Lightable

CORDEK LIMITED

STORAGE YARD

SPRING COPSE BUSINESS PARK

LIGHTING ASSESSMENT

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EXECUTIVE SUMMARY

This Lighting Assessment has been prepared for Cordek Limited by Dan Alasfar, an Incorporated Engineer and Registered Member of the Institute of Lighting Professionals ("ILP") with 10+ years' experience of technical input for environmental lighting.

The assessment has been prepared to ensure site lighting is designed with sensitivity, safeguarding the character of the area and protecting the night-time sky. Lighting shall be both necessary and proportionate, carefully directed and controlled, and specified to remove unnecessary spill, glare, and any upward light.

Key findings

- **Hours of operation:** The site is anticipated to be in daily use from 05:00 until 20:00. Site lighting is therefore only anticipated to be operational during hours of darkness between these hours. Site lighting shall otherwise be switched off.
- **Light Intrusion:** Calculations confirm that light intrusion levels remain within acceptable thresholds for surrounding residential properties.
- **Sky Glow:** Upward Light Ratio (ULR) remains within the acceptable thresholds.

This assessment has been produced in accordance with all relevant local and national policy and guidance. If external lighting is installed in accordance with this assessment the overall lighting impact is anticipated to be negligible.

Recommendations:

- Utilise high-quality, LED luminaires with shielding optics.
- All luminaires shall be warm white colour temperature (3000K).
- Provide light only where necessary, and illuminate to a tight tolerance of the performance requirements.
- Adopt an effective lighting controls strategy.

1.0 INTRODUCTION

This report sets out to achieve the following:

- Review relevant policy and guidance.
- Establish the baseline and location of all potentially sensitive receptors.
- Provide mitigation measures to remove potentially adverse impacts.
- Provide recommended luminaire types.
- Undertake detailed lighting modelling, designed to provide a high-quality, low impact proposal which reduces lighting impact to negligible levels.

2.0 POLICY AND GUIDANCE

Horsham District Planning Framework (2015)

The Horsham District Planning Framework (HDPF) is the overarching planning document for Horsham district outside the South Downs National Park (SDNP).

Policy 24 Strategic Policy: Environmental Protection

"The high quality of the district's environment will be protected through the planning process and the provision of local guidance documents. Taking into account any relevant Planning Guidance Documents, developments will be expected to minimise exposure to and the emission of pollutants including noise, odour, air and light pollution [...]"

Policy 25: The Natural Environment and Landscape Character

"The Natural Environment and landscape character of the District, including the landscape, landform and development pattern, together with protected landscapes and habitats will be protected against inappropriate development. [...]"

Policy 33: Development Principles

"In order to conserve and enhance the natural and built environment developments shall be required to:

- *[...] 2. Ensure that it is designed to avoid unacceptable harm to the amenity of occupiers/users of nearby property and land, for example through overlooking or noise, whilst having regard to the sensitivities of surrounding development; [...]"*

National Planning Policy Framework (2024)

The Revised National Planning Policy Framework (NPPF) provides guidance relating to planning and pollution control for new development in England. The purpose of the planning system is to contribute to achievement of sustainable development. In relation to lighting, Paragraph 198 states:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should: c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."

Environmental Protection Act 1990 / Clean Neighbourhoods and Environment Act (2005)

The CNEA 2005 amended section 79(1) of the Environmental Protection Act 1990, extending the statutory nuisance regime to include light nuisance stating the following:

"(fb) artificial light emitted from premises so as to be prejudicial to health or a nuisance."

Institute of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light (GN01/21)

The ILP has proposed lighting guidance and criteria for local authorities with a recommendation that they are incorporated at the local plan level. ILP GN01/21 recommends that the immediate environment is classified into an environmental zone based on ambient lighting levels in the surrounding area. The environmental zones are detailed in **Table 1**. Zone E0 requires the strictest level of control and E4 the lowest.

Table 1. Environmental Zones

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty, etc
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night- time activity

BS EN 12464-2: Lighting of Workplaces, Outdoor Workplaces (2024)

This standard specifies requirements for lighting of tasks in most outdoor work places and their associated area in terms of quantity and quality of illumination. In addition, recommendations are given for good lighting practice. This standard includes important recommendations on how obtrusive light can be limited to keep night skies free of light pollution.

3.0 BASELINE

The study area includes the Site, the surrounding areas and any sensitive receptors which may have a direct view towards external lighting proposals and/or which may be affected during the construction and operation of the Site.

Assessment of designation, use, habitat, and external lighting condition dictates the classification of Environmental Zone across the proposed Site location and surrounding areas.

Environmental Zone

Based on the findings of this baseline study, the Site is deemed to fall within Environmental Zone E2.

Table 2. Environmental Zones

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty etc
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night- time activity

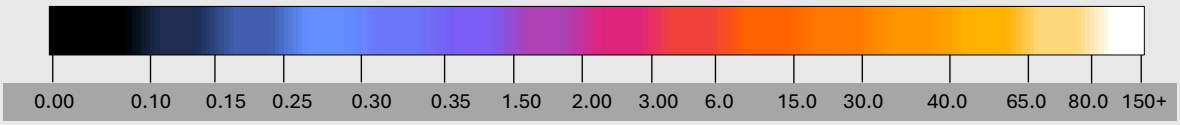
Local Radiance

The Visible Infrared Imaging Radiometer Suite (VIIRS) is a satellite instrument which orbits earth to collect and record radiance data (light emissions). The latest data was recorded in 2024 and is available in visual format. An extract at the Site location is included in **Figure 1**.

It is important to state that recognised organisations, such as the ILP, have not calibrated VIIRS radiance data with the Environmental Zones as defined by the ILP. It is also important to note the data should not accurately be relied upon and should be viewed conservatively. The data should be used as one tool to help understand the context of existing light emissions local to the Site.

Figure 1. Local radiance





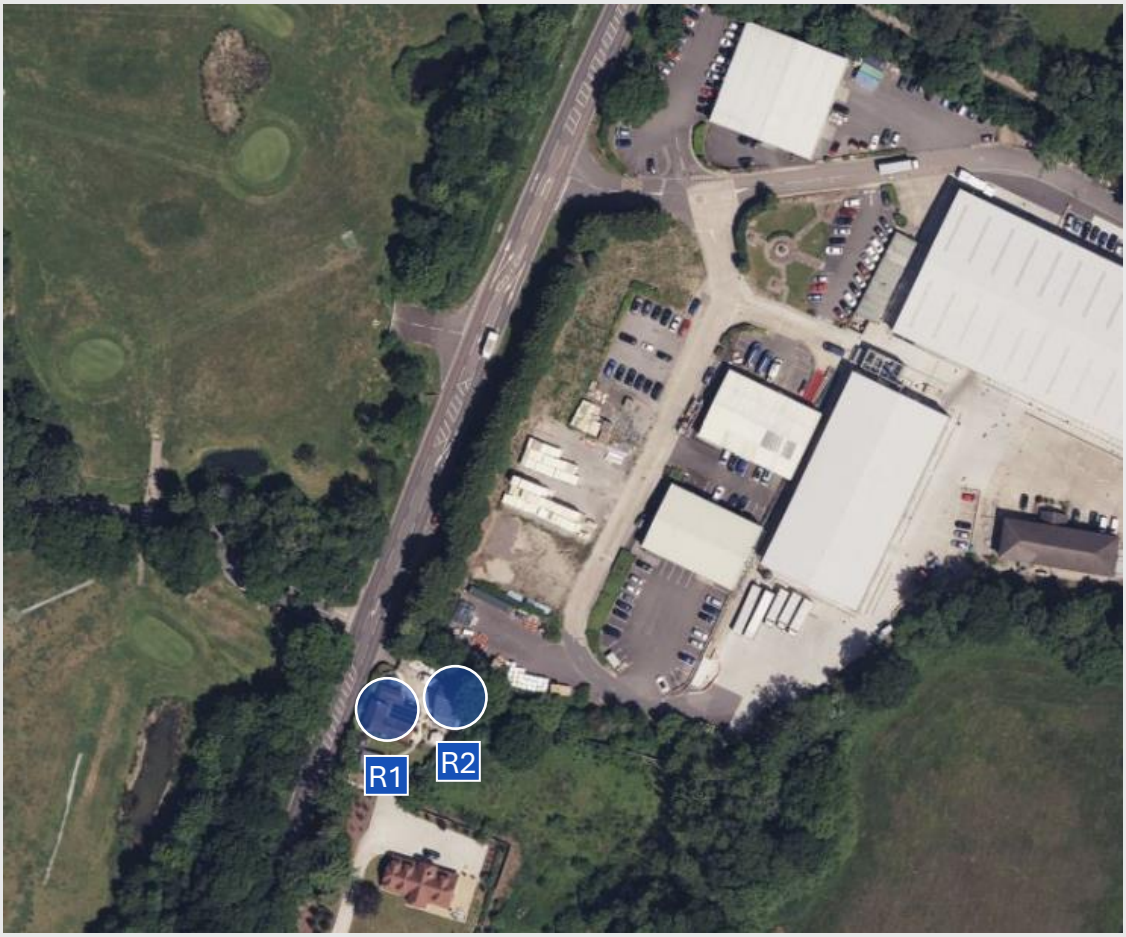
Mean Radiance, calculated about a 1km radius from the Site:	0.57 nW/ cm²/sr

Residential Receptors

Residential receptors surrounding the Site have been identified based on a desktop study using mapping data in conjunction with Google Earth satellite and street view imagery.

Residential properties with a direct or partial view of the Site are considered potentially sensitive.

Figure 2. Residential receptors



R1	Dwelling 1
R2	Dwelling 2

4.0 DESIGN PARAMETERS

This Section sets out the parameters for Site lighting, both lighting performance requirements and obtrusive light limits which must be complied with in order to reduce adverse impacts to negligible levels.

Lighting Performance

Site lighting shall accord with the requirements set out in **Table 3,** designed to meet standard set out in BS EN 12464-2 *Lighting of outdoor workplaces*.

Maintained average is the average amount of light received by surface. Uniformity ratio is a measure of how evenly distributed the light falls across a surface.

Table 3. Performance criteria

Site Area	Maintained average (lux)	Uniformity ratio
Storage Yard	10	0.25

Obtrusive Light

The following criteria shall be assessed at the identified receptor locations.

Residential Receptors

Light intrusion, as defined in ILP GN01/21, specifically limits the amount of artificial light that can spill into residential properties from neighbouring lighting installations. The guidance ensures that light trespass is minimised to acceptable levels.

Table 4. Obtrusive light limit – Light intrusion

Parameter	**Conditions**	Environmental Zone E2 Limits
Illuminance in the vertical plane (lux)	Pre-curfew	5 lux
	Post-curfew	1 lux

Sky Glow (Upward light ratio)

The upward light ratio in ILP GN01/21 sets a maximum percentage of total luminous flux from a lighting installation that is allowed to be emitted above the horizontal plane. This limit is designed to reduce sky glow by minimising the amount of light that escapes directly upwards into the night sky.

Table 5. Obtrusive light limit – Sky glow

Parameter	Conditions	Environmental Zone E2 Limits
Upward light ratio (%)	n/a	2.5%

5.0 MITIGATION

Poorly thought-out lighting has the potential to cause unacceptable impacts on sensitive receptors. The following key mitigation steps have been applied in an effort to reduce adverse impacts to negligible levels.

Lighting Controls

Site lighting shall operate strictly only when required.

Lighting shall be controlled by a wireless smart lighting controls system. A time program shall be set to automatically switch lights off outside of business hours which are from 05:00 until 20:00. **Figure 3** and **4** indicate the anticipated Site lighting operating hours during winter and summer months.

Figure 3. Anticipated hours of site lighting operation - Winter Months

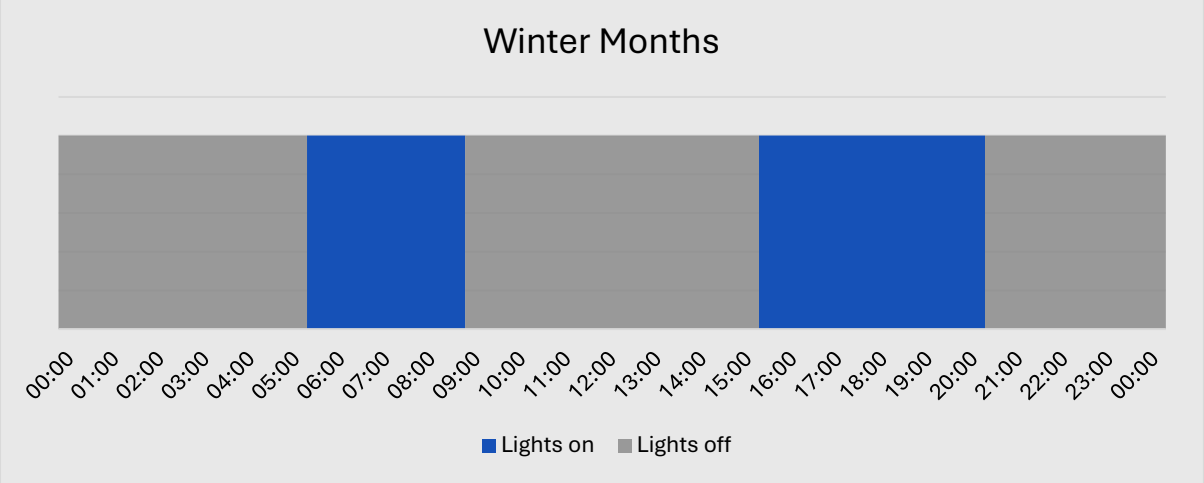
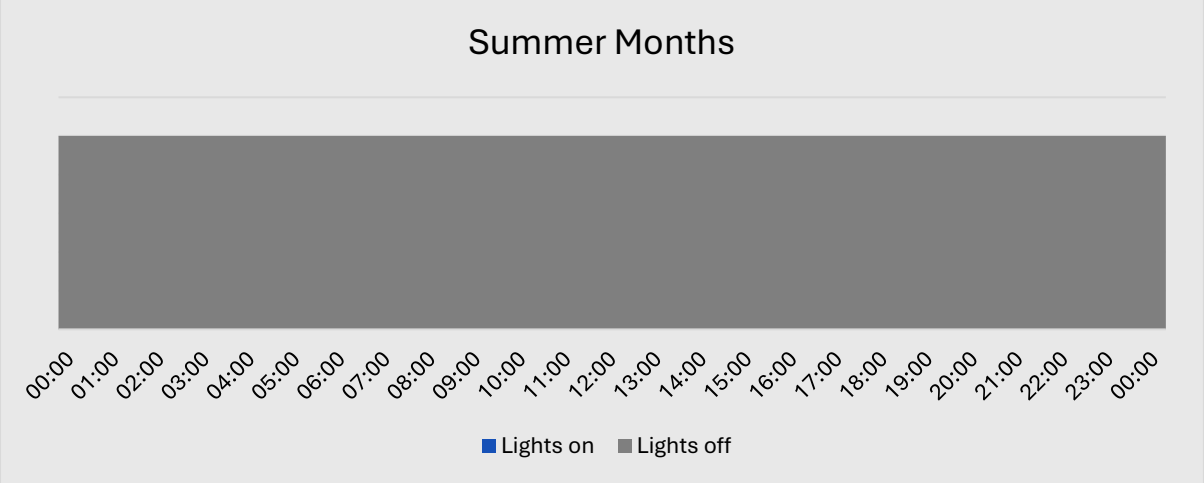


Figure 4. Anticipated hours of site lighting operation - Summer Months



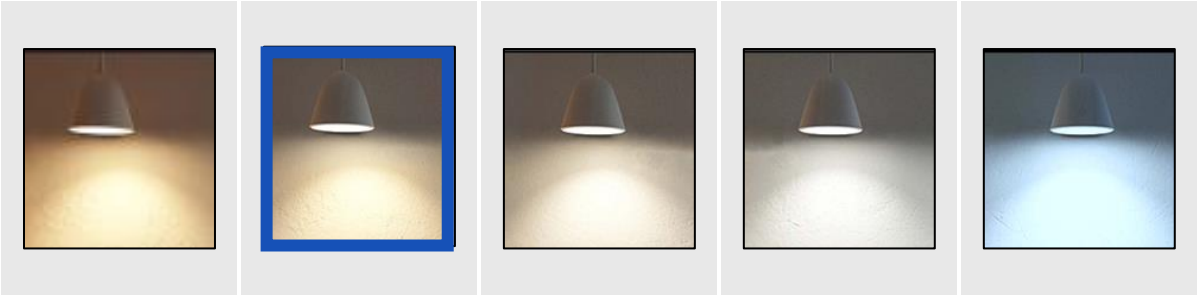
Careful design

Illumination levels across the site shall be designed to a tight tolerance of the minimum lighting performance criteria. The lowest practical mounting height shall be adopted and lighting shall be carefully positioned and only provided where required for safety and security.

Warm colour temperature

All proposed luminaires shall be 3000K warm white colour temperature with a peak wavelength higher than 550nm. Warm white is less prone to disrupt natural sleep-wake cycle and melatonin production and causes less light "scatter" which contributes to sky glow.

Figure 5. Selected colour temperature

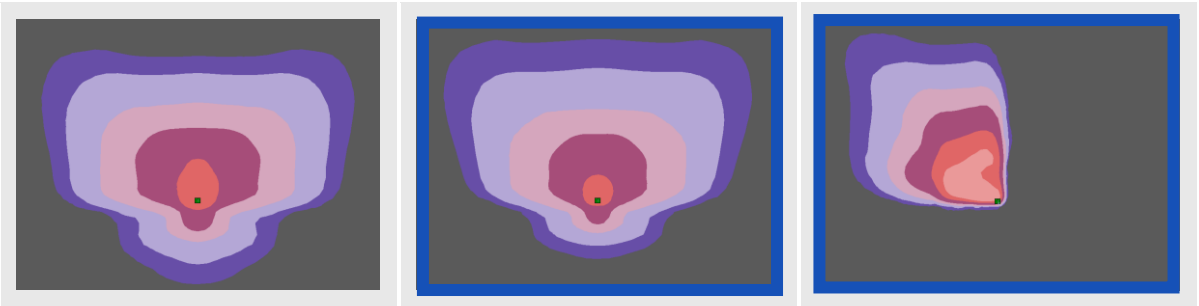


2700K	3000K	4000K	5000K	6000K
Warm white		Neutral White	Cool white	

Latest generation optical control

Lighting shall be carefully controlled and highly targeted, using luminaires with optics specifically selected to direct light only to the areas where it is required. This approach minimises unnecessary light spill and ensures that illumination levels are appropriate for the intended use and sensitive to the surrounding environment.

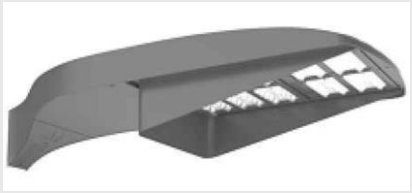
Figure 6. Proposed light distribution

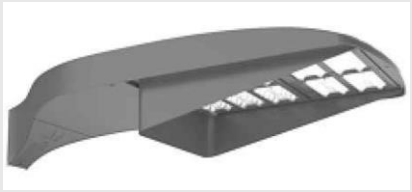


FW Optic	FW Optic	RCCO Optic
Unshielded	+ External glare shield	+ External glare shield
(not used)	Type A	Type B

6.0 PROPOSED LUMINAIRES

The following luminaires have been used as part of this assessment. High quality LED luminaires are proposed which offer excellent optical control, minimising obtrusive light.

Type A	
Specification	Description
Mounting	8m column mount
Location	Storage yard
Manufacturer	Holophane Lighting
Product	DSX-1 c/w FW Optic & External glare shield
Output	145W | 22000 lumens
Colour temperature	3000K
Luminaire image	

Type B	
Specification	Description
Mounting	8m column mount
Location	Storage yard
Manufacturer	Holophane Lighting
Product	DSX-1 c/w RCCO Optic & External glare shield
Output	145W | 22000 lumens
Colour temperature	3000K
Luminaire image	

7.0 MODELLING

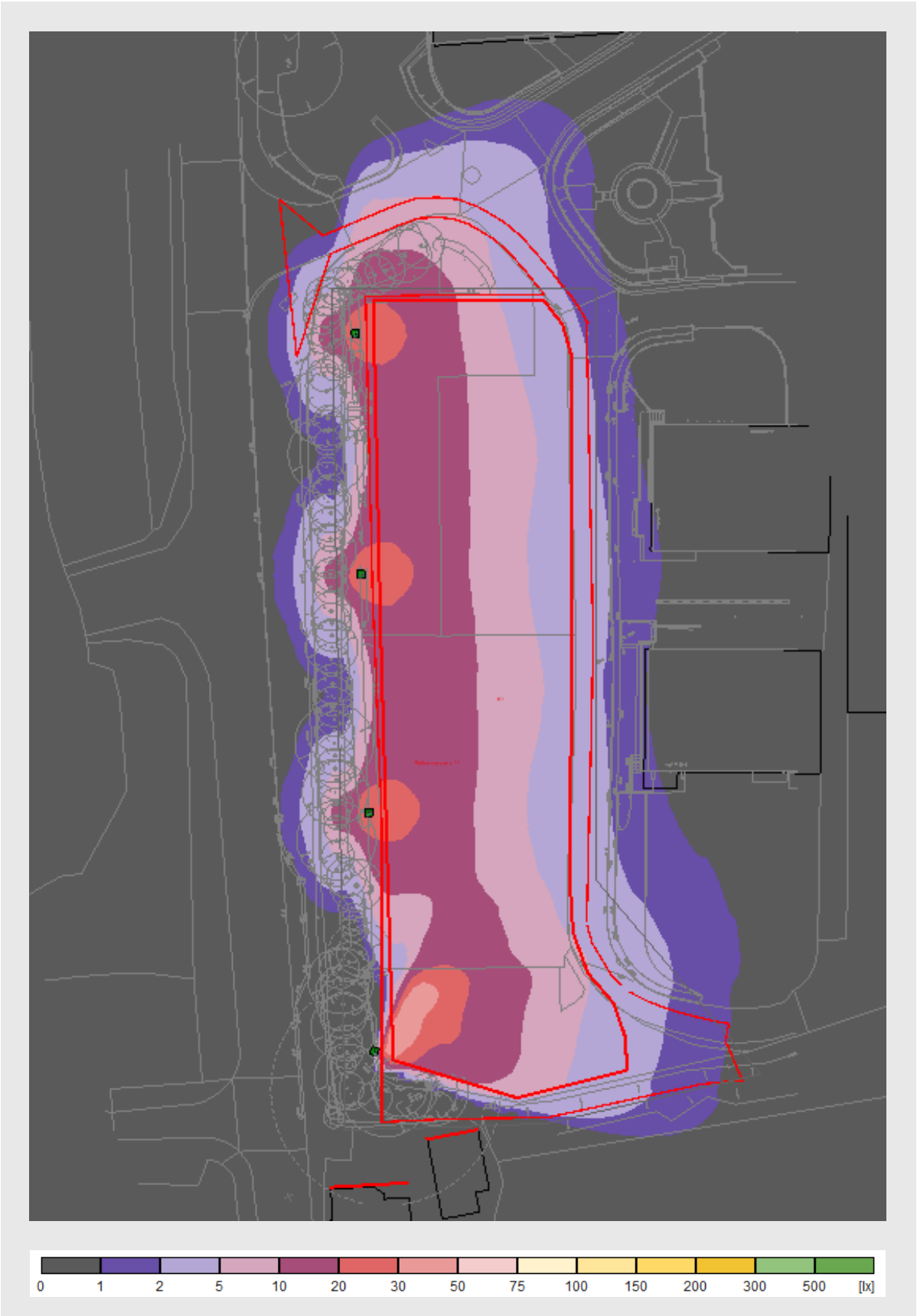
Introduction

The Site has been modelled based on the latest architectural drawings and OS Mapping. Lighting performance and obtrusive light calculations have been undertaken and assessed against the Design Parameters as set out in **Section 4.0**.

An illuminance view has been extracted from the lighting model and provided in **Figure 11** to illustrate the predicted light distribution across the site. The illuminance is shown in false colour format, graduated on the lux scale below.

Appendix 1 includes an external lighting layout, indicating anticipated positions heights, and quantities of proposed luminaires. **Appendix 2** includes an external lighting lux plot layout.

Figure 7. Illuminance view



Lighting Performance

Table 9 summarises the lighting design calculation results with a PASS / FAIL assigned against each test.

Table 6. Lighting design summary

Area	Performance requirements		Calculated results		PASS / FAIL
	Maintained average (lux)	Uniformity	Maintained average (lux)	Uniformity	
Storage yard	10	0.25	10.5	0.25	PASS

Obtrusive Light

Table 10 and **11** summarise the obtrusive light calculation results with a PASS / FAIL assigned against each test. The calculations have been assessed against the limits for Environmental Zone E2. As can be seen the proposed installation complies with light pollution guidance as set out in ILP GN01/21.

Table 7. Obtrusive light – Light Spill (Light intrusion)

Receptor	Light spill			PASS / FAIL
	Pre-curfew limit (lux)	Post-curfew limit (lux)	Calculated (lux)	
R1 (Dwelling 1)	5	1	0.55	PASS
R2 (Dwelling 2)	5	1	0.78	PASS

Table 8. Obtrusive light – Upward light ratio (Sky Glow)

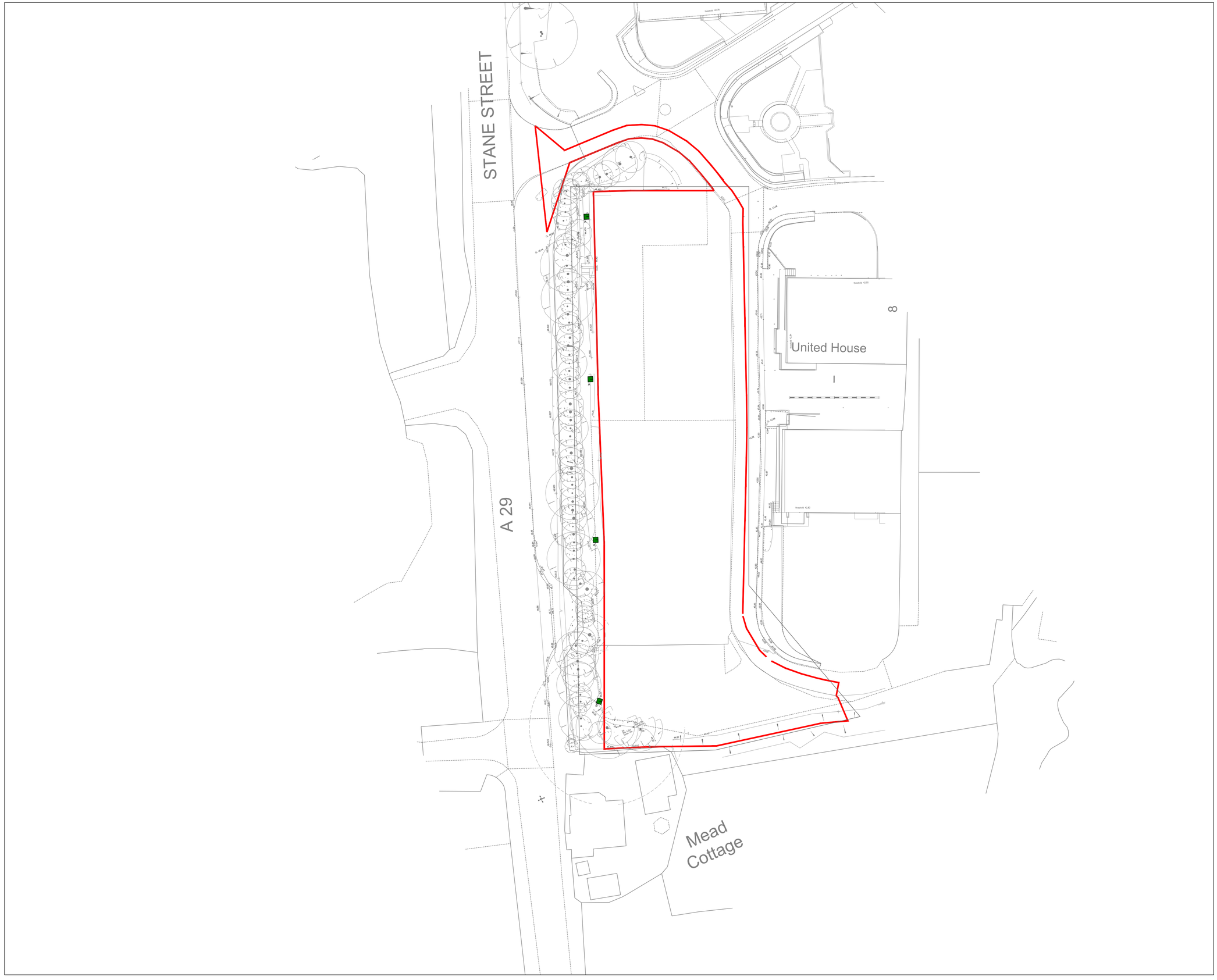
Receptor	Upward light ratio		PASS / FAIL
	Threshold	Calculated	
Site	2.5%	0.9%	PASS

8.0 CONSTRUCTION PHASE LIGHTING

While construction phase lighting is expected to be short term and reversible, it is important to minimise disruption as far as practicable. To reduce the effects of lighting during the construction phase the following measures should be put in place:

- Lighting will operate in all external areas used by construction workers after dark in order to provide a safe and secure working environment without over lighting. High quality LED light sources with high colour rendering index (CRI) shall be utilised to maximise visibility with efficient light output;
- Lighting shall be provided to meet the target lux level as set out in BS 12464-2 *Lighting of outdoor workplaces* without over lighting. Luminaires shall be mounted at the lowest practical mounting height, providing lighting only where lighting is required;
- The Contractor shall specify working hours, uses of lighting, location of temporary floodlights and construction compound and agreeing these with the local council to reduce duration of impact;
- Lighting controls should be employed to dim or switch off any lighting that is not needed;
- Lighting that needs to be sited close to the perimeter or ecologically sensitive areas should be fitted with shielding or be switched off or dimmed when not in use;
- Lighting should be controlled in such a way to illuminate high activity, hazardous or high security areas while reducing lighting levels at less pertinent areas; and
- The Contractor should act responsibly to adjust any temporary lighting reported as causing nuisance.

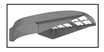
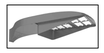
APPENDIX 1 – EXTERNAL LIGHTING LAYOUT



NOTES

1. THIS IS NOT A CONSTRUCTION DRAWING.
2. DO NOT SCALE FROM THIS DRAWING.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER PROJECT DOCUMENTS.

KEY

LUMINAIRE SCHEDULE		
SYMBOL	DESCRIPTION	IMAGE
A	HOLOPHANE LIGHTING DSX1 C/W FW OPTIC & EXTERNAL SHIELD 22000 LUMENS 3000K 8M COLUMN MOUNT 0°	
B	HOLOPHANE LIGHTING DSX1 C/W RCCO OPTIC & EXTERNAL SHIELD 22000 LUMENS 3000K 8M COLUMN MOUNT 15°	

CALCULATION SUMMARY			
AREA	AVG. lux	MIN. lux	UNIFORMITY
STORAGE YARD	10.5	2.6	0.25

REV	DATE	DESCRIPTION
P1	19.09.25	INFORMATION ISSUE

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PROJECT

STORAGE YARD
SPRING COPSE BUSINESS PARK

DRAWING TITLE

EXTERNAL LIGHTING LAYOUT

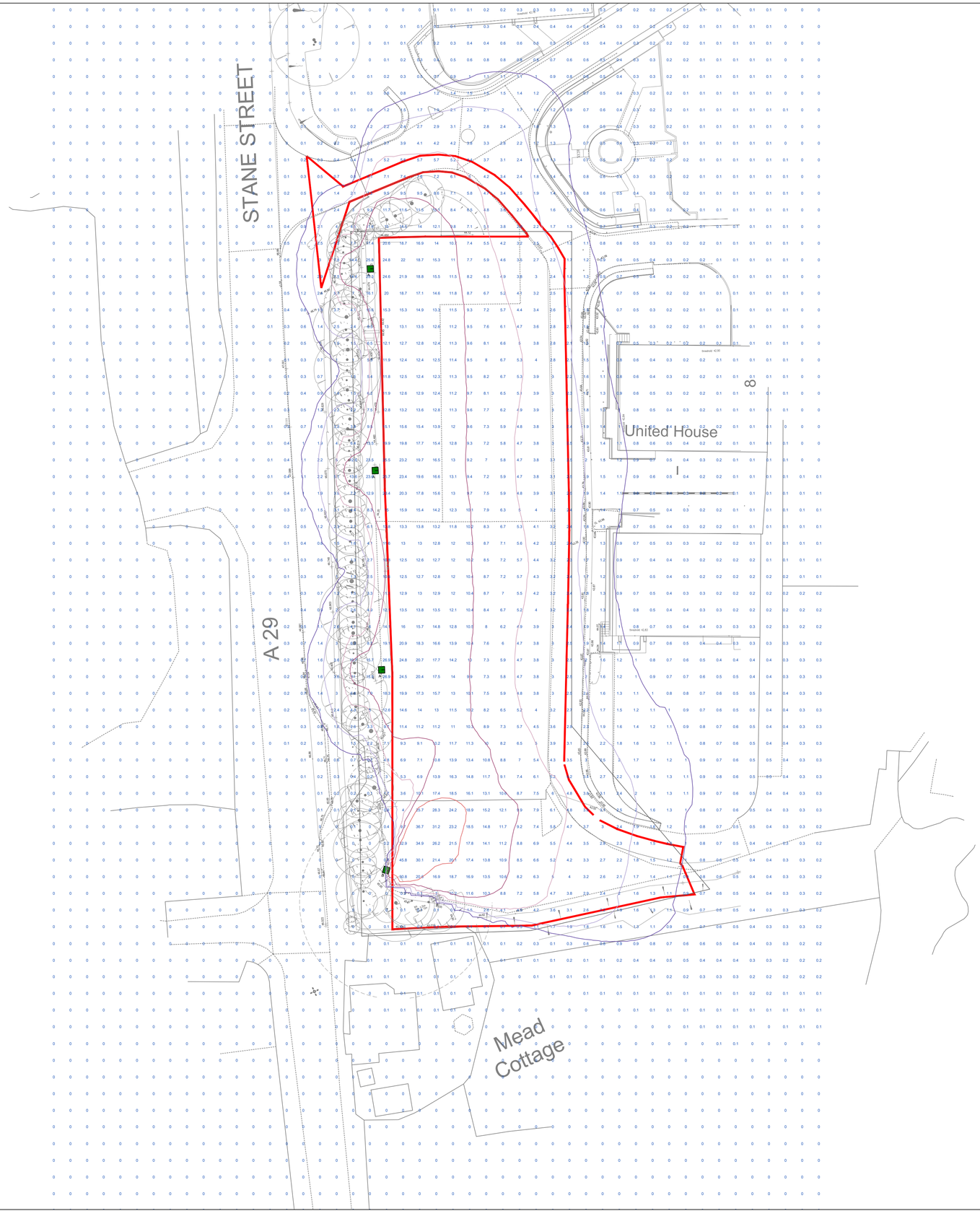
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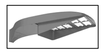
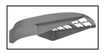
APPENDIX 2 – EXTERNAL LIGHTING LUX PLOT LAYOUT



NOTES

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KEY

LUMINAIRE SCHEDULE		
SYMBOL	DESCRIPTION	IMAGE
A	HOLOPHANE LIGHTING DSX1 C/W FW OPTIC & EXTERNAL SHIELD 22000 LUMENS 3000K 8M COLUMN MOUNT 0°	
B	HOLOPHANE LIGHTING DSX1 C/W RCCO OPTIC & EXTERNAL SHIELD 22000 LUMENS 3000K 8M COLUMN MOUNT 15°	

CALCULATION SUMMARY			
AREA	AVG. lux	MIN. lux	UNIFORMITY
STORAGE YARD	10.5	2.6	0.25

ISOLUX CONTOURS (lux)	
	10.0
	5.0
	2.0
	1.0

ISOLUX GRID			
0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1
0.1	0.1	0.2	0.2
0.1	0.2	0.3	0.4

REV	DATE	DESCRIPTION
P1	19.09.25	INFORMATION ISSUE

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PROJECT
STORAGE YARD
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DRAWING TITLE
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LUX PLOT LAYOUT

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