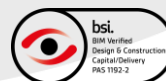


External Lighting Report
For the
Galway Port LRD
At
Galway Port
For
The Land Development Agency

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Document History

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Contents

1. Executive Summary	4
2. Introduction	5
3. Lighting Design	5
3.1 Road Lighting	6
3.2 Main Road Lighting	6
4. Lighting Mitigation	6
5. Proposed Luminaires	7
5.1 Road & Path Lighting	7
5.2 Open Spaces	7
6. Conclusion	7
6.1 Road & Path Lighting P3	7
6.2 Junctions Class C4	7
6.3 Open Spaces / Amenity	7

1. Executive Summary

Axiseng have been commissioned by The Land Development Agency to prepare this external lighting report for the Large-Scale Residential Development proposed at Galway Port in Galway City.

The purpose of this report is to demonstrate the required levels for each item of roadway and foot paths are met, e.g., P Class for roadways/paths and C Class for Conflict Zones.

A Lighting Reality calculation has been completed highlighting the classes which are being met as required. This report can be found in Appendix A of this document. A drawing accompanies this highlighting the location of fittings, GALP-X-X-DR-AXE-EE-60102.

Appendix A (Lighting Reality Report) demonstrates the following results for the calculation areas to the class standards:

Lighting Class	Maintained Average Illuminance, lux (Eav)	Maintained Minimum Illuminance, lux (Emin)	Uniformity Emin/Eav
Required Levels @ P3	7.5 – 11.25	1.50	N/A
Roadways & footpaths	8.7	1.7	0.2
Required Levels @ P4	5	1	N/A
Open Spaces	6.3	1.2	
Required Levels @ C4	10	N/A	0.4
Junctions	13		0.41

2. Introduction

Galway City Council – The Land Development Agency intends to apply to Galway City Council for permission for a 'Large-Scale Residential Development' (LRD) at a site of 1.621 Ha in Galway Port at Dock Road and Lough Atalia Road, Galway City, and extending to include parts of both roads for road infrastructure works and water services infrastructure works.

The proposed development principally consists of: the demolition of the existing office / bus depot building (370.2 sq m) and ancillary building (26.0 sq m); the partial demolition of the existing ESB sub station and ancillary building (67.4 sq m); the demolition of existing boundary walls at the south-west and north-west; and the construction of a mixed-use development.

The proposed mixed-use development primarily comprises: 356 No. residential apartments (172 No. 1-bed, 169 No. 2-bed and 15 No. 3-bed); crèche (255.9 sq m); 2 No. café/restaurant units (totalling 428.4 sq m); and 1 No. retail unit (156.0 sq m).

The development has a total floor area of 32,096.0 sq m and is primarily proposed in 4 No. blocks (identified as A–D) that generally range in height from 6 No. to 13 No. storeys: Block A ranges from 6 No. to 9 No. storeys; Block B ranges from 6 No. to 11 No. storeys; Block C is 6 No. storeys; and Block D ranges from 6 No. to 13 No. storeys.

The proposed development also includes: new internal street and pedestrian network, including a one-way vehicular route at the north-western side of the site and new junctions with Dock Road at the south-west and with the access road from Lough Atalia at the north-west; upgrades to Lough Atalia Road and the access road from it at the north-west of the site, including the provision of a new toucan pedestrian/cycle crossing at Lough Atalia Road; upgrades to the footpath and road interface with Dock Road to the south-west; 37 No. car parking spaces; 1 No. set-down/delivery bay; 741 No. cycle parking spaces; hard and soft landscaping, including as public open spaces and communal amenity spaces; private amenity spaces as balconies and terraces facing all directions; boundary treatments; public lighting; bin stores; double sub-station; plant rooms; green roofs; rooftop lift overruns and plant; rooftop telecommunications, plant and enclosure at Block C; recladding of the existing sub-station and pumping station; and all associated works above and below ground.

For the purpose of this project, the following guidance documents have been used:

- EN 13201- 2:2015 (CEN/CENELEC, 2016) – Road Lighting Part 2: Performance Requirements
- BS 5489-1:2020 – Lighting of roads and public amenity areas

The calculation has been carried out using 'Lighting Reality' software. The results of which are included in Appendix A.

This report shall be read in conjunction with the drawing GALP-X-X-DR-AXE-EE-60102.

3. Lighting Design

To meet the required lighting design for the development, the following shall be incorporated:

- LED luminaires with a 2700K colour temperature.
- All Public Lighting lanterns shall be controls shall be achieved by means of photocells, with each lantern being switching "ON" from dusk to dawn. An individual Photo-Electric Control Unit (PECU) shall include a "fail safe" circuit that switches the lantern on in the event of a photocell failure. The PECU shall be a 35lux rating with a 2:1 ratio.

- A NEMA socket shall be wired to each lantern control circuit and shall include connection of communications cable driver.
- Luminaires shall provide a light output ratio in excess of 90% with an upward light output ratio of no more than 0.5%

The following has not been included within the calculations and report.

- Tree lines, proposed and existing, have not been included within the calculations.
- Assumptions have been made for existing lighting and associated levels.

3.1 Road Lighting

The lighting design for the roads and paths have been assumed to be a P3 from the I.S. EN 13201-2:2015 (CEN/CENELEC, 2016) – Road Lighting Part 2: Performance Requirements.

To meet these classifications, the requirements are:

- To achieve P3 Class:
 - Average 7.5 – 11.25lux
 - Minimum Lux – 1.5lux
- To achieve P4 Class:
 - Average 5lux
 - Minimum Lux – 1lux
- To achieve C4 Class:
 - Average 10lux
 - Uniformity 0.4 and above

3.2 Main Road Lighting

The main road has been calculated to achieve an average of 10lux min to meet the requirements set by BS EN 12464-2 Light and Lighting and 0.4 uniformity are required. Estimates have been used for existing lighting.

4. Lighting Mitigation

The public lighting has been designed to P3 class (footpaths & road) and C4 class as per EN 13201, this lighting will include a step back to P4 and C4 classes after midnight.

The lighting has been designed in accordance with Bat Conservation Ireland guidelines and the Bat Conservation Trust requirements. Lighting in proximity to the water edge has also be designed to reduce the spill and all lighting is specified as 2700K.

A lighting accessory in the form of shields may be installed, where necessary, as a preventative measure to reduce unwanted light spill. The proposed lamps have limited backward light properties, these assist in reducing the backward light spill. Lamps have been specified with 0 degree tilt to ensure limited unwanted light spill.

5. Proposed Luminaires

There are numerous luminaires proposed to suit each area of the development.

5.1 Road & Path Lighting

The luminaire used for Roads and Pathways in areas that may be taken in charge are the Veelight Metro Streetlight with varying outputs used in different areas as required to meet the lux level requirements.

5.2 Open Spaces

In the Open Space areas which include areas that are solely for use by occupiers of the residential apartments and other areas which will be publicly accessible, the luminaires used are a combination of Veelight Metro Streetlight, Veelight Camino Bollard and Veelight Chi Series.

6. Conclusion

6.1 Road & Path Lighting P3

The results from the 'Lighting Reality' calculation demonstrate that the minimum average lux levels for a P3 road are exceeded. The average requirement is to achieve 7lux and 11.25lux with a minimum of 1.5lux.

The average lux levels achieved are 8.7 lux with a minimum of 1.7 and a uniformity of 0.2. This complies with the IS EN 13201- 2.

These results can be found in the attached Appendix.

6.2 Junctions Class C4

The results from the 'Lighting Reality' calculation demonstrate that the minimum average lux levels for junctions have been achieved. The average requirement is to achieve 10lux with a uniformity of 0.4 in this area.

The maintained average illuminance achieved is 13 lux with minimum of 1.2 lux. This complies with the IS EN 13201- 2.

These results can be found in the attached Appendix.

6.3 Open Spaces / Amenity

The results from the 'Lighting Reality' calculation demonstrate that the minimum average lux levels for Open Spaces have been achieved.

The maintained average illuminance achieved is 6.3 lux with a minimum of 1.2 lux. This complies with the BS 5489-1 – Lighting of roads and public amenity areas.

These results can be found in the attached Appendix.