

PART 8 - ST. PATRICK'S PARK, RATHANGAN,
CO. KILDARE.

PLANNING REF NO. P82022.14.



Project Ref.	Document Title	Rev	Prepared by:	Issue Date	Checked by:
1809	Site Lighting Report	P1	C.M.	02-11-22	A.C

1.0 INTRODUCTION

This report documents the approach taken by Homan O' Brien to develop an external lighting design for the proposed mixed use development at the existing St Patricks Park, Rathangan, Co. Kildare. Homan O' Brien carried out the lighting calculations with the Dialux (9.0) lighting simulation software platform. The calculation results are then compared to figures detailed in industry design standards. Appended to the report is the proposed luminaires.

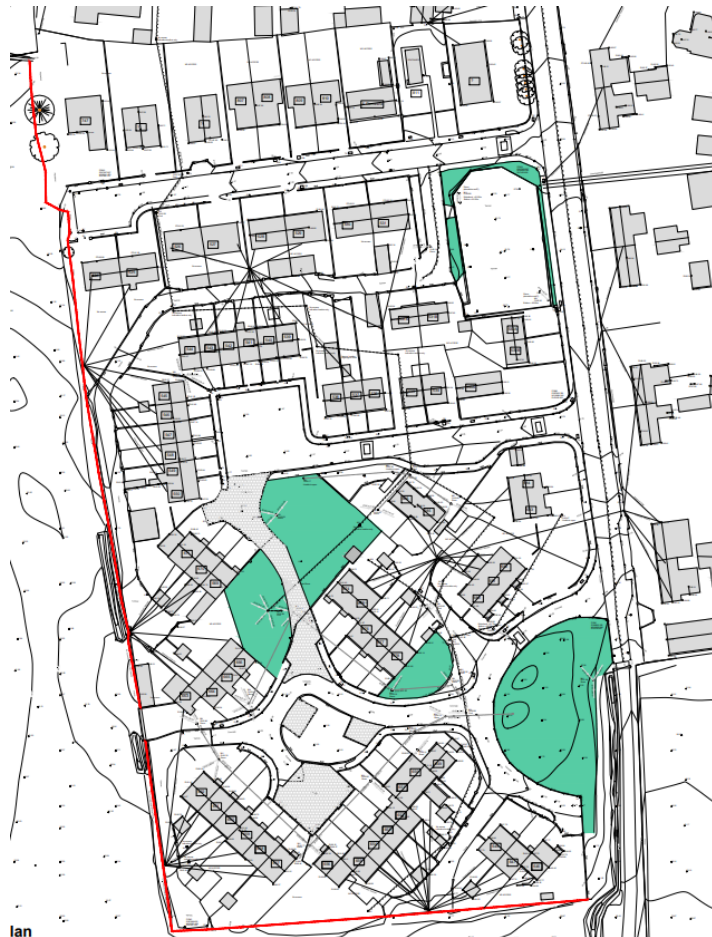


Figure 1: St Patrick's Park - Site Location.

1.1. Development Description:

The proposed development comprises of the demolition of 15 no. dwellings, Refurbishment of 25 no. dwellings, construction of 7 no. dwellings and extensive site development works to create a new landscaped public open space. These works will consist of:

- Construction of 1 no. 4-Bed 1-storey dwelling, 3 no. 3-Bed 2-storey dwellings and 3 no. 2-bed single-storey dwellings.
- Refurbishment of 17 no. vacant units and 8 no. occupied units.
- Demolition of 15 no. units to allow the development of a new landscaped public open space.
- Removal of existing hardscaped play area and replacement with a new landscaped public open space and car parking.

- The provision of new car park area on Kildare County Council lands to the north-west.
- Proposed new gate access to adjacent Kildare County Council lands.
- The removal of existing back lane and extension of existing gardens to the rear of units 657 to 662.
- Associated site development and civil works; including works to existing site and dwelling boundaries, boundaries to new dwellings; drainage, utilities, public lighting; upgrade of paths and roads, new paths and roads and hard landscaping, ancillary site services and site development works above and below ground; Extensive Site Development Works to create New Landscaped Public Open Space

2.0 PROPOSED APPROACH

There were five key lighting design elements reviewed in advance of carrying out lighting calculations. The lighting design should conform to all standards listed below.

Design Criteria

1. Lighting Lux Levels, and uniformity on walkways
2. Light pollution on surrounding properties
3. Luminaire intensity
4. Up Light Ratio (ULR)
5. Lighting Controls

Standards

- EN 12464-2 2014 - Light and lighting. Lighting of work places. Outdoor work places
- SLL Code of Lighting 2012
- SLL Lighting Handbook 2018
- SLL Lighting Guide 6 – Exterior environment
- SLL Lighting Guide 9 – Lighting for communal residential buildings
- I.S 3217:2013
- Building Regulations Part M
- BS 5489.1 2013
- Kildare County Council Public Lighting Technical Specification

2.1 DESIGN CRITERIA

St Patrick's Park is classified as an 'E3' environment in accordance with IS EN 12464-2:2014. This represents medium district brightness areas, such as industrial or residential suburbs. The following lighting criteria must be adhered to when designing a lighting installation for an E3 environment.

Light Pollution on Surrounding Properties

- 10 lux pre-curfew (maximum value of vertical illuminance on properties)
- 2 lux post-curfew (maximum value of vertical illuminance on properties)

Luminaire Intensity (cd - candela)

- 10000 pre-curfew
- 100 post-curfew

Upward Light (ULR %)

- 15%

General Lighting Values

- Walkways exclusively for pedestrians – 5 lux (Illuminance)
- Regular Vehicle traffic – 5 lux (Illuminance) based on P4/P3 class as per Table A.7 of BS5489-1:2013
- Main street Vehicle traffic – 7.5 lux (Illuminance) based on P3/S3 class as per Table A.7 of BS5489-1:2013
- GRI – 50 (Glare Rating)
- Ra – 20 Ra (Colour Rendering)

Table A.5 Lighting classes for subsidiary roads with a typical speed of main user $v \leq 30$ mph

Traffic flow	Lighting class			
	Ambient luminance: very low (E1)	Ambient luminance: low (E2)	Ambient luminance: moderate (E3)	Ambient luminance: high (E4)
Busy ^{A)}	S3 or P3	S3 or P3	S2 or P2	S2 or P2
Normal ^{B)}	S4 or P4	S4 or P4	S3 or P3	S3 or P3
Quiet ^{C)}	S5 or P5	S5 or P5	S4 or P4	S4 or P4

^{A)} Busy traffic flow refers to areas where the traffic usage is high and can be associated with local amenities such as clubs, shopping facilities, public houses, etc.

^{B)} Normal traffic flow refers to areas where the traffic usage is of a level equivalent to a housing estate access road.

^{C)} Quiet traffic flow refers to areas where the traffic usage is of a level equivalent to a residential road and mainly associated with the adjacent properties or properties on other equivalent roads accessed from this road.

Table A.7 Variation of maintained lighting level with S/P ratio of light source

Lighting class	Values in lux					
	Benchmark (e.g. $R_a < 60$ or when S/P ratio of light source is not known or specified)		S/P ratio = 1.2 and $R_a \geq 60$ (e.g. some types of warm white lamp such as metal halide)		S/P ratio = 2 and $R_a \geq 60$ (e.g. some types of cool white compact fluorescent or LED)	
	\bar{E}	E_{min}	\bar{E}	E_{min}	\bar{E}	E_{min}
P1 or S1	15.0	3.0	13.4	2.7	12.3	2.5
P2 or S2	10.0	2.0	8.6	1.7	7.7	1.5
P3 or S3	7.5	1.5	6.3	1.3	5.5	1.1
P4 or S4	5.0	1.0	4.0	0.8	3.4	0.7
P5 or S5	3.0	0.6	2.2	0.4	1.8	0.4
P6 or S6	2.0	0.4	1.4	0.4	1.1	0.4

Lighting Controls

Lighting controls are essential for all exterior lights. A dimming control system is recommended to allow the light levels to be reduced during the hours of curfew (2am to 6am).

3.0 PROPOSED LIGHTING

Pole top lighting are the primary lighting types proposed throughout. The proposed luminaires are utilized to meet all the aforementioned design criteria (minimum lux levels, glare, colour rendering etc.). Lighting specification sheet can be seen in Appendix 1.

Figure 2: Pole Top Luminaire No1 Example



3.1 PROPOSED LIGHTING CALCULATION: RESULTS

Figures 3 to 11 below details the light calculation result generated by Dialux.

- Pedestrian walkways for the residential development - average lux level : 5 Lux

On review of the lighting results, light levels achieved are in line with standards and little or no light pollution on adjacent properties exist.

The ULR (Upward light ratio) has been estimated at 1.0% which is less than the design criteria maximum of 15% for an E3 environment.

Figure 3 -Dialux Calculation Output-



Properties	E	E_{min}	E_{max}	g_1	g_2
Pedestrians Perpendicular illuminance Height: 0.000 m	5.03 lx	1.01 lx	10.0 lx	0.20	0.10

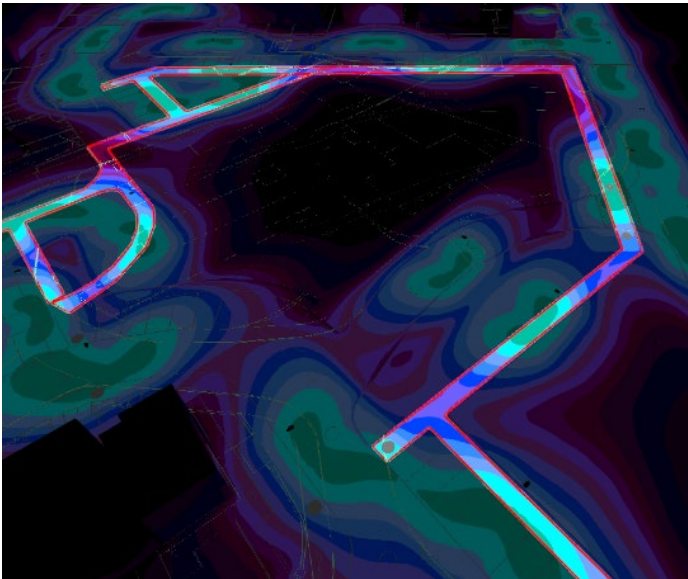


Figure 4 -Dialux Calculation Output –



Properties	\bar{E}	E_{min}	E_{max}	g_1	g_2
Main road Perpendicular illuminance Height: 0.000 m	7.40 lx	3.12 lx	12.2 lx	0.42	0.26

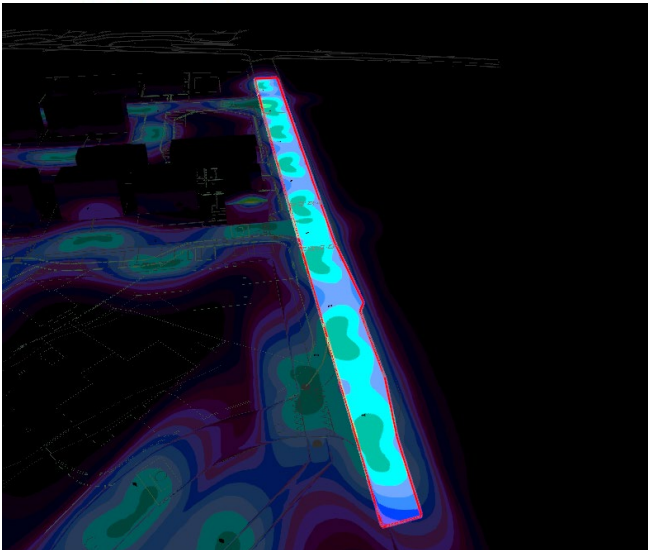


Figure 5 -Dialux Calculation Output –



Properties	E	E_{min}	E_{max}	g_1	g_2
Secondary Road Perpendicular illuminance Height: 0.000 m	5.54 lx	1.65 lx	9.32 lx	0.30	0.18

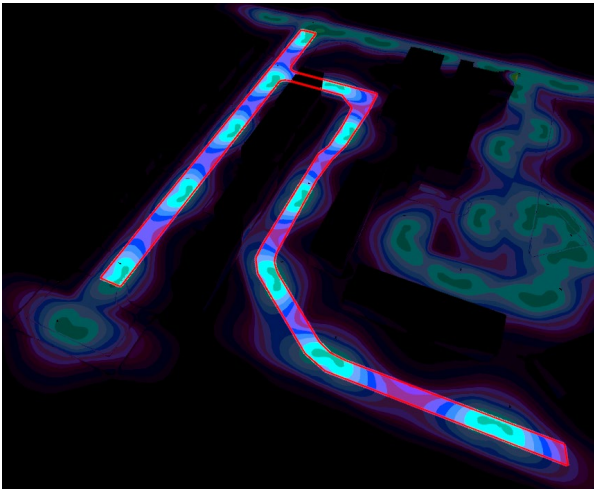


Figure 6 -Dialux Calculation Output –



Properties	E	E_{min}	E_{max}	g_1	g_2	Index
Secondary road Perpendicular illuminance Height: 0.000 m	5.31 lx	0.69 lx	9.40 lx	0.13	0.073	S7

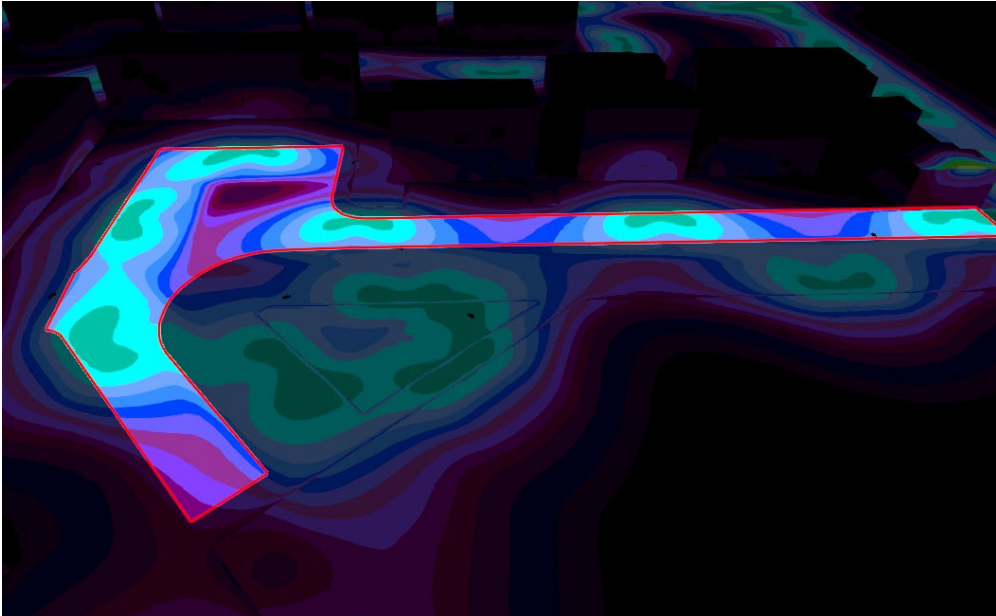


Figure 7 -Dialux Calculation Output



Properties	\bar{E}	E_{min}	E_{max}	g_1	g_2	Index
Secondary roads Perpendicular illuminance Height: 0.000 m	5.29 lx	0.92 lx	10.9 lx	0.17	0.084	S8

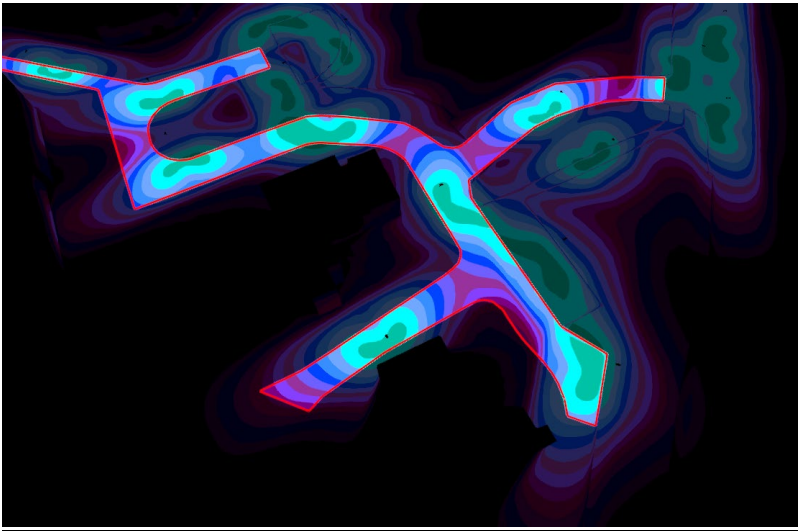


Figure 8 Dialux Model 3D Visual:

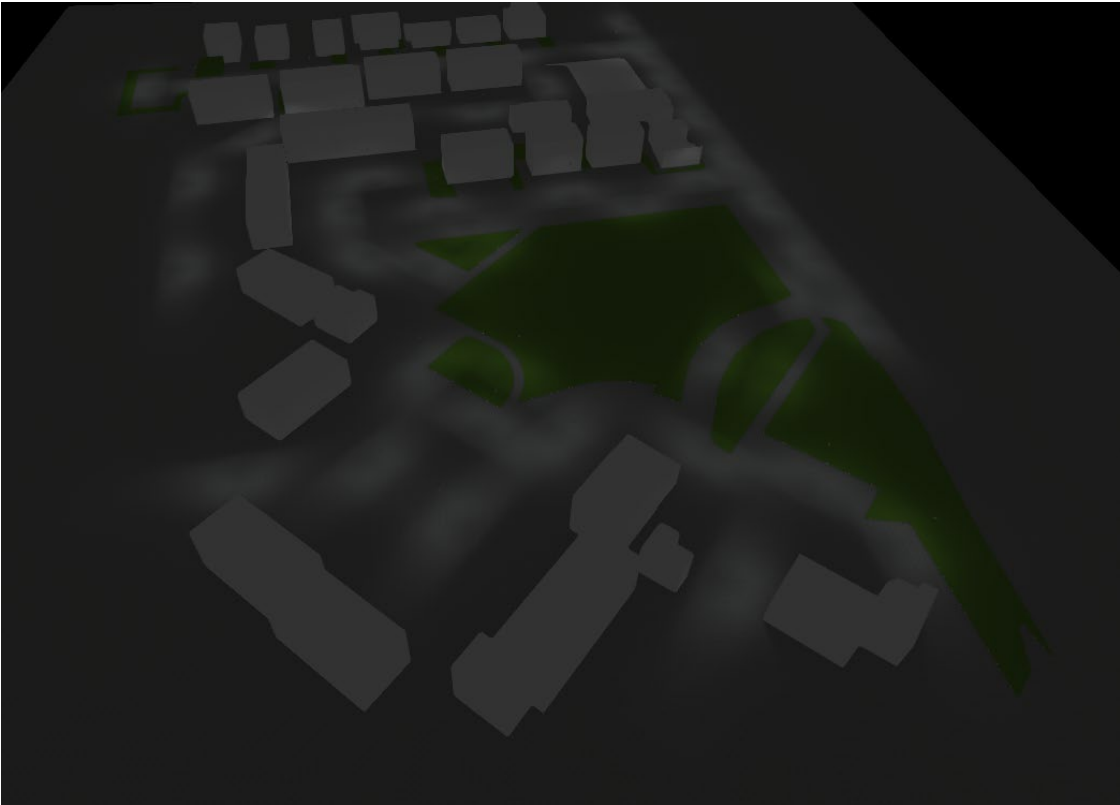


Figure 9 Dialux Lighting Output Visual:

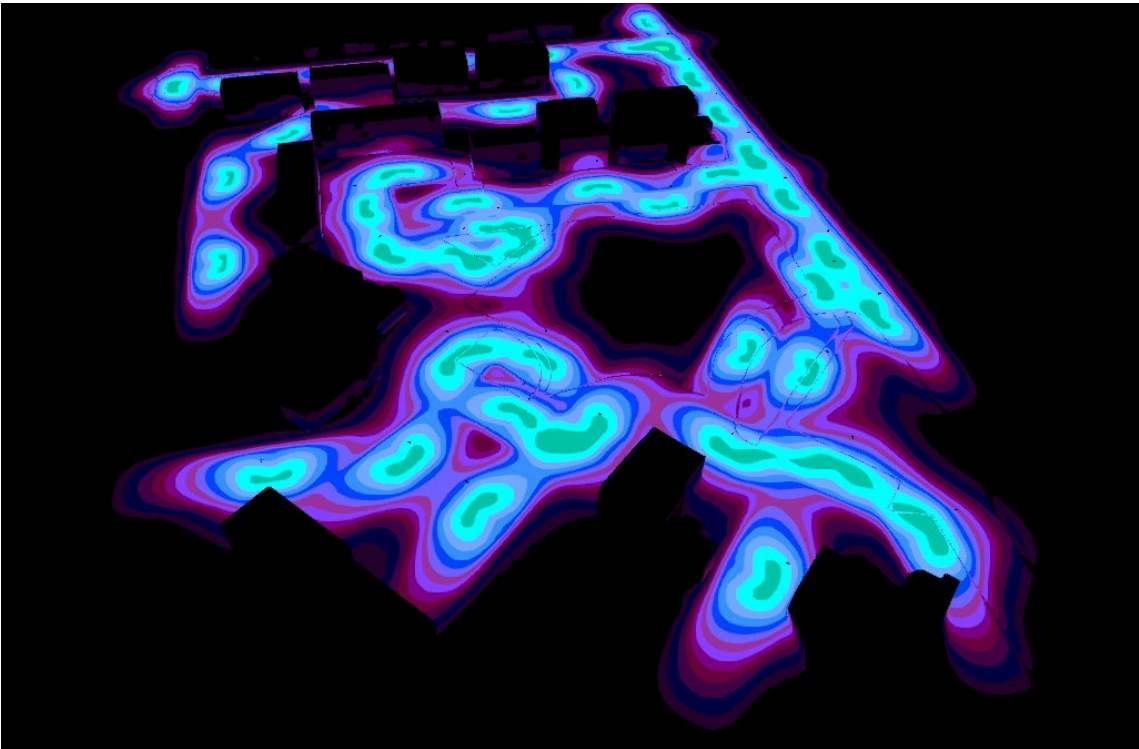


Figure 10 Dialux Model 3D Visual:

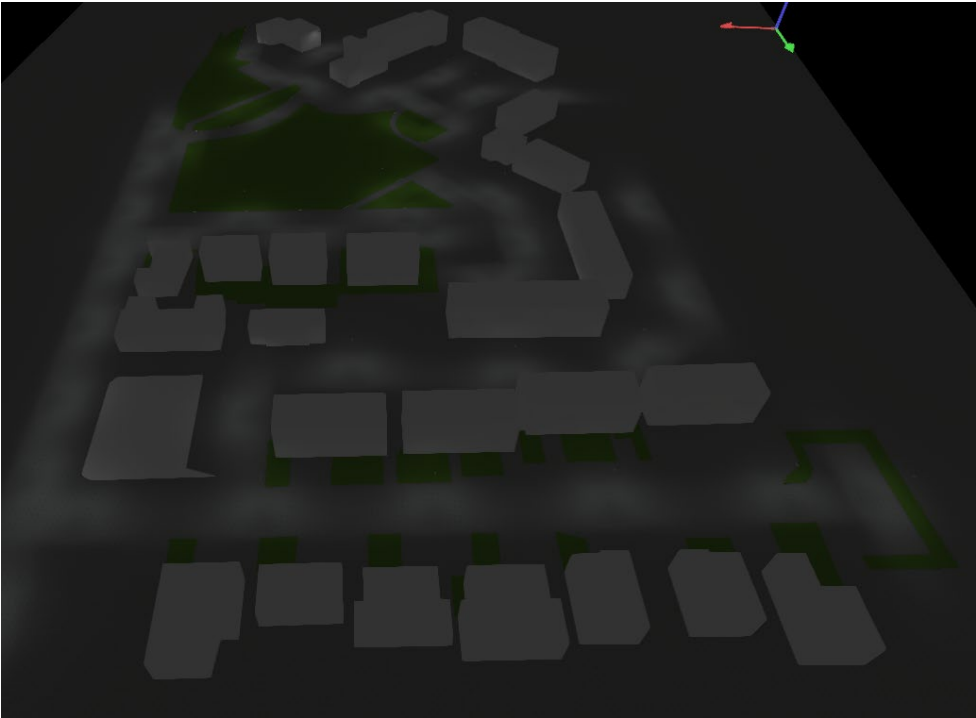
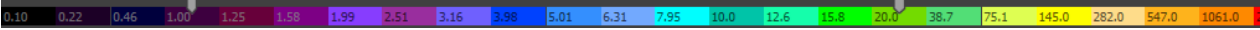
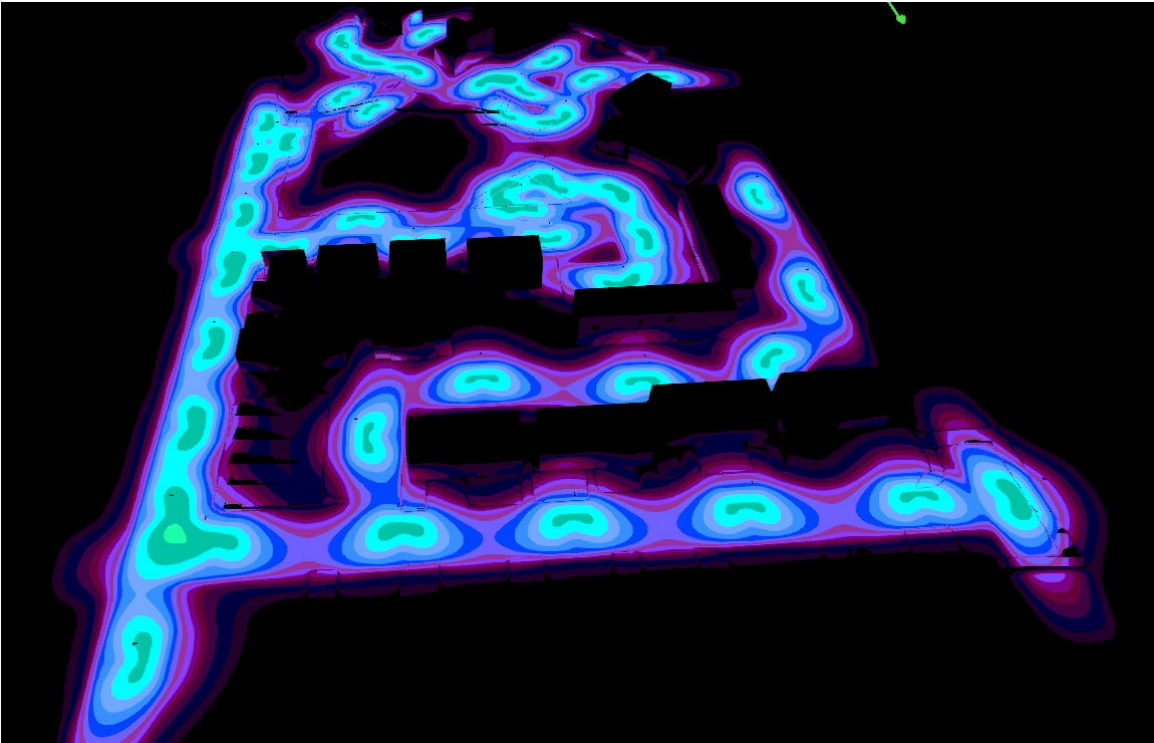


Figure 11 Dialux Lighting Output Visual:



4.0 CONCLUSION

Dialux calculations indicate that there will be negligible light pollution on surrounding areas. The upward light is estimated at 1.0% which is below the 15% maximum for an E3 environment.

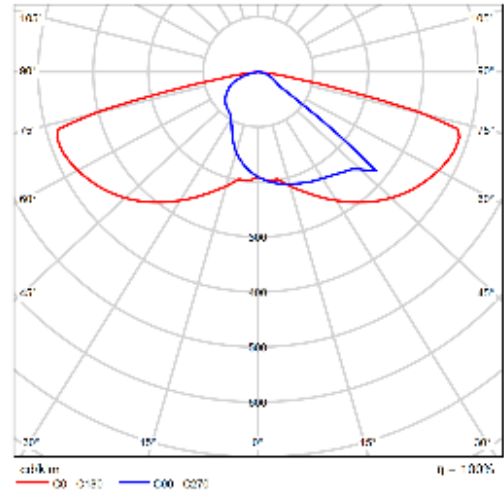
The proposed layout offers a design aesthetically pleasing for occupants and for the site as a whole. Homan O' Brien believe the proposed layout will blend seamlessly into the surrounding environment

APPENDIX 1 - LUMINAIRE SCHEDULE & SPECIFICATION

Thorn R2L2 S 12L35 NR 740 CL1 [STD]



Article No.	96268397
P	15.0 W
Φ_{Lamp}	1887 lm
$\Phi_{Luminaire}$	1887 lm
η	100.00 %
Luminous efficacy	125.8 lm/W
CCT	3000 K
CRI	100



Polar LDC







A small size LED road lighting lantern with 12 LEDs driven at 350mA with Narrow Road optic. Electronic, fixed output control gear. Class I electrical, IP66, IK08. Housing: die-cast aluminium, powder coated textured light grey. Diffuser: tempered flat glass. Screws: stainless steel, Ecolubric® treated. Post top (Ø60/76mm, tilted 0°/5°/10°) or lateral (Ø34/42/49/60mm, tilted 0°/-5°/-10°/-15°) mounting. Complete with 4000K LED.

Dimensions: 655 x 362 x 155 mm
Total power: 15 W
Weight: 9.08 kg
Scx: 0.05 m²

pcs.	Manufacturer	Article No.	Article name	P	Φ	Luminous efficacy
44	Thorn	96268397	R2L2 S 12L35 NR 740 CL1 [STD]	15.0 W	1887 lm	125.8 lm/W

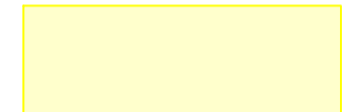
APPENDIX 2 – HOB DRAWING E1001 SITE PLAN

Reference of Symbols:

- PUB LTG 2no. New 100mm dia. Public Lighting Ducts
 - OPEN EIR 2no. 100mm dia. New underground Open Eir ducts.
 - ESB 2no. 100mm dia. New ESB network ducts
 - 50mm duct from Open Eir man hole to telecom cabinet
 - 50mm duct from ESB mini-pillar to ESB meter box
 - EV 100# Ducting for future EV Charging. Connect to existing ESB LV Supply.
-
-  ESB Mini-Pillar (with adjacent public lighting micro pillar where indicated)
 -  Open Eir Manhole
 -  ESB Meters
 -  ESB mini-pillar
 -  Open Eir Manhole
 -  ESB Manhole

Notes:

1. Type EX-1 Fitting installed on 6m high poles.
- This Drawing is for information only. Contractor to complete full survey of site. All/If any live services are found these are to be kept live & Established by site services. Live services found will need to be maintained throughout construction and to be diverted to suit new site layout.
- This Drawing is for information only. Contractor to complete full survey of site. All/If any live services are found these are to be kept live & Established by site services. Live services found will need to be maintained throughout construction and to be diverted to suit new site layout.
- Thorn R2L2 2L35 Large Luminaires to be mounted on 6m. Hight Column Poles. 6m Poles to be to Kildare Co. co standard.
- All ESB Micro/Mini Pillar locations subject to ESB confirmation.
- Built in Dimming is required in Luminaire to Dim the output of the Luminaire to 67% of its Full working capacity between the hours of midnight to 6 am.
- All Lighting Columns to comply with WCC General Specification for Residential Lighting Schemes and comply with EN40. Where Columns are not fully accessible by Hoist, the column is to be of the Raising & Lowering type.
- Refer to Electrical Specification for all underground ducts notes with compliance with ESB/EIR Requirements



All new services.

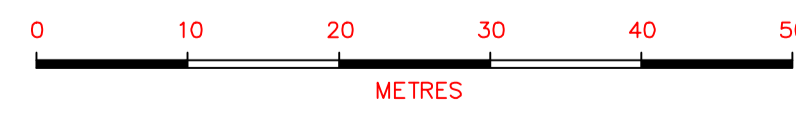


Image of ESB mini pillar with adjacent Public lighting micro pillar.

Notes:

- No Gas network in the area

ISSUED FOR INFORMATION



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St. Patricks Housing Rathangan			
Electrical Services Installation		MCORM Architects	
Site Plan		Albert Place West	
Public Lighting & Site Services Layout		Harcourt Lane	
Dublin 2		Dublin 2	
Drawing Number	Date	Scale	Drawn
1809-E1001	06-08-2018	Refer to Scalebar	R.B.
			Checked
			C.M.
			Issue
			I01

Revision	Issue: P-Preliminary T-Tender CN-Construction A-Approval I-Information	Date	Checked	Revision	Issue: P-Preliminary T-Tender CN-Construction A-Approval I-Information	Date	Checked
				Issued for Information			
				30-06-2022 I01 S.O.B.			

APPENDIX 3 – LIGHTING AUDIT

St Patrick's Park, Rathangan.

Site inspection comments 19/07/2021

(The content of this report is based on visual inspection only where the observations of supplies, terminations and earthing is of a sample of enclosures that were accessed.)

Overview:

The map below highlights the area inspected in red.

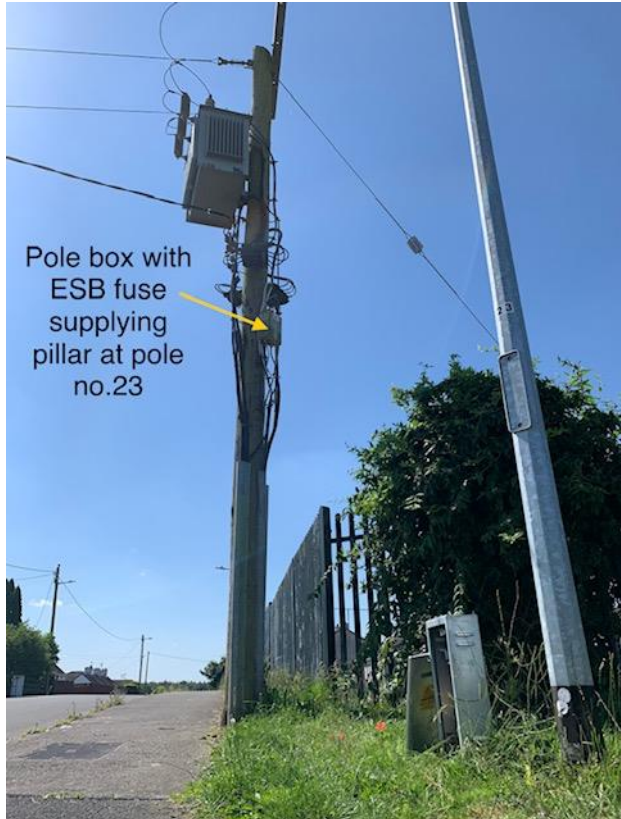


There are 27 lights in the area inspected. 3 lights are fitted below the network on ESB poles and recorded on Deadsure under street reference "Demesne St Patricks Park Rathangan, while the remaining 24 lights are fitted to underground supplied lighting columns referenced to "St Patricks Park Rathangan".

Pillar:

There is one pillar, adjacent to pole no.23, that supplies lights 1-24 St Patrick's Park (i.e. all lights except ESB pole mounted lights). The supply to the lights is switched from a central photocell fitted on light no.23.

The pillar has no ESB interface fuse or isolator, instead the ESB is in a box mounted on the adjacent ESB transformer/MV pole (see photos). It is recommended that a new ESB is installed from the same pole into the pillar and the pole box is removed.



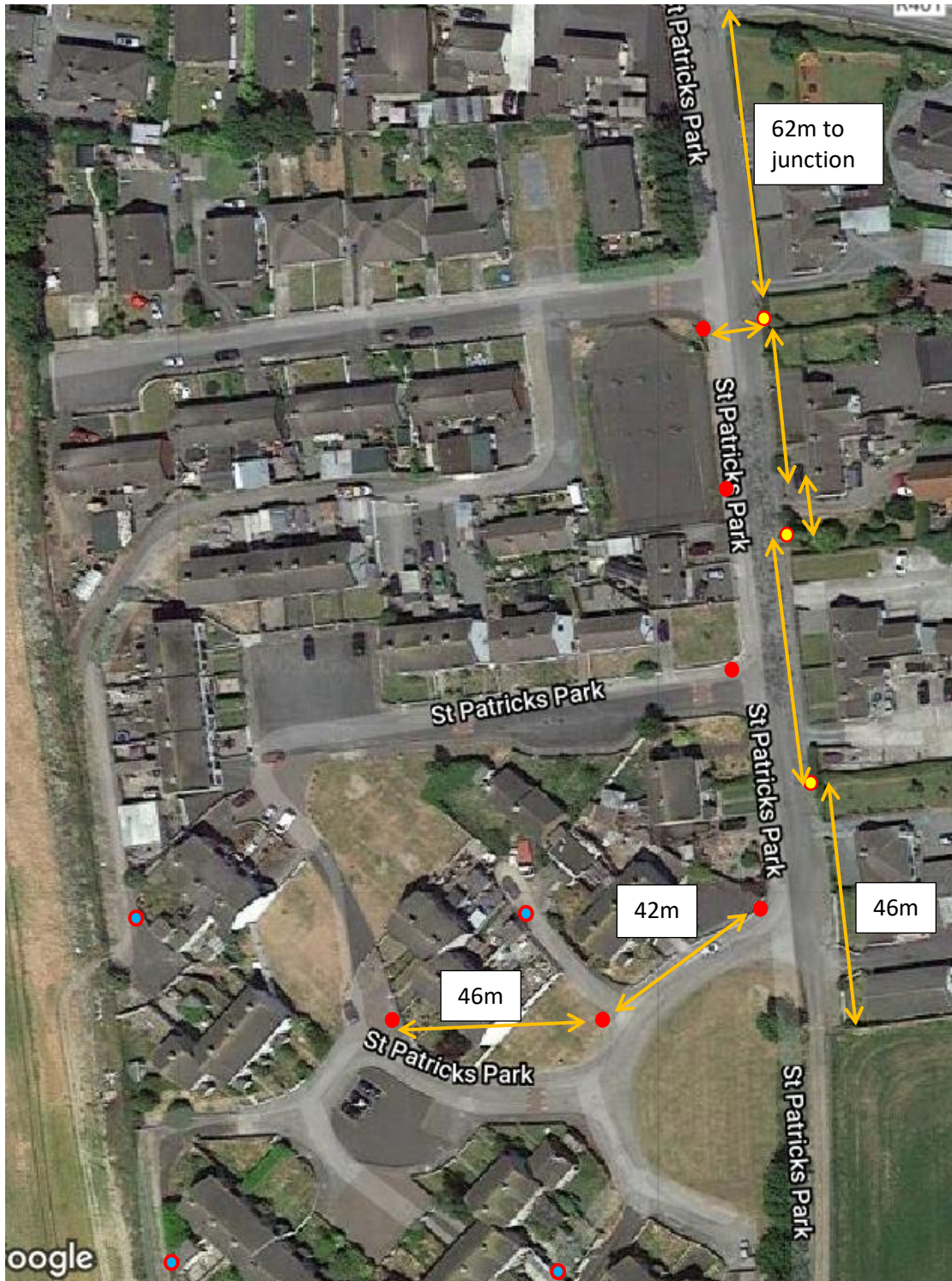
Columns & spacings:

As previously mentioned there are 24 lighting columns in addition to 3 lights mounted on ESB poles. 5 of the 24 lighting columns (no.s 2, 20, 21, 22, 24) are 6m octagonal poles, while the remaining 19 columns are tubular type fitted with either with 1m/0.5m “swan neck” brackets or 1m straight up extensions that bring the the lantern mounting heights to just under 6m.

Light no.s 3 and 23 are positioned relatively close to ESB overhead MV lines which may be hazardous for maintenance works, they are shown below.



There are areas where the spacings between lights are excessive and irregular and it is recommended that a lighting design is carried out to provide a solutions. These are shown below with the “Desmesne” ESB pole lights in yellow and the lightig columns in red.



The 4 columns shown in blue/red (no.s 3,6,8,20) on the previous plan are in back lanes and stand alone with no comparable spacing to adjacent lights. It is probable that the underground cables supplying one or more of these three columns run through garden(s) of the residential properties.

Cables & terminations:

Most of the 24 lighting columns are supplied by 6mmsq NYCY 2 core & earth sheath (phase, neutral and earth), although there is one area where the cables appear to be TN-C phase / neutral only. This is highlighted in the plan below.



There may be continuous 3 core cable between the pillar at pole 23 to pole 23 and pole 22 to pole 21. The photo of pole no.22 however indicates a possibility of TN-C cabling. Access to the base chambers of columns 18 and 19 was not possible, as they are in gardens and in bushes or blocked by a wall (see photos), while column 17 does have a 3 core cable although the earth sheath was not being used and the neutral was terminated to protective conductors. A photo of column no.15 (not in the above plan) is also shown.



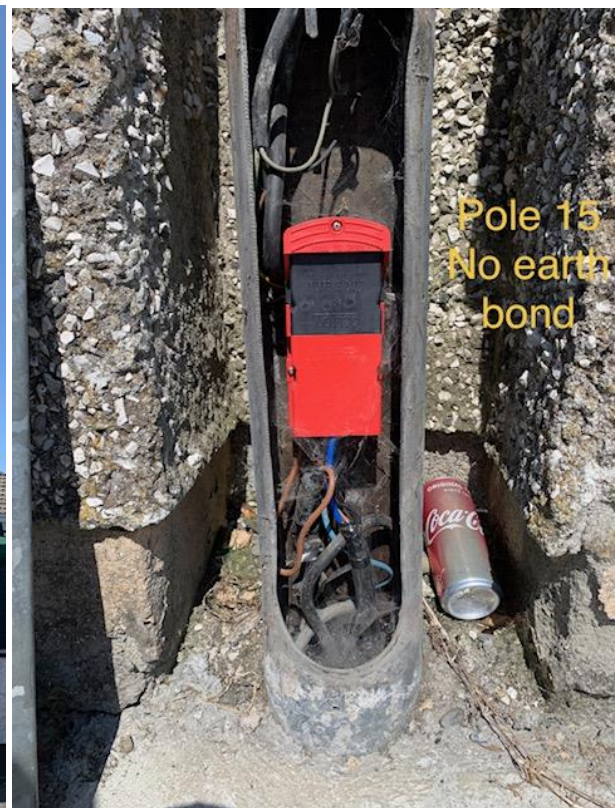
Pole 22
Both PN&E
and TN-C in
base



Pole no.19
Pole in
garden, door
inaccessible



Pole no.18
In residential
garden, pole
showing surface
rust



Pole 15
No earth
bond

Lights:

There are 27 lights in the area, all of which are operational. The types are as follows:

14 x 28W LED

10 x 55W SOX

2 x 55w PLL

1 x 70W SON.