



Client Report

Markfield – External Lighting Report

Presented to



50091-ESP-XX-XX-CRP-E-0001-03 Markfield
External Lighting Report

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Date	18/03/2026

Revision Schedule			
Revision	Description	Document Reference	Date of Issue
01	External Lighting Strategy (Planning Submission)	50091-ESP-XX-XX-CRP-E-0001-01 Markfield External Lighting Report	13/08/2025
02	Site plan updated with masterplan drawing	50091-ESP-XX-XX-CRP-E-0001-02 Markfield External Lighting Report	19/09/2025
03	Document updated to reflect updated lighting design including modelled landscaping and reduced lux levels and obtrusive light levels.	50091-ESP-XX-XX-CRP-E-0001-03 Markfield External Lighting Report	18/03/2026

ESPD0622 V015 JUN25

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1.0 INTRODUCTION

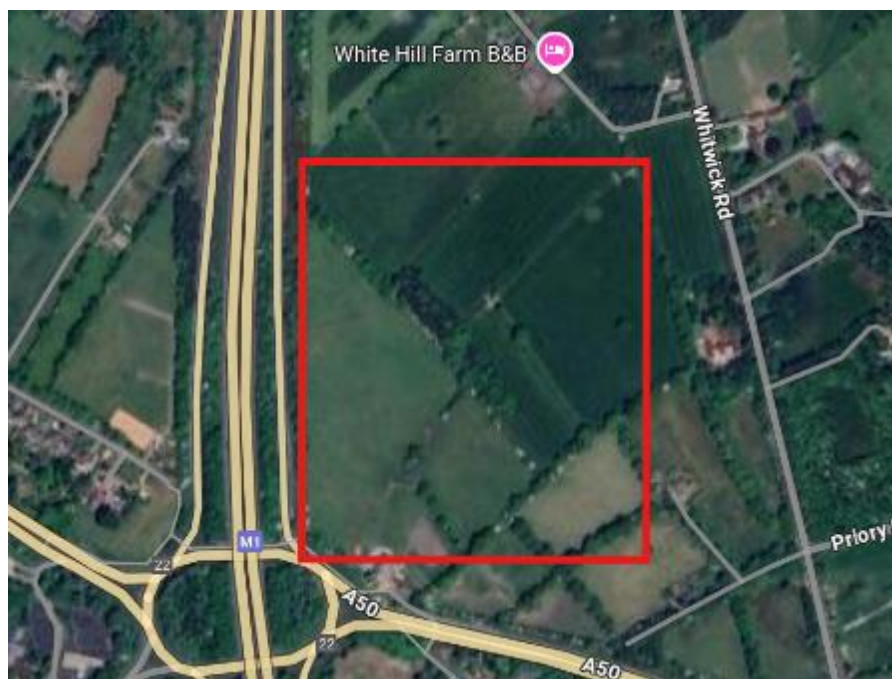
1.1 General

- 1.1.1 The contents of the external lighting strategy report has been prepared by Engineering Services Partnership Limited on behalf of Caddick Developments for the proposed Markfield development site, land North East of Junction 22 M1, Leicestershire.
- 1.1.2 The report provides an external lighting assessment to serve the proposed 6No sites (Units 01-06) and outlines the proposed external lighting design strategy and calculated outputs focusing on the artificial light pollution/glare to neighbouring properties and highways.
- 1.1.3 This report details the external lighting design criteria, luminaire specification and associated layout drawings outlining design compliance and minimal impact to neighbouring properties achieved through lighting design and product selection.

2.0 SITE LOCATION

2.1 General

- 2.1.1 The proposed Markfield development site is located within land situated East of Junction 22 from the M1 motorway network in the Hinckley and Bosworth district of Leicestershire.
- 2.1.2 The site comprises of a total site area of 69.84 acres with a net Developable area of 34.68 acres for the proposed 6No individual units.
- 2.1.3 The proposed site is located within a rural setting north of the village of Markfield accessible from A50 eastbound and Whitwick Road.



Site location

3.0 PROPOSED DEVELOPMENT

3.1 General

3.1.1 The proposed site development comprises of 6No individual industrial units installed within undeveloped rural farmland.

3.1.2 Proposed site access is provided from A50 eastbound and Whitwick Road.



Proposed Site layout

3.2 External Lighting Design Principles

3.2.1 Lighting design undertaken in accordance with BS EN 12464-1 Indoor Workplaces and BS EN 12464-2 Outdoor Workplaces, CIBSE Lighting design guides and EUROBATS 'Publication Series No. 8 – Guidelines for consideration of bats in lighting projects.

3.2.2 The maximum obtrusive light permitted for exterior lighting installation has been compiled based on an E3 environmental classification zone for medium district areas such as industrial or residential suburbs.

3.2.3 The external lighting installation for the development has been designed to satisfy the following requirements:

- Obtrusive light designed in accordance with BS EN 12464-2.

- Provide adequate illumination for safe vehicular access to the site parking.
- Provide adequate illumination for safe pedestrian access to the site and vicinity of the main building and walking routes.
- Comply with adequate safety, amenity use and security while minimising energy use and light pollution.
- Ensure minimal light spill or illumination.
- Designed to focus lighting on the areas where light is required and avoid obtrusive light pollution and/or glare to neighbouring properties, highways and on to adjacent land.

The designs include the proposed

- To ensure wildlife avoidance of areas served by artificial light are minimised luminaires shall be designed as detailed above in conjunction with warm white 2700K CCT (Correlated Colour Temperature) light sources.
- Artificial lighting design designed to minimise light spill onto habitats both within and adjacent to the site used by wildlife and bat population for foraging and commuting in accordance with site specific ecology reports.
- Avoidance of direct lighting on existing trees, hedgerows, river corridors or proposed habitat creation/landscape planting.
- Design and installation of directional lighting, hooded/shielded luminaires to prevent light spill onto sensitive habitats/neighbouring highways/properties.
- External lighting designs incorporate the proposed landscaping within the site and at site boundaries.
- Emergency luminaires shall be installed at each escape door from the buildings to allow compliance with BS5266 and Building Regulations.

4.0 LIGHTING CONTROL

4.1 General

- 4.1.1 A dedicated external LV distribution system comprising of main distribution equipment, remote feeder pillars served via centralised and remote lighting control systems (photocells, timeclocks and contactors) to serve the proposed external lighting installation.
- 4.1.2 The installation is proposed to operate via a timeclock arrangement with dusk to dawn sensors and override controls to optimise energy savings ensuring efficient illumination.
- 4.1.3 Where feasible overall site illumination levels could be reduced by control measures based on site operations and individual requirements during periods of site inactivity via dedicated individual unit lighting control arrangements to serve the proposed unit and adjacent car parking areas.

5.0 LUMINAIRE PROPOSALS

5.1 General

- 5.1.1 The lighting distribution strategy serving the site shall be provided via a combination of external lighting column post-top mounted luminaires mounted at either 6m or 8m and building mounted floodlight luminaires installed at 3m AFFL as detailed on the appended external lighting layouts.
- 5.1.2 High efficacy LED version luminaires (>130 luminaire Lm/W) with directional optics have been utilised within the proposed lighting design. To promote further optimisation and energy savings dedicated zoned/area lighting controls shall be provided as applicable.
- 5.1.3 Each individual unit shall be provided with a dedicated lighting installation to serve the external yard lighting, it is proposed this is installed with dedicated area control with automatic controls with manual override facility.
- 5.1.4 Individual external luminaire proposals shall be strategically located, installed and commissioned accounting for the luminaire orientation, tilt angle and installation of dedicated anti-glare/cut-off diffusers with luminaire optics as applicable to reduce/limit light pollution to local habitat and mitigate overspill beyond the site boundary and neighbouring properties/highways these shall be fully co-ordinated with the proposed landscaping and boundary treatment for this development.

6.0 LUMINAIRE SPECIFICATION

6.1 General

- 6.1.1 High efficacy LED version luminaires are proposed to serve the lighting installation, the specification of luminaires have been selected based on available luminaires with lower lumen output luminaires selected to serve the environmental requirements of the site.
- 6.1.2 Proposed luminaires shall be long lifespan luminaires rated at 100,000Hrs, luminaire output ratio (LOR) shall be based on 100% darksky approved luminaires where applicable, lamp sources shall comprise of 2700K CCT >70 Colour Rendering Indexing (CRI).

6.2 Luminaire Schedule

	Luminaire	Light Source	Light Engine
	Kingfisher - VASTA	vas – 160W LED AL50 – (VAS-FT70-740-160D)	2700K CCT, L90/B10 100,000Hr >70 CRI
	Kingfisher - VASTA	vas – 250W LED AL50 – (VAS-FT70-740-250D)	2700K CCT, L90/B10 100,000Hr >70 CRI

	Kingfisher – SEMITA Urban	smu – 6W LED OC	2700K CCT, L80/B10 100,000Hr >70 CRI
	Kingfisher – SEMITA Urban	smu – 11W LED OC	2700K CCT, L80/B10 100,000Hr >70 CRI
	Kingfisher – VIVA-City Pro	vcp – 80W LED AY70	2700K CCT, L80/B20 100,000Hr >70 CRI
	Kingfisher – VIVA-City Pro	vcp – 80W LED FW70	2700K CCT, L80/B20 100,000Hr >70 CRI
	Kingfisher – VIVA-City Pro	vcp – 60W LED AY70	2700K CCT, L80/B20 100,000Hr >70 CRI
	Kingfisher – VIVA-City Pro	vcp – 60W LED FW70	2700K CCT, L80/B20 100,000Hr >70

7.0 EXTERNAL LIGHTING ASSESSMENT

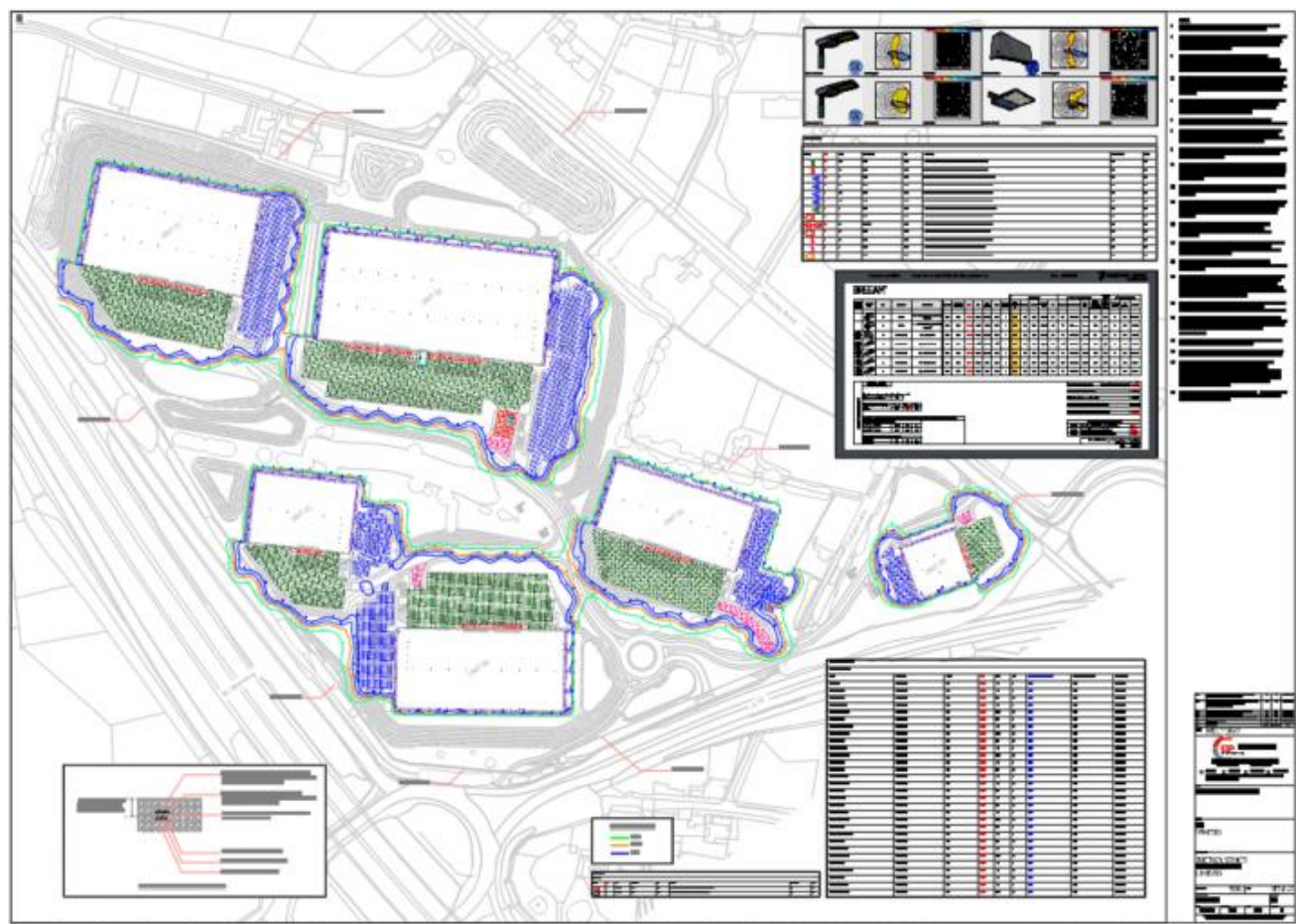
7.1 General

- 7.1.1 External photometric lighting designs have been undertaken using manufacturers approved electronic design software and individual luminaire output technical data files with the calculated output results detailed below.
- 7.1.2 The proposed external lighting design has taken into account the impact of the neighbouring properties and the luminaire/equipment selection, orientation, tilt angle and site landscaping have been considered to mitigate the effects of artificial lighting.
- 7.1.3 The contents of this report shall be reading in conjunction with the proposed schedules of luminaires and equipment detailed within Section 7.0 of this report and associated appended layout drawings.

7.2 Individual Unit 1-6 - Levels of illuminance per Area (Loading Bays, Service Yards, Unit Perimeter).

Calculation Summary						
Project: Project_1						
Label	CalcType	Units	Avg	Max	Min	Uniformity (Min/Avg)
Site Road	Illuminance	Lux	2.49	59	0	0.00
Unit 1 Carpark	Illuminance	Lux	20.04	54	5	0.25
Unit 1 Loading	Illuminance	Lux	50.68	74	30	0.59
Unit 1 Perimeter	Illuminance	Lux	17.38	58	5	0.29
Unit 1 service yard	Illuminance	Lux	30.69	105	13	0.42
Unit 2 Carpark	Illuminance	Lux	19.08	74	4	0.21
Unit 2 Entrance Road	Illuminance	Lux	23.59	46	7	0.30
Unit 2 Gate house	Illuminance	Lux	58.71	142	24	0.41
Unit 2 Loading	Illuminance	Lux	51.45	73	32	0.62
Unit 2 Perimeter	Illuminance	Lux	13.59	35	4	0.29
Unit 2 Service yard	Illuminance	Lux	30.89	175	13	0.42
Unit 3 carpark	Illuminance	Lux	21.03	69	3	0.14
Unit 3 Loading	Illuminance	Lux	50.35	72	37	0.73
Unit 3 Perimeter	Illuminance	Lux	14.39	30	5	0.35
Unit 3 Service yard	Illuminance	Lux	30.56	96	13	0.43
Unit 4 Carpark	Illuminance	Lux	20.65	71	6	0.29
Unit 4 Entrance	Illuminance	Lux	34.14	51	11	0.32
Unit 4 Loading	Illuminance	Lux	52.05	72	34	0.65
Unit 4 perimeter	Illuminance	Lux	14.99	40	4	0.27
Unit 4 service yard	Illuminance	Lux	30.63	104	13	0.42
Unit 5 Carpark	Illuminance	Lux	18.52	74	2	0.11
Unit 5 Entrance Road	Illuminance	Lux	14.64	62	4	0.27
Unit 5 Loading	Illuminance	Lux	50.93	71	34	0.67
Unit 5 perimeter	Illuminance	Lux	10.48	33	3	0.29
Unit 5 Service yard	Illuminance	Lux	32.92	101	14	0.43
Unit 6 Carpark	Illuminance	Lux	22.04	44	6	0.27
Unit 6 Entrance Road	Illuminance	Lux	29.97	51	8	0.27
Unit 6 Loading	Illuminance	Lux	59.53	99	26	0.44
Unit 6 Perimeter	Illuminance	Lux	16.73	36	6	0.36

Individual Levels of Illuminance



External Lighting Lux Levels – Units 1-6

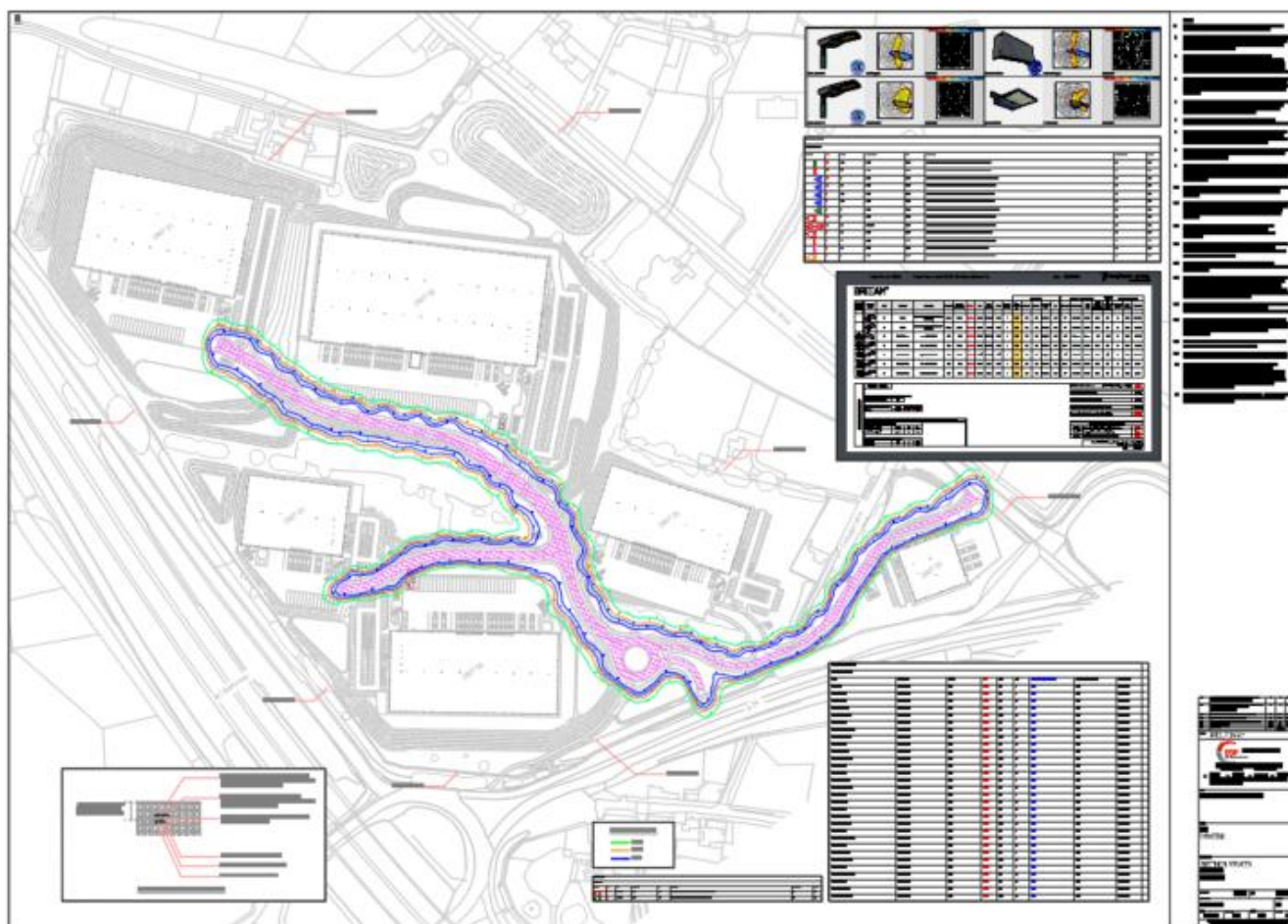
7.3 Road Way

Calculation Summary						
Project: Project_1						
Label	CalcType	Units	Avg	Max	Min	Uniformity (Min/Avg)
Site Road	Illuminance	Lux	19.54	51	8	0.41

Site Road Levels of Illuminance

Project: Road					
Symbol	Qty	Label	Arrangement	LLF	Description
	26	D (Site Road)	Single	0.900	80W VIVA-CITY Pro-2700K-805mA-FW70 forward throw optic Column mounted at 8m
	20	H (Site Road)	Single	0.900	80W VIVA-CITY Pro-2700K-805mA-AY70 street optic Column mounted at 8m

Proposed Luminaires



External Road Way Levels of Illuminance

7.4 External Site Lighting – Obtrusive

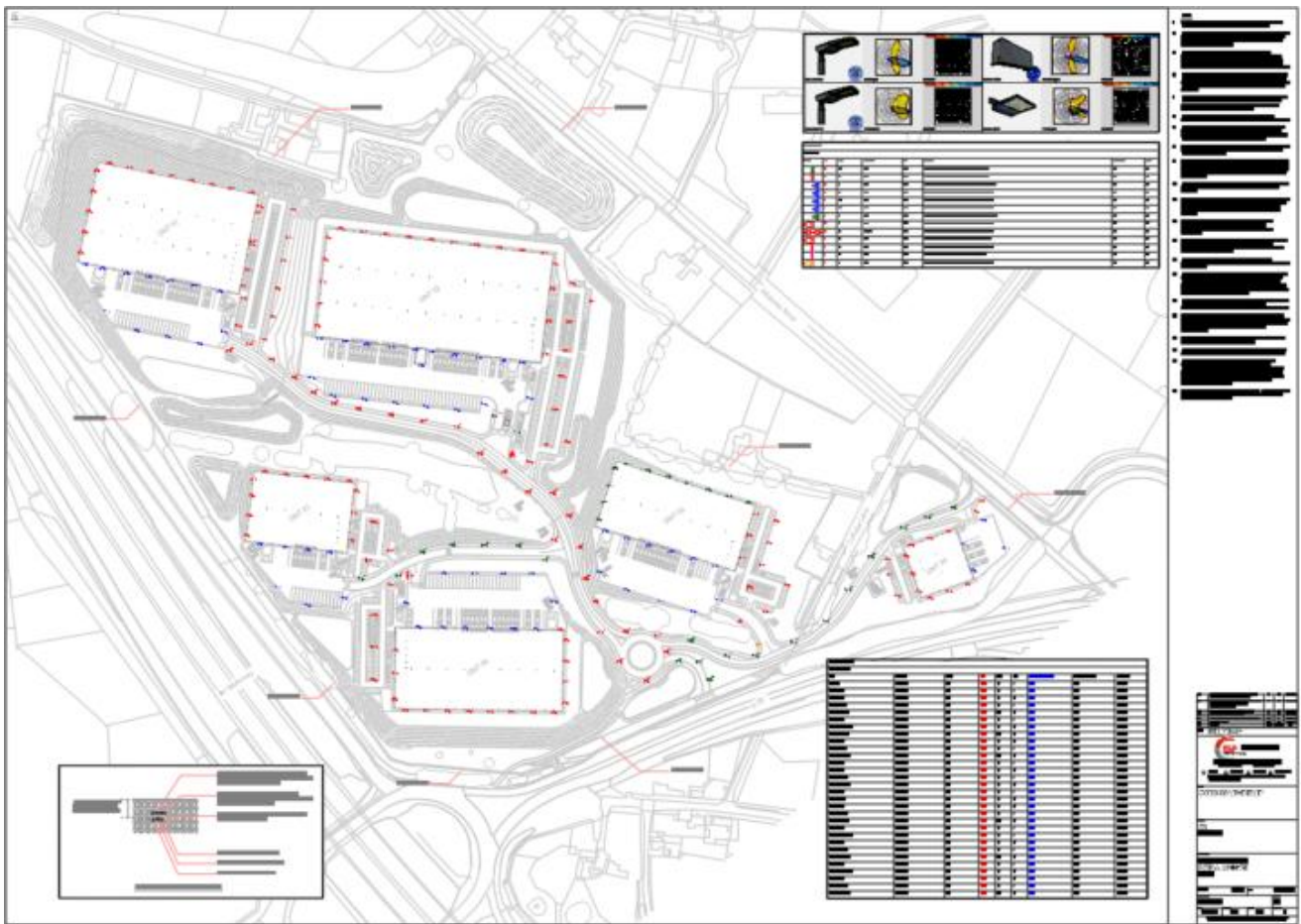
Calculation Summary						
Project: Vertical						
Label	CalcType	Units	Avg	Max	Min	Uniformity (Min/Avg)
Vertical around unit 1_III_Seg1	Obtrusive - III	Lux	0.00	0	0	N.A.
Vertical around unit 1_III_Seg2	Obtrusive - III	Lux	0.00	0	0	N.A.
Vertical around unit 1_III_Seg3	Obtrusive - III	Lux	0.01	1	0	0.00
Vertical around unit 2_III_Seg1	Obtrusive - III	Lux	0.87	14	0	0.00
Vertical around unit 2_III_Seg2	Obtrusive - III	Lux	0.00	0	0	N.A.
Vertical around unit 2_III_Seg3	Obtrusive - III	Lux	0.00	0	0	N.A.
Vertical around unit 2_III_Seg4	Obtrusive - III	Lux	0.00	0	0	N.A.
Vertical around unit 2_III_Seg5	Obtrusive - III	Lux	0.00	0	0	N.A.
Vertical around unit 2_III_Seg6	Obtrusive - III	Lux	0.00	0	0	N.A.
Vertical around unit 2_III_Seg7	Obtrusive - III	Lux	0.05	1	0	0.00
Vertical around unit 2_III_Seg8	Obtrusive - III	Lux	0.00	0	0	N.A.
Vertical around unit 2_III_Seg9	Obtrusive - III	Lux	0.08	1	0	0.00

Vertical around unit 3 East_Ill_ Seg1	Obtrusive - Ill	Lux	0.25	1	0	0.00
Vertical around unit 3 East_Ill_ Seg2	Obtrusive - Ill	Lux	0.14	1	0	0.00
Vertical around unit 3 East_Ill_ Seg3	Obtrusive - Ill	Lux	0.17	1	0	0.00
Vertical around unit 3 East_Ill_ Seg4	Obtrusive - Ill	Lux	0.25	1	0	0.00
Vertical around unit 3 East_Ill_ Seg5	Obtrusive - Ill	Lux	0.05	1	0	0.00
Vertical around unit 3 East_Ill_ Seg6	Obtrusive - Ill	Lux	0.18	1	0	0.00
Vertical around unit 3 West_Ill_ Seg1	Obtrusive - Ill	Lux	0.00	0	0	N.A.
Vertical around unit 3 West_Ill_ Seg2	Obtrusive - Ill	Lux	0.00	0	0	N.A.
Vertical around unit 3 West_Ill_ Seg3	Obtrusive - Ill	Lux	0.00	0	0	N.A.
Vertical around unit 3 West_Ill_ Seg4	Obtrusive - Ill	Lux	0.00	0	0	N.A.
Vertical around unit 3 West_Ill_ Seg5	Obtrusive - Ill	Lux	0.00	0	0	N.A.

Vertical around unit 3 West_Ill_ Seg6	Obtrusive - Ill	Lux	0.00	0	0	N.A.
Vertical around unit 5+6_Ill_ Seg1	Obtrusive - Ill	Lux	0.00	0	0	N.A.
Vertical around unit 5+6_Ill_ Seg2	Obtrusive - Ill	Lux	0.00	0	0	N.A.
Vertical around unit 5+6_Ill_ Seg3	Obtrusive - Ill	Lux	0.00	0	0	N.A.
Vertical around unit 5+6_Ill_ Seg4	Obtrusive - Ill	Lux	0.00	0	0	N.A.
Vertical around unit 5+6_Ill_ Seg5	Obtrusive - Ill	Lux	0.00	0	0	N.A.
Vertical around unit 5+6_Ill_ Seg6	Obtrusive - Ill	Lux	0.06	1	0	0.00
Vertical around unit 5+6_Ill_ Seg7	Obtrusive - Ill	Lux	0.94	25	0	0.00
Vertical around unit 5+6_Ill_ Seg8	Obtrusive - Ill	Lux	0.00	0	0	N.A.

External Unit Vertical Levels of Illuminance

7.5 External Site Lighting Layout



External Lighting Layout & Fittings Used

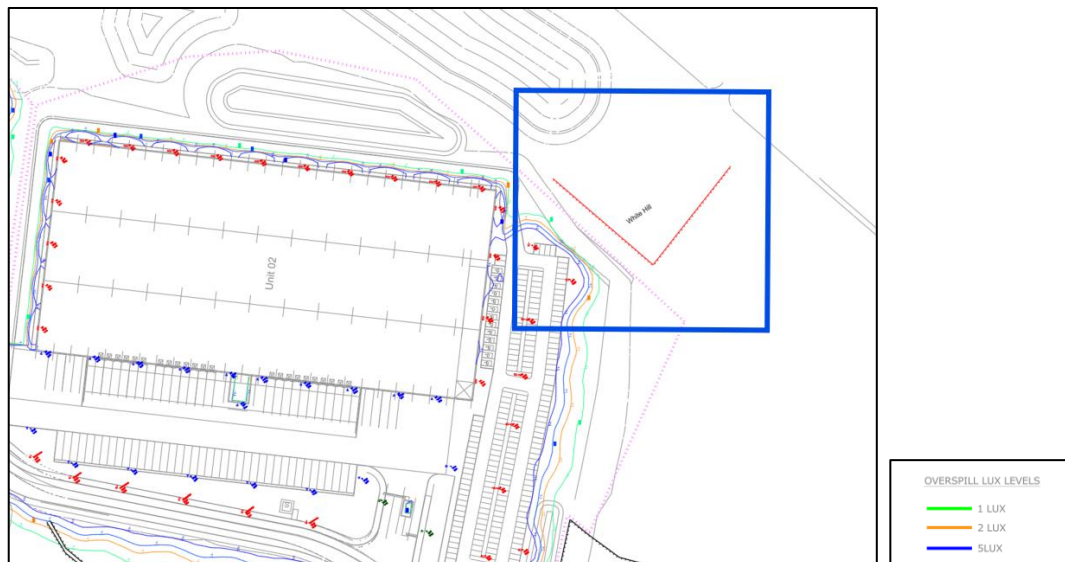
7.6 Neighbouring Properties

7.7 General

- 7.7.1 Existing residential properties located adjacent to the proposed development have been considered within the assessment with the selection of luminaire and equipment specification to ensure compliance with the requirements of BS EN 12464-2 and the Environmental Zone classification.
- 7.7.2 External lighting designs have been undertaken with the reselection of luminaires, luminaire optics and cut off diffusers to control the distribution of artificial light from each luminaire.
- 7.7.3 Lighting design calculations have included within the model the proposed landscaping and finished levels of mounded embankments within the site and boundary edges which support to contain the spill of artificial and obtrusive light. The inclusion of the landscaping within the lighting design calculation has seen a reduction of obtrusive light from the proposed development as referenced in the following section.
- 7.7.4 Calculated photometric design data for the external lighting scheme contained within the site boundary, outlines the controlled overspill of artificial light (1Lux as identified by the Green line) as detailed below and within the appended design drawings.

7.7.5 The proposed external lighting design does not incorporate the existing hedgerow and tree networks and respective densities that exist alongside the residential access road and within the existing neighbouring property site boundaries.

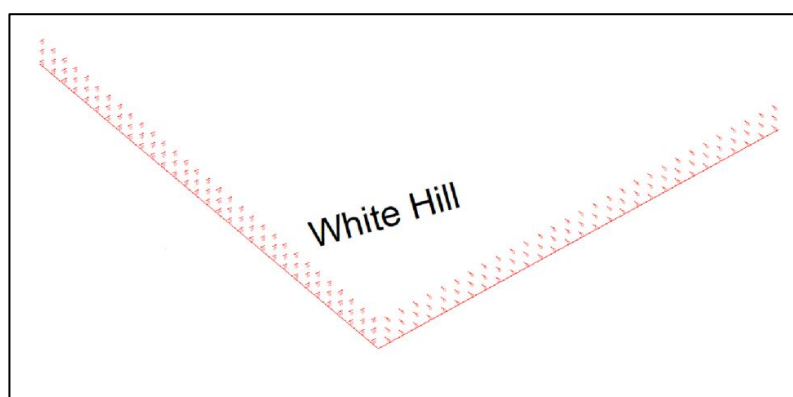
7.8 White Hill



External Site Plan – Isolux Level Distribution of Illuminance.

Calculation Summary						
Project: Properties						
Label	CalcType	Units	Avg	Max	Min	Uniformity (Min/Avg)
White Hill_Cd_Seg1	Obtrusive - Cd	N.A.	67.63	226	0	0.00
White Hill_Cd_Seg2	Obtrusive - Cd	N.A.	55.02	65	46	0.84
White Hill_Ill_Seg1	Obtrusive - Ill	Lux	0.00	0	0	N.A.
White Hill_Ill_Seg2	Obtrusive - Ill	Lux	0.00	0	0	N.A.

White Hill Boundary – Calculation Summary



White Hill Boundary – Obtrusive Lux Measurement (0 Lux).

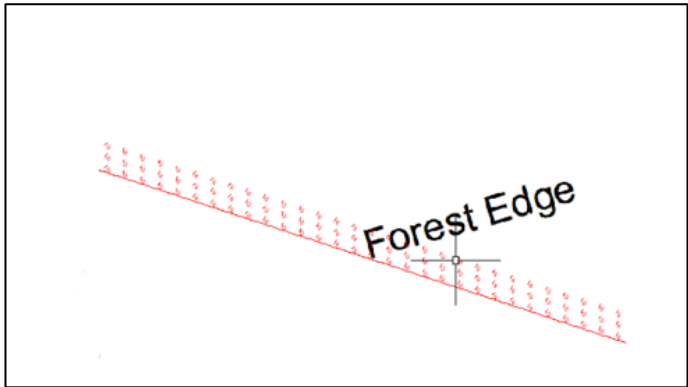
7.9 Forest Edge



External Site Plan – Isolux Level Distribution of Illuminance.

Calculation Summary						
Project: Properties						
Label	CalcType	Units	Avg	Max	Min	Uniformity (Min/Avg)
Forest Edge_Cd_Seg1	Obtrusive - Cd	N.A.	66.46	141	3	0.05
Forest Edge_Ill_Seg1	Obtrusive - Ill	Lux	0.00	0	0	N.A.

Forest Edge Boundary – Calculation Summary



Forest Edge – Obtrusive Lux Measurement (0 Lux).

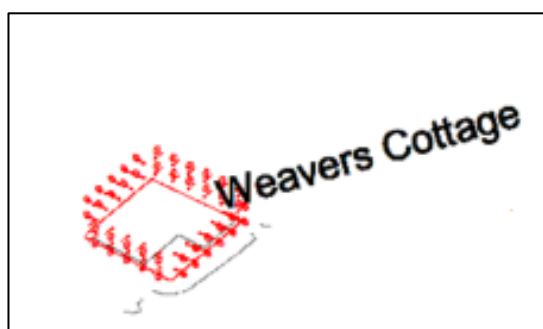
7.10 Weavers Cottage



External Site Plan – Isolux Level Distribution of Illuminance.

Calculation Summary						
Project: Properties						
Label	CalcType	Units	Avg	Max	Min	Uniformity (Min/Avg)
Weaver Cottage_Cd_Seg1	Obtrusive - Cd	N.A.	189.20	244	128	0.68
Weaver Cottage_Cd_Seg2	Obtrusive - Cd	N.A.	114.92	172	74	0.64
Weaver Cottage_Cd_Seg3	Obtrusive - Cd	N.A.	87.83	136	67	0.76
Weaver Cottage_Cd_Seg4	Obtrusive - Cd	N.A.	230.40	272	201	0.87
Weaver Cottage_Ill_Seg1	Obtrusive - Ill	Lux	0.00	0	0	N.A.
Weaver Cottage_Ill_Seg2	Obtrusive - Ill	Lux	0.00	0	0	N.A.
Weaver Cottage_Ill_Seg3	Obtrusive - Ill	Lux	0.00	0	0	N.A.
Weaver Cottage_Ill_Seg4	Obtrusive - Ill	Lux	0.00	0	0	N.A.

Weavers Cottage Boundary – Calculation Summary



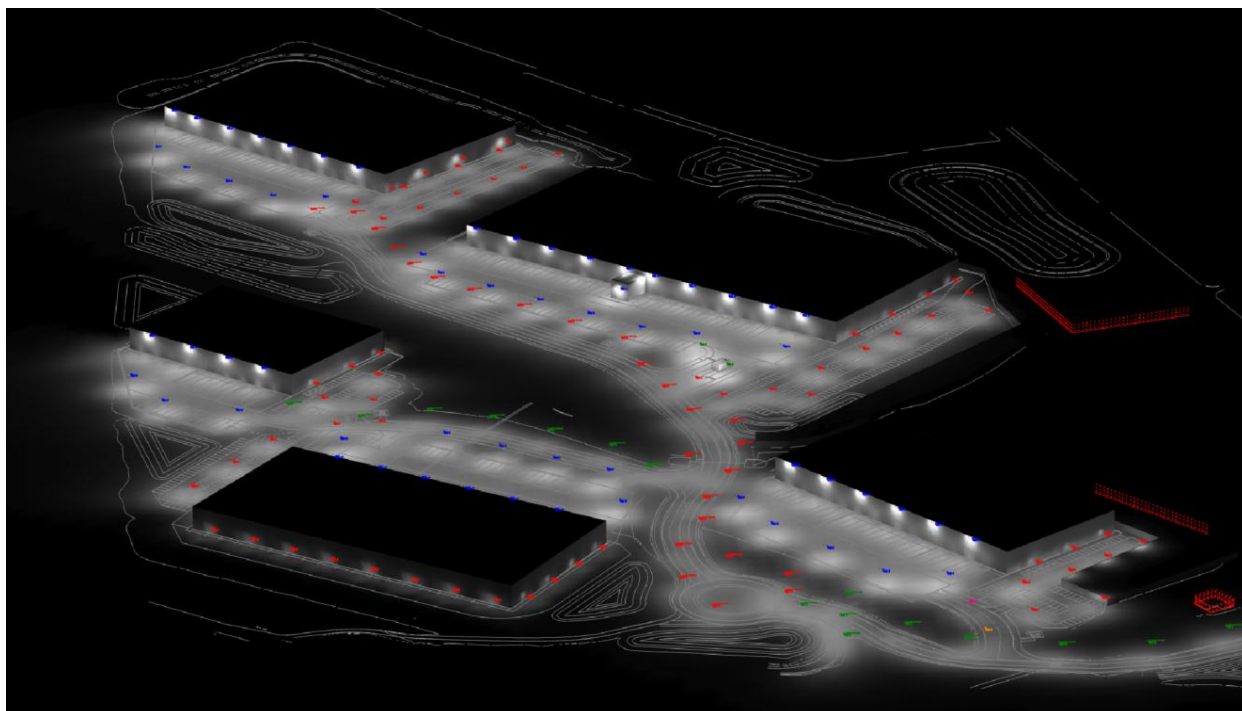
Weavers Cottage – Obtrusive Lux Measurement (0 Lux).

8.0 SUMMARY

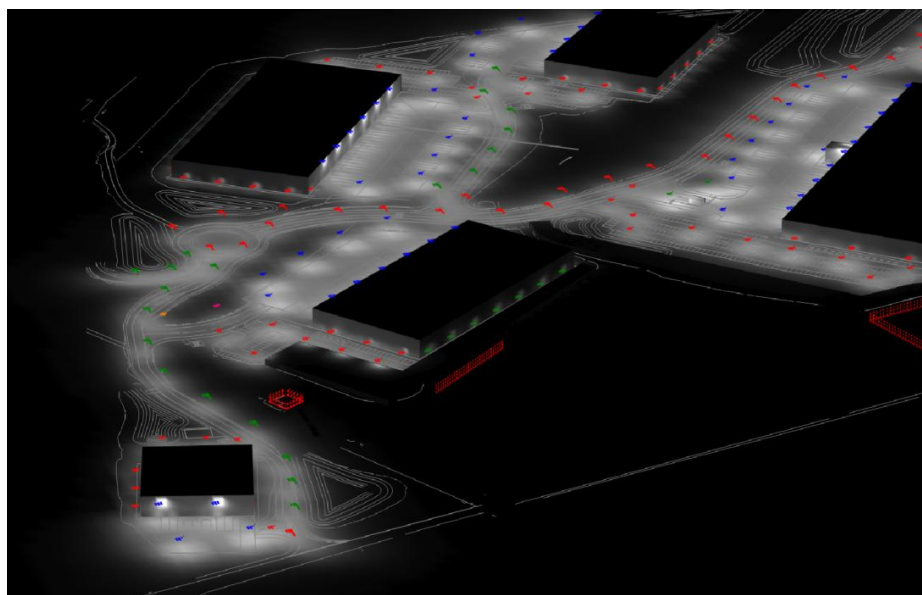
8.1 General

- 8.1.1 The calculated levels of illuminance and obtrusive light detailed in this report and associated drawings detail the proposed external lighting design to serve the proposed development.
- 8.1.2 The proposed external lighting design achieves compliance with the design criteria outlined within this report and the site specific ecological report.
- 8.1.3 Through the co-ordinated design of the proposed luminaires and associated lighting distribution accessories and external landscaping requirements this has resulted in the control and overall reduction of obtrusive light.
- 8.1.4 Output calculations have been included for each neighbouring property as referenced which shows minimal horizontal illumination (0Lux) and luminous intensity (cd) from the proposed external lighting scheme.
- 8.1.5 The electronic calculation design outputs are based on the proposed site developments and do not include any of the existing hedgerows/tree network, boundary walls/fencing which will provide further shielding to the neighbouring properties from the proposed external lighting installation.

APPENDIX A – DIALUX RENDERING IMAGES



Site Plan - West View



Site Plan - South View

APPENDIX B – EXTERNAL LIGHTING LAYOUT DRAWINGS

- 50091-E-110 External Lighting lux Levels
- 50091-E-111 Roadway Lux Levels
- 50091-E-112 External Lighting Layout