PMEP
Penston MEP Consulting

Client: NEW IRELAND ASSURANCE COMPANY PLC

Project: DRIVE THRU COFFEE SHOP, LUCAN RETAIL PARK

Title: SITE LIGHTING REPORT

Date: MARCH 2022

Revision: P2

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Revision	Purpose	Originated	Checked	Reviewed	Authorised	Date
P2	ISSUED FOR PLANNING	FB	ST	NP	NP	04/03/22
P1	PRE-PLANNING – For Comment	FB	CG	NP	NP	29/11/21

INTRODUCTION

This report is prepared on behalf of New Ireland Assurance Company PLC in relation to the new drive thru coffee shop development at the existing Lucan Retail Park, Lucan Road, Ballydowd, Lucan. The application site is bound by Lucan Road to the North and East and the existing Retail Park to the South and West.

The proposed development consists of the construction of 1 no. drive thru coffee shop. The unit will consist of 170sq.m. of shop and a maximum building height of 6.8m. The proposal also includes minor changes to the existing parking area.

The proposed development also includes for the provision of 12 no. cycle parking spaces (8 public and 4 staff), 2 no. disabled parking spaces, 2 no. Ecar charging points and an external yard area. Access to the facility will be done by modifying the existing Lucan Retail Park parking area.

1 DESIGN CONSIDERATIONS

1.1 Road Usage

When designing the proposed lighting scheme for the development the following traffic classifications have been considered;

- Vehicular Traffic
- Pedestrian Traffic
- Car parking

1.2 Lighting Design Parameters

The lighting layout was designed with the following considerations:

- Meet the clients lighting requirements to provide a safe & operational site
- Provide safe entry to the parking area and Drive Thru.
- Avoid light spill entering adjacent areas.
- Ensure light trespass onto adjacent properties are within acceptable levels
- Ensure visibility is good for all road users and ensure there are no dark areas within the development
- Coordination with the landscape developers to ensure light positions do not clash with landscaping, limiting light obstruction and future maintenance costs.
- Maintain tilt angles on streetlights and floodlights and limit tilt angles to avoid sky glow and unnecessary light pollution.
- Using flat glass in the light fitting to reduce light spill
- High colour rendering index to assist residents and visitors with their ability to render colours and assist with signage identification.
- A sufficiently high S/P ratio in the luminaires used to assist both traffic and pedestrians with Photopic and Scotopic vision for security and safety and to assist with the identification of both moving and static objects at night.
- Maintaining adequate lighting on the pedestrian path to ensure pedestrian safety.

- Low energy lighting - luminaires identified as Energy Efficient (as listed by Sustainable Energy Authority of Ireland).
- Using LED lamp sources

2 SITE LIGHTING

2.1 Introduction

The lighting design proposal has been based on the current EN 13201 1&2 2015, I.S. EN 12464-2:2014, South Dublin County Council Public Lighting Specification, Society of Light and CIBSE Lighting Guide 06: The Exterior Environment as a minimum.

Based on the guidelines set out in the above documents, the minimum parameters applicable to the site are set out in table 1 below. Prior to lux level calculations being performed, the relevant design guidelines were used to determine the base point for the class of lighting required within the drive thru coffee shop development (ref: Table 3 BS5489-1-2013).

Table 1. Minimum lighting class levels

Location	Lighting Class	Maintained (Eave) Lux Level	Maintained (Emin) Lux Level
Site Entrance/T-Junction	C2	20 Lux	8 Lux
Main Roads-Traffic areas for slow moving vehicles	P2	10 Lux	2 Lux
Subsidiary Roads-Traffic areas for slow moving vehicles	P4	5 Lux	1 Lux
Pedestrian & Cyclist areas	P5	3 lux	0.6 lux

2.2 Lighting Class

As the entrance and exit to the drive thru coffee shop development is considered a conflict area, it will be illuminated to the minimum requirement of 20 lux and achieve a uniformity of 0.4Uo in line with a lighting class C2.

**Conflict areas are typically junctions, intersections, roundabouts and pedestrian crossings, where significant streams of motorized traffic intersect with each other or with other road users such as pedestrians and cyclists. At conflict areas, the visual task is generally more difficult than on straight roads, and a higher luminance or illuminance class may be selected at the conflict area. Ref BS 5489-1:2003 +A2:2008 Code of practice for the design of road lighting — Part 1: Lighting of roads and public amenity areas*

The disabled car park spots located at the front of the development will be illuminated at a maintained 20 lux, to comply with current regulations.

2.3 Colour Rendering

The technical performance of the LED streetlights used in the design will facilitate the ability of road users to render colours accurately by eye. This will aid the ability of drivers to correctly identify different colours and assist in ensuring potential for accidents are mitigated as much as this can assist with.

2.4 Luminaire Selection

The proposed lighting scheme within the development consists of 8m pole mounted fittings as indicated on the drawings (refer to dwg T024-PMEP-00-00-DR-E-01 & T024-PMEP-00-00-DR-E-02).

The proposed pole mounted fittings are as shown in figures below. The Cree lighting - energy uno led street / area luminaire range of LED streetlights were used for the following reasons;

- Minimises upward light spill (Dark sky friendly streetlights);
- Use of low voltage LED lamps;

Fig 1. Cree Energy Uno – 54w

3 LIGHTING LAYOUT

Fig. 2 indicates the proposed lighting layout (refer to dwg T024-PMEP-00-00-DR-E-01 & T024-PMEP-00-00-DR-E-02)

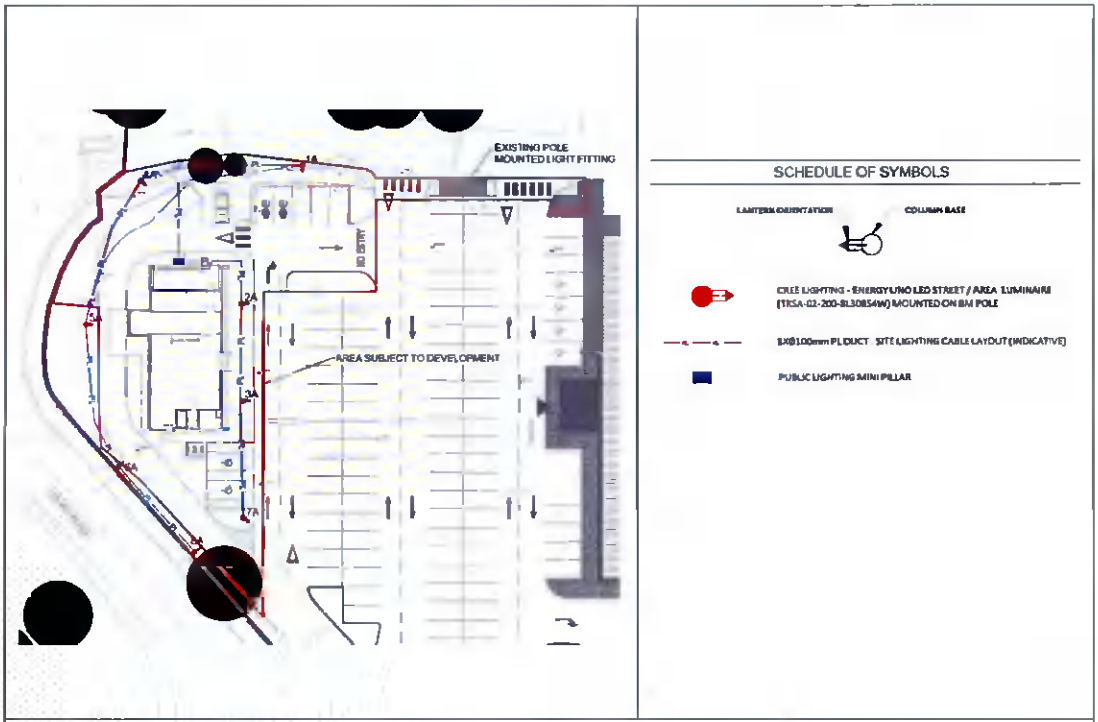

Fig 2. Site Lighting Layout

4 ADDITIONAL DESIGN CONSIDERATION

To ensure new developments are not over lit and to reduce light pollution, each development is categorised into an environmental zone (ref; Table extract from Society of Light and Lighting LG06 below & ILE Guidance notes for the reduction of light pollution). This site location would be considered a class E4 high brightness district. Fig 3. Illustrates the isolux contour lines of the site lighting with the varies lux lines indicated to demonstrate the avoidance of unnecessary light spill onto adjacent parking, roads, and pedestrian walkway areas.

Zone	Surroundings	Lighting environment	Examples
E0	Protected	Dark	IDA Dark Sky Parks, UNESCO Starlight Reserves
E1	Natural	Intrinsically dark	Areas of Outstanding Natural Beauty, relatively uninhabited rural areas
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 and city centres, commercial areas

Source: CIE 150: 2003.

Environmental Zone	Sky Glow ULR [Max %]	Light into Windows E_v [Lux] (1)		Source Intensity I [kcd] (2)		Building Luminance Before curfew (3)	
		Before curfew	After curfew	Before curfew	After curfew	Average, L [cd/m^2]	Maximum L [cd/m^2]
E1	0	2	1*	0	0	0	0
E2	2.5	5	1	20	0.5	5	10
E3	5.0	10	2	30	1.0	10	60
E4	15.0	25	5	30	2.5	25	150

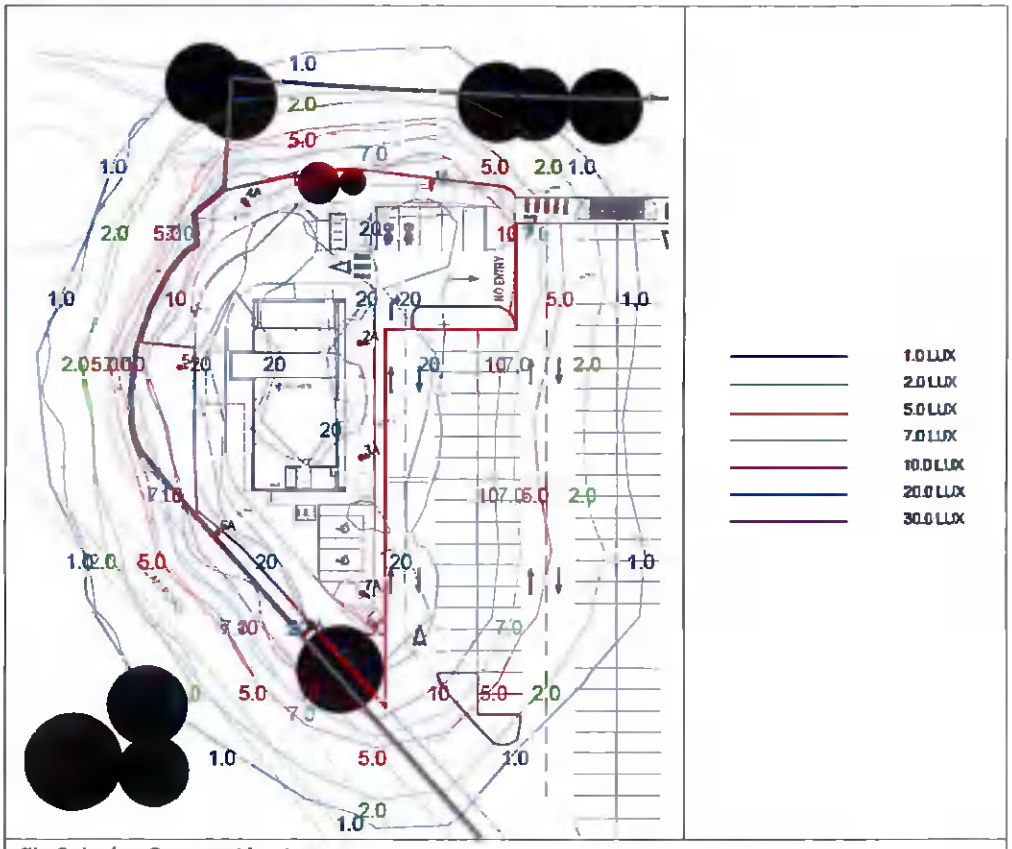

Fig 3. Isolux Contour Line Layout

4.1 Lighting Control

Each light fitting will be a highly efficient Led light fitting controlled via an individual Photoelectric Control Unit (PECU) from a nearby mini pillar. The PECU will switch the external light fittings on and off at dusk and dawn respectively.

Fig 3 above illustrates the maintained lux level:

5 CONCLUSION

The proposed lighting installation for the Drive Thru coffee shop, achieves the following;

- Luminaire selection limits upward light spill.
- The lighting scheme achieves the recommended lux levels in accordance with current regulations and standards.
- The lighting scheme achieves good uniformity throughout the development to ensure good visibility at night.
- Co-ordination with the landscape developers will ensure light positions do not clash with tree position, limiting light obstruction and future maintenance costs.
- Consideration of disabled access lighting requirements (20 lux)
- Utilisation of 3000K colour correlated temperature LED luminaires in the residential road and circulation routes to enhance security and visibility for both disability and general vehicular drivers.

6 REFERENCE INFORMATION

Codes and Standards;

Calculations performed and results produced in this document are in accordance with the following relevant codes and standards;

- South Dublin County Council Public Lighting Specification
- I.S. EN 12464-2:2014
- BS 5489 – 1 2003 A1 2008
- BS 5489 – 1 2003 A2 2008
- BS 5489 – 1 2013
- PD CEN TR 13201 – 1 2004
- EN 13201 – 1&2 2015
- CIBSE Lighting Guide 6 2016 – Outdoor Environment