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Phase 1 - The Meadows - Bessborough

Proposed Residential Development

6600 EXTERNAL LIGHTING ANALYSIS REPORT

Bessborough,
Ballinure,
Blackrock,
Co. Cork

Estuary View Enterprises 2020 Ltd

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1 Introduction

1.1 Report purpose

This report gives information on the projects public lighting installation covering the main access road, circulation roads and public car parking areas/spaces.

with particular focus on minimising the effects on any possible bat habitats in the existing tree dominated western and eastern boundaries.

1.2 Instruction

DKPartnership (DKP) have been commissioned by Estuary View Enterprises 2020 Ltd, to carry out the analysis and report for the proposed development at Bessborough, Co. Cork.

1.3 Development description

The development consists of 280 build to sell apartments , associated supporting uses , a 25 child creche facility , communal open space areas, landscaping, under-podium and car parking spaces (99 spaces), bicycle parking spaces, bin stores, public lighting and all ancillary site development works.
The development also consists of a new pedestrian and cycle way bridge connecting the site to the passage west greenway to the Eastern boundary. The development is arranged around 4 main L-shaped blocks ,Builds A,B,C,& D with a central spine public route running East-West. A raised landscape podium is located to the South of this route .Building Heights range form 1 - 10 storeys at varying locations.

1.4 Design considerations

The external lighting design has been executed with the following design considerations:
External lighting code EN132201

2 Executive summary

2.1 Analysis conducted

This report analyses and reports on the illumination layouts and calculation results (appendix) of the existing main access road to the proposed development, new project circulation road, adjacent public carparking, cycle / foot path and pedestrian areas.

2.2 Design considerations

The external lighting design has been executed using the European design standard EN 1332201 class P3 for the main access road and P4 for the estate roads, parking and other circulation area's / routes (foot bridge, cycle path, foot path, pedestrian areas). The public lighting has also been designed to take in account the projects ecologists Dixon-Brosnan report indicating the potential bat roosting / foraging areas to the east of the development. The EN 1332201 class P3 and P4 standard has the following compliance criteria;

Area	Class	E avg min (lx)	E Max (lx)	E min (lx)
Main access road	P3	7.50	n/a	1.5
Estate roads, parking, general circulation	P4	5.00	n/a	1.0

Table 4.1

2.3 EN132201 External lighting calculation input.

From appendix A representing the illumination calculations and illustrations we note that the proposed lighting design covers the main access road into the development site, the site estate road, adjacent public carparking, foot bridge and cycle & foot path / pedestrian areas using the proposed fittings listed below in accordance with EN 1332201 class P3 / P4, in-line with the Local Authority requirements (Cork City Council) and having taken in account the particular lighting requirements for the bat roosting/foraging areas. The final illumination calculation results are derived using the following 2 types of light fittings ;

Type A Phillips BGP307 40W, 3000K on a 6m pole > Main access road.
Type C Phillips BGP760 27W, 3000K on a 4.5m pole > Estate roads, parking, other routes/areas.

2.4 Calculation data results

From appendix A and B representing the illumination calculations and illustrations for the relevant elements we note the average illuminance Eav for the main access road to be 8.78lx and in excess of the P3 class requirements of 7.50lx. The average illuminance Eav for the estate road, adjacent public carparking, foot bridge and cycle & foot path / pedestrian areas is 6.09lx and is in excess of the P4 class requirement of 5.00lx. The minimum illuminance Emin for the main access road is 1.91lx and in excess of the P3 class requirement of 1.50lx. The minimum illuminance Emin for the estate road, adjacent public carparking, foot bridge and cycle & foot path / pedestrian areas is 1.54lx and in excess of the P4 class requirements of 1.00lx.

Element / area	Class	E avg min (lx)	E max (lx)	E min (lx)
EN13201 standard (main road)	P3	7.50	n/a	1.50
Main road achieved	P3	8.78	17.69	1.91
EN13201 standard (estate roads)	P4	5.00	n/a	1.0
Estate roads, path, areas acieved	P4	6.09	15.75	1.54

Table 5.1

2.5 Conclusion

The external (public) lighting design as per illumination report appendix A meets the criteria set out in EN13201 for lighting class P3 and P4 and we, DKP, therefor deem the external lighting design to be in compliance with the applied standards and recommendations. We further note that the light spillage in the by the ecology report highlighted tree dominated areas with possible bat habitats is extremely low (from zero to less than 0.1lx) and we DKP therefore consider the external lighting design to meet the criteria required to lower any disturbance to bat habitats as a result of artificial lighting to a minimum.

2.6 Mitigation measures / actions

No mitigation measures required for compliance to lighting standards.

3 Geographical overview

3.1 Project location & extend.

Image 3.1 the (google) site map below indicates the location of the site approximately outlined.

Image 3.1: approximate proposed phase 1 (Meadows) development site area outlined

4 Approach and methodology

4.1 Analysis approach

The external lighting was designed with specific design considerations ;
A – As per the guidelines set out by the European standard EN132201 for external lighting applied to the sites circulation road, parking areas, foot bridge and cycle/foot path / pedestrian areas. The main access road into the development site has exiting public lighting installed and this has been included in the illumination calculations and B - For the preservation of possible bat habitats in the tree dominated areas the spillage of external lighting illumination is to be minimised.

4.2 EN132201 external lighting data and targets

The external lighting standard EN132201 was applied using the class P3 for the main access road and P4 for the estate roads, parking and other circulation areas (footpath or cycle path). The table below indicates the minimum P3 and P4 EN13201 illumination targets.

Area	Class	E avg min (lx)	E Max (lx)	E min (lx)
Main access road	P3	7.50	n/a	1.5
Estate roads, parking, general circulation	P4	5.00	n/a	1.0

Table 4.1

4.3 A - Roads, public parking and pedestrian areas, foot & cycle path identified.

The following areas have been including in the for the external (public) lighting design in the image below ;.

Image 2.1 Roads, parking areas and pedestrian walk ways identified for public lighting.

A = New estate road (orange)
B = New pedestrian areas, foot & cycle path (green)
C = Main access road to development (blue)

4.4 B – Tree dominated areas with possible tat habitat areas and minimum light spillage

Dixon-Brosnan, the project ecologists, carried out bat activity surveys for the Phase 1 development. Small numbers of Common Pipistrelle and Leisler's bat were recorded foraging along the treeline along on the eastern site boundary of the Phase 1 'The Meadows'. This mature treeline and scrub which runs adjacent to the Blackrock-Passage greenway has moderate suitability as a foraging/commuting route, to link roost sites to foraging areas and facilitate the dispersal of bats into the wider landscape. The external lighting design was therefore to be designed to minimise light spillage into the "bat" identified areas. Bat Conservation Ireland 2010, Stone 2013 recommend the following ; Lighting types that emit a narrow spectrum with no / little UV attract relatively less insects than broad spectrum types with high UV therefore, the narrow spectrum types with no / little UV have a relatively lower impact on bats by not attracting their insect prey base away from the nearby habitats where bats will be searching for prey. The use of directional lighting and luminaire accessories (shield, louvre) are also very successful approaches to reducing light spillage nuisance into the surrounding environment in relation to bats. Where artificial lighting is managed and/or designed to avoid light spillage into the wider environment, potential effects on foraging/commuting bats would be considered neutral imperceptible. In this case, this would include avoiding light spillage onto the existing tree areas on the Eastern boundary.

Taking the above into account we applied asymmetric diffusers to the proposed pole top light on the Eastern boundary as opposed to symmetric ones and orientated so that the glass of the luminaries is positioned parallel to the eastern boundary ground as recommended. This will ensure that the light is cast in a downward direction and avoids horizontal spillage of the light. The use of LED lighting with no/low UV component due to the phosphors within an LED lamp converting UV to white light will also play a great part to keep disruption to a low level. The light fittings also have a dimming capability for a possible night tome mode subject to the local authorities approval.
Height of the columns have been minimised to 4 metres to further reduce light spill or trespass.
The construction phase lighting scheme will be designed to minimise light spillage nuisance on retained/new wildlife corridors by using shielded, downward directed lighting wherever possible; switching off all non-essential lighting during the hours of darkness; using narrow spectrum lighting types with no UV and luminaire accessories (e.g. shielding plates). Furthermore no light spillage will occur in relation to the tree-dominated eastern boundary. This will benefit bats as well as other fauna active/resting at night". See image 2.2 below with the tree dominated area highlighted in blue.

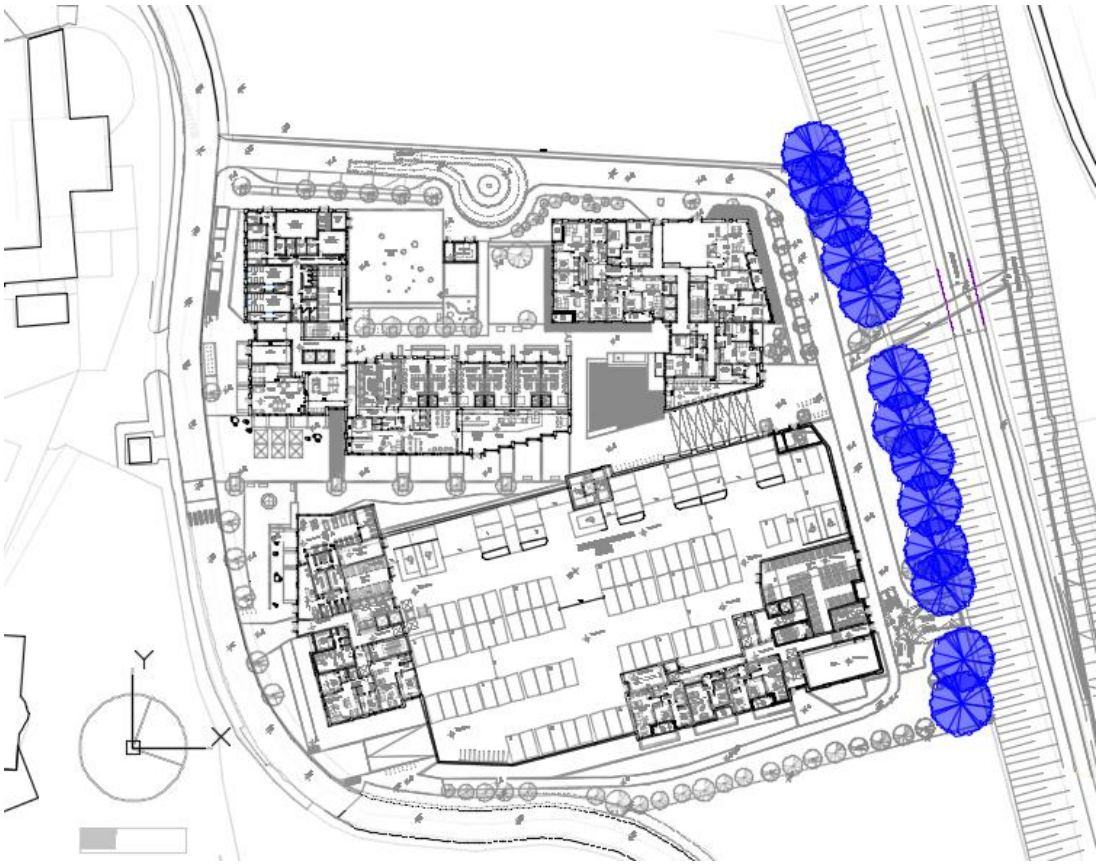

Image 2.2 Area's identified as possible bat habitat or foraging areas. (Blue trees)

4.5 C – Existing public lighting.

The main carriage road from the round-about at the Bessborough road to the proposed development location is already complete with a public lighting system.
The existing fitting are LED and noted in the report and illuminance calculation as fitting A using the data below.

Luminaire A Data

Supplier	
Type	BGP307 T25 DM50 LED40/740 NO
Lamp(s)	LED40-4S/740
Lamp Flux (klm)	4.00
File Name	ofmt1_bgp307t251xled40-4s740dm50.ies
Maintenance Factor	0.80
Imax70,80,90(cd/klm)	889.0, 63.6, 0.0
No. in Project	15

Table 4.2 Main access road light fitting type A data

The image below shows the existing public lighting locations adjacent to the new proposed development.

Image 2.3 Exiting public lighting pole locations.

5 Calculation data and conclusion

5.1 Calculation results.

From appendix A and B representing the illumination calculations and illustrations for the relevant elements we note the average illuminance Eav for the main access road to be 8.78lx and in excess of the P3 class requirements of 7.50lx. The average illuminance Eav for the estate road, adjacent public carparking, foot bridge and cycle & foot path / pedestrian areas is 6.09lx and is in excess of the P4 class requirement of 5.00lx. The minimum illuminance Emin for the main access road is 1.91lx and in excess of the P3 class requirement of 1.50lx. The minimum illuminance Emin for the estate road, adjacent public carparking, foot bridge and cycle & foot path / pedestrian areas is 1.54lx and in excess of the P4 class requirements of 1.00lx.

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Estate roads, path, areas acieved	P4	6.09	15.75	1.54

Table 5.1

The drawing below shows the high level pole locations for the existing and new proposed lighting columns;

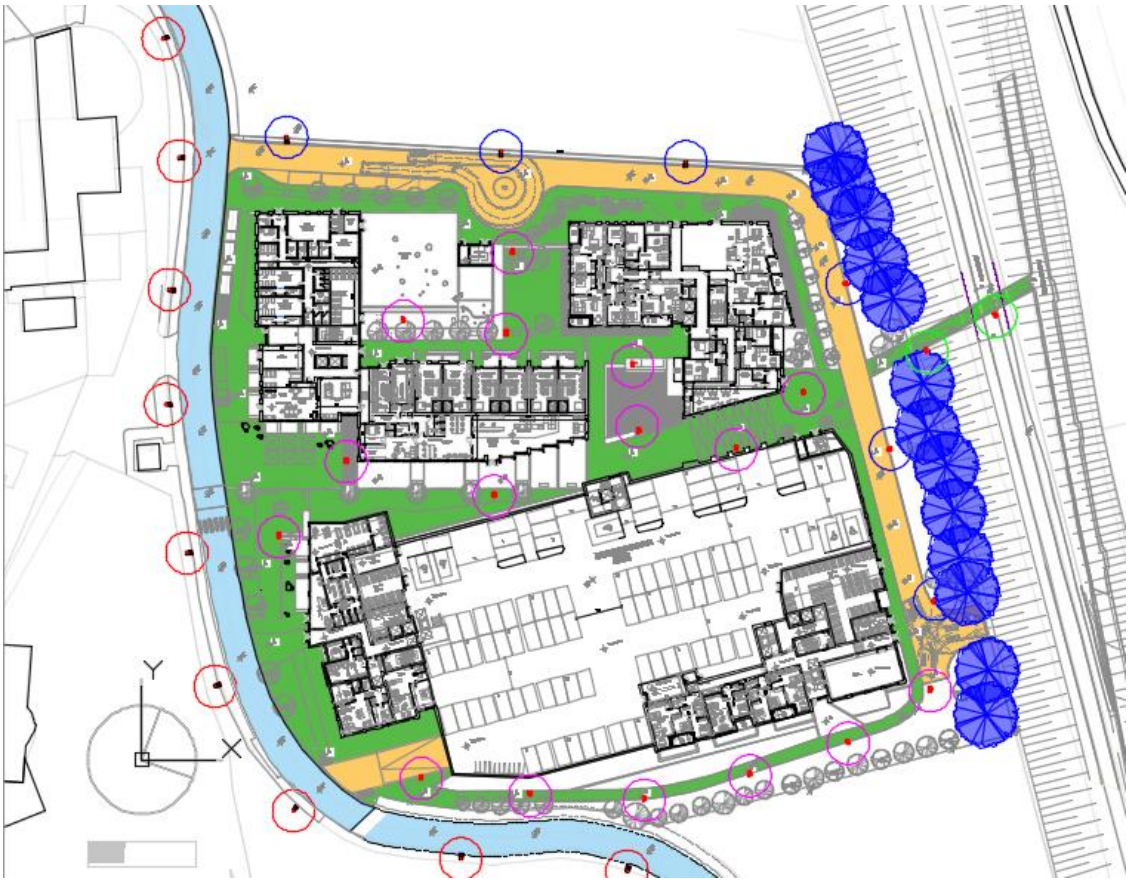

Image 2.4 Exiting public lighting pole locations and new proposed public lighting pole locations

Main access road columns (6m)	
Estate road lighting columns (4.5m)	
Cycle / foot path / pedestrianised areas columns (4.5)	

The illumination data was calculated using different light fittings and columns. ;
Type A Phillips BGP307 40W, 3000K on a 6m pole > Main access road.
Type C Phillips BGP760 27W, 3000K on a 4.5m pole > Estate road, parking, pedestrian and cycle pathways.

The light fittings adjacent to the areas identified as bat roosting/foraging areas (blue trees) are fitted with asymmetric diffusers to minimise light spill into the relevant areas.

5.2 Lifgt fiiting illustration..

Type A Phillips BGP307 40W, 3000K on a 6m pole > Main circulation road around phase 1.

Type C Phillips BGP760 27W, 3000K on a 4.5m pole > Estate road, Pedestrian and cycle pathways.

5.3 Conclusion

The external (public) lighting design as per illumination report appendix A meets the criteria set out in EN13201 for lighting class P3 and P4 and we, DKP, therefor deem the external lighting design to be in compliance with the applied standards and recommendations. We further note that the light spillage in the by the ecology report highlighted tree dominated areas with possible bat habitats is extremely low (from zero to less than 0.1lx) and we DKP therefore consider the external lighting design to meet the criteria required to lower any disturbance to bat habitats as a result of artificial lighting to a minimum.

5.4 Mitigation measures / actions

No mitigation measures required for compliance to lighting standards.