MHL & ASSOCIATES LTD.

For: **Clockstrike Ltd.**

Proposed Residential Development - Phase 2, Ringwood, Blarney.



Planning Lighting Design

December 2025

MHL & Associates Ltd.
Consulting Engineers

MHL & ASSOCIATES LTD.

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1 Introduction

M.H.L. & Associates Ltd. Consulting Engineers have been engaged by Clockstrike Ltd. to produce a Public Lighting Design to supplement an LRD planning application (Phase 2) for a Large-scale Residential Development at Ringwood, Blarney, Co. Cork.

1.1 Site Description- Phase 2

The LRD Phase 2 planning description states:

Clockstrike Ltd., intend to apply for permission for a Large-Scale Residential Development (LRD), at this site at Ringwood, Shean Upper and Shean Lower, Blarney, Cork. The proposed development will consist of a large-scale residential development (LRD), representing Phase 2 of development in the Blarney East / Ringwood Expansion Area, and comprising the construction of (i) 323 no. residential dwellings comprising of 157 no. terraced, end-of-terrace, and detached houses (including 129no. 3-bed and 28no. 4-bed units); 52 no. duplexes provided in 5 no. 3-storey buildings (including 26 no. 2-bed and 26 no. 3-bed units) and 114 no. apartments provided in 2 no. 5-storey buildings (including 54 no. 1-bed and 60 no. 2-bed units); (ii) a primary care centre, over 2 stories and 1,724sqm in area, incorporating GP services (iii) the refurbishment and redevelopment of existing farm outbuildings for conversion to a retail/pharmacy use, 80sqm in area, and café/restaurant use, 380sqm in area; (iv) a new access roadway into the site from the R617 with associated pedestrian and cyclist infrastructure, which will form the 1st phase of the proposed Stoneview Access Link Road, (v) a new signalised junction on the R617 road which will provide a single lane approach to the west and a two lane approach to the east, comprising one lane for through traffic on the R617 and a right turn lane for traffic turning into the site, and associated footpath improvements and cycle lane provision (vi) a new signalised junction at the R617 and Killard Road junction which will provide a two lane approach from the west, one lane for through traffic heading eastbound on the R617 and a right turn lane onto the Killard Road, with associated footpath improvements and pedestrian and cyclist infrastructure; (vii) a new signalised junction on Station Road that reflects the junction permitted under the Phase 1 LRD scheme (Reg. Ref. 2443031) (viii) private, communal, and public open spaces and hard and soft landscaping, boundary treatments and amenity areas, including a new wetland public amenity area, (ix) drainage works and nature-based SuDS measures (x) foul sewer infrastructure, including 1no. pump station, the diversion of existing foul and water sewers and other new network works, (xi) car parking, including EV charging points, bicycle parking, and motorcycle parking bays (xii) 2no. substations, all associated ancillary site, drainage and development works. The planning application is accompanied by an Environmental Impact Assessment Report (EIAR).



Figure 1.1: Development Site Layout (Phase 2) (c: CCK Architects)

The development proposes to connect onto Station Road with a proposed new development junction. Extensive traffic analysis for this junction and surrounding road networks has been carried out by Systra Ltd. Please refer to their submitted documentation for further details. This junction arrangement has been arrived at following preliminary discussions with Cork City Council.

1.2 Phase 1 (permitted grant)

The phase 1 site description states:

The Phase 1 development will consist of a largescale residential development (LRD) of 246no. residential dwellings comprising the following: 101no. apartments arranged in 4no. part 3-storey, part 4-storey apartment blocks (to include 6no. 1-bed studio units, 35no. 1-bed units and 60no. 2-bed units); 30no. duplex dwellings arranged in 3no. 3-storey buildings (to include 15no. 1-bed dwellings and 15no. 2-bed dwellings); and 115no. 2-storey and 3-storey houses (to include 19no. 2-bed dwellings, 64no. 3- bed dwellings, and 32no. 4-bed dwellings).The proposed development also includes crèche (380.6sqm) with capacity to accommodate 61no. children. "



Figure 1.2: Development Site Layout (Phase 1) (c: CCK Architects)
Please note that the application (Phase 02) is noted as future phase in the figure above.

1.3 Proposed Lighting Design

The design of site lighting is focused on protecting dark refuges, which are essential for bats, particularly in urban and suburban areas. Lighting layouts and specifications are designed to avoid creating barriers to bat commuting and foraging, especially within and along the edges of retained hedgerows and woodland habitats. At the same time, the lighting is implemented to meet health and safety requirements for residents and visitors, ensuring ecological sensitivities are balanced with functional site illumination.

This report assesses the proposed Phase 2 residential development, with a focus on outdoor lighting and its potential environmental effects. It outlines the assessment methodology, including environmental zone classification, obtrusive light, domestic lighting, and junction lighting considerations. The report presents the lighting design brief, calculations, and modelling, followed by a review of site, public, and estate road lighting, as well as landscaping and ecological factors. Recommendations for avoiding and mitigating adverse effects, including domestic lighting management, are provided.

The report aim is to ensure the lighting design meets functional and safety requirements while protecting the environment and minimising light pollution.

2 Assessment Methodology

2.1 Environmental Zone Classification

All standards consulted are nationally recognised documents, (some internationally also) which deal with all design issues associated with external lighting.

CIE Standards, the CIBSE and the Society of Light & Lighting guidance documents, all apply a common Environmental Zoning system, which is summarised in the table below.

Table 1 – Environmental Zones

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty etc
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night-time activity

Figure 2.1 Environmental Zone (ILP)

2.2 Obtrusive Light

- Obtrusive light (or sometimes referred to as light pollution) refers to any light emitted in a direction in which it is not required or wanted and as such is detrimental to other users.
- Light intrusion refers to the spilling of light beyond the boundary of the area to be lit. This includes the intrusion of light into bedroom windows.
- Skyglow refers to the brightening of the sky above towns cause by direct or reflected upward light.
- Glare refers to the uncomfortable brightness of a light source when viewed against a dark background. The figure below illustrates the different types of obtrusive light.

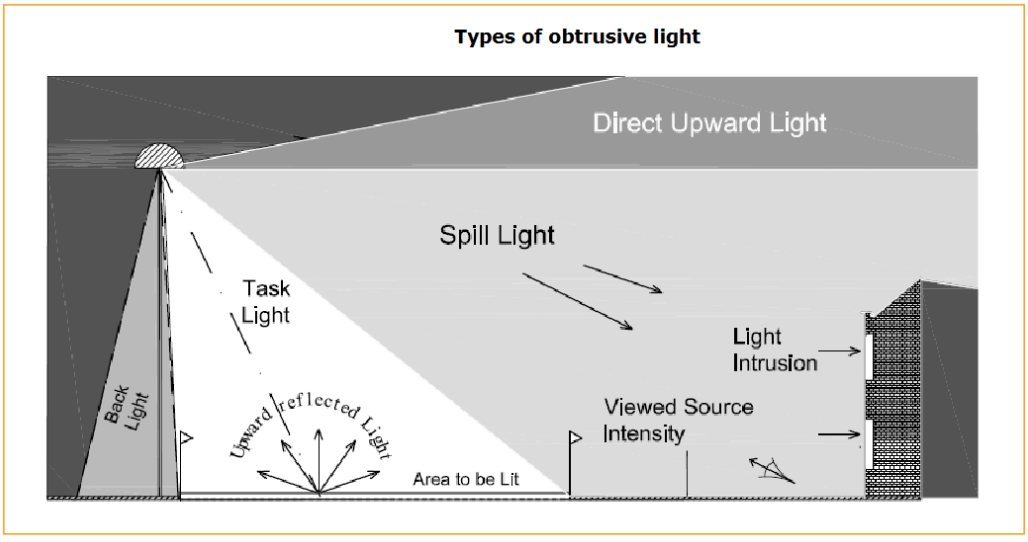


Figure 2.2 Types of Obtrusive light (ILP)

2.3 Potential Effects

Poorly designed public lighting can contribute the following obtrusive light components:

- Light spill into windows: this is typical of wall-mounted luminaires with high tilt angles.

- Upward light causing sky glow: this is typical of up-lighting.
- Glare: due to high light source intensity from floodlights
- Intrusive light affecting ecology: caused by excessive height and tilt.

Poorly designed lighting consists of the installation of a limited number of luminaires that are being used to light a wide area. Due to this, the lighting is normally installed with tilt angles that are too great, because there is a need to spread the light as far as possible, lighting the intended area, as well as surfaces where the lighting was not intended.

Many of the potential effects of artificial lighting can be effectively mitigated by a suitable lighting strategy, good design and choice of suitable lighting equipment. It is proposed that the lighting impact is to be limited by using accepted methods of lighting control, limiting illuminance, and controlling light spill. Lighting shall be selected to provide safety and security without polluting the surrounding environment.

2.4 Domestic Light Sources from the development

Although it falls outside the scope of the public lighting design, to mitigate potential light trespass from development unit windows, measures have been employed at optimising site configuration to minimise domestic spill lighting, implementing screening through soft landscaping and physical barriers.

Internal luminaires can be recessed (as opposed to using a pendant fitting) where installed in proximity to windows to reduce glare and light spill. Low transmission glazing treatments to achieve further reduced illuminance targets from internal domestic sources at specified locations are also proposed and are be agreed between the applicant and Cork City Council at preconstruction stage. The measures proposed can be incorporated by way of condition in a grant of planning.

By implementing these mitigation measures, the project can effectively address concerns related to light spill and contribute to the preservation of natural habitats and the reduction of light pollution in the surrounding area.

Notwithstanding that it has been demonstrated that lighting design will ensure that lighting within the proposed development will be contained within the site and no light spill will occur, the potential to reduce lighting glare from elevated windows / those nearest sensitive ecology receptors can also be offset through the use of recessed internal luminaires near windows and / or use of glazing treatments, where necessary, to restrict any lighting trespass. The BCT guidelines advise that where needed, low transmission glass may be a suitable option in achieving reduced illuminance targets. It may not be necessary having regard to height and position of windows, as well as intervening-built form or landscape screening. A range of glazing specification options exists in respect of lower light transmission of glass, and where deemed necessary, a final specification can be agreed with the project ecologist.

2.5 Proposed Development junction accesses

The proposed development is to connect onto Station Road to the west of the site and to the south onto the R617. The design of the development entrances has been a particular focus of the design team, with appropriate designs proposed for these main accesses, ensuring the lighting standard specified is appropriated to the level of traffic passing on the adjoining roadway.

3 Lighting Assessment

3.1 Lighting Brief

The lighting assessment aim is to ensure that lighting is fit for its purpose and to ensure safety and security for vehicles and pedestrians during the hours of darkness, whilst minimising the potential for obtrusive light. Lighting performance details outlined in this section of the document are to be considered in conjunction with the submitted lighting design layouts.

3.2 Lighting Calculations and Modelling

An external lighting calculation has been prepared by MHL & Associates Ltd for the proposed development. The site was modelled using industry-standard software Lighting Reality. Lighting Reality is a software package which utilises the manufacturer's luminaire photometric data files to simulate the lighting output of lighting units.

It is to be noted that the lighting calculation report has been produced with a luminaire maintenance factor of 1.0 as specified in the ILP publication, Public Lighting Guide 04 – Guidance on undertaking an Environmental Assessment Report. It defines a maintenance factor of 1.0 as being the worst-case scenario as all the outdoor lighting will be performing at peak intensity.

Light spill calculations are based on the luminaires at full output, with a maintenance factor of 1.0, as this will represent the worst-case scenario. The light spill model does not consider physical obstructions and provides light spill details for the initial light output, therefore disregarding the maintenance factor used for ensuring the lighting design performs as required at the end of its life. Considering this, the light spill diagram provides an exaggerated and absolute worst-case scenario with regards to the light spill at ground level, assuming no light limiting features are present.

The calculation model (illustrated by illuminance levels and Isolux contour lines on the layout drawing) does not include any proposed or existing planting/hedgerows/ trees on site, or in the surrounding area.

4 Outdoor Lighting Requirements

4.1 Lighting Classification

The design is a residential estate comprising of housing units and apartments. All internal estate roads have been designed to lighting Class P3. Isolated footpaths and Plaza Areas have been designed to lighting Class P4.

4.2 Development Site Lighting

The proposed public lighting for the new development has been designed using Lighting Reality Public Lighting Reality. This lighting design software provides lighting compliant designs to EN13201:2015. The design is a residential estate comprising of housing units and apartments.

All internal estate roads have been designed to lighting Class P3.
Isolated footpaths and Plaza Areas have been designed to lighting Class P4.
All internal lighting is to Philips luminaires on 6.0m, 8.0m and 10.0m columns. Isolated footpath columns are to be hinged type.

Please refer to Public Lighting layouts for the site in Planning Drawing Pack accompanying this report.

Lighting Specification:

- Lanterns should comply with IS EN 60598-2-3
- Columns are to have a double locked framed door and should be multisided galvanised to Cork City Council specification.
- Columns shall be manufactured to BS 5649.
- Public lighting to be fed from new power supply connections.
- Minimum lux level on public roads, paths, and playgrounds within the housing estate to be 1.5 lux.
- The S/P ratio can be applied to the internal estate lux levels depending on lantern type.
- The proposed internal estate public lights are to be dimmable from 12.00 midnight to 06.00 as per dimming class 2A in housing estates.

4.3 Notes on Landscaping:

No trees to be located within 1.5 times the height of the lighting columns.
i.e. Not within 10m of all estate lighting including pathways and playground areas.

4.4 Notes on Ecology:

All ecological constraints as raised in the Ecology Report as produced by Atkins have been accounted for by optimising the revised design to cater for the protection of wildlife (EC Habitats Directive and the Wildlife Act), ensuring the impact of artificial light is mitigated against and controlled. The approach to lighting has been directly informed by the recommendations of the project ecologists, including bat specialist.

Light spillage is to be kept to a minimum by:

- Lighting with suitably chosen lantern heads where optics selected stop indirect lighting.
- Inclusion of lighting hoods/shields to direct light only where it is needed.

- Luminaires design to be mounted on the horizontal with zero degrees vertical tilt, reducing spill light and preventing backlighting.
- All luminaires to lack UV elements.
- The proposed lighting design has been designed using warm white spectrum (2700k) lanterns to reduce the blue light component.
- Lanterns to be flat glass type to limit the amount of upward light and spill light onto the surrounding area.
- The LEDs proposed have sharp cut offs, lower intensity, good colour rendition and dimming capability.
- An option for dimming and part-night lighting, controlled diurnally, seasonally, and according to human activity can be employed

Design drawings:

Drawings have been compiled showing the lantern types, column locations and lux contours for 1.5, 3.0, 5.0, 10, 15 and 20, as appropriate.

4.5 Proposed development accesses- R617 and Station Road public lighting:

The light spread from the propsed lighting columns/ luminaires are contained with the immediate area as noted.

4.6 Proposed residential estate roads and footpath lighting:

Ground Levels proposed within the site show how light spread from the estate would be mitigated against due to the existing surrounding topography and heights of the nearby treeline. External security lighting to be set on motion-sensors and short (1min) timers.Taller buildings are located to the farthest location on site, sufficiently set back from key habitats to limit light spill. Street lights internally within the development are located so that the rear shields and optics selected stop back light thereby directing light into the task area where needed.

4.7 Notes on Ecology:

Ecological constraints as raised in the Ecology Report as produced by Atkins have been accounted for by optimising the revised design to cater for the protection of wildlife (EC Habitats Directive and the Wildlife Act), ensuring the impact of artificial light is limited to acceptable levels. Woodland edges and hedgerow habitats provide key flyways and feeding areas for a range of bat species. Artificial lighting at night can negatively impact foraging behaviour, as light-averse bats may avoid illuminated areas, reducing their use of established commuting and feeding routes. Without appropriate mitigation, any construction lighting—if required—could indirectly cause significant negative effects on bats at the local level. These impacts would be temporary in nature but would persist for the duration of the construction phase.

To minimise disturbance to bats and other nocturnal fauna, construction activities during hours of darkness should be minimised. During the bat activity period (April to September), when daylight extends beyond the site's permitted working hours, no artificial lighting will be required on site, thereby avoiding potential impacts on foraging and commuting bats.

Proposed mitigation at this location:

- Position columns to the farside of the road(western side)
- Cowl installation
- Zero tilt optics/ recessed optics
- Luminaire type as proposed

5 Recommendations For Avoidance And Control Of Effects

Key habitats suitable for bats immediately adjacent to the site which may be impacted must also be taken into consideration.

- Lux contour plans include an output with no Maintenance Factor applied, i.e. full ('Day 1') lighting efficiency and this should be clearly stated.
- 'Warm white' LED luminaires with colour temperatures of 2700K or less is be used wherever possible due to their reduced UV spectrum component. The presence of glare acting is considered, with direct line of sight between a relatively intense light source (or group of light sources) to the flight corridors within Zones A and B is to be avoided through the luminaire type, location, angle/direction or use of blinds and cowls.

Light spillage is to be kept to a minimum by:

- Lighting with suitably chosen lantern heads where optics selected stop indirect lighting.
- Inclusion of lighting hoods/shields to direct light only where it is needed.
- Luminaires design to be mounted on the horizontal with zero degrees vertical tilt, reducing spill light and preventing backlighting.
- All luminaires to lack UV elements.
- The proposed lighting design has been designed using warm white spectrum (2700k) lanterns to reduce the blue light component, with peak wavelengths greater than 550nm. Lower colour temperature lanterns can be employed 2200k, subject to CCC approval. Lantern manufacturer confirmed assessment Isolux extents for 2200k, 3000k and 4000k lanterns are equivalent to one another.
- Lanterns to be flat glass type to limit the amount of upward light and spill light onto the surrounding area.
- The LEDs proposed have sharp cut offs, lower intensity, good colour rendition and dimming capability.
- Luminaires to be mounted on the horizontal, i.e., no upward tilt. Only luminaires with an upward light ratio of 0% and with good optical control be used – See ILP Guidance for the Reduction of Obtrusive Light.

Please refer to the project ecologist for further commentary on ecological aspects of the project.

5.1 Design Conformity

Conformity to these limits is demonstrated via a lux contour plan of the proposed development prepared by a qualified lighting engineer. To demonstrate that these limits have been met, including information on the contribution and glare from more distant, intense sources, the following should be noted:

- The lighting plan includes the anticipated horizontal illuminance at ground level within all areas of the site, with actual lux figures or contours displayed.
- Upwards lighting is not be permitted.
- Light trespass from windows to be mitigated against, with the design focused on development units location, FFL, building height, specification, orientation.

5.2 Domestic Lighting

This report focuses on the public lighting design aspect of the scheme but notes mitigation measures to account for domestic lighting spill light.Mitigating light spill involves several steps aimed at reducing the amount of light that spills beyond the intended area of illumination. Measures to reduce the impact of light trespass from private properties, can include:

- Sensitive site configuration: Ensuring FFL and unit type are located optimally to reduce domestic spill lighting.
- Screening: screened through soft landscaping and the installation of walls, fences and bunding.
- Glazing treatments: low transmission glazing treatments are suitable option in achieving reduced illuminance targets.
- Fixture Selection: Lighting fixtures with proper shielding and optics to minimise light spillage. Full cutoff fixtures are particularly effective in directing light downward and reducing spillage.
- Optimal Placement: Fixtures installed at appropriate heights and angles to ensure that light is directed where it's needed without unnecessary spillage into neighboring properties or the night sky.
- Lighting Design: Design plan takes into account the specific requirements of the space and minimises overlighting through the use a combination of lighting techniques such as task lighting, accent lighting, and ambient lighting to achieve desired illumination levels with minimal spill.
- Timers and Sensors: Utilise timers, motion sensors, or photocells to control when lights are on, ensuring they are only activated when necessary and reducing the duration of unnecessary light spillage.
- Dimming and Control Systems: Implement dimming and lighting control systems that allow for precise adjustment of light levels based on time of day, occupancy, or ambient light conditions.
- Vegetation and Landscaping: Landscaping features such as trees, shrubs, and hedges help shield and diffuse light, reducing the visibility of light spill from adjacent properties.
- Community Engagement: Engage with the community to raise awareness about the importance of reducing light spill and encourage participation in mitigation efforts through responsible lighting practices.

The upper storey windows of housing units and apartments will be subject to appropriate glazing treatments to restrict and reduce light trespass. Specification is to be agreed prior to construction stage.

By implementing these mitigation measures, it's possible to significantly reduce light spill from domestic properties and its associated impacts on the environment, wildlife, and human health while still providing adequate illumination for safety and security.

6 Proposed Mitigation

The primary mitigation measures proposed for reducing light spill and the impacts of artificial lighting for this application, as per BCT Lighting Guidelines (BCT, 2023).

Lighting Design with BCT Specifications: Designing the lighting for the proposed development site according to BCT (2023) specifications helps ensure that the light is contained within the site boundaries, reducing spillage into neighbouring areas and minimising light pollution. By using fixtures and design practices that comply with these specifications, the development can achieve its lighting goals while mitigating potential negative impacts on the surrounding environment.

Landscaping: Implementing landscaping, such as new planting, serves as a natural barrier. Vegetation helps to shield and diffuse light, reducing its intensity and minimising its impact on sensitive ecosystems and wildlife habitats. This approach not only mitigates light spill but also enhances the visual aesthetics of the area.

Appropriate lighting has be used within the proposed development and adjacent areas with more sensitive lighting regimes deployed in wildlife sensitive areas, including the foraging areas for bats along hedgerows and woodland edges.

- All luminaires used will lack UV elements to reduce impact.
- LED luminaires will be used due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (<2700 Kelvins) is recommended to reduce the blue light component.
- Light sources shall feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Waymarking inground markers (low output with cowls or similar to minimise upward light spill) to delineate path edges.
- Column heights shall be carefully considered to minimise light spill and glare visibility. This should be balanced with the potential for increased numbers of columns and upward light reflectance as with bollards.
- Only luminaires with a negligible or zero Upward Light Ratio, and with good optical control, should be considered - See ILP GN01.
- Luminaires shall always be mounted horizontally, with no light output above 90° and/or no upward tilt.
- Where appropriate, external security lighting shall be set on motion sensors and set to as short a possible a timer as the risk assessment will allow. For most general residential purposes, a 1- or 2-minute timer is likely to be appropriate.
- The use of bollard or low-level downward-directional luminaires is strongly discouraged. This is due to a considerable range of issues, such as unacceptable glare, poor illumination efficiency, unacceptable upward light output, increased upward light scatter from surfaces and poor facial recognition which makes them unsuitable for most sites.

Therefore, they should only be considered in specific cases where the lighting professional and project manager are able to resolve these issues.

- Only if all other options have been explored, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed. However, due to the lensing and fine cut-off control of the beam inherent in modern LED luminaires, the effect of cowls and baffles is often far less than anticipated and so should not be relied upon solely.

7 Conclusion

7.1 Design Commentary

This lighting assessment outlines the lighting design criteria for the proposed development, to ensure that the lighting is fit for purpose whilst maintaining sensitivity towards the environment. This is achieved through compliance with relevant lighting industry standards and ecological guidance.

Compliance with this lighting strategy will allow a safe and sensitive level of light for the movement of pedestrians/drivers at night, whilst reducing the potential for obtrusive light and limiting this to a negligible level.

In addition to mitigating the potential effects of lighting on residential amenities, ecologically sensitive receptors have been considered using warm white light sources with lower blue light content and through minimising boundary light spill as far as reasonably practicable. The sensitive receptors as shown in the supporting ecological assessment identify the existing woodland which shall remain when the proposed development has been completed.

The proposed development is planned to be built off Station Road and the R617 in the vicinity of substantial woodland and a river, both of which needed to be considered during the lighting design. Isolux lines have been shown on the design lighting layouts as submitted. These values have taken standard maintenance factors. Using a reduced maintenance factor provides typical 'realistic' light levels which uses lumen depreciation, driver degradation and lens grime.

Final lighting specification to be agreed between the applicant/appointed contractor, bat specialist and the Cork City Council as required prior to construction /compliance.

In summary it is our considered opinion that the proposed lighting installation will not have a significant negative impact on the immediate environment concerning lighting pollution or energy usage, that the lighting upgrade to LED on Station Road and R617 is an improvement over the current scenario and that all sensible steps, through consultation with the project ecologist and bat conservationist, have been taken within the design stage of this lighting scheme to keep the impact to the environment to a minimum.

8 Reference

- BS5489-1: Code of practice for the design of road lighting- Part 1: Lighting roads and public amenity areas
- EN13201:2015 Road Lighting
- Lighting Reality software
- Google Aerial Photography
- Recommendations for site development works for housing areas. Dept. of Environment
- DMURS: Design Manual for Urban Roads and Streets
- Cork City Council Development Plan 2022-2028
- Code of Practice for Avoiding Danger from Overhead Electricity Lines, May 2019, ESB Networks.
- Avoidance of Electrical Hazards When Working Near Overhead Electric Lines, ESB Networks
- GN08/23 Guidance Note. Bats and Artificial Lighting at Night. ILP
- GN08/18 Bats and artificial lighting in the UK. ILP.

Conditions
MHL & Associates Ltd accept no responsibility or liability for:

- The consequence of this documentation being used for any purpose or project other than that for which it was commissioned.
- The issue of this document to any third party with whom approval for use has not been agreed.
- Ahead of construction stage, lighting manufacturer/contractor to confirm lux optics before installation.

9 Appendix

9.1 Lighting Reality Models

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DATE: **19 November 2025**

DESIGNER: **MHL & Associates Ltd.**

PROJECT No: **21079HD**

PROJECT NAME: **Ringwood Phase 2 (Upper)**

Lighting Classification:

Estate Spine and link roads to P3.

Isolated minor roads/ paths/ carparks to P4.

Outdoor Lighting Report

PREPARED BY:

MHL & Associates Ltd.
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Layout Report

General Data

Dimensions in Metres Angles in Degrees

Calculation Grids

ID	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	GRID 1	561424.89	576298.04	270.04	277.47	1.49	1.50
2	GRID 3	561552.94	576292.02	427.79	234.39	1.71	1.49
3	GRID 2	561688.09	576235.66	320.12	277.55	1.50	1.49

Luminaires



Luminaire A Data

Supplier	Philips
Type	BGP291 DW10
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	6.00
File Name	LumiStreet Gen2 Micro_BGP291_DW10_6000_20LED_5.2S_CLO_L90_730.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	415.9, 39.5, 0.0
No. in Project	69



Luminaire C Data

Supplier	Philips
Type	BGP291 DN25
Lamp(s)	LED-HB 5.2S 740
Lamp Flux (klm)	0.80
File Name	LumiStreet Gen2 Micro_BGP291_DN25_800_6LED_5.2S_CLO_L90_740.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	705.1, 87.1, 0.0
No. in Project	23



Luminaire E Data

Supplier	Philips
Type	BGP292 DX10
Lamp(s)	LED-HB 5.2S 740
Lamp Flux (klm)	6.00
File Name	LumiStreet Gen2 Mini_BGP292_DX10_6000_40LED_5.2S_CLO_L90_740.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	513.2, 85.3, 0.0
No. in Project	6

Layout

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	A	561542.99	576338.01	8.00	61.63	0.00	0.00	0.50			
2	A	561463.70	576364.53	8.00	256.00	0.00	0.00	1.00			
3	A	561500.53	576352.88	8.00	254.18	0.00	0.00	0.50			
6	A	561565.58	576323.27	8.00	61.63	0.00	0.00	0.50			
7	A	561592.88	576308.09	8.00	61.63	0.00	0.00	0.50			
8	A	561627.51	576294.55	8.00	61.63	0.00	0.00	0.50			
13	A	561773.08	576283.47	8.00	90.00	0.00	0.00	1.00			
14	A	561809.53	576281.35	8.00	76.00	0.00	0.00	1.00			

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
15	A	561841.05	576272.62	8.00	72.00	0.00	0.00	1.00			
16	A	561864.13	576279.62	8.00	239.00	0.00	0.00	1.00			
17	A	561868.04	576260.83	8.00	65.06	0.00	0.00	1.00			
18	A	561919.81	576222.32	8.00	62.00	0.00	0.00	1.00			
19	A	561944.38	576204.08	8.00	65.06	0.00	0.00	0.50			
18	A	561552.55	576369.03	8.00	135.00	0.00	0.00	0.50			
19	E	561982.62	576273.08	8.00	141.00	0.00	0.00	1.00			
77	A	561525.19	576358.49	8.00	317.00	0.00	0.00	0.50			
23	A	561848.92	576290.24	8.00	141.00	0.00	0.00	0.50			
88	E	561951.93	576228.70	8.00	158.00	0.00	0.00	1.00			
89	E	561966.38	576252.58	8.00	141.00	0.00	0.00	1.00			
93	C	561533.36	576333.70	6.00	81.00	0.00	0.00	0.50			
27	A	561865.28	576311.03	8.00	141.00	0.00	0.00	0.50			
28	A	561879.92	576322.93	8.00	141.00	0.00	0.00	0.50			
29	A	561878.81	576349.60	8.00	313.00	0.00	0.00	0.50			
30	A	561900.11	576343.99	8.00	141.00	0.00	0.00	0.50			
31	E	561846.88	576335.62	8.00	326.00	0.00	0.00	0.50			
32	E	561827.25	576350.69	8.00	61.00	0.00	0.00	0.50			
33	E	561807.26	576364.32	8.00	70.00	0.00	0.00	0.50			
34	A	561802.39	576384.14	8.00	240.00	0.00	0.00	0.50			
35	A	561802.97	576397.24	8.00	151.00	0.00	0.00	0.50			
36	A	561798.36	576412.49	8.00	349.00	0.00	0.00	0.50			
37	A	561802.82	576435.09	8.00	354.00	0.00	0.00	0.50			
38	A	561711.82	576313.90	8.00	73.00	0.00	0.00	0.50			
39	A	561744.69	576309.65	8.00	88.00	0.00	0.00	0.50			
40	A	561770.03	576305.24	8.00	50.00	0.00	0.00	0.50			
41	A	561762.67	576333.77	8.00	346.00	0.00	0.00	0.50			
42	A	561770.87	576356.51	8.00	325.00	0.00	0.00	0.50			
43	A	561782.39	576372.91	8.00	321.00	0.00	0.00	0.50			
44	A	561769.07	576379.17	8.00	73.00	0.00	0.00	0.50			
45	A	561753.17	576390.18	8.00	264.00	0.00	0.00	0.50			
46	A	561732.88	576381.26	8.00	73.00	0.00	0.00	0.50			
47	A	561717.77	576394.93	8.00	245.00	0.00	0.00	0.50			
48	A	561747.25	576469.83	8.00	261.00	0.00	0.00	0.50			
49	A	561777.62	576465.72	8.00	261.00	0.00	0.00	0.50			
50	A	561801.94	576462.57	8.00	261.00	0.00	0.00	0.50			

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
51	A	561827.96	576458.82	8.00	261.00	0.00	0.00	0.50			
52	A	561890.61	576362.84	8.00	309.00	0.00	0.00	0.50			
53	A	561907.93	576253.22	8.00	230.00	0.00	0.00	1.00			
54	A	561554.42	576396.80	8.00	317.00	0.00	0.00	0.50			
55	A	561582.91	576409.33	8.00	134.00	0.00	0.00	0.50			
56	A	561587.81	576433.36	8.00	317.00	0.00	0.00	0.50			
57	A	561625.08	576456.96	8.00	292.00	0.00	0.00	0.50			
58	A	561657.75	576460.85	8.00	274.00	0.00	0.00	0.50			
59	A	561679.76	576452.06	8.00	115.00	0.00	0.00	0.50			
60	A	561693.44	576471.02	8.00	279.00	0.00	0.00	0.50			
61	A	561713.87	576473.62	8.00	264.00	0.00	0.00	0.50			
62	A	561696.82	576445.83	8.00	175.00	0.00	0.00	0.50			
63	A	561696.21	576426.87	8.00	175.00	0.00	0.00	0.50			
64	A	561695.43	576405.40	8.00	175.00	0.00	0.00	0.50			
65	A	561627.99	576430.76	8.00	16.00	0.00	0.00	0.50			
66	A	561633.36	576416.82	8.00	12.00	0.00	0.00	0.50			
67	A	561635.96	576397.69	8.00	12.00	0.00	0.00	0.50			
68	A	561665.52	576403.28	8.00	281.00	0.00	0.00	0.50			
69	A	561694.39	576381.59	8.00	179.00	0.00	0.00	0.50			
70	A	561693.87	576359.86	8.00	179.00	0.00	0.00	0.50			
71	A	561693.01	576335.88	8.00	179.00	0.00	0.00	0.50			
72	A	561687.81	576319.77	8.00	86.00	0.00	0.00	0.50			
73	A	561666.26	576318.82	8.00	117.00	0.00	0.00	0.50			
74	A	561648.68	576306.79	8.00	125.00	0.00	0.00	0.50			
75	A	561592.84	576334.63	8.00	346.00	0.00	0.00	0.50			
76	A	561612.70	576351.90	8.00	157.00	0.00	0.00	0.50			
77	A	561627.96	576374.21	8.00	149.00	0.00	0.00	0.50			
78	A	561894.79	576242.85	8.00	65.10	0.00	0.00	1.00			
79	C	561617.88	576488.88	8.00	18.00	0.00	0.00	0.50			
80	C	561905.44	576312.61	6.00	326.00	0.00	0.00	0.50			
81	C	561621.63	576472.33	8.00	18.00	0.00	0.00	0.50			
83	C	561688.26	576479.57	8.00	18.00	0.00	0.00	0.50			
84	C	561899.68	576271.59	6.00	127.00	0.00	0.00	0.50			
92	C	561811.29	576398.86	6.00	119.00	0.00	0.00	0.50			
93	C	561826.20	576410.62	6.00	119.00	0.00	0.00	0.50			
94	C	561836.73	576419.15	6.00	119.00	0.00	0.00	0.50			

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
95	C	561823.38	576422.83	6.00	278.00	0.00	0.00	0.50			
96	C	561626.87	576425.14	6.00	241.00	0.00	0.00	0.50			
90	C	561849.92	576402.68	6.00	311.00	0.00	0.00	0.50			
92	A	561891.48	576311.89	8.00	230.00	0.00	0.00	1.00			
93	A	561916.37	576290.30	8.00	230.00	0.00	0.00	1.00			
94	A	561946.45	576264.25	8.00	225.00	0.00	0.00	1.00			
95	C	561921.27	576295.63	6.00	127.00	0.00	0.00	0.50			
96	C	561930.33	576307.00	6.00	127.00	0.00	0.00	0.50			
97	C	561939.69	576317.79	6.00	127.00	0.00	0.00	0.50			
98	C	561906.01	576300.09	6.00	41.00	0.00	0.00	0.50			
99	C	561932.78	576294.19	6.00	41.00	0.00	0.00	0.50			
100	C	561828.44	576385.58	6.00	311.00	0.00	0.00	0.50			
101	C	561839.67	576394.36	6.00	311.00	0.00	0.00	0.50			
102	C	561848.73	576376.08	6.00	223.00	0.00	0.00	0.50			
103	C	561852.91	576353.77	6.00	136.00	0.00	0.00	0.50			
104	C	561864.56	576365.86	6.00	142.00	0.00	0.00	0.50			
105	C	561874.64	576376.66	6.00	134.00	0.00	0.00	0.50			
106	A	561611.60	576437.20	8.00	140.00	0.00	0.00	0.50			

Horizontal Illuminance (lux)

GRID 1



Results

Eav	9.97
Emin	2.02
Emax	21.03
Emin/Emax	0.10
Emin/Eav	0.20

Horizontal Illuminance (lux)

GRID 3



Results

Eav	5.70
Emin	1.35
Emax	17.87
Emin/Emax	0.08
Emin/Eav	0.24

Horizontal Illuminance (lux)

GRID 2



Results

Eav	9.75
Emin	1.98
Emax	21.00
Emin/Emax	0.09
Emin/Eav	0.20

DATE: **12 November 2025**

DESIGNER: **MHL & Associates Ltd.**

PROJECT No: **21079HD**

PROJECT NAME: **Ringwood Phase 2- PCC**

Lighting Classification:

Estate Spine and link roads to P3.

Isolated minor roads/ paths/ carparks to P4.

Outdoor Lighting Report

PREPARED BY:

MHL & Associates Ltd.
Unit 1B,
The Atrium,
Blackpool,
Cork

Layout Report

General Data

Dimensions in Metres Angles in Degrees

Calculation Grids

ID	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	GRID 001	561703.92	575630.41	247.99	271.15	1.49	1.50
2	Grid 2	561783.61	575678.52	116.47	94.08	1.49	1.49

Luminaires



Luminaire A Data

Supplier	Philips
Type	BGP291 DW10
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	5.40
File Name	LumiStreet Gen2 Micro_BGP291_DW10_5400_20LED_5.2S_CLO_L90_730.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	415.9, 39.5, 0.0
No. in Project	1



Luminaire B Data

Supplier	Philips
Type	BGP291 DX10
Lamp(s)	LED-HB 5.2S 740
Lamp Flux (klm)	3.00
File Name	LumiStreet Gen2 Micro_BGP291_DX10_3000_20LED_5.2S_CLO_L90_740.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	513.2, 85.3, 0.0
No. in Project	12



Luminaire C Data

Supplier	Philips
Type	BGP291 DN25
Lamp(s)	LED-HB 5.2S 740
Lamp Flux (klm)	0.80
File Name	LumiStreet Gen2 Micro_BGP291_DN25_800_6LED_5.2S_CLO_L90_740.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	705.1, 87.1, 0.0
No. in Project	3



Luminaire D Data

Supplier	Philips
Type	BGP291 DM70
Lamp(s)	LED-HB 5.2S 740
Lamp Flux (klm)	2.60
File Name	LumiStreet Gen2 Micro_BGP291_DM70_2600_10LED_5.2S_CLO_L90_740.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	407.4, 472.4, 0.0
No. in Project	3

Layout

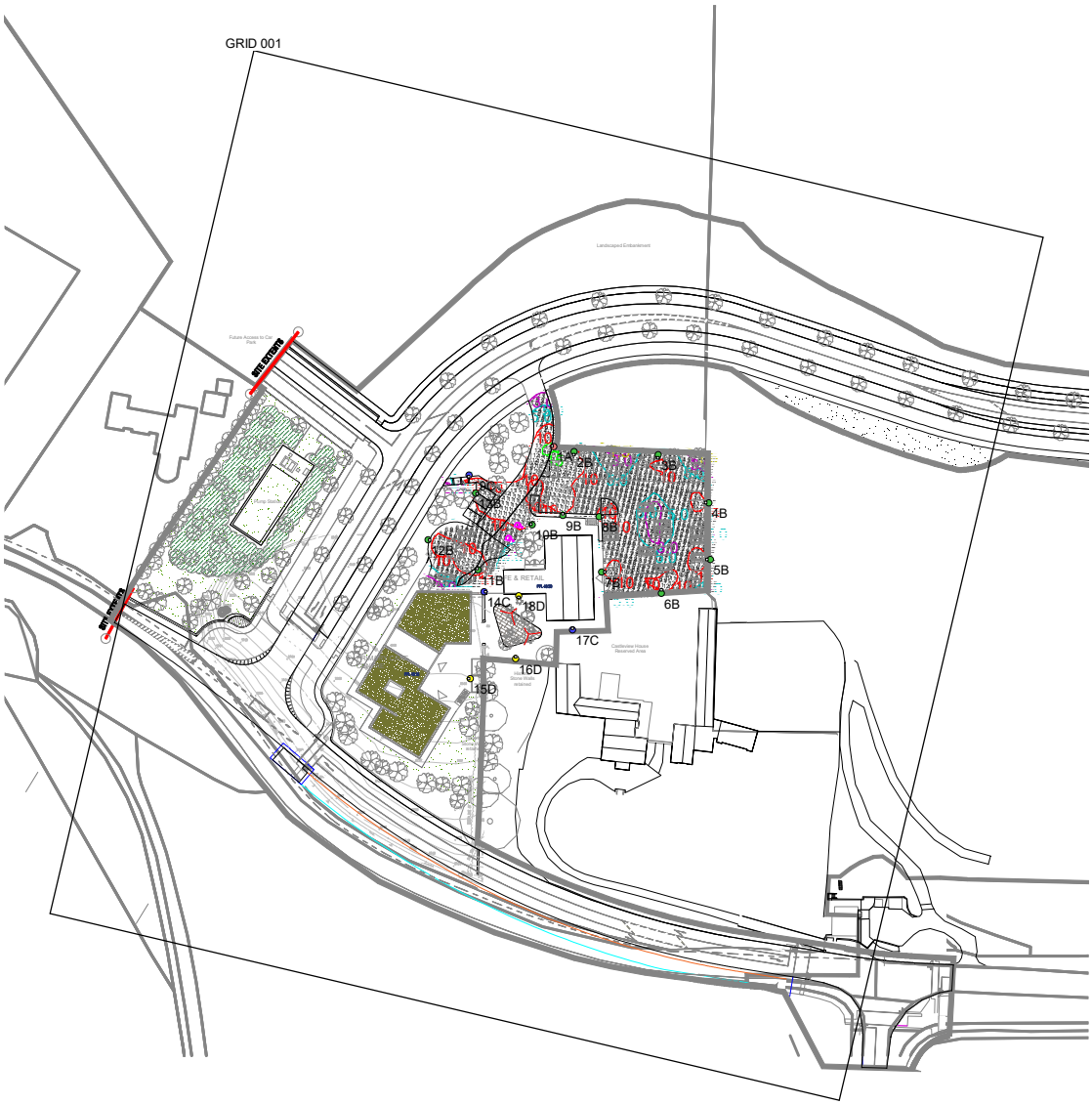
ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	A	561857.93	575773.21	8.00	159.00	0.00	0.00	0.50			
7	B	561872.61	575734.83	6.00	0.00	0.00	0.00	1.00			
2	B	561864.17	575771.69	6.00	268.00	0.00	0.00	1.00			
3	B	561889.87	575770.74	6.00	267.00	0.00	0.00	1.00			
4	B	561905.43	575756.01	6.00	177.00	0.00	0.00	1.00			
5	B	561905.85	575738.72	6.00	183.00	0.00	0.00	1.00			
8	B	561871.89	575751.76	6.00	0.00	0.00	0.00	1.00			
11	B	561834.86	575735.57	6.00	128.00	0.00	0.00	0.50			
13	B	561834.05	575759.00	6.00	336.00	0.00	0.00	0.50			

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
9	B	561860.76	575752.19	6.00	91.00	0.00	0.00	0.50			
12	B	561819.52	575744.73	6.00	353.00	0.00	0.00	0.50			
10	B	561851.42	575749.32	6.00	154.00	0.00	0.00	0.50			
6	B	561890.89	575728.40	6.00	93.00	0.00	0.00	1.00			
14	C	561836.64	575728.85	6.00	0.00	0.00	0.00	0.50			
15	D	561832.42	575702.23	6.00	180.00	0.00	0.00	0.50			
16	D	561846.31	575708.43	6.00	94.00	0.00	0.00	0.50			
17	C	561863.68	575717.15	6.00	85.00	0.00	0.00	0.50			
18	D	561847.26	575727.58	6.00	267.00	0.00	0.00	0.50			
19	C	561832.05	575764.52	6.00	259.00	0.00	0.00	0.50			

Horizontal Illuminance (lux)

GRID 001

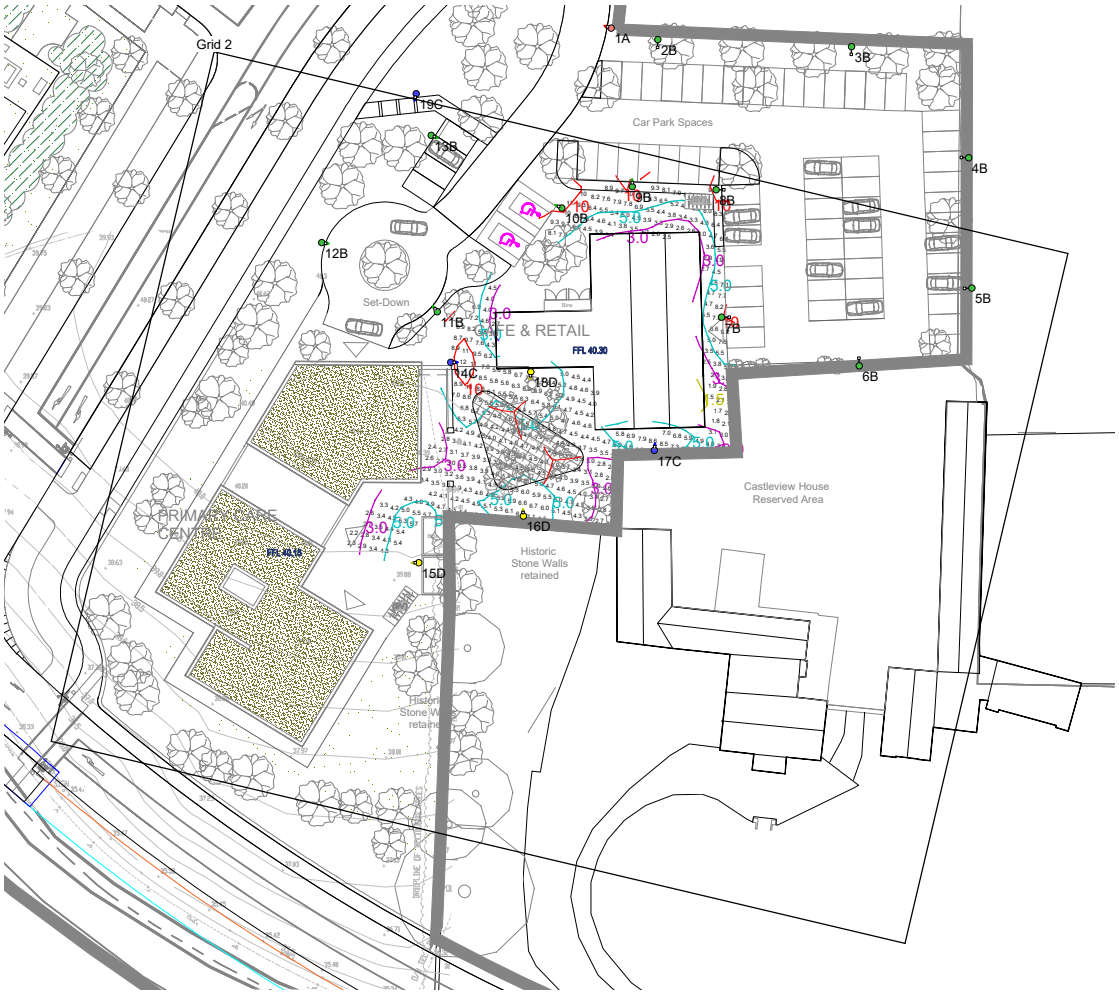


Results

Eav	8.14
Emin	1.60
Emax	16.21
Emin/Emax	0.10
Emin/Eav	0.20

Horizontal Illuminance (lux)

Grid 2



Results

Eav	5.12
Emin	1.53
Emax	11.53
Emin/Emax	0.13
Emin/Eav	0.30

DATE: **12 November 2025**

DESIGNER: **MHL & Associates Ltd.**

PROJECT No: **21079HD**

PROJECT NAME: **Ringwood Spine Road/ R617**

Lighting Classification:

Spine Road to P2.

Main Road Junction to C3.

R617 Road to P2.

Outdoor Lighting Report

PREPARED BY: MHL & Associates Ltd.
Unit 1B,
The Atrium,
Blackpool,
Cork

Layout Report

General Data

Dimensions in Metres Angles in Degrees

Calculation Grids

ID	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	SR P1	561754.06	575737.57	360.14	125.02	1.49	1.49
2	Ringwood Development Junct...	561622.67	575689.54	268.24	231.44	1.50	1.49
3	SR P2	562197.69	575711.27	251.05	134.15	1.49	1.49
4	SR P3	561953.22	576190.37	350.76	148.28	1.50	1.50
5	SR P4	561763.61	576449.09	374.58	145.62	1.50	1.49
6	R617 regional road	561608.21	575673.19	359.10	136.33	1.50	1.50

Luminaires



Luminaire A Data

Supplier	Philips
Type	BGP293 DM50
Lamp(s)	LED-HB 5.2S 740
Lamp Flux (klm)	16.50
File Name	LumiStreet Gen2 Medium_BGP293_DM50_16500_80LED_5.2S_CLO_L90_740.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	939.1, 42.1, 0.0
No. in Project	34



Luminaire B Data

Supplier	Philips
Type	BGP293 DM70
Lamp(s)	LED-HB 5.2S 740
Lamp Flux (klm)	19.50
File Name	LumiStreet Gen2 Medium_BGP293_DM70_19500_80LED_5.2S_CLO_L90_740.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	407.4, 472.4, 0.0
No. in Project	1



Luminaire C Data

Supplier	Philips
Type	BGP293 DM70
Lamp(s)	LED-HB 5.2S 740
Lamp Flux (klm)	21.50
File Name	LumiStreet Gen2 Medium_BGP293_DM70_21500_80LED_5.2S_CLO_L90_740.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	407.4, 472.4, 0.0
No. in Project	8



Luminaire D Data

Supplier	Philips
Type	BGP293 DM70
Lamp(s)	LED-HB 5.2S 740
Lamp Flux (klm)	18.50
File Name	LumiStreet Gen2 Medium_BGP293_DM70_18500_80LED_5.2S_CLO_L90_740.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	407.4, 472.4, 0.0
No. in Project	4

Layout

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	A	561725.70	575727.88	10.00	241.00	0.00	0.00	0.50			
2	D	561750.62	575699.34	12.00	50.67	0.00	0.00	1.00			
3	A	561799.64	575674.85	12.00	224.00	0.00	0.00	1.00			
4	D	561791.17	575705.45	12.00	147.94	0.00	0.00	1.00			
5	A	561827.31	575764.74	12.00	147.94	0.00	0.00	1.00			

Layout Continued

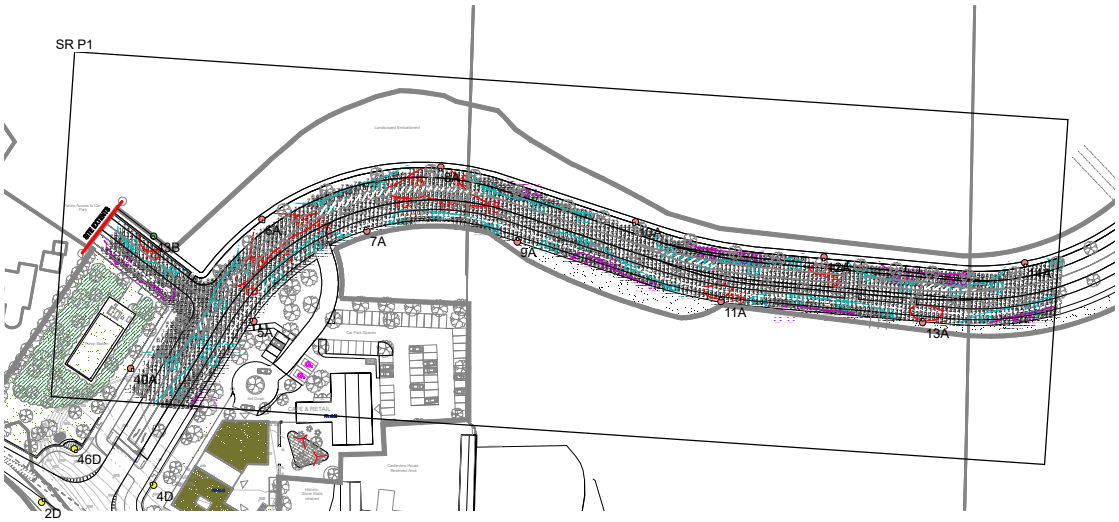
ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
6	A	561830.23	575801.71	12.00	308.00	0.00	0.00	1.00			
7	A	561868.22	575797.39	12.00	110.00	0.00	0.00	1.00			
8	A	561895.02	575820.64	12.00	261.00	0.00	0.00	1.00			
9	A	561922.62	575793.52	12.00	77.00	0.00	0.00	1.00			
10	A	561965.39	575800.82	12.00	240.00	0.00	0.00	1.00			
11	A	561996.28	575771.96	12.00	86.00	0.00	0.00	1.00			
12	A	562033.61	575788.12	12.00	262.00	0.00	0.00	1.00			
13	A	562069.30	575764.36	12.00	86.51	0.00	0.00	1.00			
14	A	562106.27	575785.98	12.00	284.00	0.00	0.00	1.00			
15	A	562147.63	575780.42	12.00	113.00	0.00	0.00	1.00			
16	A	562159.75	575817.33	12.00	324.00	0.00	0.00	1.00			
17	A	562191.70	575837.99	12.00	164.00	0.00	0.00	1.00			
18	A	562177.66	575876.02	12.00	354.00	0.00	0.00	1.00			
19	A	562191.23	575907.04	12.00	188.00	0.00	0.00	1.00			
20	A	562155.64	575926.38	12.00	45.00	0.00	0.00	1.00			
21	A	562146.92	575963.04	12.00	236.00	0.00	0.00	1.00			
22	A	562103.09	575970.66	12.00	55.00	0.00	0.00	1.00			
23	A	562087.94	576010.69	12.00	236.00	0.00	0.00	1.00			
24	A	562046.95	576021.47	12.00	23.00	0.00	0.00	1.00			
25	A	562053.10	576060.74	12.00	189.00	0.00	0.00	1.00			
26	A	562027.09	576091.16	12.00	354.00	0.00	0.00	1.00			
27	A	562055.15	576120.45	12.00	153.00	0.00	0.00	1.00			
28	A	562042.70	576158.72	12.00	340.00	0.00	0.00	1.00			
29	A	562067.59	576190.59	12.00	180.00	0.00	0.00	1.00			
30	A	562038.60	576219.14	12.00	11.00	0.00	0.00	1.00			
31	A	562038.39	576260.43	12.00	236.00	0.00	0.00	1.00			
32	A	561999.86	576267.84	12.00	42.00	0.00	0.00	1.00			
33	C	561990.20	576306.44	12.00	236.00	0.00	0.00	1.00			
34	C	561962.24	576333.38	12.00	225.00	0.00	0.00	1.00			
35	C	561933.14	576359.43	12.00	236.00	0.00	0.00	1.00			
36	C	561904.67	576384.60	12.00	238.00	0.00	0.00	1.00			
37	C	561875.32	576410.90	12.00	236.00	0.00	0.00	1.00			
38	C	561855.37	576446.87	12.00	193.00	0.00	0.00	1.00			
39	A	561833.10	575653.49	12.00	224.00	0.00	0.00	1.00			
40	A	561782.77	575747.82	12.00	318.00	0.00	0.00	1.00			
41	C	561849.27	576486.26	12.00	189.00	0.00	0.00	1.00			

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
42	C	561838.34	576524.77	12.00	199.00	0.00	0.00	1.00			
43	B	561791.15	575795.64	10.00	237.00	0.00	0.00	0.50			
44	A	561872.18	575636.38	12.00	247.00	0.00	0.00	1.00			
45	A	561916.69	575625.28	12.00	253.00	0.00	0.00	1.00			
46	D	561762.41	575718.65	12.00	301.00	0.00	0.00	1.00			
47	D	561769.65	575678.30	12.00	50.70	0.00	0.00	1.00			

Horizontal Illuminance (lux)

SR P1



Results

Eav	10.92
Emin	3.49
Emax	19.10
Emin/Emax	0.18
Emin/Eav	0.32

Horizontal Illuminance (lux)

Ringwood Development Junction

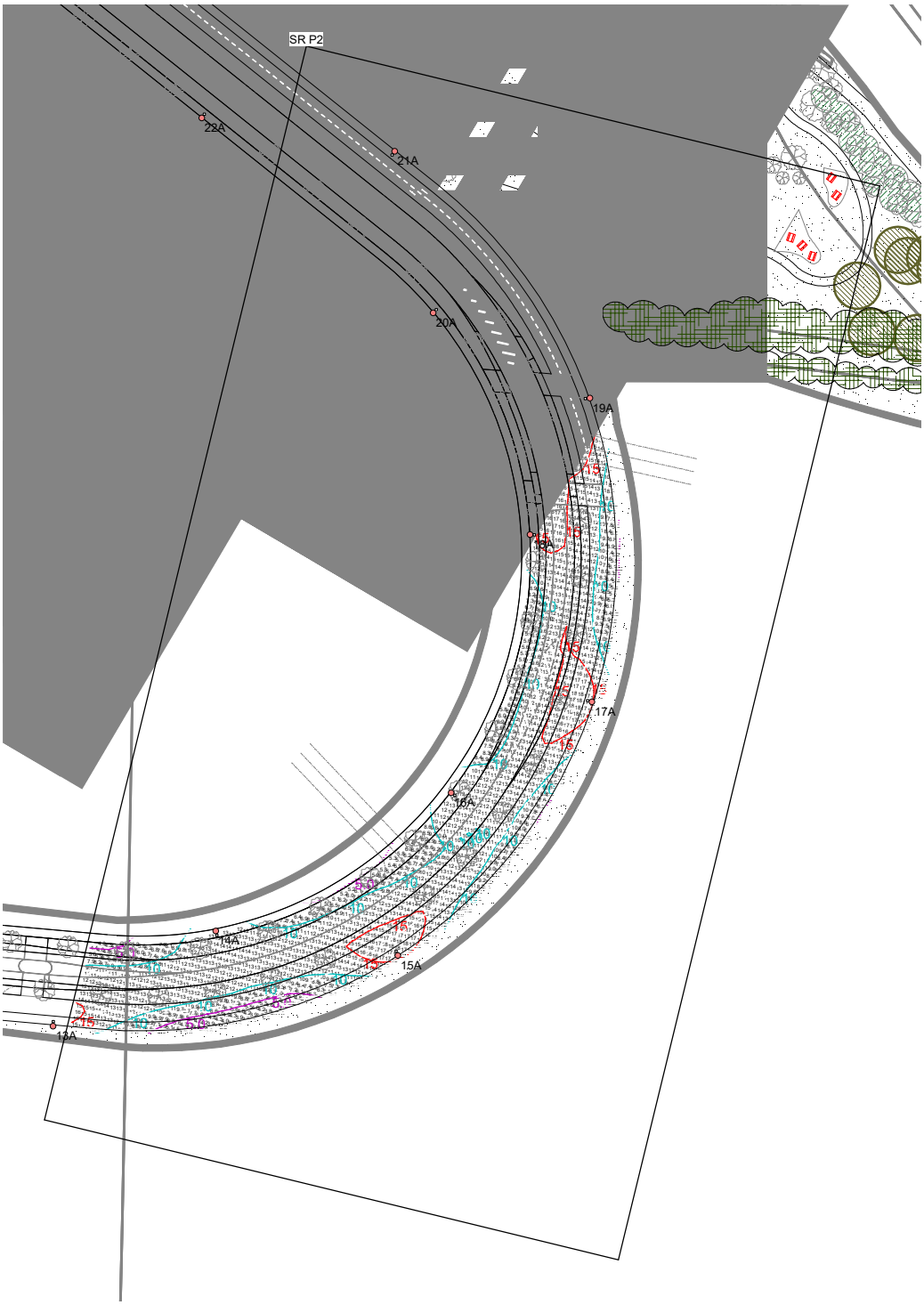


Results

Eav	15.47
Emin	6.34
Emax	21.44
Emin/Emax	0.30
Emin/Eav	0.41

Horizontal Illuminance (lux)

SR P2

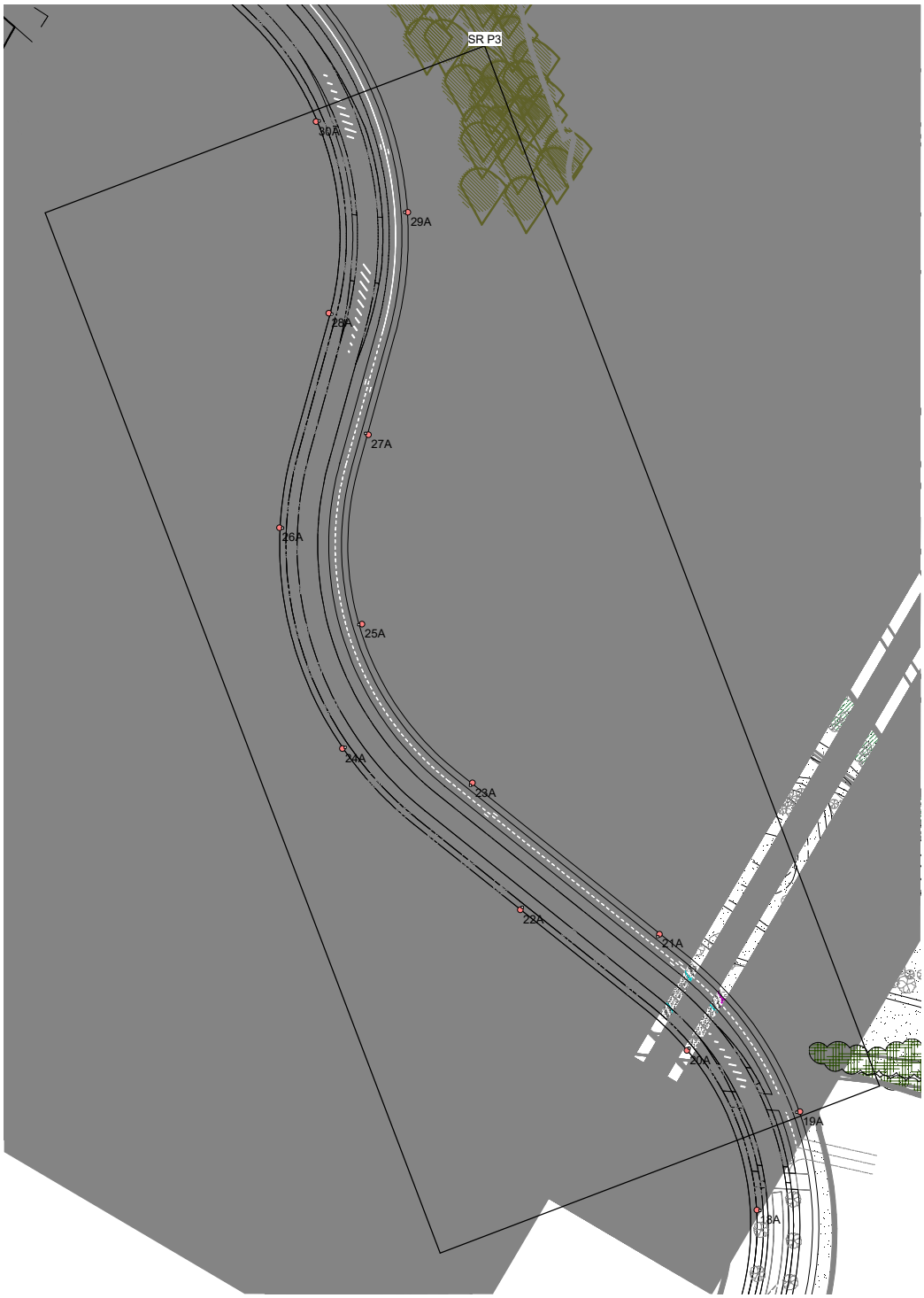


Results

Eav	11.52
Emin	3.54
Emax	19.14
Emin/Emax	0.18
Emin/Eav	0.31

Horizontal Illuminance (lux)

SR P3



Results

Eav	10.79
Emin	3.75
Emax	19.11
Emin/Emax	0.20
Emin/Eav	0.35

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Horizontal Illuminance (lux)

SR P4

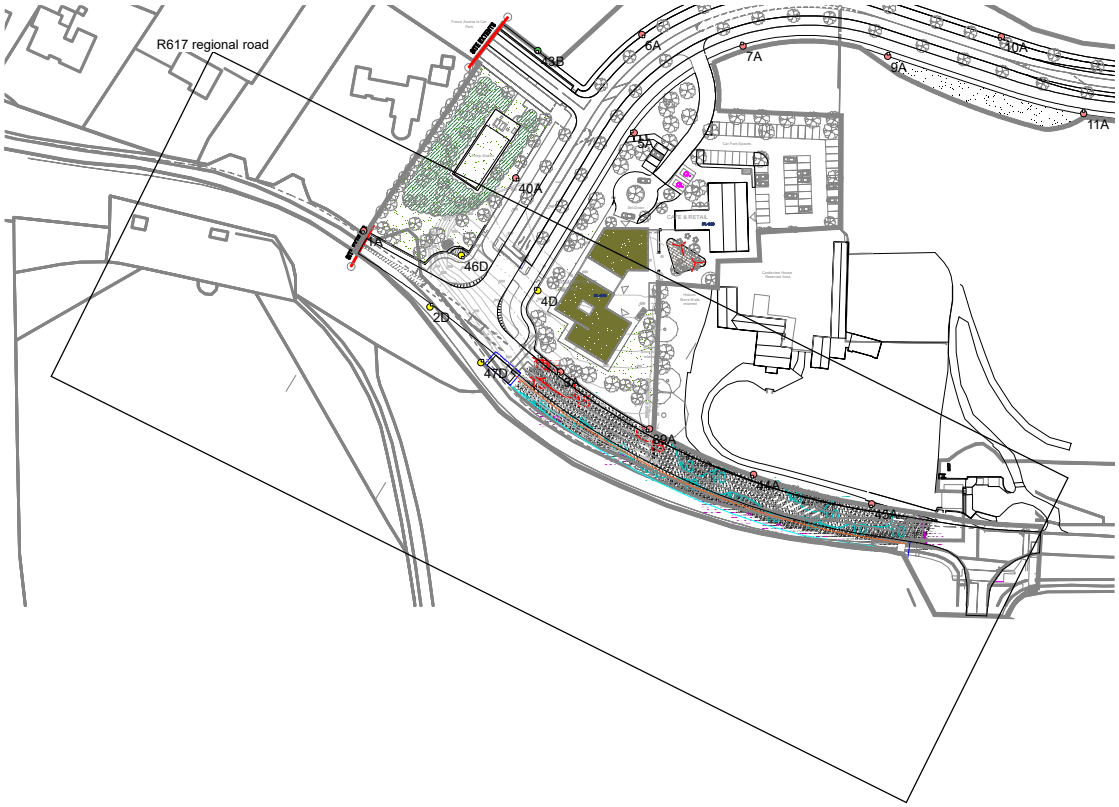


Results

Eav	10.04
Emin	3.34
Emax	17.40
Emin/Emax	0.19
Emin/Eav	0.33

Horizontal Illuminance (lux)

R617 regional road



Results

Eav	10.77
Emin	4.06
Emax	18.00
Emin/Emax	0.23
Emin/Eav	0.38

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