to the site entrances should aim to create a warm and welcoming environment for all. Visually brighter spaces at entrance points help to create a sense of arrival.



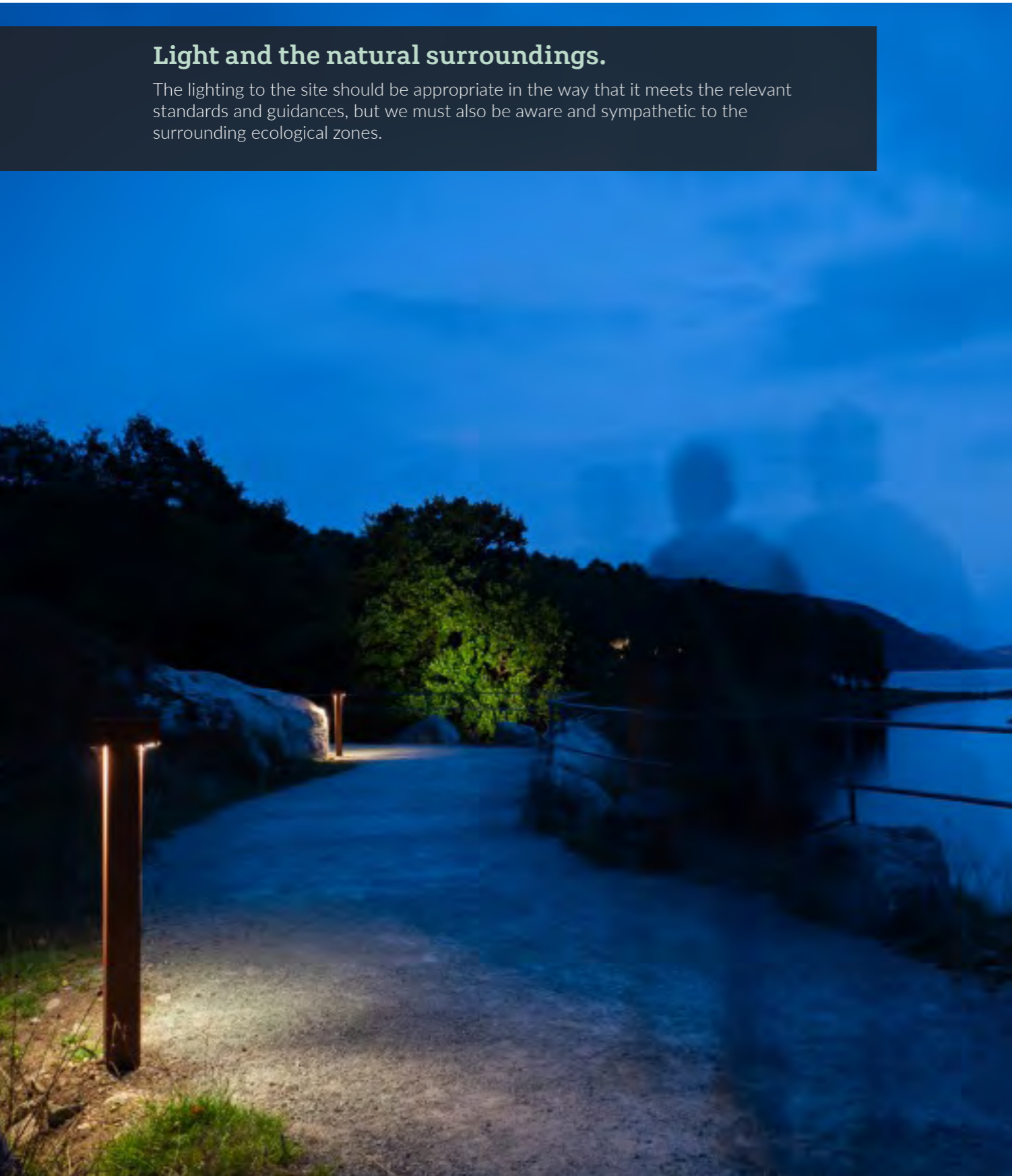
Creating a safe space.

It is important that routes through the site and to building entrances are lit appropriately to give people a sense of safety and security. It is also important that there is a good balance between vertical and subject brightness.



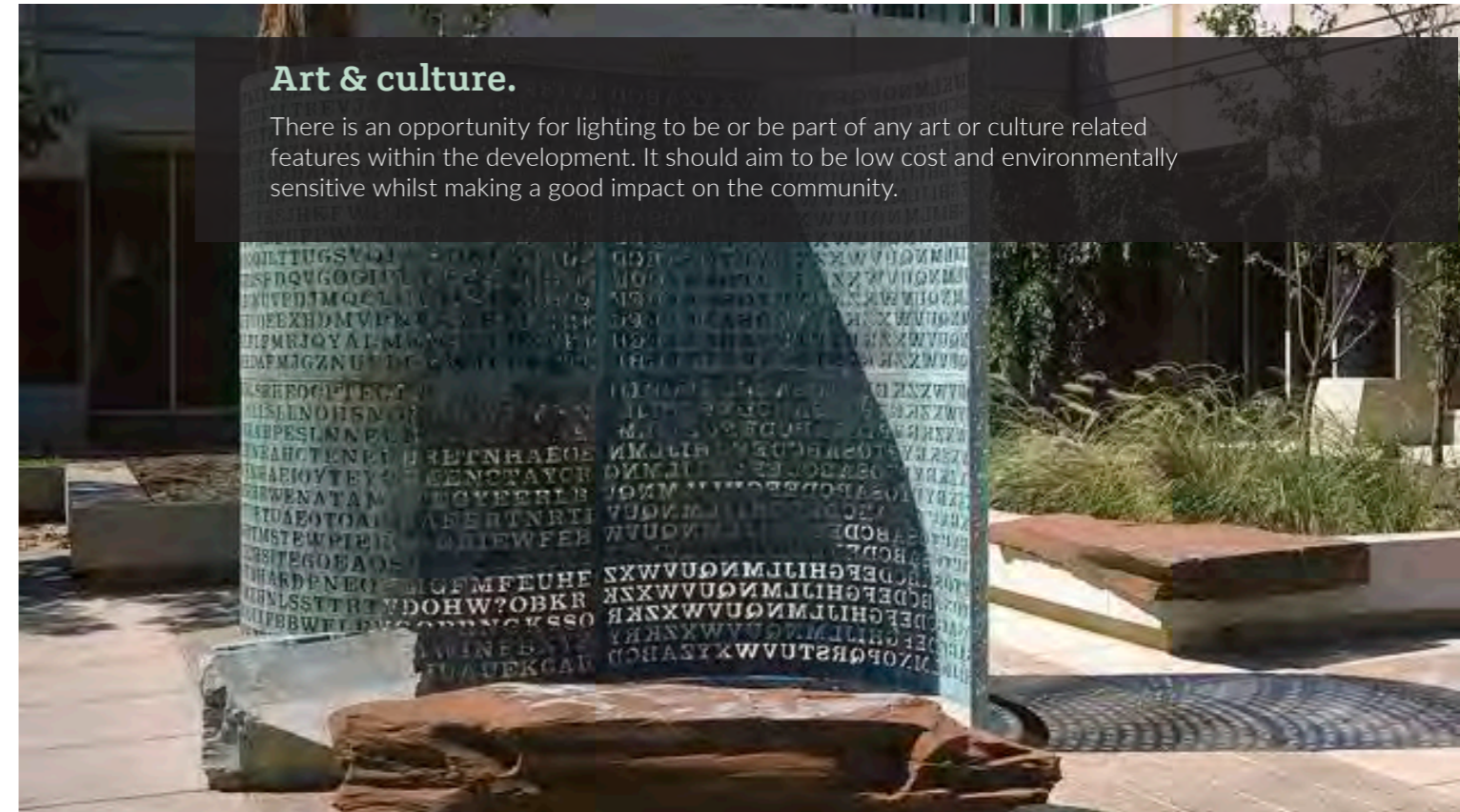
Light and the natural surroundings.

The lighting to the site should be appropriate in the way that it meets the relevant standards and guidances, but we must also be aware and sympathetic to the surrounding ecological zones.

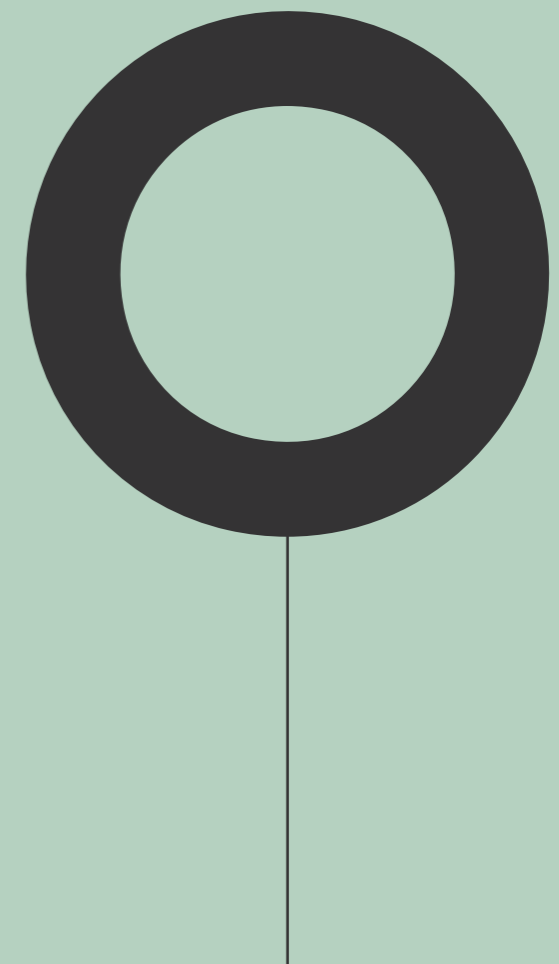


Art & culture.

There is an opportunity for lighting to be or be part of any art or culture related features within the development. It should aim to be low cost and environmentally sensitive whilst making a good impact on the community.



Lighting strategy.



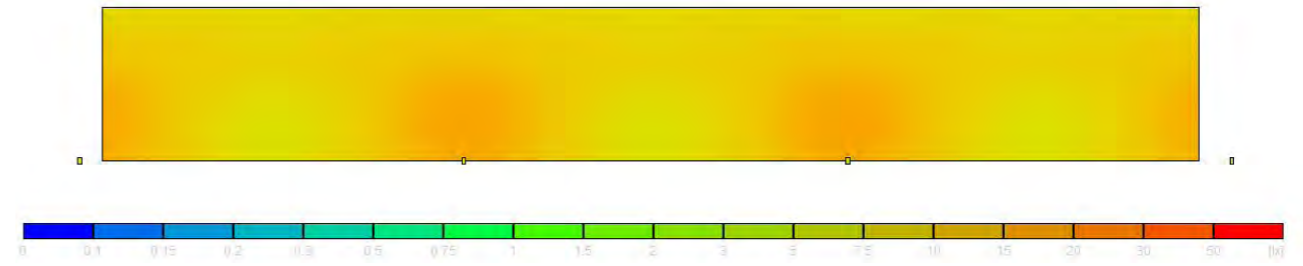
Lighting strategy.

P2 Areas

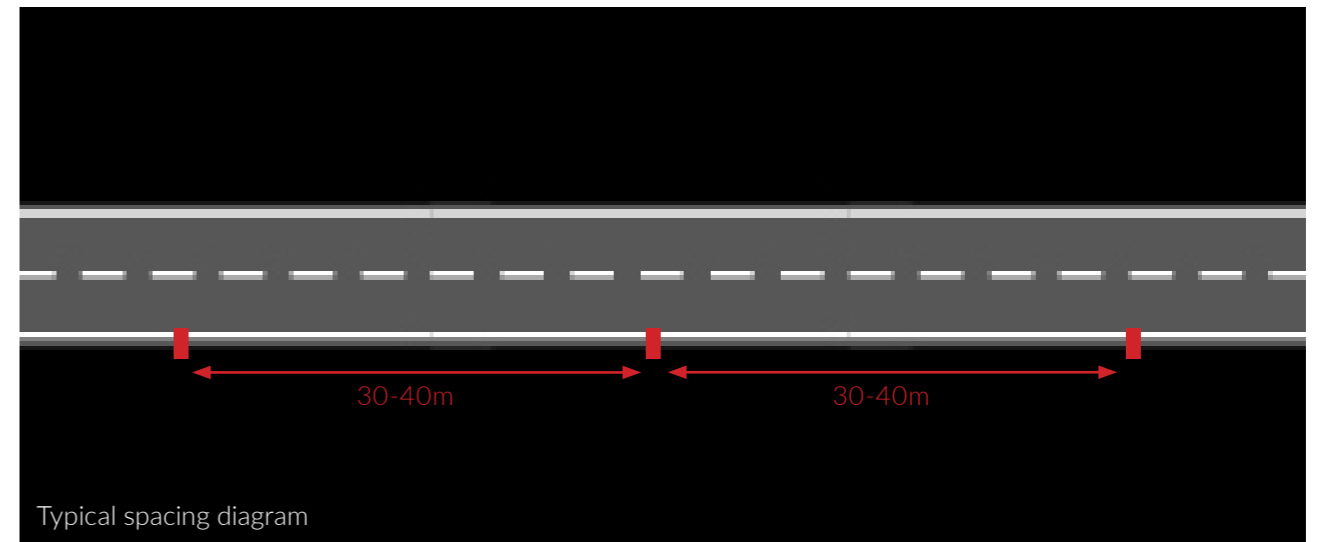
Below are a set of typical luminaires that could be used in these areas along with a typical space plan and calculation.

Typical wattage: 70-90W

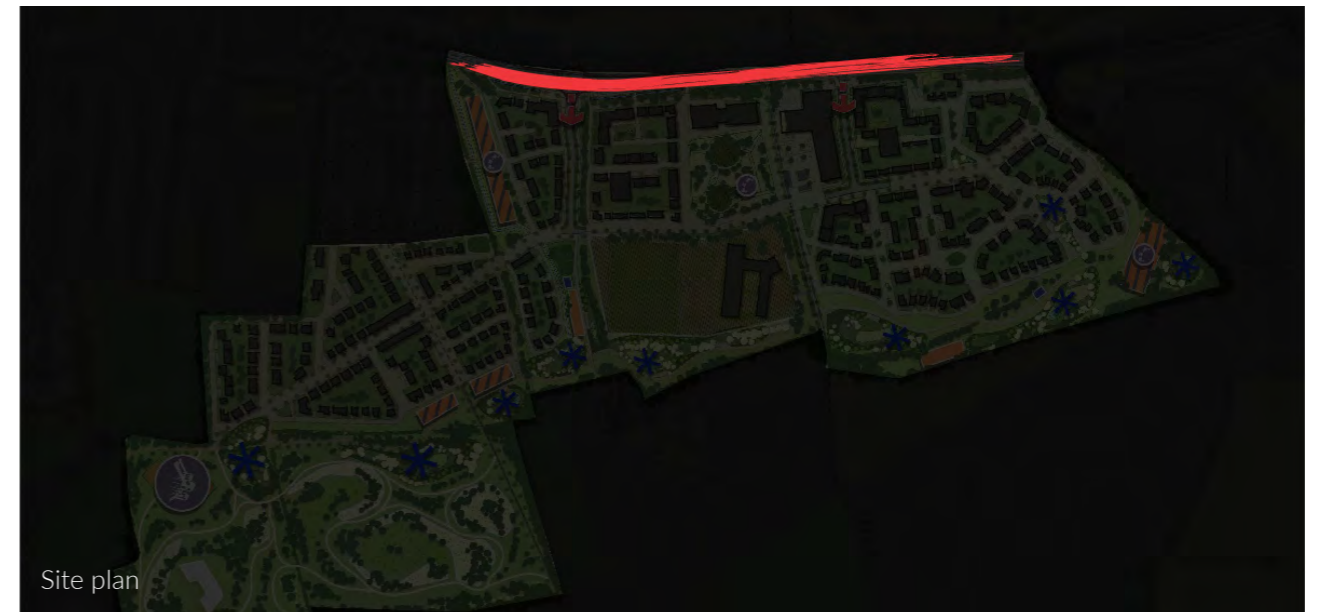
Typical mounting heights: 8-10m



Typical calculation extract



Typical spacing diagram



Site plan

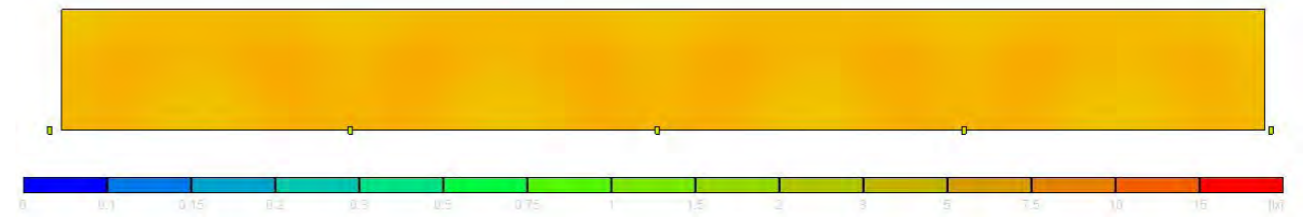
Lighting strategy.

P3 Areas

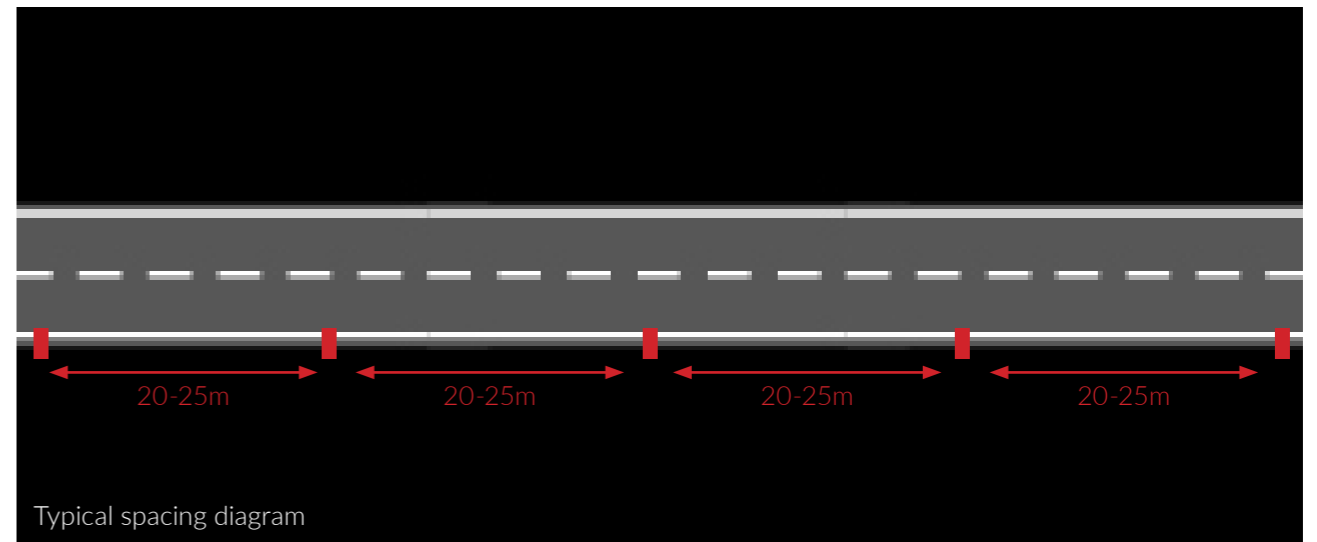
Below are a set of typical luminaires that could be used in these areas along with a typical space plan and calculation.

Typical wattage: 30-50W

Typical mounting heights: 6-8m



Typical calculation extract



Typical spacing diagram



Site plan

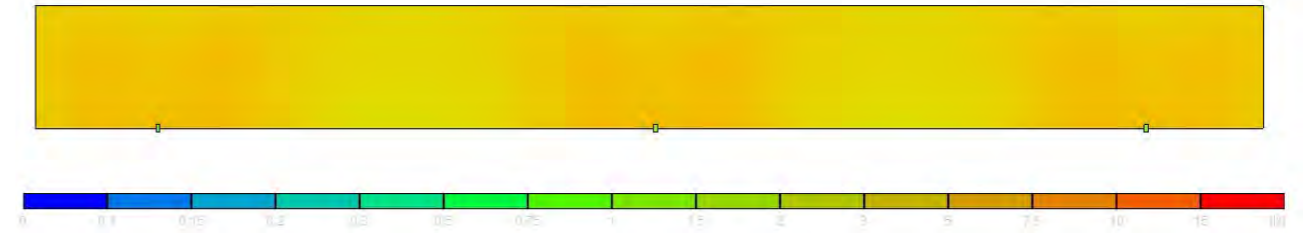
Lighting strategy.

P4 Areas - Vehicle & pedestrian

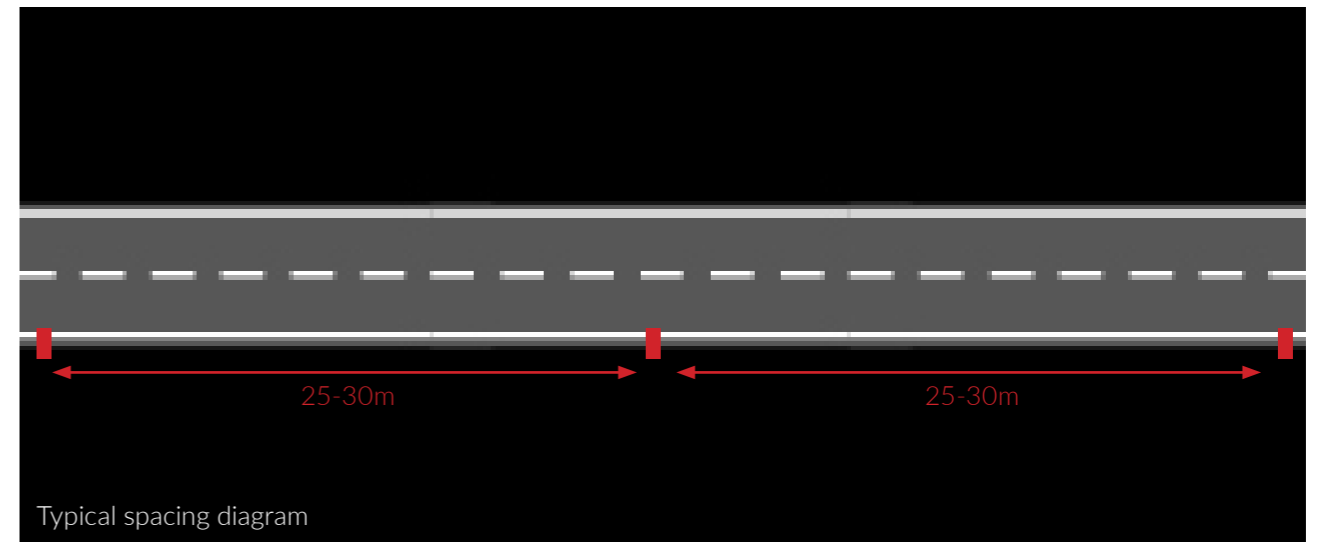
Below are a set of typical luminaires that could be used in these areas along with a typical space plan and calculation.

Typical wattage: 30-50W

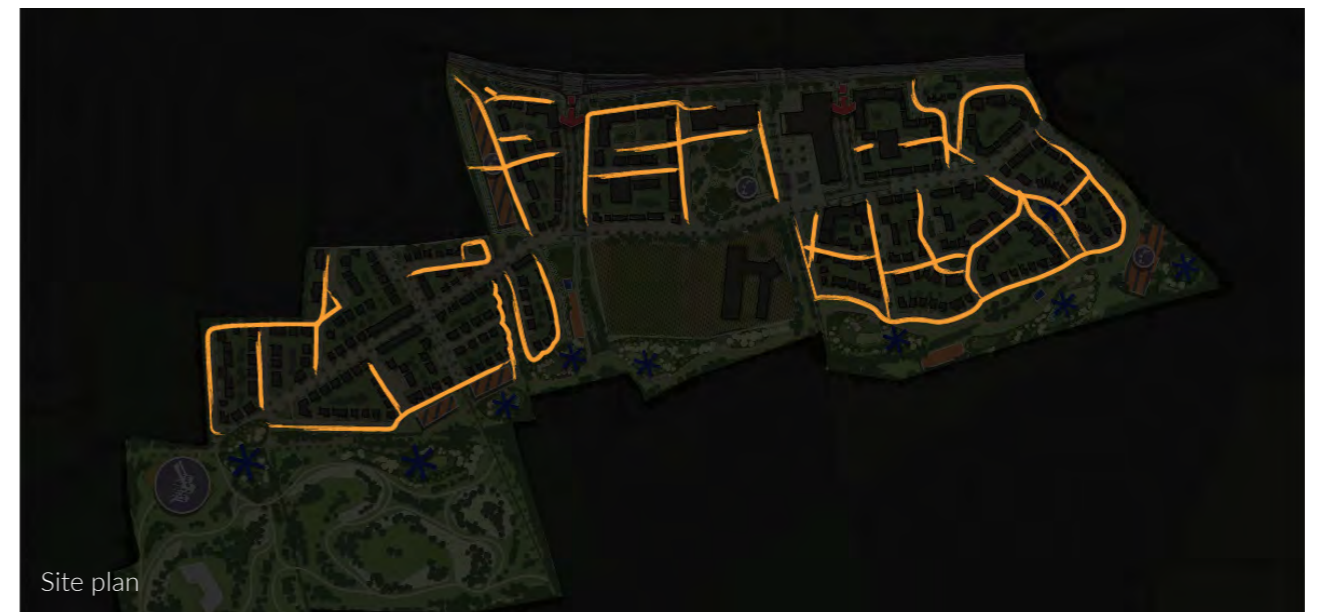
Typical mounting heights: 6-8m



Typical calculation extract



Typical spacing diagram



Site plan

Lighting strategy.

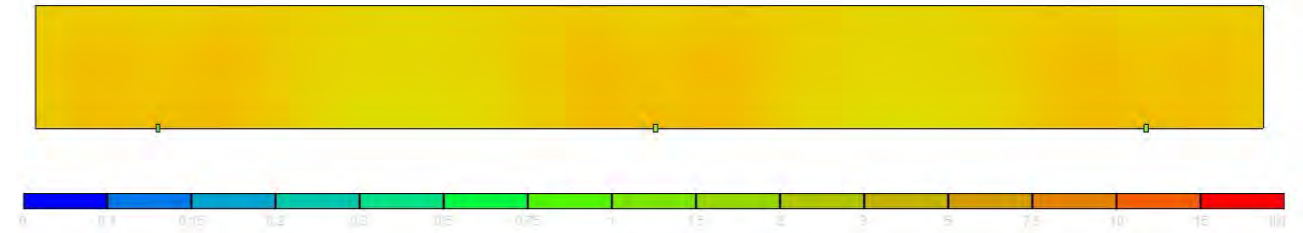
P5 Areas - Cycle route & pedestrian

Below are a set of typical luminaires that could be used in these areas along with a typical space plan and calculation.

Typical wattage: 30-50W

Typical mounting heights: 4-6m

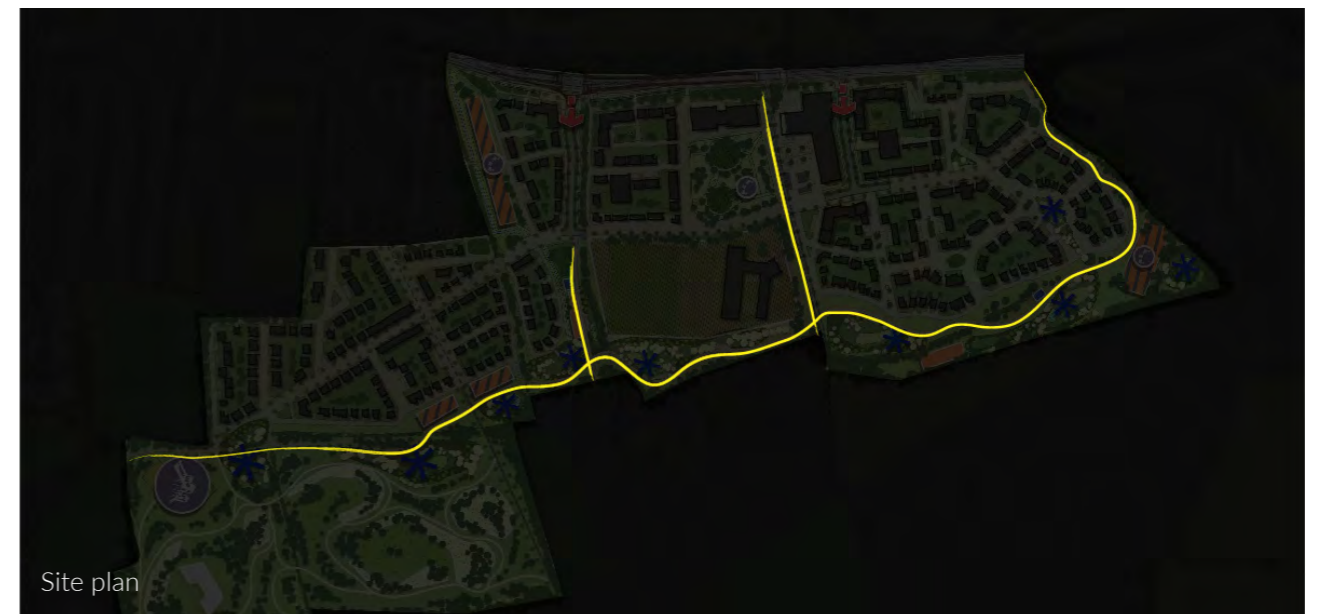
Note: Particular attention to ILP Lighting for cycling infrastructure (PLG 23) required.



Typical calculation extract



Typical spacing diagram

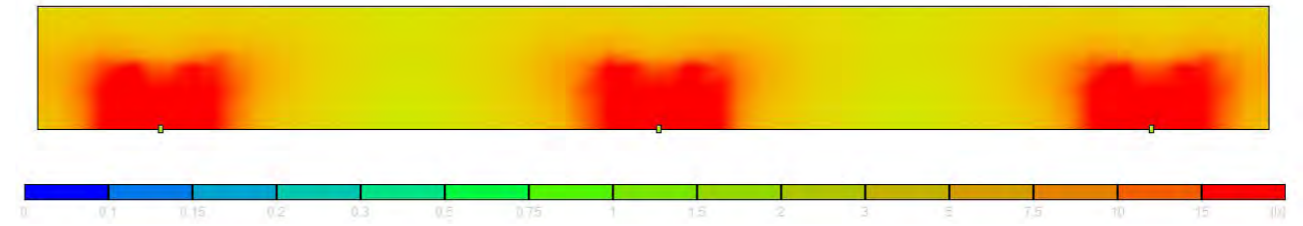


Site plan

Lighting strategy.

P6 Areas - Tertiary pedestrian paths

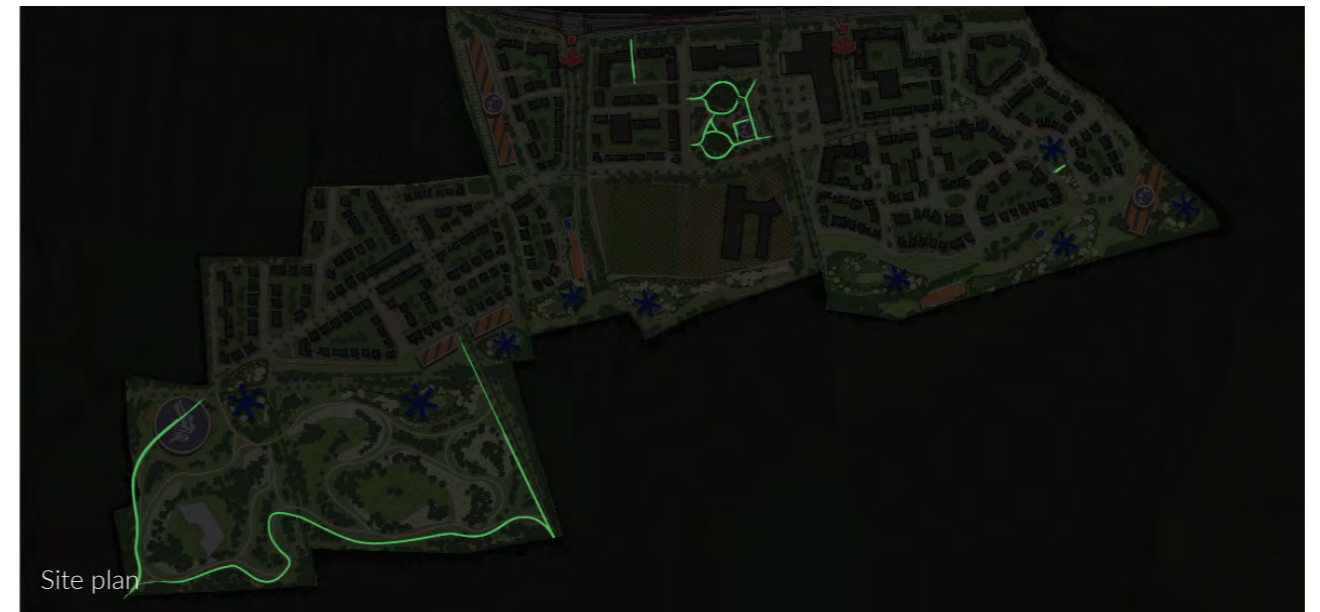
Below are a set of typical luminaires that could be used in these areas along with a typical space plan and calculation.



Typical calculation extract



Typical spacing diagram



Site plan



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