

FORMER CHADWICKS SITE  
GREENHILLS ROAD,  
WALKINSTOWN,  
DUBLIN 12.



Project Ref.	Document Title	Rev	Prepared by:	Issue Date	Checked by:
2034	Site Lighting Report	P03	C.M	31/01/2022	S.O'B

**INDEX**

1.0 INTRODUCTION.....3  
2.0 PROPOSED DESIGN APPROACH.....4  
    2.1 DESIGN CRITERIA .....5  
    2.2 BAT PROTECTION.....6  
3.0 PROPOSED LIGHTING SCHEME .....7  
    3.1 PROPOSED LIGHTING CALCULATION Results:.....8  
4.0 CONCLUSION ..... 18

**Schedule of Appendices**

Appendix 1;  
Luminaire Schedule and Specification

Appendix 2;  
Lighting Layout Drawings

## 1.0 INTRODUCTION

### *Development Description:*

The proposed development will consist of the following:

- (i) *The demolition of the former Chadwicks Builders Merchant development comprising 1 no. two storey office building and 9 no. storage/warehouse buildings ranging in height from 3 m – 9.9 m as follows: Building A (8,764 sq.m.), Building B (1,293 sq.m.), Building C (two-storey office building) (527 sq.m.), Building D (47 sq.m.), Building E (29 sq.m.), Building F (207 sq.m.), Building G (101 sq.m.), Building H (80 sq.m.), Building I (28 sq.m.), and Building J (44 sq.m.), in total comprising 11,120 sq.m.;*
- (ii) *the construction of a mixed-use Build-Rent residential and commercial development comprising 633 no. build-to-rent apartment units (292 no. one-beds, 280 no. two-beds and 61 no. three-beds), 1 no. childcare facility and 10 no. commercial units in 4 no. blocks (A-D) ranging in height from 5 to 12 storeys as follows:*
- (a) *Block A comprises 209 no. apartments (102 no. 1 bed-units, 06 no. 2 bed-units and 1 no. 3-bed units) measuring 5 - 10 storeys in height. (b) Block B comprises 121 no. apartments (53 no. 1 bed-units, 45 no. 2 bed-units and 23 no. 3 bed-units) measuring 8 - 10 storeys in height. (c) Block C comprises 130 no. apartments (38 no. 1-bed units, 71 no. 2-bed units and 21 no. 3-bed units) measuring 6 - 10 storeys in height. All apartments will be provided with private balconies/terraces;*
- (iii) *provision of indoor communal residential amenity/management facilities including a co-working space, communal meeting room/work space, foyer, toilets at ground floor of Block A; gym, changing rooms, toilets, resident's lounge, studio, laundry room, communal meeting room/ work space, multi-function space with kitchen at ground floor of Block B; games room with kitchenette, media room, co-working space, resident's lounge, communal meeting room/ work space, reception area, management office with ancillary staff room and toilets, toilets, parcel room at ground floor of Block C;*
- (iv) *the construction of 1 no. childcare facility with dedicated outdoor play area located at ground floor of Block A;*
- (v) *the construction of 8 no. commercial units at ground floor level of Blocks A, B and D, and 2 no. commercial units at second floor level (fronting Greenhills Road) of Block C as follows: Block A has 3 no. units at ground floor comprising 79.46 sq.m., 90.23 sq.m., and 121.39 sq.m., Block B has 1 no. unit at ground floor comprising 127.03 sq.m., Block C has two units at second floor comprising 120.85 sq.m. and 125.45 sq.m., and Block D has 4 no. units at ground floor comprising 84.45 sq.m., 149.77 sq.m., 155.48 sq.m. and 275.59 sq.m.;*
- (vi) *the construction of 3 no. vehicular entrances; a primary entrance via vehicular ramp from the north (access from Greenhills Road) and 2 no. secondary entrances from the south for emergency access and services (access from existing road to the south of the site) with additional pedestrian accesses proposed along Greenhills Road;*
- (vii) *provision of 424 no. car parking spaces comprising 398 no. standard spaces, 21 no. mobility spaces and 5 no. car club spaces located at ground floor level car park located within Block A and accessed via the proposed entrance at Greenhills Road, a two-storey car park located within Blocks C and D also accessed from the proposed entrance at Greenhills Road and on-street parking at ground floor level adjacent to Blocks A and C. Provision of an additional 15 no. commercial/ unloading/ drop-off on-street parking spaces at ground floor level (providing for an overall total of 439 car parking spaces). Provision of 4 no. dedicated motorcycle spaces at ground floor level parking area within Blocks C and D;*
- (viii) *provision of 1363 no. bicycle parking spaces comprising 1035 no. residents' bicycle spaces, 5 no. accessible bicycle spaces and 7 no. cargo bicycle spaces in 9 no. bicycle storerooms in ground and first floor parking areas within Blocks A, C and D, and 316 no. visitors' bicycle spaces located externally at ground floor level throughout the development;*
- (ix) *provision of outdoor communal amenity space (5,020 sq.m.) comprising landscaped courtyards that include play areas, seating areas, grass areas, planting, and scented gardens located on podiums at first and second floor levels; provision of a communal amenity roof garden in Block C with seating area and planting (176 sq.m.); and inclusion of centrally located public open space (3,380 sq.m.) adjacent to Blocks B and C comprising grassed areas, planting, seating areas, play areas, water feature, flexible use space; and incidental open space/public realm;*
- (x) *development also includes landscaping and infrastructural works, foul and surface water drainage, bin storage, ESB substations, plant rooms, boundary treatments, internal roads, cycle paths and footpaths and all associated site works to facilitate the development. This application is accompanied by an Environmental Impact Assessment Report (EIAR).*

**Proposed  
Development Site**



Figure 1: Chadwicks - Site Location.

## 2.0 **PROPOSED DESIGN APPROACH**

There were six 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
6. Bat disturbance mitigation

### **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

## 2.1 DESIGN CRITERIA

The former Chadwicks site, Greenhill's Road, Walkinstown is classified as an 'E3' environment in accordance with IS EN 12464-2:2014. This represents high 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
- 1000 post-curfew

### **Upward Light (ULR %)**

- 15%

General Task Lighting allows occupants navigate through the site and around building pedestrian pathways. General lighting is required during the normal operation of the building while emergency lighting is required in the case were the normal lighting operation fails due to power loss. The CIBSE lighting guides and IS EN 12464-2: 2014 recommend lighting values for external roadways & path ways.

### **General Lighting Values**

- Walkways exclusively for pedestrians – 5 lux (Illuminance)
- Regular Vehicle traffic – 20 lux (Illuminance)
- GRI – 50 (Glare Rating)
- Steps & ramps – 100lux
- Ra – 20 Ra (Colour Rendering)

### **Lighting Controls**

Lighting controls are essential for all exterior lights. A photo-electric cell (PEC) is proposed for automatic switch-on at dusk and off with time control. Presence detection may also be incorporated for safety purposes & bat consideration, e.g. when nobody is outside, after a set interval time, lighting reduces to a pre-determined level, e.g. 50%, but as soon as human or vehicular movement is detected, full illumination is restored.

## 2.2 **BAT PROTECTION**

For Bat protection, the following mitigation measures have been imposed.

- Lighting has only been installed where necessary for public safety. These lights have been designed and selected with specific shutters and filters to minimise any potential for back spills into the sensitive locations while still providing the primary function of safely lighting the circulation routes.
- Reflectance's – Downward lighting can be reflected from bright surfaces. To minimize bat disturbance, the design avoids the use of bright surfaces and incorporates darker colour lamp heads and poles to reduce reflectance.
- Shielding of Luminaires & Light - To minimize bat disturbance, the design avoids the use of upward lighting by shielding or by downward directional focus.
- Type of Light – To minimize bat disturbance, the design avoids the use of strong UV lighting. The lighting design is based on the use of LED lighting which has minimal or no UV output of significance.

3.0 **PROPOSED LIGHTING SCHEME**

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

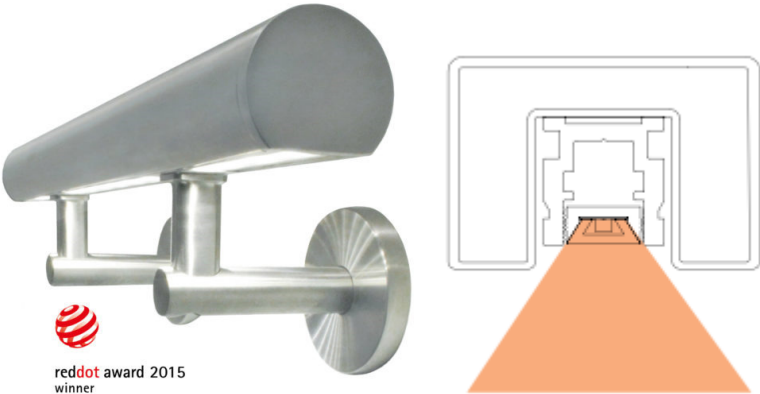
**Figure 2: Pole Top Luminaire No1**



**Figure 3: Pole Top Luminaire No 2**



**Figure 4: Strip light No 3**



### 3.1 PROPOSED LIGHTING CALCULATION Results:

Figure 5, 6, 7, 8, 9, 10 & 11 below details the light calculation result generated by Dialux.

- Plaza Space – Average lux level : 9.85 Lux
- Primary Access Road, Shared Car Parking Spaces - Average lux level : 23.7 Lux
- Podium Park, Community Gardens & Leisure Lawns - average lux level : 9.06 Lux
- Walkway Adjacent Primary Access Road : 14.3 Lux
- Walkway Adjacent Block A : 8.4 Lux
- Bike path : 9.18 Lux
- Entrance Plaza : 8.5 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 has been estimated at 1.0% which is less than the design criteria maximum of 15% for an E3 environment.



Primary Access Road, Shared Car Parking Spaces - Average lux level : 23 Lux at 0.24 Uniformity

Results

	Symbol	Calculated
Workplane	$E_{\text{perpendicular}}$	23.7 lx
	$g_1$	0.24



Figure 5 - Dialux Calculation Output – Primary Access Road, Shared Car Parking Spaces



Walkway Adjacent Primary Access Road : 14.3 Lux at 0.2 Uniformity

	Symbol	Calculated
Workplane	$E_{\text{perpendicular}}$	14.3 lx
	$g_1$	0.20

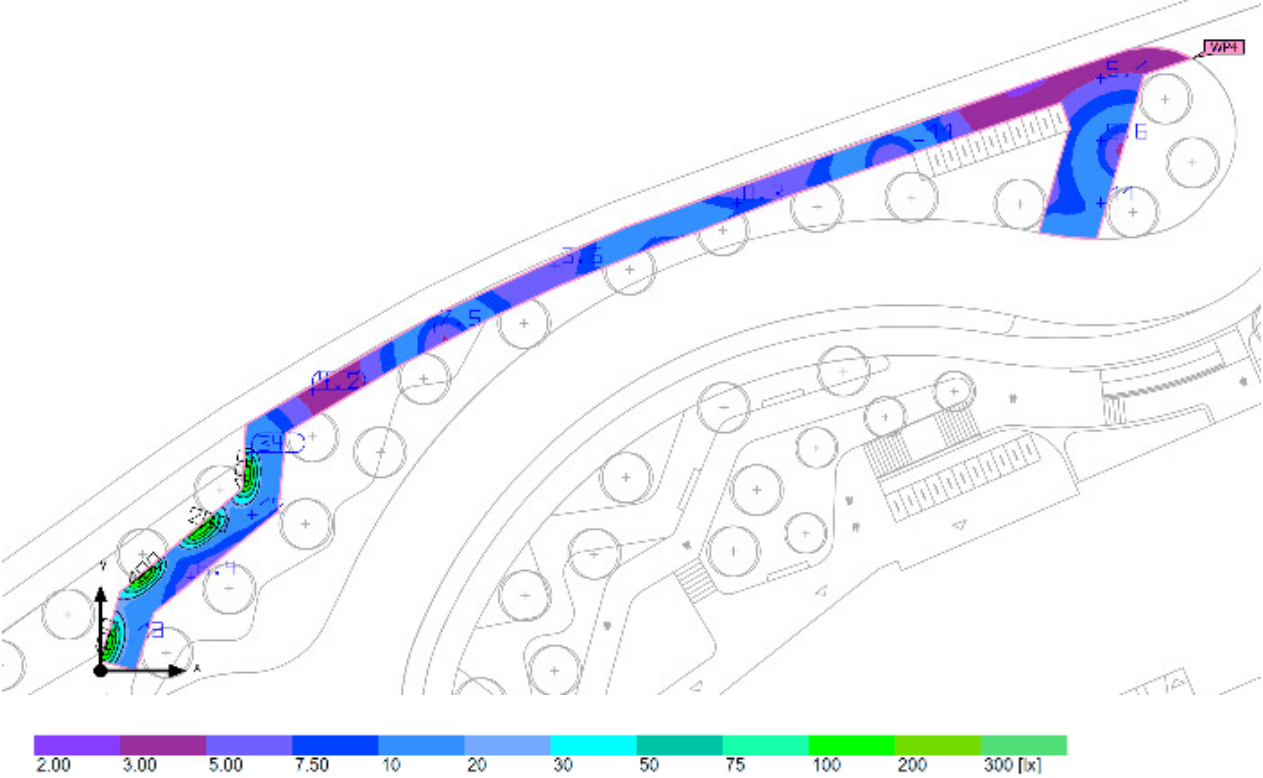
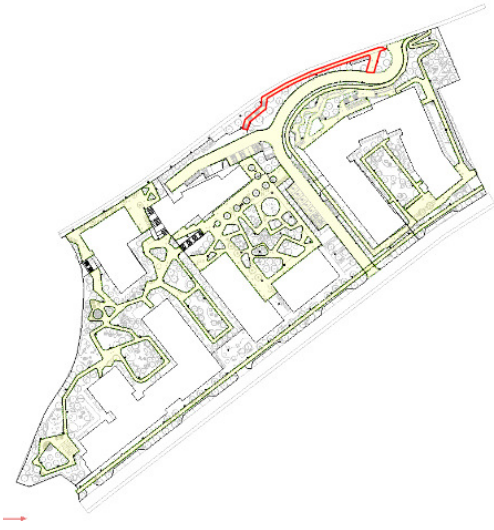


Figure 7 - Dialux Calculation Output – Walkway Adjacent Primary Access Road:



Walkway Adjacent Block A : 8.4 Lux at 0.27 Uniformity

Results

	Symbol	Calculated
Workplane	$E_{\text{perpendicular}}$	8.40 lx
	$g_1$	0.27

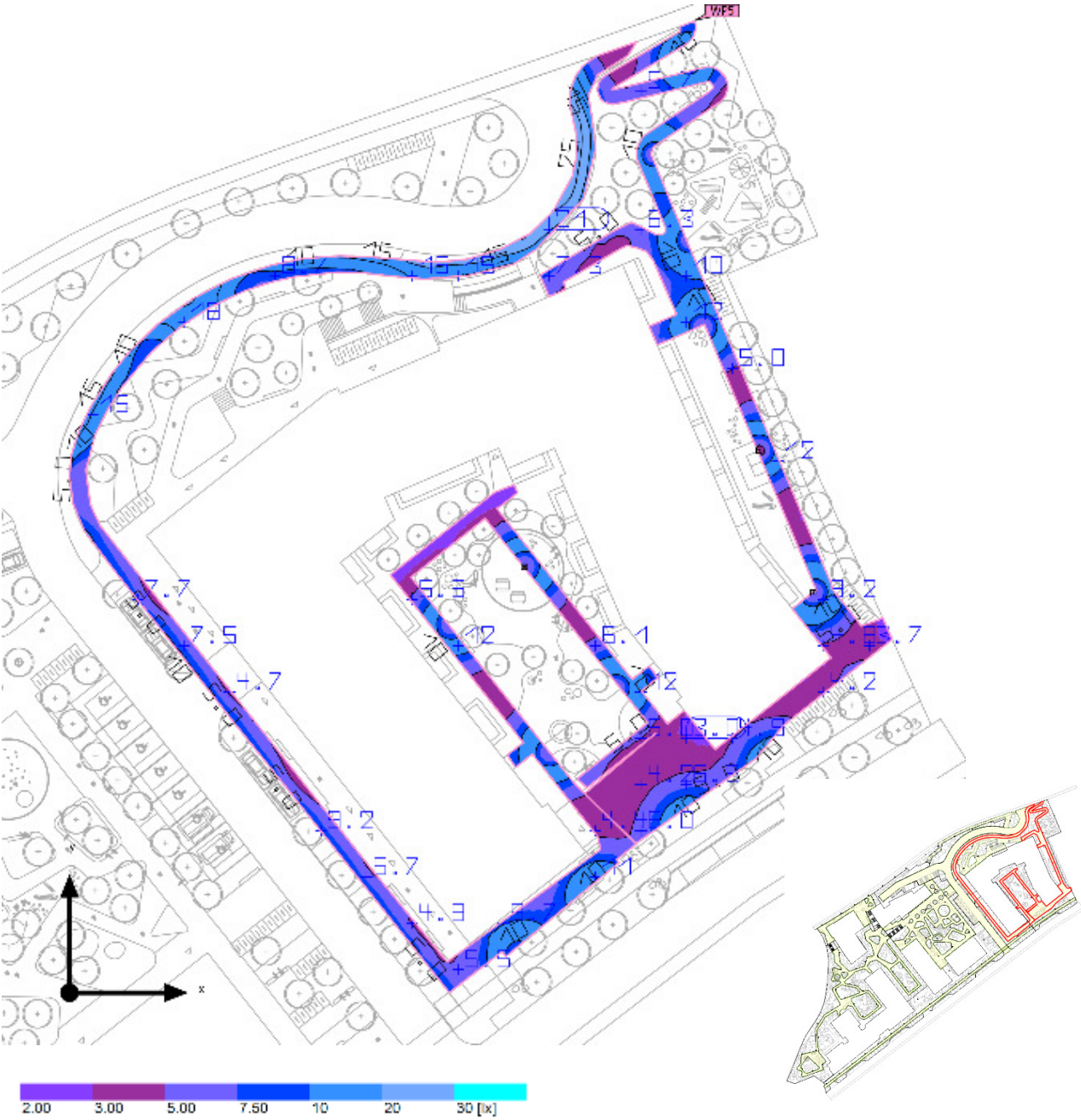


Figure 8 - Dialux Calculation Output – Walkway Adjacent Block A:

Plaza Space – Average lux level : 9.85 lux at 0.4 Uniformity

Results

	Symbol	Calculated
Workplane	$E_{\text{perpendicular}}$	9.85 lx
	$g_1$	0.40

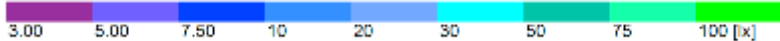
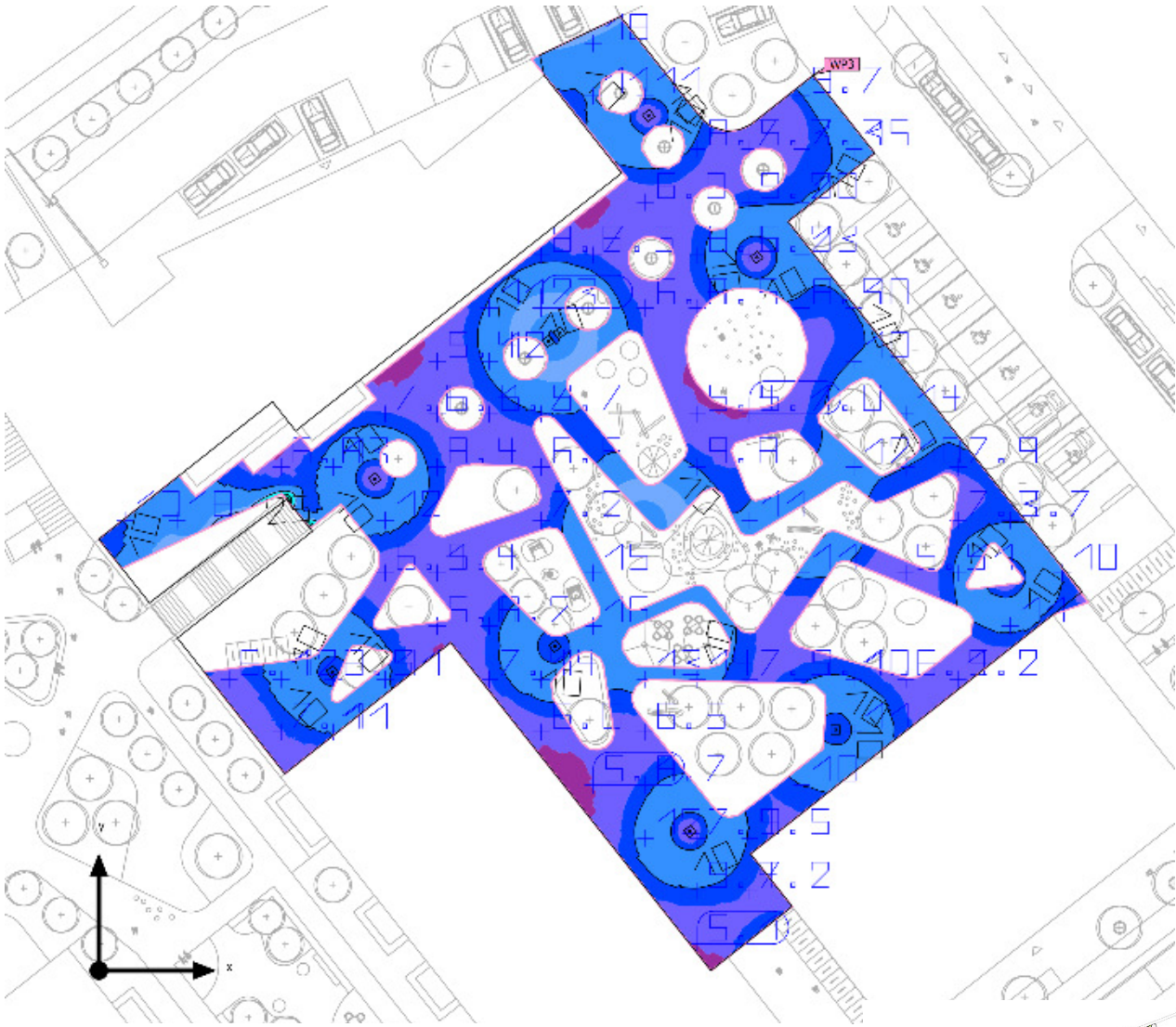
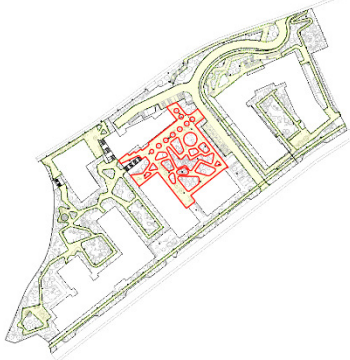


Figure 9 - Dialux Calculation Output –Plaza Space:



Entrance Plaza : 8.37 Lux at 0.33 Uniformity

Results

	Symbol	Calculated
Workplane	$E_{\text{perpendicular}}$	8.37 lx
	$g_1$	0.33

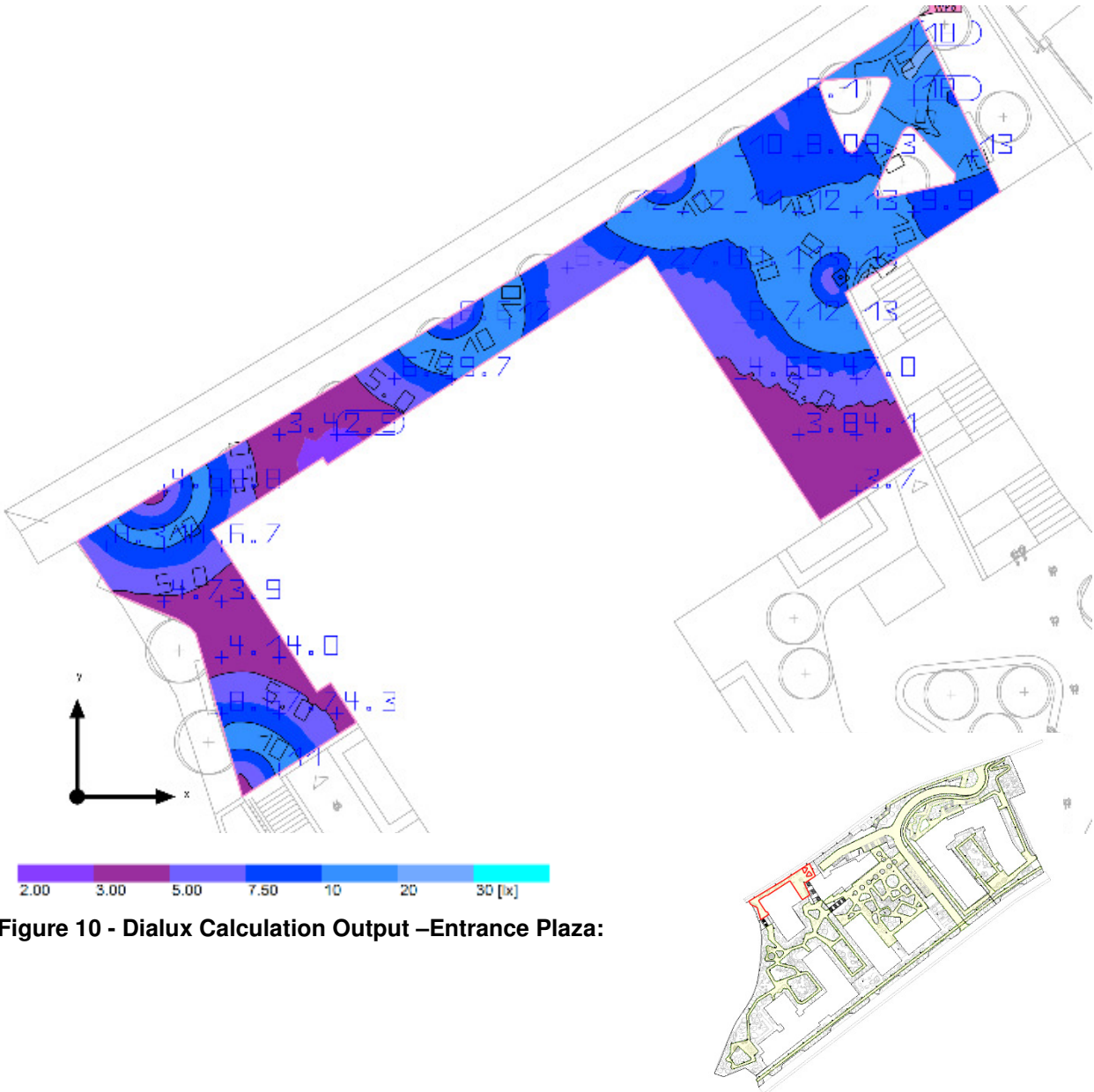


Figure 10 - Dialux Calculation Output –Entrance Plaza:

Bike Path : 9.18 Lux at 0.47 Uniformity  
Results

	Symbol	Calculated
Workplane	$E_{\text{perpendicular}}$	9.18 lx
	$g_1$	0.47

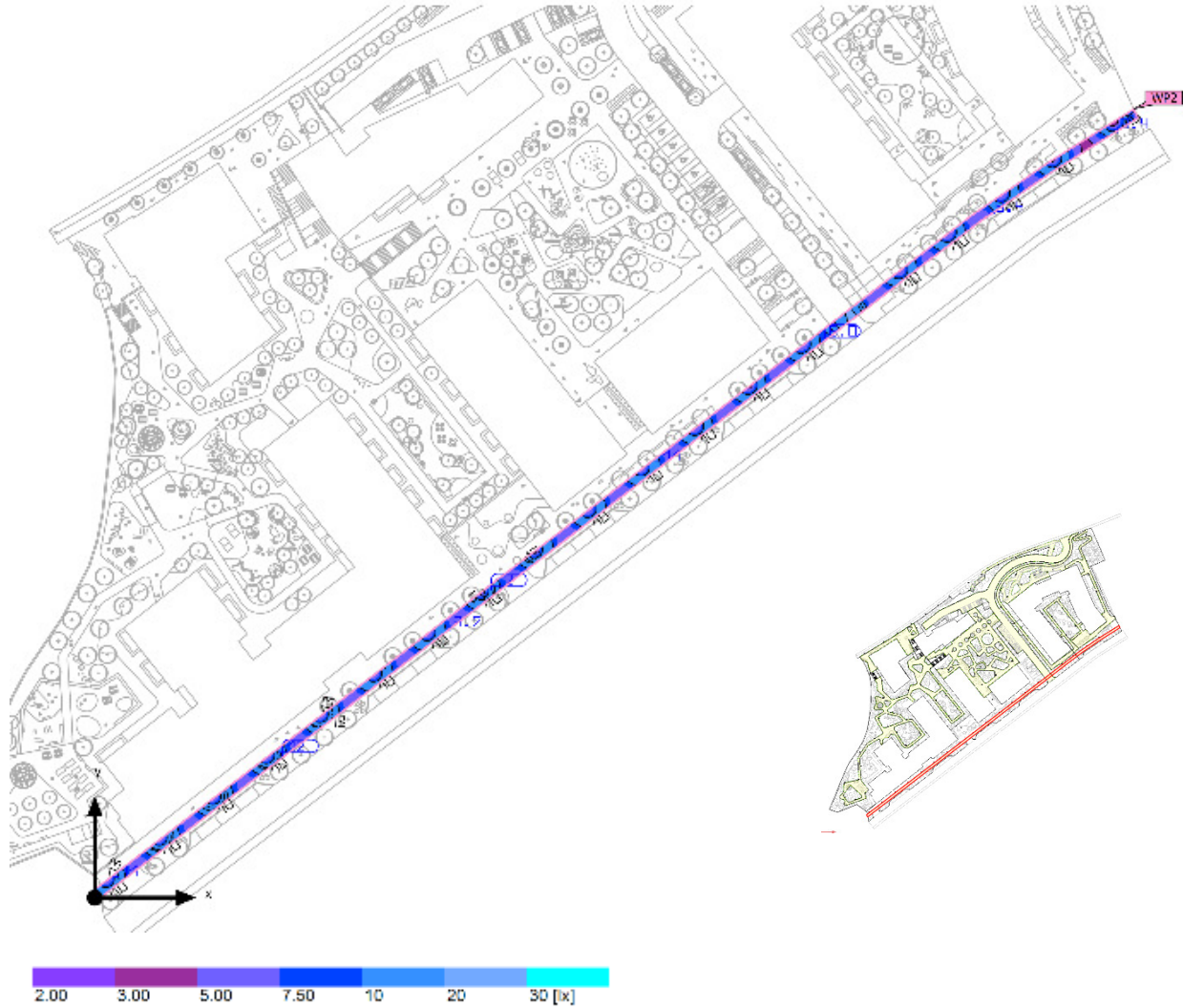


Figure 11 - Dialux Calculation Output –Bike Path:

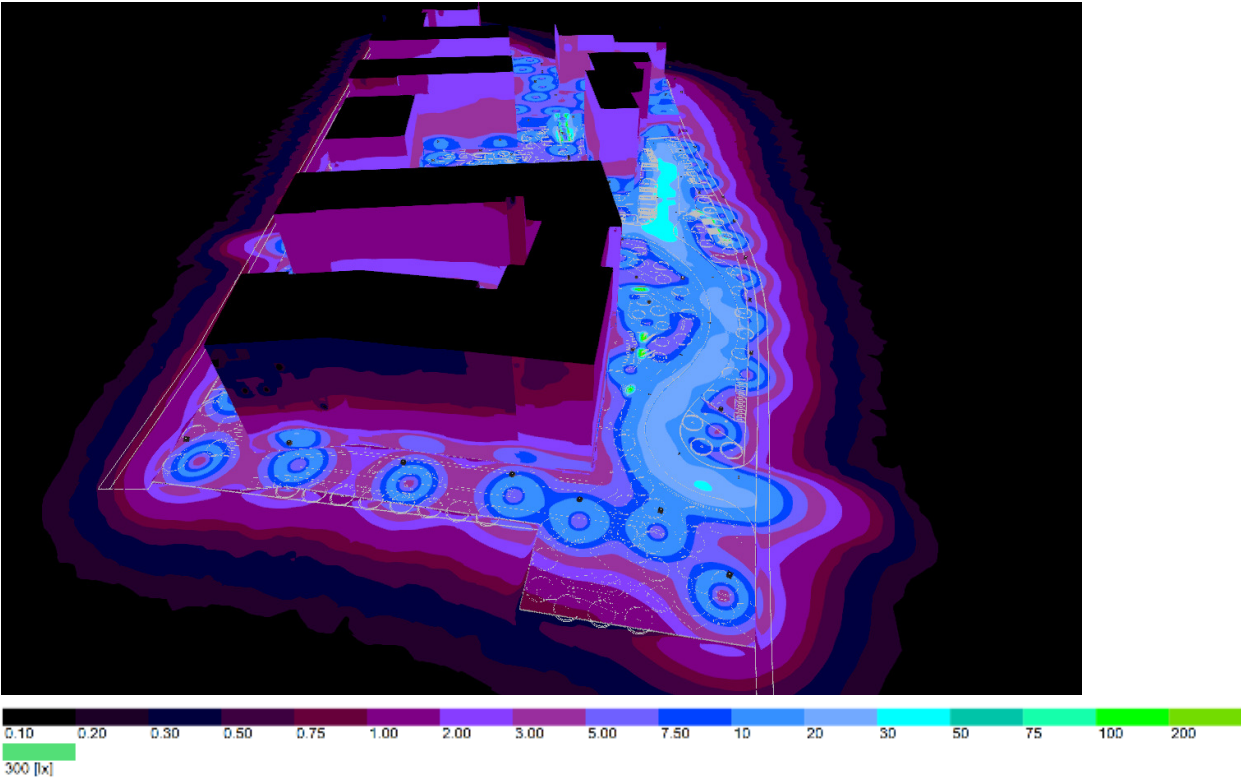


Figure 12 - Dialux Model 3D Visual – View along Greenhills Road

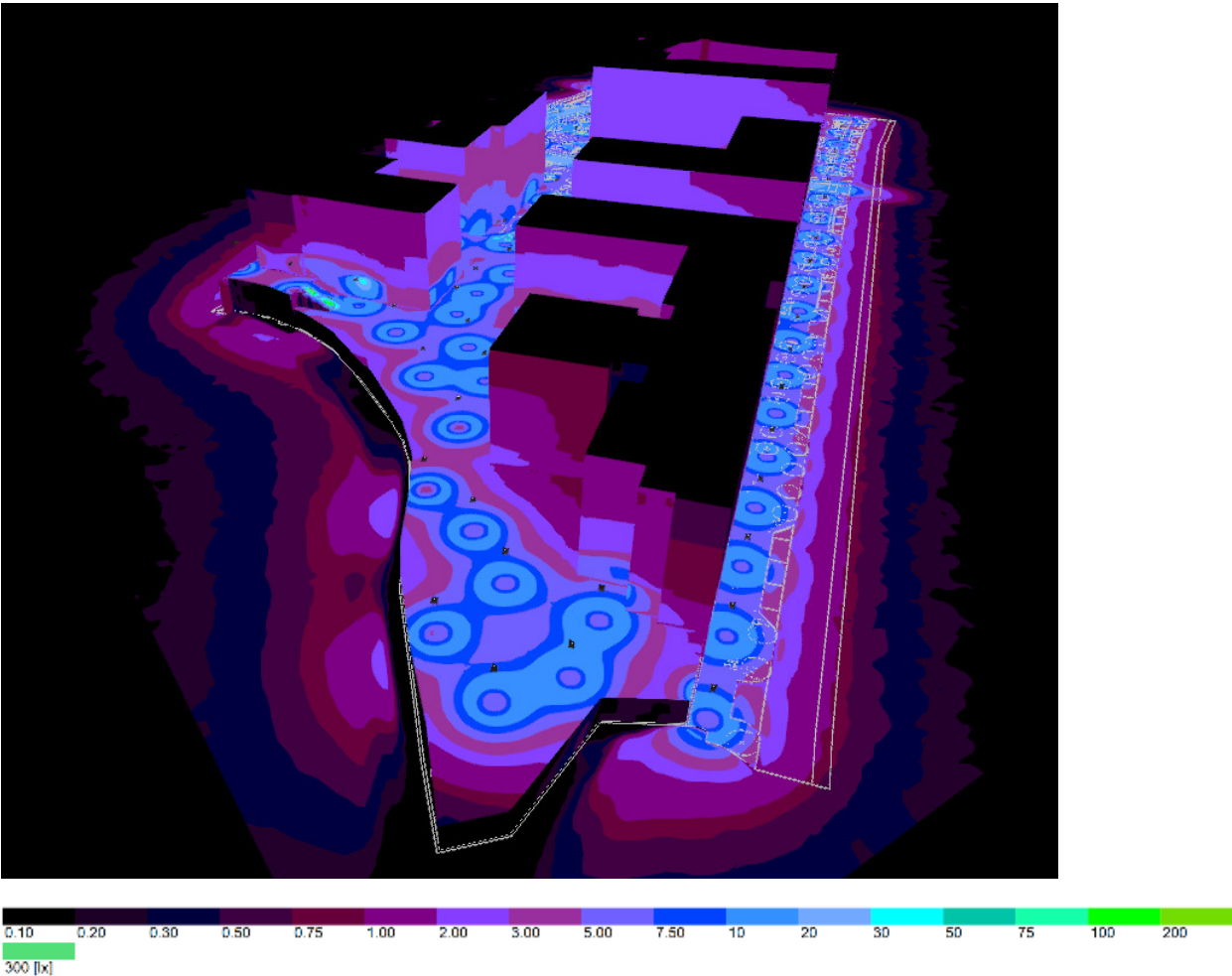


Figure 13 - Dialux Model 3D – View along road from emergency access exit



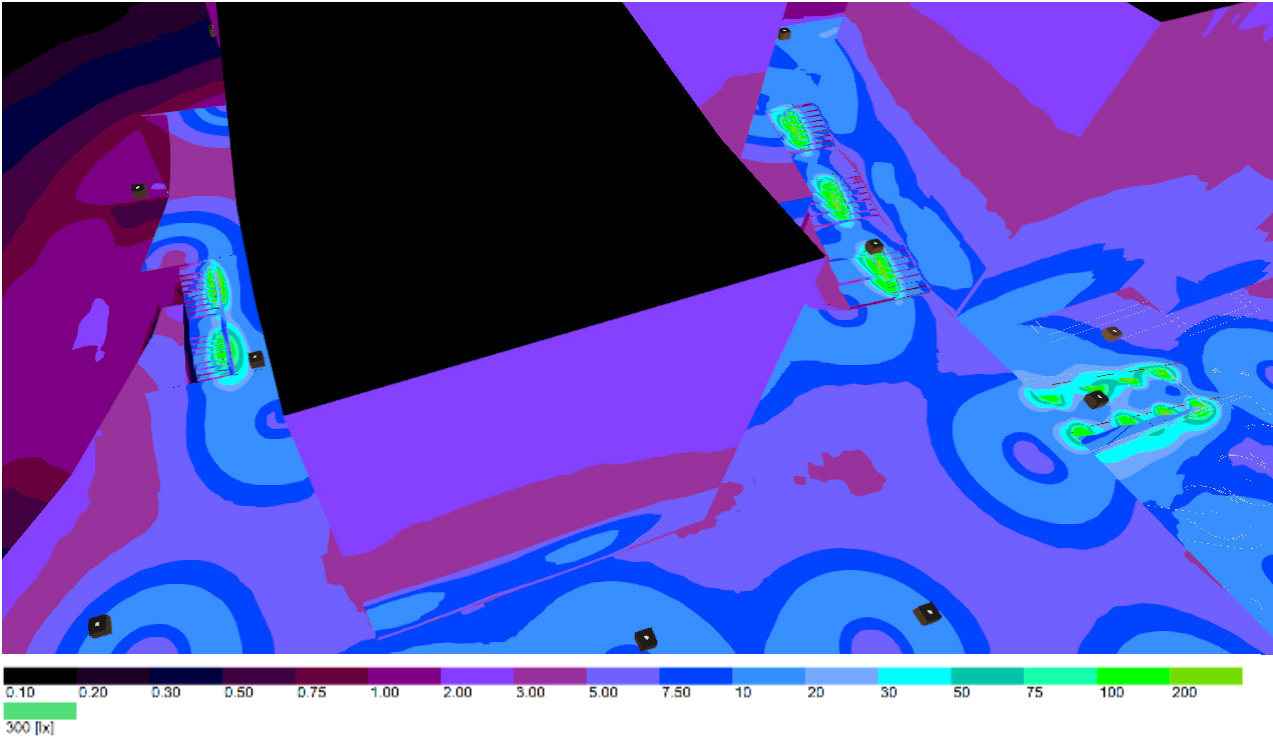


Figure 14 - Dialux Model 3D – Steps & Ramps in Podium Park

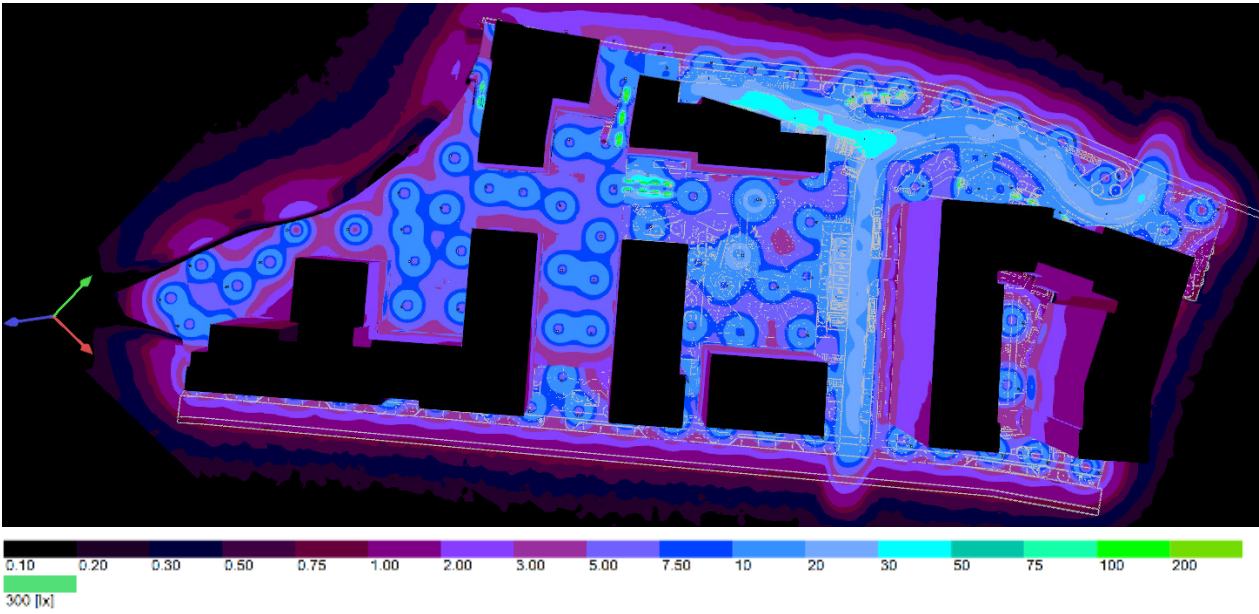


Figure 15 - Dialux Model 3D – Birds Eye View

#### **4.0 CONCLUSION**

The calculations confirm that the design as presented complies with the design criteria of an E3 environment.

The design includes for mitigation to bat foraging which are light sensitive.

The calculations also demonstrate there will be no upward lighting emitted above the horizontal of the luminaire.

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 AND SPECIFICATION**

**Luminaire list**

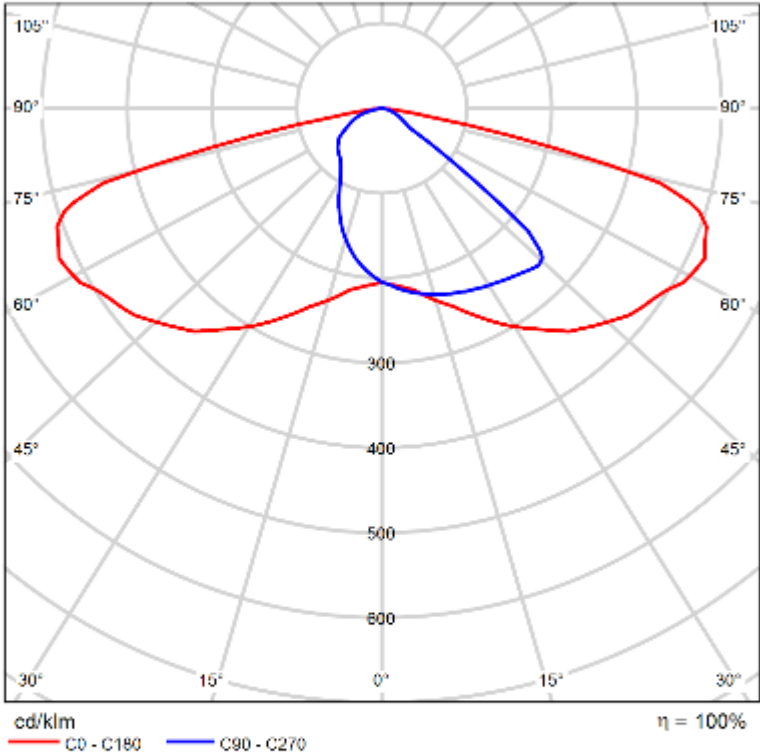
$\Phi_{total}$ 298158 lm	$P_{total}$ 3848.8 W	Luminous efficacy 77.5 lm/W
-----------------------------	-------------------------	--------------------------------

pcs.	Manufacturer	Article No.	Article name	P	$\Phi$	Luminous efficacy
98	Thorn Lighting	96221655	JOHANNA LED 18L50-730 CL2 4,5M MTP60 [STD]	31.0 W	2061 lm	66.5 lm/W
24	Thorn Lighting	96634352	IS 12L70-730 NR CL2 WS7 T60F GY [STD]	27.0 W	3375 lm	125.0 lm/W
44	Triolight B.V.	.	liniLED® Handrail 42.4 mm clear cover Warm White 3000K Power	3.7 W	345 lm	93.4 lm/W

Thorn Lighting - IS 12L70-730 NR CL2 WS7 T60F GY [STD]



Article No.	96634352
P	27.0 W
$\Phi_{Lamp}$	3375 lm
$\Phi_{Luminaire}$	3375 lm
$\eta$	100.00 %
Luminous efficacy	125.0 lm/W
CCT	3000 K
CRI	70

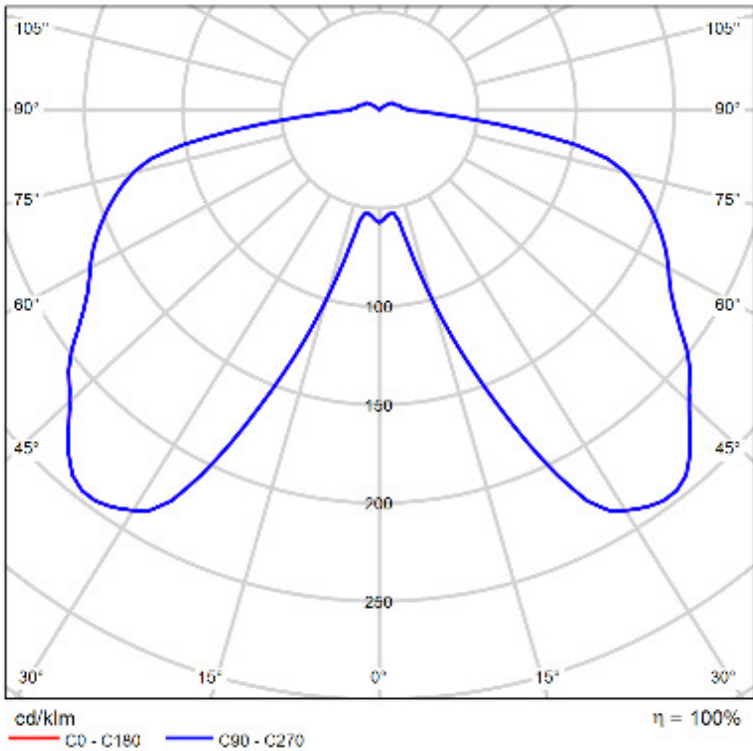


Polar LDC

Thorn Lighting - JOHANNA LED 18L50-730 CL2 4,5M MTP60 [STD]



Article No.	96221655
P	31.0 W
$\Phi_{Lamp}$	2061 lm
$\Phi_{Luminaire}$	2061 lm
$\eta$	100.00 %
Luminous efficacy	66.5 lm/W
CCT	3000 K
CRI	70

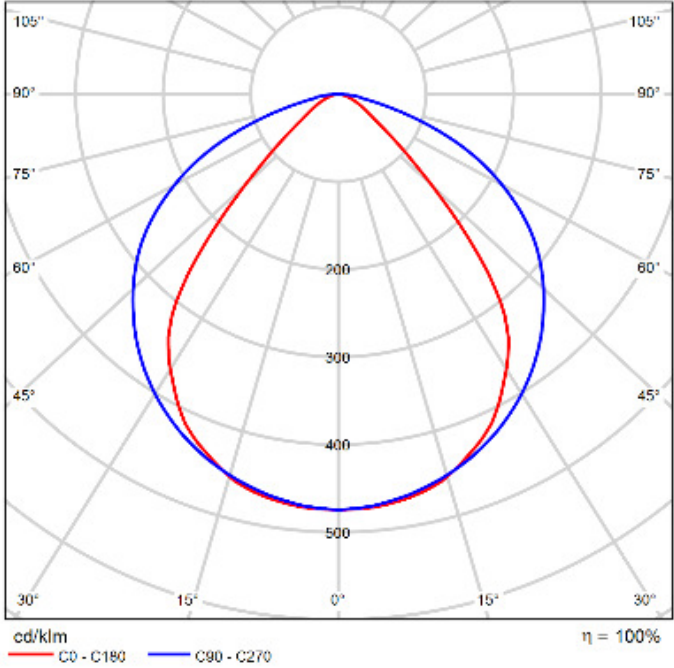


Polar LDC

Triolight B.V. - liniLED® Handrail 42.4 mm clear cover Warm White 3000K Power



P	3.7 W
$\Phi_{Lamp}$	346 lm
$\Phi_{Luminaire}$	345 lm
$\eta$	99.97 %
Luminous efficacy	93.4 lm/W
CCT	3000 K
CRI	100



Polar LDC

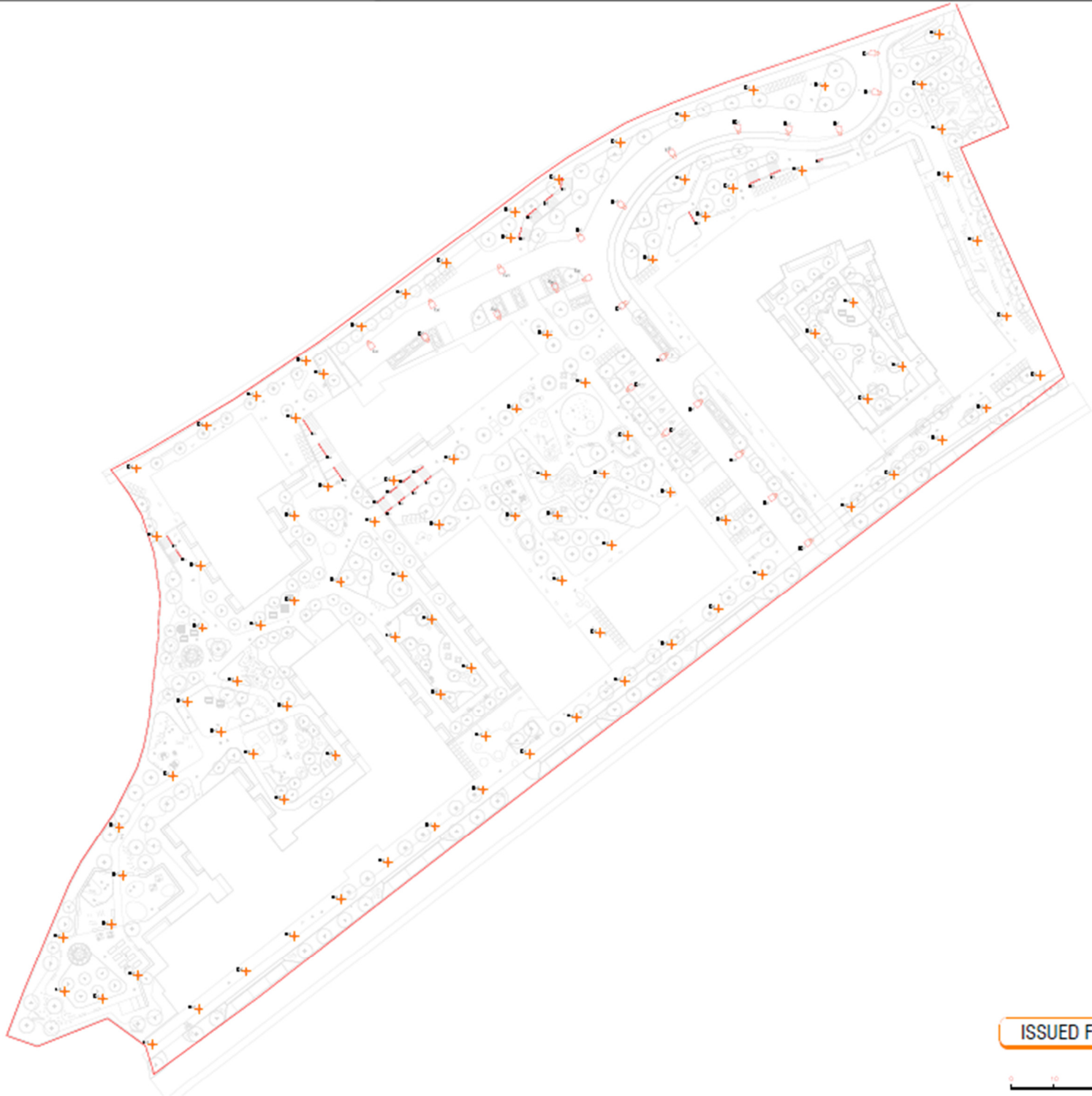
**APPENDIX 2**

**LIGHTING LAYOUT DRAWINGS**

No part of this document may be reproduced or transmitted in any form or by any means without the written permission from Homan O'Brien Associates as copyright holder except as agreed for use on the project for which the document was originally issued. © Homan O'Brien Associates Copyright.

Lighting Schedule

- 100W LED (04-12-2021) 27W LED, 3000K, 200lm
- 150W LED (04-12-2021) 27W LED, 3000K, 300lm, 100% CRI, 5W
- 150W LED (04-12-2021) 27W LED, 3000K, 300lm, 100% CRI, 5W



Lighting Fixtures



Lighting Fixtures



Lighting Fixtures

**ISSUED FOR PLANNING**



Item	Description	Quantity	Unit	Notes
1	100W LED	100	sq	
2	150W LED	150	sq	
3	150W LED	150	sq	
4	150W LED	150	sq	
5	150W LED	150	sq	

**HOMAN O'BRIEN**  
Engineering Excellence.

Company Details:  
25 Commercial Way, Stratford, Ox10 6DE  
Tel: 0185 205 500, Fax: 0185 205 501  
Email: sales@hob.co.uk  
Web: www.hob.co.uk

Project: Chadwick's Site	Project Number: 1000000000
Client: Chadwick's Site	Client Reference: 1000000000
Drawn: J.M./N.S.	Checked: J.M./N.S.
Date: 12-01-2021	Scale: 1:100



No part of this document may be reproduced or transmitted in any form or by any means without the written permission from Homan O'Brien Associates as copyright holder, except as agreed for use on the project for which the document was originally issued. © Homan O'Brien Associates Copyright.

- Legend:**
- ☐ T100 - 1000 (Code: 90504352) 27W LED, 3200K, 2000L
  - ✦ T100 - 1000 (Code: 90504352) 27W LED, 3200K, 2000L, 1000, 1/2" x 1/2"
  - ✦ T100 - 1000 (Code: 90504352) 27W LED, 3200K, 2000L



Lighting Type: P10  
T100-1000



Lighting Type: P10  
T100-1000



Lighting Type: P10  
T100-1000

ISSUED FOR INFORMATION



Rev	Description	Date	By	Check
01	Issue for Information	01/01/2021	AS	AS
02	Issue for Information	01/01/2021	AS	AS
03	Issue for Information	01/01/2021	AS	AS
04	Issue for Information	01/01/2021	AS	AS
05	Issue for Information	01/01/2021	AS	AS

**HOMAN O'BRIEN** Engineering Excellence.

Company Name: Homan O'Brien Associates  
 Registered Office: 10000 Oldfield Road, Oldfield, Wokingham, RG40 3EJ, UK  
 Company No: 02052020  
 VAT No: 264 580 880

Project Name: Chadwicks Site Greenhills	Client Name: [Redacted]
Project Address: [Redacted]	Client Address: [Redacted]
Project No: 2021-001	Client No: [Redacted]
Issue Date: 01/01/2021	Issue No: [Redacted]