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Appendix A – External Lighting Layout

Appendix B - External Lighting Calculation Report

1 INTRODUCTION

This external lighting report has been developed to accompany this LRD Stage 3 submission in relation to the Confey Phase 1a Masterplan lands, located within the townlands of Newtown and Confey, Leixlip, Co. Kildare. The report will outline the design criteria, luminaire types proposed for the development and how the proposed design will meet the relevant public lighting standards.

The aim for road and public space lighting schemes can include any or all the following:

- Facilitation of safe movement of vehicles and people.
- Deterring anti-social or criminal behaviour.
- Contributing to the prestige and amenity of an area through increased aesthetic appeal.
- Minimum light spill and glare.

The lighting system was designed to achieve the required Lux levels and set out a plan to bring overall performance to the desired limits. In line with Kildare County Development Plan (Section 5.12) and Confey Design Code, the design ensures safe and adequate public lighting, coordinated with landscaping, energy-efficient technology, and minimal environmental impact, with due regard for protected species such as bats.

The lighting guidelines being used for the study require that in no event shall any light element associated with the buildings adversely impact the operation of motor vehicles on entire roads. Additionally, the Lux light levels shall not significantly adversely impact the workers community, nearby heritage, and ecological sensitive receptors.

2 PROPOSED DEVELOPMENT DESCRIPTION

Vanisland Limited, intend to apply for planning permission for a Large-scale Residential Development (LRD) on lands within the townlands of Newtown and Confey, Leixlip, Co. Kildare. The application site is bound by the R149 to the east, the L1015 to the north, Paceland and Captains Hill (residential dwellings) to the north-east, greenfield lands to the west, and the Royal Canal to the south.

The proposed development provides for the construction of 272 no. residential units comprising: 101 no. terraced houses (54 no. 3-bed 2 no. storey houses, 28 no. 4-bed 2 storey houses and 19 no. 4-bed 3 no. storey houses); 12 no. own door 1-bed apartment units in an end of terrace (3 storey) arrangement throughout the site; 78 no. duplex apartment units (33 no. 2-bed and 45 no. 3-bed units) provided in terraced and end of terrace (3 storey) arrangements throughout the site; and provision of a mixed use area (referred to as Block A) comprising 81 no. apartments / duplex apartments units (29 no. 1-bed, 36 no. 2-bed, and 16 no. 3-bed units) in 4 no. blocks partially over a podium / undercroft level (Blocks A1 to A4) ranging from 3 no. storeys to 6 no. storeys.

The provision at ground floor and podium / undercroft level of Block A of a childcare facility and associated play area; 3 no. commercial units (for Class 1- Shop, or Class 2- Office / Professional Services, or Class 11 Gym, or Restaurant / Café use, including ancillary takeaway use, or Class 8- Health Centre / Civic, or Cultural Use); a Restaurant / Café unit; bike stores; bin stores; plant areas; 1 no. ESB substation and associated switch rooms; and car parking.

The development provides public open space and communal open space to serve the residential units, and c. 1 ha of the proposed strategic open space comprising a linear park to the north of the Royal Canal.

Provision of 2 no. vehicular and pedestrian / cyclist access from the R149 to the east and the L1015 to the north; and proposed upgrades (horizontal widening and minor vertical road alignment) to the R149 to the east and to the L1015 along the northern boundary of the site.

The development will provide for car parking spaces; bicycle parking spaces; internal roads, pedestrian and cycle paths; and the provision of the proposed infrastructure up to the application site boundary to facilitate future connections to adjoining lands.

Provision of foul, watermain and surface water drainage, including upgrade works to the existing watermain along the R149; public lighting; landscaping and boundary treatment works; PV panels; services; bin and bicycle stores; and all associated infrastructure and site works to facilitate the development.



Figure 1 – Proposed Site Layout

3 STAGE 2 LRD COMMENTS FROM KILDARE COUNTY COUNCIL

Ref	KCC Opinion	Applicant Response
1	The applicant to submit a comprehensive separate Public Lighting drawings including proposed upgrading of lighting on L1015 and R419 and internal development. The applicant to clarify if public lighting extends to the southwest corner of the development adjacent the Royal Canal. The applicant to demonstrate that the development will not be a source of light pollution to Confey Railway Station and public road network. The lighting scheme is to be in accordance with KCC Lighting Policy Street Lighting Technical Spec. June 2019	As per Section 5.7 and Appendix A – External Lighting Layout, a comprehensive public lighting design has been prepared for the proposed development, including the internal road network and the proposed upgrades to the existing public lighting infrastructure along the L1015 and R419 roads. The proposed public lighting extends to the southwest corner of the development adjacent to the Royal Canal, in accordance with the TIC layout. The lighting design has been developed in accordance with the following standards and guidance documents: • Kildare County Council Street Lighting Technical Specification (October 2023) • Kildare County Council Street Lighting Policy & Planning Guidelines The proposed lighting arrangement has been designed to provide the required lighting levels while minimising light spill beyond the site boundary. The assessment of lighting levels in the vicinity of Confey Railway Station is included within Section 5.7, with the corresponding calculated light levels illustrated on the External Lighting Layout drawing contained in Appendix A.

4 LIGHTING STANDARDS

The lighting design will follow guidance from the following standards:

- SLL Code for Lighting – Society of Light and Lighting
- BS5489-1:2020 – Design of Road Lighting
- BS EN 13201-2:2015 Road Lighting. Part 2: Performance requirements
- Kildare County Council Street Lighting Technical Specification October 2023
- Kildare County Council Street Lighting Policy & Planning
- Leixlip Local Area Plan 2020-2023 Extended to March 2026 and Amended by Amendment No.1 (including Confey Masterplan and Confey Design Code)

Compliance with the above lighting standards will ensure a uniform level of light suitable to the task at hand is provided across the public areas.

5 LIGHTING DESIGN CRITERIA

5.1 LIGHTING DESIGN PROCESS STAGES

The lighting design process stages used to design the external lighting of the development will be considered to comprise of three key steps:

- a) Concept (valid for this stage).
- b) Preliminary (will be developed in Preliminary Design Stage)
- c) Detailed (will be developed in Tender Stage)

Concept Design:

The concept design stage was the first stage of the lighting design process that was used to develop the following aspects:

- a) Identify the approximate extents of the area to be lit.
- b) Undertake an initial assessment for the options using the energy performance indicators identified in IS EN 13201-5.
- c) Identify constraints and hazards.
- d) Initial risk assessments.
- e) Prepare an outline design methodology summarising lighting aspect to be included as part of the design file and the assumptions that have been made in developing the concept lighting design.
- f) Prepare the Lighting Design File

5.2 PLANNING POLICY CONTEXT

The proposed external lighting scheme has been developed in accordance with the relevant policies and objectives of the Kildare County Development Plan (Section 5.12) and the Confey Design Code.

Kildare County Development Plan (Section 5.12):

TM O124 Expand the existing public lighting network and ensure that all new developments are provided with adequate public lighting for the safety of all pedestrians, cyclists and minority groups. Such lighting networks shall have regard for protected species such as bats which can potentially be affected by lighting systems. The Lux, wavelength and TTC28 (Total Transfer Capability) will be considered in the selection of appropriate lighting.

TM O125 Ensure that landscape proposals detail public lighting locations and that proposed street lighting is not compromised by tree planting. The landscape proposals should ensure that the trees are planted a sufficient distance from public lighting so that when the canopy matures it does not cover the light standard.

TM O126 Remove all inappropriate and unnecessary street lighting and cabling and ensure future street lighting installations do not adversely impact sensitive physical, environmental, natural and heritage resources within the county.

TM O127 Ensure that all new street lighting is provided in accordance with best practice guidelines and standards in terms of the type of lighting columns, lantern types, lighting class, lux levels and LEDs

being provided. The 'white light' delivered by LED lights will provide greater colour rendering and provide sharper contrast and improved safety for road users.

TM O128 Explore the possibility of providing solar powered lighting for new street lighting schemes, where appropriate.

TM O129 Consider replacing sodium lights with Smart LEDs and motion sensors and deploying Central Management Systems, to improve the efficiency of the existing public lighting assets in order to minimise electricity usage as upgrades or improvements occur.

TM O130 Ensure that the design of external lighting schemes minimises the incidence of light spillage or pollution in the immediate surrounding environment and has due regard to the residential amenity of surrounding areas and the need to mitigate adverse impacts on sensitive fauna and protected species.

Confey Design Code:

4.4.34. Public lighting proposals must support the creation a sense of a welcoming, safe and secure neighbourhood made up of well lit streets and pedestrian routes and to reduce the risk of night-time accidents and risk.

4.4.35. Light spill into adjacent properties must be minimised through the appropriate specification, sighting, orientation and control of lighting apparatus.

4.4.36. Public realm lighting equipment must be robust, low energy and with a long maintenance cycle.

4.4.37. The position of lighting equipment must be coordinated with landscape layouts to mitigate against interference from and with tree canopies, vehicle tracking, pedestrian crossings and play spaces.

4.4.38. New lighting must be designed to minimise clutter and must be located to minimise conflicts with pedestrian movement within the public realm where possible.

4.4.39. Light spill into areas of bat habitats should be minimised through the appropriate specification, sighting, orientation and control of lighting apparatus.

4.4.40. Lighting should be pointed away from areas of habitat areas using directional lighting where possible. No light should fall on any areas of vegetation suitable as a commuting and/or foraging resource.

Compliance with Kildare County Development Plan and Confey Design Code:

The proposed scheme ensures uniform illumination and adequate Lux levels across pedestrian and vehicular routes, enhancing safety for all users in line with TM O124 and Design Code 4.4.34. Lighting column placement has been coordinated with the landscape plan to avoid interference with future tree canopies and maintain visibility (TM O125, 4.4.37). The design avoids unnecessary lighting and limits cabling to reduce visual and environmental impacts (TM O126, 4.4.38).

All luminaires are energy-efficient LED fittings with robust design and long service life, consistent with TM O127, TM O129, and Design Code 4.4.36. The system is compatible with future integration of smart controls and energy-saving measures (TM O128–TM O129).

Directional fittings and controlled mounting heights minimise light spillage into nearby properties, habitats, and bat-sensitive areas (TM O124, TM O130, 4.4.35, 4.4.39, 4.4.40). Lighting is carefully oriented to prevent illumination of vegetation used for foraging or commuting routes.

Overall, the proposed external lighting strategy fully complies with the Kildare County Development Plan and the Confey Design Code, balancing safety, sustainability, and ecological protection.

5.3 COMPETENCY FOR DESIGNERS & QUALITY ASSURANCE

The design of lighting was undertaken by competent and experienced Team who could demonstrate an appropriate understanding of road lighting design principles.

5.4 DESIGN FILE

This report has been prepared to accompany an LRD Stage 3 submission to Kildare County Council regarding the Confey Phase 1a Masterplan lands, located within the townlands of Newtown and Confey, Leixlip, Co. Kildare.

5.5 CONTROL OF OBTUSIVE LIGHTING

To safeguard and enhance the night-time environment it is necessary to control obtusive light (Also known as light pollution), which can present physiological and ecological problems to the surrounding areas and people. The limits of intrusive light for exterior installations, to minimise problems for people are given in the below table extracted from IS EN 12464-2 Lighting of Outdoor Workplaces. The designer proposes that the figures outlined in E3 are utilised. The external lighting design will ensure the positions of each luminaire are designed in such a way to limit obtusive light.

Table 2 — Maximum obtusive light permitted for exterior lighting installations

Environmental zone	Light on properties		Luminaire intensity		Upward light ratio	Luminance	
	E_v lx		I cd		R_{UL} %	L_b cd m ⁻²	L_s cd m ⁻²
	Pre-curfew ^a	Post-curfew	Pre-curfew	Post-curfew		Building facade	Signs
E1	2	0	2 500	0	0	0	50
E2	5	1	7 500	500	5	5	400
E3	10	2	10 000	1 000	15	10	800
E4	25	5	25 000	2 500	25	25	1 000

where

E1 represents intrinsically dark areas, such as national parks or protected sites;

E2 represents low district brightness areas, such as industrial or residential rural areas;

E3 represents medium district brightness areas, such as industrial or residential suburbs;

E4 represents high district brightness areas, such as town centres and commercial areas;

E_v is the maximum value of vertical illuminance on properties in lx;

I is the light intensity of each source in the potentially obtusive direction in cd;

R_{UL} is the proportion of the flux of the luminaire(s) that is emitted above the horizontal, when the luminaire(s) is (are) mounted in its (their) installed position and attitude, and given in %;

L_b is the maximum average luminance of the facade of a building in cd m⁻²;

L_s is the maximum average luminance of signs in cd m⁻².

^a In case no curfew regulations are available, the higher values shall not be exceeded and the lower values should be taken as preferable limits.

5.6 ECOLOGICAL REPORT

The public lighting will be designed in accordance with KCC lighting specification, adhering to the recommendation for neutral white light 4000K for Traffic Routes and 3000K for Residential Schemes. This approach ensures that all installations comply with the relevant specifications for safety, efficiency, and environmental considerations, while providing appropriate illumination for public areas and utilising a 3000K spectrum to support a bat-sensitive lighting design within the development.

As per the recommendations of the ecological report, the external lighting for the Apartment's Public Open Space and South Side Pedestrian Route adjacent to Royal Canal will be designed to limit overspill and prevent light pollution. The key design features include:

- All luminaires shall be designed to minimize the spill of upward light and should not emit any up-light.
- All luminaires shall lack UV elements when manufactured and shall be LED
- A warm white spectrum (ideally ≤ 2700 Kelvin) shall be adopted to reduce blue light component
- Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats

Along the corridor adjacent to the canal, the lighting has been designed to illuminate the walkway only, while minimising light spill to adjacent areas and the retained hedgerow boundary. Light shields will be installed on luminaires located close to the boundary to prevent back spill.

5.7 LUX LEVELS

The lighting design for the development will follow guidance from the following standards:

- BS5489-1:2020 – Design of Road Lighting
- BS EN 13201-2:2015 Road Lighting. Part 2: Performance requirements

Public Lighting:

The existing SON public lighting along the R149 Road is to be upgraded with modern LED luminaires, retaining the existing columns. The existing LED fittings and columns at the R149 and L1015 junction are to be retained.



Figure 2 – R149 Road Existing SON Lighting (to be upgraded)



Figure 3 – R149 / L1015 Roads Junction Existing LED Lighting (to be retained)

There is currently no public lighting along the L1015 Confey Road. New public lighting is proposed to serve the proposed development.



Figure 4 –L1015 Confey Road (no existing public lighting)

The L1015 Confey Road and R149 Road lighting has been designed to meet P1 class standards.

Table 3 — P lighting classes

Class	Horizontal illuminance		Additional requirement if facial recognition is necessary	
	$\bar{E}^*$ [minimum maintained] lx	E_{min} [maintained] lx	$E_{v,min}$ [maintained] lx	$E_{sc,min}$ [maintained] lx
P1	15,0	3,00	5,0	5,0
P2	10,0	2,00	3,0	2,0
P3	7,50	1,50	2,5	1,5
P4	5,00	1,00	1,5	1,0
P5	3,00	0,60	1,0	0,6
P6	2,00	0,40	0,6	0,2
P7	performance not determined	performance not determined		

^a To provide for uniformity, the actual value of the maintained average illuminance shall not exceed 1,5 times the minimum $\bar{E}$ value indicated for the class.

The Access Road lighting has been designed to meet P3 class standards.

Table 3 — P lighting classes

Class	Horizontal illuminance		Additional requirement if facial recognition is necessary	
	$\bar{E}^*$ [minimum maintained] lx	E_{min} [maintained] lx	$E_{v,min}$ [maintained] lx	$E_{sc,min}$ [maintained] lx
P1	15,0	3,00	5,0	5,0
P2	10,0	2,00	3,0	2,0
P3	7,50	1,50	2,5	1,5
P4	5,00	1,00	1,5	1,0
P5	3,00	0,60	1,0	0,6
P6	2,00	0,40	0,6	0,2
P7	performance not determined	performance not determined		

^a To provide for uniformity, the actual value of the maintained average illuminance shall not exceed 1,5 times the minimum $\bar{E}$ value indicated for the class.

The Conflict Zones lighting at site entrances has been designed to meet C3 class standards.

Table 2 — C lighting classes based on road surface illuminance

Class	Horizontal illuminance	
	$\bar{E}$ [minimum maintained] lx	U_a [minimum]
C0	50	0,40
C1	30	0,40
C2	20,0	0,40
C3	15,0	0,40
C4	10,0	0,40
C5	7,50	0,40

The Residential Roads lighting has been designed to meet P4 class standards.

Table 3 — P lighting classes

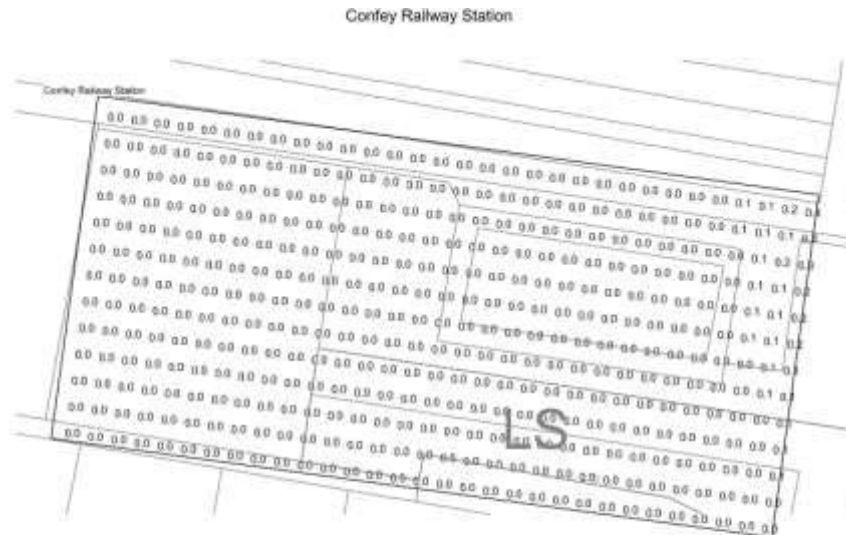
Class	Horizontal illuminance		Additional requirement if facial recognition is necessary	
	$\bar{E}^*$ [minimum maintained] lx	E_{min} [maintained] lx	$E_{r,min}$ [maintained] lx	$E_{sc,min}$ [maintained] lx
P1	15,0	3,00	5,0	5,0
P2	10,0	2,00	3,0	2,0
P3	7,50	1,50	2,5	1,5
P4	5,00	1,00	1,5	1,0
P5	3,00	0,60	1,0	0,6
P6	2,00	0,40	0,6	0,2
P7	performance not determined	performance not determined		
* To provide for uniformity, the actual value of the maintained average illuminance shall not exceed 1,5 times the minimum $\bar{E}$ value indicated for the class.				

South Side Pedestrian Route lighting has been designed to meet P4 class standards.

Table 3 — P lighting classes

Class	Horizontal illuminance		Additional requirement if facial recognition is necessary	
	$\bar{E}^*$ [minimum maintained] lx	E_{min} [maintained] lx	$E_{r,min}$ [maintained] lx	$E_{sc,min}$ [maintained] lx
P1	15,0	3,00	5,0	5,0
P2	10,0	2,00	3,0	2,0
P3	7,50	1,50	2,5	1,5
P4	5,00	1,00	1,5	1,0
P5	3,00	0,60	1,0	0,6
P6	2,00	0,40	0,6	0,2
P7	performance not determined	performance not determined		
* To provide for uniformity, the actual value of the maintained average illuminance shall not exceed 1,5 times the minimum $\bar{E}$ value indicated for the class.				

The lighting calculation report and layout demonstrate that the proposed public lighting scheme will not give rise to light pollution impacting Confey Railway Station:



Results

Eav	0.02
Emin	0.00
Emax	0.37
Emin/Emax	0.01
Emin/Eav	0.12

External Private Lighting:

The Open Public Space lighting has been designed to meet P4 class standards.

Table 3 — P lighting classes

Class	Horizontal illuminance		Additional requirement if facial recognition is necessary	
	E_{av} [minimum maintained] lx	E_{min} [maintained] lx	$E_{x,min}$ [maintained] lx	$E_{sc,min}$ [maintained] lx
P1	15,0	3,00	5,0	5,0
P2	10,0	2,00	3,0	2,0
P3	7,50	1,50	2,5	1,5
P4	5,00	1,00	1,5	1,0
P5	3,00	0,60	1,0	0,6
P6	2,00	0,40	0,6	0,2
P7	performance not determined	performance not determined		

* To provide for uniformity, the actual value of the maintained average illuminance shall not exceed 1,5 times the minimum E value indicated for the class.

6 KEY DEFINITIONS

In accordance with the Guidance Notes for the Reduction of Obtrusive Light, the following definitions are used to describe lighting effects in this assessment:

- **Average Road Luminance:** Road Luminance is a measure of the visibility of the road and it is based on the principle of illuminating the road enough to see the outline of the obstacle.
- **Uniformity:** Uniformity is an index to measure the uniformity of light distribution on the road, which can be expressed as overall uniformity (U0) and longitudinal uniformity (UI).
- **Glare:** Glare is the blinding sensation that occurs when the brightness of light exceeds the level of adaptation of the human eye to light.
- **Light spill:** the unwanted spillage of light onto adjacent areas and may affect sensitive receptors, particularly residential properties; (this includes the spill of light from a badly aimed floodlight stray in beyond the task area such as light into windows or a neighbouring property).
- **Colour Rendering Index:** The colour rendering index measures the ability of artificial light sources to display or reproduce the colour of the road or objects on the road relative to natural light sources.

7 PROPOSED LIGHT FITTINGS

The proposed light fittings will all be of the LED type:

- Fittings A – Street Light
- Fittings B – Street Light
- Fittings C – Street Light
- Fittings D - Bollard
- Fittings E – Post Top Light
- Fittings F – Street Light

PUBLIC LIGHTING:



Fitting A – Street Light



Fitting B – Street Light



Fittings C – Street Light



Fittings F – Street Light

PRIVATE LIGHTING:**Fitting D – Bollard****Fitting E – Post Top Light**

8 CONTROL STRATEGY

It is proposed that external luminaires will be controlled via photocells. The controls strategy aims to provide the necessary level of light at the time when it is needed in the most energy efficient manner.



APPENDIX A
External Lighting Layout



NOTES

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER ARCHITECTS, STRUCTURAL ENGINEERS, BUILDING SERVICES, SPECIFICATIONS & SCHEDULES.
- ALL DIMENSIONS ARE IN MILLIMETERS.
- THE CONTRACTOR SHALL NOTE THAT THIS DRAWING IS INDICATIVE AND ILLUSTRATES DESIGN INTENT ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DETAILED DESIGN AND COORDINATION WITH OTHER SERVICES.

LEGEND

PUBLIC LIGHTING:

- TYPE A - PUBLIC LIGHTING FITTING CU PHOSCO P82K 3.144m, 27w, 3000K, 8m column
- TYPE B - PUBLIC LIGHTING FITTING CU PHOSCO P82K 2.394m, 20w, 3000K, 6m column
- TYPE C - PUBLIC LIGHTING FITTING CU PHOSCO P863 10.45m, 77w, 4000K, 10m column
- TYPE F - STREET LIGHTING FITTING CREE UNO 1.09km, 10w, 2700K, 5m column
- TYPE G - EXISTING PUBLIC LIGHTING FITTING

Residential Roads	Conflict Zone 2
Results - Horizontal Illuminance (lux)	Results - Horizontal Illuminance (lux)
Eav= 5.05	Eav= 33.25
Emin= 1.14	Emin= 24.69
Emax= 18.60	Emin= 38.18
Emin/Emax= 0.06	Emin/Emax= 0.65
Emin/Eav= 0.20	Emin/Eav= 0.74
Emin/Eav= 3.18	Emin/Eav= 1.15

South Side Pedestrian Route	R149 Road
Results - Horizontal Illuminance (lux)	Results - Horizontal Illuminance (lux)
Eav= 5.42	Eav= 15.02
Emin= 1.18	Emin= 4.19
Emin= 14.22	Emin= 31.68
Emin/Emin= 0.08	Emin/Emin= 0.13
Emin/Eav= 0.22	Emin/Eav= 0.26
Emin/Eav= 2.82	Emin/Eav= 2.11

L1015 Confey Road	Confey Railway Station
Results - Horizontal Illuminance (lux)	Results - Horizontal Illuminance (lux)
Eav= 18.41	Eav= 0.02
Emin= 3.91	Emin= 0.00
Emin= 38.28	Emin= 0.31
Emin/Emin= 0.10	Emin/Emin= 0.01
Emin/Eav= 0.21	Emin/Eav= 0.12
Emin/Eav= 2.08	Emin/Eav= 18.14

Access Road
Results - Horizontal Illuminance (lux)
Eav= 9.00
Emin= 2.84
Emin= 25.32
Emin/Emin= 0.11
Emin/Eav= 0.32
Emin/Eav= 2.81

Conflict Zone 1
Results - Horizontal Illuminance (lux)
Eav= 18.94
Emin= 15.09
Emin= 31.46
Emin/Emin= 0.70
Emin/Eav= 0.80
Emin/Eav= 1.13

PRIVATE LIGHTING:

- TYPE D - BOLLARD TRT LIGHTING VIA ASY 0.41km, 9w, 2700K, 1m
- TYPE E - POST TOP LIGHTING FITTING SCHREDER FLEXIA BRASSO MIDI, 1.52km, 310mA, 2700K, 5m column

Apartments Public Open Space
Results - Horizontal Illuminance (lux)
Eav= 6.55
Emin= 1.57
Emin= 30.76
Emin/Emin= 0.04
Emin/Eav= 0.20
Emin/Eav= 4.42

- Light Shield (to prevent backspill lighting)

The lighting calculation software does not have the capability to accurately model luminaires fitted with light shields. Therefore, the layout lines and calculated lighting levels shown behind the installed shields should be considered as effectively dark, as the shields are intended to prevent backspill into these areas.

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0	11-07-2025	DRAFT	AZ	GM

Client

VANISLAND LIMITED

Project

CONFHEY PHASE 1A LRD

Title

EXTERNAL LIGHTING LAYOUT

Drawing No.

D25007-ZZ-ZZ-DR-EDC-E-70101

RIBA Work Stage	Status Code	Revision
STAGE 2	P3	3

Scale @ A0

1:450

Mechanical & Electrical Consulting Engineers

EDC

100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 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1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 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1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1540, 1541, 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1576, 1577, 1578, 1579, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1597, 1598, 1599, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618, 1619, 1620, 1621, 1622, 1623, 1624, 1625, 1626, 1627, 1628, 1629, 1630, 1631, 1632, 1633, 1634, 1635, 1636, 1637, 1638, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1650, 1651, 1652, 1653, 1654, 1655, 1656, 1657, 1658, 1659, 1660, 1661, 1662, 1663, 1664, 1665, 1666, 1667, 1668, 1669, 1670, 1671, 1672, 1673, 1674, 1675, 1676, 1677, 1678, 1679, 1680, 1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1720, 1721, 1722, 1723, 1724, 1725, 1726, 1727, 1728, 1729, 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 1740, 1741, 1742, 1743, 1744, 1745, 1746, 1747, 1748, 1749, 1750, 1751, 1752, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1770, 1771, 1772, 1773, 1774, 1775, 1776, 1777, 1778, 1779, 1780, 1781, 1782, 1783, 1784, 1785, 1786, 1787, 1788, 1789, 1790, 1791, 1792, 1793, 1794, 1795, 1796, 1797, 1798, 1799, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820,

APPENDIX B
External Lighting Calculation Report

DATE: 14 May 2026
DESIGNER: Andrii Zaporozhchenko
PROJECT No: D25007
PROJECT NAME: Confey



Lighting to BS5489:1 2020

Public Lighting:

Access Road lighting to P3

Residential Roads lighting to P4

South Side Pedestrian Route lighting to P4

Conflict zones lighting to C3

Upgrading of Public Lighting:

L1015 Confey Road lighting to P1

R149 Road lighting to P1

Private Lighting:

Apartments Public Open Space lighting to P4

Lights type G are existing

Outdoor Lighting Report

PREPARED BY: EDC-Mechanical & Electrical Consulting Engineers
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Layout Report

General Data

Dimensions in Metres Angles in Degrees

Calculation Grids

ID	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	Residential Roads	-647.83	-188.97	335.95	319.56	1.50	1.49
2	Apartments Public Open Spa...	-458.88	-149.44	116.95	89.21	1.50	1.49
3	South Side Pedestrian Rout...	-735.73	-114.58	278.58	43.33	1.39	1.44
4	L1015 Confey Road	-490.32	110.10	225.36	25.97	1.43	1.44
5	Access Road	-387.47	-44.30	86.52	19.27	1.49	1.48
6	Conflict Zone 1	-317.98	-96.93	5.64	11.06	1.13	1.38
7	Conflict Zone 2	-433.12	93.81	10.51	6.25	1.50	1.25
8	R149 Road	-343.16	-179.00	12.93	182.81	1.44	1.50
9	Confey Railway Station	-396.08	-223.39	36.38	17.30	1.17	1.33

Luminaires

Luminaire A Data



Supplier	C U Phosco
Type	P852K-12-P4-W/W-CA0730-27W
Lamp(s)	730C WW
Lamp Flux (klm)	3.14
File Name	P852K-12-P4-W/W-CA0700-27W.Jes
Maintenance Factor	0.83
Imax70,80,90(cd/klm)	730.4, 161.4, 0.8
No. in Project	5

Luminaire B Data



Supplier	C U Phosco
Type	P852K-12-P4-W/W-CA0500-20W
Lamp(s)	730C WW
Lamp Flux (klm)	2.35
File Name	P852K-12-P4-W/W-CA0500-20W.Jes
Maintenance Factor	0.83
Imax70,80,90(cd/klm)	730.4, 161.4, 0.8
No. in Project	68

Luminaire C Data



Supplier	C U Phosco
Type	P863-128-P4-740-W/5-550-71W
Lamp(s)	71C55
Lamp Flux (klm)	10.45
File Name	P863-128-P4-740-W/5-550-71W.Jes
Maintenance Factor	0.83
Imax70,80,90(cd/klm)	29.6, 140.1, 0.5
No. in Project	11

Luminaire D Data



Supplier	TRT Lighting
Type	VIA_DARK-SKY_LED_9W_ASY_2700K_EX P_290mA
Lamp(s)	42 0009 0300 100
Lamp Flux (klm)	0.41
File Name	VIA_DARK-SKY_LED_9W_ASY_2700K_EX P_290mA.Jes
Maintenance Factor	0.83
Imax70,80,90(cd/klm)	615.4, 383.7, 51.6
No. in Project	11

Luminaires

Luminaire E Data

Supplier	
Type	FLC XIA BRASO MDI 5301 Flat glass 10 L H351C@310mA WW 727 230
Lamp(s)	10 I H351C@310mA WW 777 730V 31-37- 043
Lamp Flux(klm)/Colour	1.52 W/W 2700K/70
File Name	10.8W 563952 Flat glass 230V EF .lit
Maintenance Factor	0.83
Imax70,80,90(cd/klm)	505.5, 38.4, 1.5
No. in Project	23

Luminaire F Data

Supplier	Cree Lighting
Type	TRSA-02-K10-2L-278_10W
Lamp(s)	403-QL22-S06
Lamp Flux (klm)	1.09
File Name	TRSA-02-K10-2L-278_10W.IES
Maintenance Factor	0.83
Imax70,80,90(cd/klm)	579.6, 33.2, 0.2
No. in Project	14



Luminaire G Data

Supplier	Philips
Type	BGP293 DM50
Lamp(s)	LED-J ILI 5.2S 740
Lamp Flux (klm)	16.50
File Name	LumStreet Gen2 Medium_BGP293_DM50_ 16500_80LED_5.2S_CLO_L90_740.es
Maintenance Factor	0.83
Imax70,80,90(cd/klm)	939.1, 42.1, 0.0
No. in Project	4



Layout

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	A	-336.05	-73.04	8.00	224.00	0.00	0.00	0.40			
2	A	-359.02	-67.26	8.00	45.00	0.00	0.00	0.40			
3	A	-361.79	-46.27	8.00	224.00	0.00	0.00	0.40			
4	A	-381.91	-39.66	8.00	65.00	0.00	0.00	0.40			
5	A	-323.51	-93.29	8.00	76.00	0.00	0.00	0.40			
6	B	-360.22	16.01	6.00	148.00	5.00	0.00	0.40			
7	B	-382.67	-4.13	6.00	327.00	0.00	0.00	0.40			
8	B	-399.39	3.78	6.00	236.00	10.00	0.00	0.40			
9	B	-429.79	10.66	6.00	49.00	0.00	0.00	0.40			
10	B	-431.17	23.73	6.00	238.00	0.00	0.00	0.40			
11	B	-450.68	23.60	6.00	51.00	0.00	0.00	0.40			
12	B	-377.41	-25.13	6.00	163.00	0.00	0.00	0.40			
13	B	-411.84	-22.66	6.00	328.00	0.00	0.00	0.40			
14	B	-426.58	-39.22	6.00	312.00	0.00	0.00	0.40			
15	B	-478.21	53.31	6.00	242.00	5.00	0.00	0.40			
16	B	-501.56	51.59	6.00	66.00	0.00	0.00	0.40			
17	B	-506.89	64.87	6.00	238.00	0.00	0.00	0.40			
18	B	-453.12	42.78	6.00	143.00	0.00	0.00	0.40			
19	B	-451.78	65.48	6.00	328.00	0.00	0.00	0.40			
20	B	-430.31	77.89	6.00	148.00	0.00	0.00	0.40			
21	B	-491.20	100.48	6.00	156.00	5.00	0.00	0.40			
22	B	-503.59	81.67	6.00	148.00	0.00	0.00	0.40			
23	B	-522.20	56.98	6.00	148.00	0.00	0.00	0.40			
24	B	-547.90	42.54	6.00	81.00	0.00	0.00	0.40			
25	B	-573.41	45.59	6.00	82.00	0.00	0.00	0.40			
26	B	-598.70	49.12	6.00	85.00	0.00	0.00	0.40			
27	B	-603.72	36.08	6.00	173.00	5.00	0.00	0.40			
28	B	-607.36	8.90	6.00	170.00	5.00	0.00	0.40			
29	B	-611.30	-19.37	6.00	167.00	0.00	0.00	0.40			
30	B	-616.67	-51.90	6.00	169.00	0.00	0.00	0.40			
31	B	-618.65	-79.93	6.00	167.00	0.00	0.00	0.40			
32	B	-622.34	-103.47	6.00	164.00	0.00	0.00	0.40			
33	B	-530.21	38.14	6.00	171.00	0.00	0.00	0.40			
34	B	-545.15	21.74	6.00	355.00	0.00	0.00	0.40			
35	B	-535.24	2.86	6.00	169.00	0.00	0.00	0.40			
36	B	-549.09	-13.79	6.00	346.00	0.00	0.00	0.40			

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
37	B	-593.76	-6.41	6.00	265.00	0.00	0.00	0.40			
38	B	-567.70	-12.64	6.00	243.00	0.00	0.00	0.40			
39	B	-478.38	26.63	6.00	332.00	5.00	0.00	0.40			
40	B	-471.79	14.36	6.00	188.00	0.00	0.00	0.40			
41	B	-485.62	-3.24	6.00	356.00	0.00	0.00	0.40			
42	B	-472.39	-19.40	6.00	177.00	0.00	0.00	0.40			
43	B	-488.10	-31.30	6.00	353.00	0.00	0.00	0.40			
44	B	-464.99	-37.64	6.00	262.00	0.00	0.00	0.40			
45	B	-444.94	-39.17	6.00	268.00	0.00	0.00	0.40			
46	B	-535.27	-30.48	6.00	196.00	0.00	0.00	0.40			
47	B	-514.40	-37.55	6.00	267.00	0.00	0.00	0.40			
48	B	-602.97	-39.70	6.00	78.00	0.00	0.00	0.40			
49	B	-585.00	-31.48	6.00	261.00	0.00	0.00	0.40			
50	B	-563.01	-46.22	6.00	83.00	0.00	0.00	0.40			
51	B	-541.69	-41.32	6.00	249.00	0.00	0.00	0.40			
52	B	-517.76	-60.21	6.00	70.00	0.00	0.00	0.40			
53	B	-491.96	-66.47	6.00	89.00	0.00	0.00	0.40			
54	B	-477.90	-45.99	6.00	179.00	0.00	0.00	0.40			
55	B	-462.08	-67.61	6.00	89.00	0.00	0.00	0.40			
56	B	-432.05	-68.49	6.00	106.00	0.00	0.00	0.40			
57	B	-412.33	-73.55	6.00	54.00	0.00	0.00	0.40			
58	B	-389.07	-58.17	6.00	165.00	0.00	0.00	0.40			
59	B	-405.46	-103.49	6.00	153.00	0.00	0.00	0.40			
60	B	-411.55	-83.99	6.00	335.00	0.00	0.00	0.40			
61	B	-425.94	-121.74	6.00	339.00	0.00	0.00	0.40			
62	B	-453.29	-136.35	6.00	89.00	0.00	0.00	0.40			
63	B	-475.37	-126.88	6.00	277.00	0.00	0.00	0.40			
64	B	-501.67	-124.71	6.00	259.00	0.00	0.00	0.40			
65	B	-523.08	-122.32	6.00	262.00	0.00	0.00	0.40			
66	B	-555.88	-117.02	6.00	256.00	0.00	0.00	0.40			
67	B	-573.91	-100.60	6.00	0.00	5.00	0.00	0.40			
68	B	-556.97	-80.39	6.00	169.00	0.00	0.00	0.40			
69	B	-565.60	-63.59	6.00	340.00	0.00	0.00	0.40			
70	B	-511.29	-106.17	6.00	6.00	5.00	0.00	0.40			
71	B	-498.83	-91.79	6.00	180.00	0.00	0.00	0.40			
72	B	-511.66	-74.44	6.00	353.00	0.00	0.00	0.40			

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
73	C	-323.23	8.32	10.00	47.00	0.00	0.00	0.40			
74	C	-358.80	38.47	10.00	44.00	0.00	0.00	0.40			
75	C	-374.24	50.96	10.00	61.00	0.00	0.00	0.40			
76	C	-394.87	68.97	10.00	45.00	0.00	0.00	0.40			
77	C	-417.54	83.19	10.00	55.00	0.00	0.00	0.40			
78	C	-443.45	99.08	10.00	56.00	0.00	0.00	0.40			
79	C	-463.64	119.86	10.00	232.00	0.00	0.00	0.40			
80	C	-426.73	98.73	10.00	232.00	0.00	0.00	0.40			
81	C	-312.11	-107.22	10.00	164.00	0.00	0.00	2.50			
82	C	-306.88	-78.54	10.00	174.00	0.00	0.00	2.50			
83	F	-721.14	-108.18	5.00	80.00	0.00	0.00	0.40			
84	F	-591.15	-126.20	5.00	55.00	0.00	0.00	0.40			
85	F	-699.76	-100.94	5.00	250.00	0.00	0.00	0.40			
86	E	-372.09	-111.01	5.00	115.00	0.00	0.00	0.00			
87	E	-359.87	-105.20	5.00	90.00	0.00	0.00	0.00			
88	D	-339.94	-104.41	1.00	250.00	0.00	0.00	0.00			
89	D	-351.57	-103.81	1.00	70.00	0.00	0.00	0.00			
90	D	-372.04	-99.01	1.00	300.00	0.00	0.00	0.00			
91	E	-384.38	-118.87	5.00	235.00	0.00	0.00	0.00			
92	E	-367.61	-120.59	5.00	340.00	0.00	0.00	0.00			
93	D	-391.31	-107.98	1.00	255.00	0.00	0.00	0.00			
94	D	-401.07	-111.79	1.00	340.00	0.00	0.00	0.00			
95	D	-372.21	-129.79	1.00	250.00	0.00	0.00	0.00			
96	E	-334.30	-124.35	5.00	170.00	0.00	0.00	0.00			
97	E	-341.63	-133.62	5.00	340.00	0.00	0.00	0.00			
100	E	-343.64	-163.02	5.00	165.00	0.00	0.00	0.00			
101	E	-352.51	-163.30	5.00	35.00	0.00	0.00	0.00			
102	E	-366.28	-148.84	5.00	250.00	0.00	0.00	0.00			
103	E	-397.60	-145.23	5.00	235.00	0.00	0.00	0.00			
104	E	-374.85	-142.81	5.00	340.00	0.00	0.00	0.00			
105	E	-399.24	-156.77	5.00	160.00	0.00	0.00	0.00			
106	E	-409.12	-138.51	5.00	85.00	0.00	0.00	0.00			
107	E	-415.62	-144.19	5.00	260.00	0.00	0.00	0.00			
108	D	-358.78	-150.42	1.00	210.00	0.00	0.00	0.00			
109	D	-361.91	-76.12	1.00	85.00	0.00	0.00	0.00			
110	D	-354.79	-80.98	1.00	160.00	0.00	0.00	0.00			

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
111	D	-352.29	-154.86	1.00	305.00	0.00	0.00	0.00			
112	D	-378.91	-107.34	1.00	285.00	0.00	0.00	0.00			
113	E	-435.20	-147.78	5.00	30.00	0.00	0.00	0.00			
114	E	-418.79	-152.57	5.00	135.00	0.00	0.00	0.00			
115	E	-416.58	-138.60	5.00	140.00	0.00	0.00	0.00			
117	E	-449.74	-141.05	5.00	270.00	0.00	0.00	0.00			
118	F	-676.64	-110.29	5.00	260.00	0.00	0.00	0.40			
119	F	-655.03	-113.90	5.00	256.00	0.00	0.00	0.40			
120	F	-630.56	-117.64	5.00	262.00	0.00	0.00	0.40			
121	F	-605.55	-118.88	5.00	114.00	0.00	0.00	0.40			
122	F	-576.24	-131.42	5.00	77.00	0.00	0.00	0.40			
123	F	-556.08	-138.25	5.00	50.00	0.00	0.00	0.40			
124	F	-530.94	-146.81	5.00	85.00	0.00	0.00	0.40			
125	F	-514.21	-140.65	5.00	106.00	0.00	0.00	0.40			
126	F	-472.99	-137.91	5.00	260.00	0.00	0.00	0.40			
125	F	-610.16	-110.59	5.00	82.00	0.00	0.00	0.40			
126	F	-584.43	-117.23	5.00	63.00	0.00	0.00	0.40			
132	E	-328.69	-107.47	5.00	160.00	0.00	0.00	0.00			
133	E	-346.33	-147.97	5.00	335.00	0.00	0.00	0.00			
137	E	-386.09	-145.00	5.00	245.00	0.00	0.00	0.00			
137	E	-369.67	-161.07	5.00	75.00	0.00	0.00	0.00			
132	B	-447.52	-125.26	6.00	274.00	0.00	0.00	0.40			
133	E	-393.74	-161.11	5.00	350.00	0.00	0.00	0.00			
134	G	-302.27	-30.87	10.00	343.00	0.00	0.00	0.40			
135	G	-290.03	-7.55	10.00	256.00	0.00	0.00	0.40			
136	G	-277.34	-25.87	10.00	81.00	0.00	0.00	0.40			
137	G	-339.72	-181.34	10.00	342.00	0.00	0.00	0.40			
138	C	-336.59	-144.07	10.00	347.00	0.00	0.00	2.50			

Horizontal Illuminance (lux)

Residential Roads



Results

Eav	5.85
Emin	1.14
Emax	18.60
Emin/Emax	0.06
Emin/Eav	0.20

Horizontal Illuminance (lux)

Apartments Public Open Space

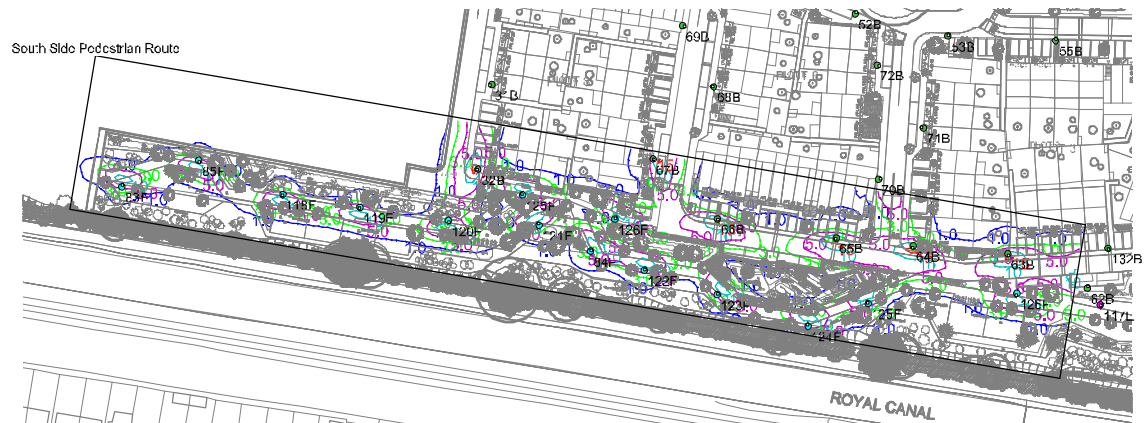


Results

Eav	6.95
Emin	1.37
Emax	30.76
Emin/Emax	0.04
Emin/Eav	0.20

Horizontal Illuminance (lux)

South Side Pedestrian Route

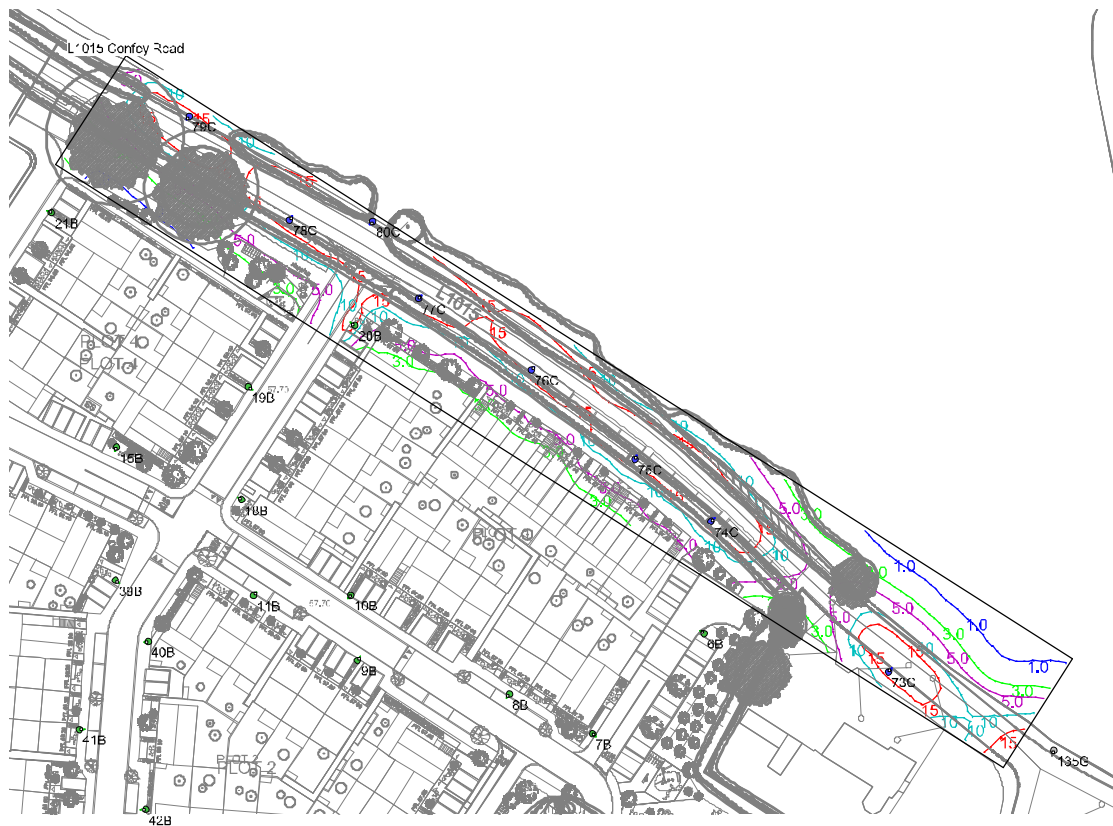


Results

Eav	5.85
Emin	1.14
E _{max}	18.60
Emin/E _{max}	0.06
Emin/Eav	0.20

Horizontal Illuminance (lux)

L1015 Confey Road



Results

Eav	5.85
Emin	1.14
Emax	18.60
Emin/Emax	0.06
Emin/Eav	0.20

Horizontal Illuminance (lux)

Access Road

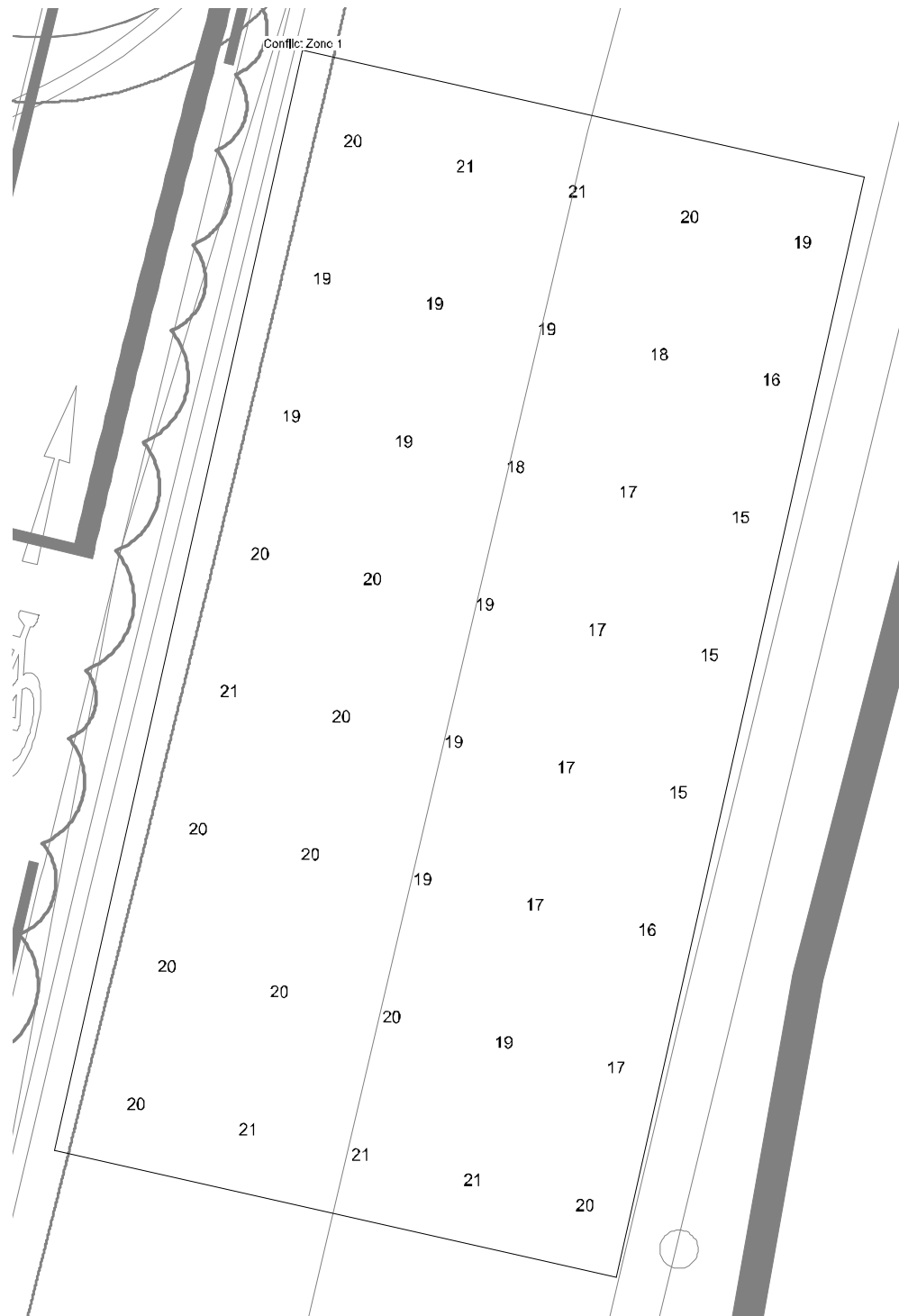


Results

Eav	5.85
Emin	1.14
E _{max}	18.60
E _{min} /E _{max}	0.06
E _{min} /E _{av}	0.20

Horizontal Illuminance (lux)

Conflict Zone 1

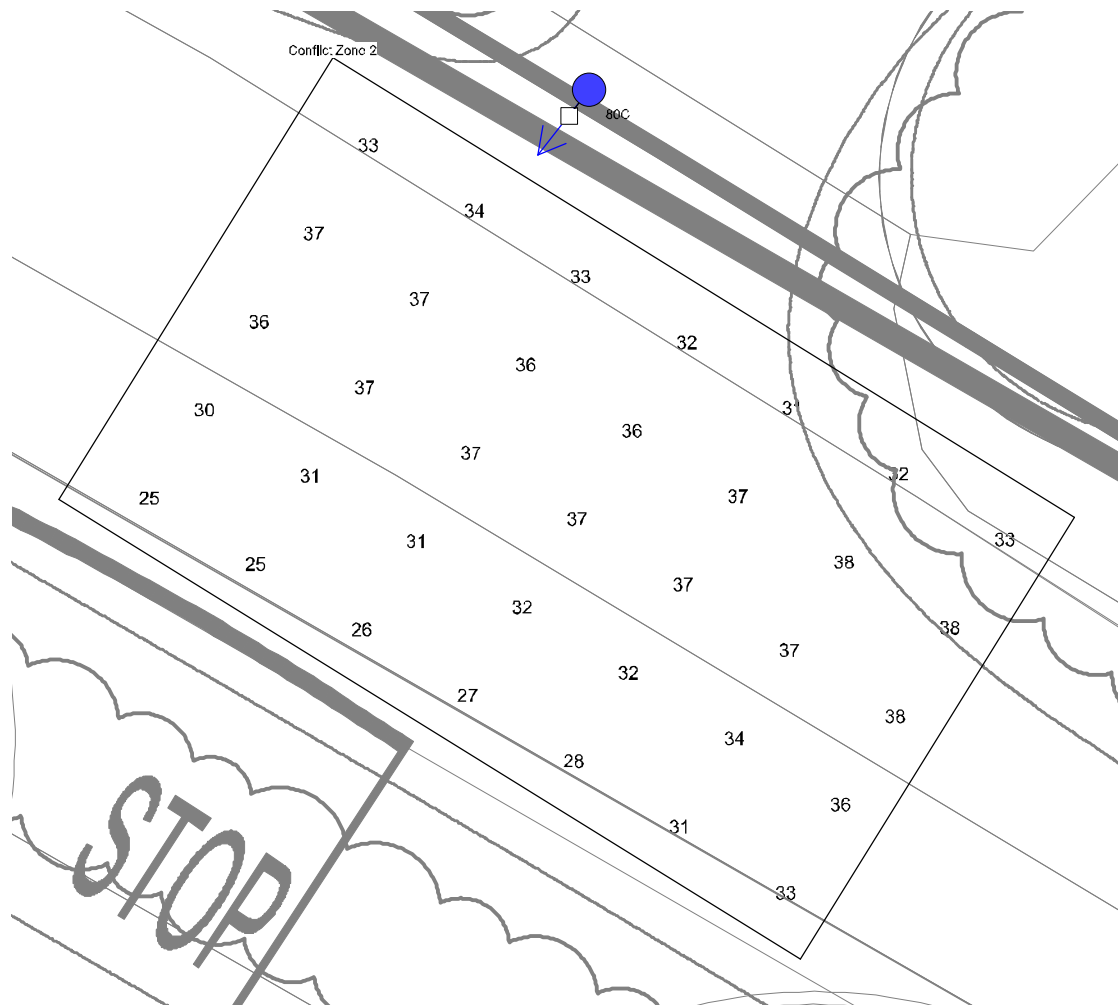


Results

Eav	5.85
Emin	1.14
E _{max}	18.60
Emin/E _{max}	0.06
Emin/Eav	0.20

Horizontal Illuminance (lux)

Conflict Zone 2

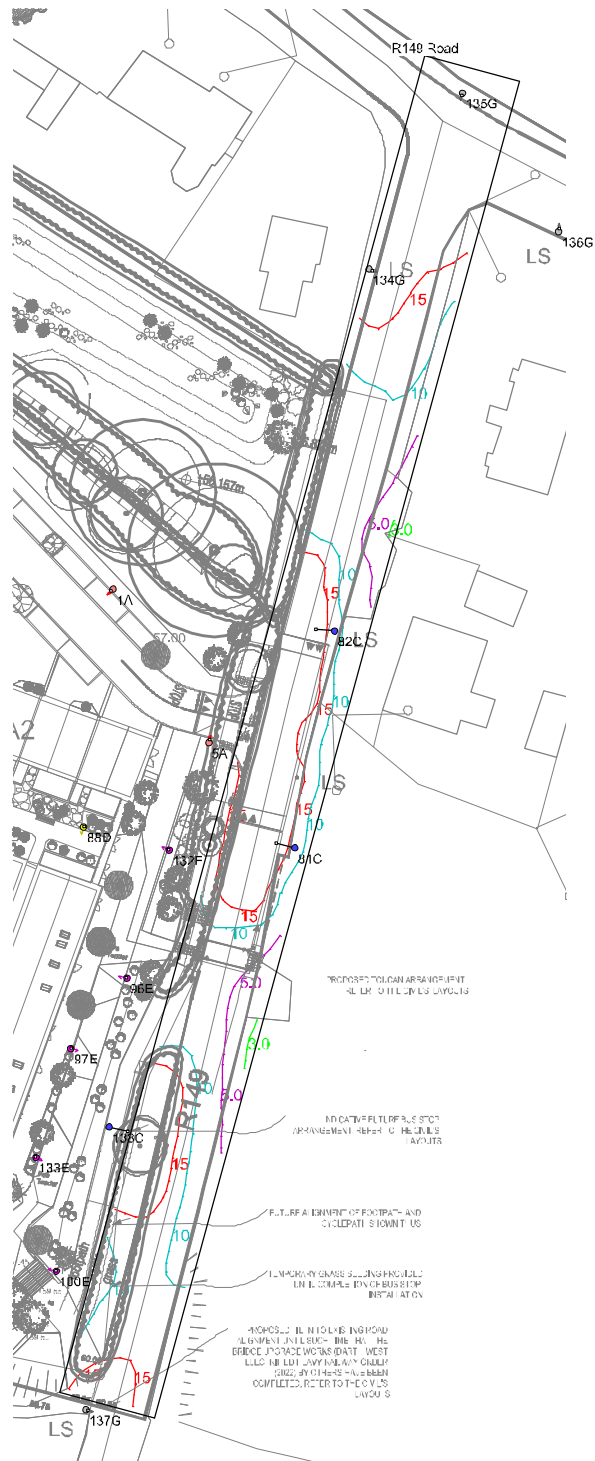


Results

Eav	5.85
Emin	1.14
Emax	18.60
Emin/Emax	0.06
Emin/Eav	0.20

Horizontal Illuminance (lux)

R149 Road

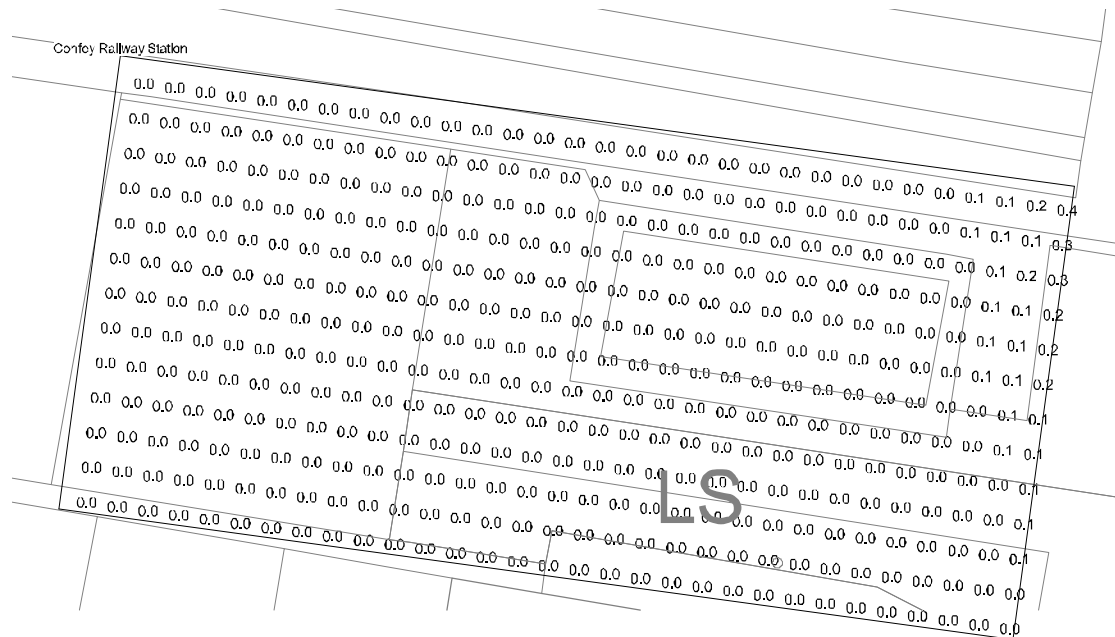


Results

Eav	5.85
Emin	1.14
Emax	18.60
Emin/Emax	0.06
Emin/Eav	0.20

Horizontal Illuminance (lux)

Confey Railway Station



Results

Eav	5.85
Emin	1.14
E _{max}	18.60
E _{min} /E _{max}	0.06
E _{min} /E _{av}	0.20



Engineering Design Consultants

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