Finsco Property Co

Land at Hornton Quarry, Banbury

Lighting Impact Assessment

713481R01

28TH AUGUST 2020

RSK GENERAL NOTES

Project No.: 713481R01

Title: Land at Hornton Quarry, Banbury - Lighting Impact Assessment Report

Client: Finsco Property Co

Date: 28th August 2020

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Date:	28th August 2020	Date:	28th August 2020

CONTENTS

1 INTRODUCTION

1.1 Background

RSK Environment Ltd (RSK) has been appointed by Finsco Property Co to prepare this Lighting Impact Assessment in support of the planning application for the construction of a new industrial development on Land at Hornton Quarry, Banbury, Oxfordshire. The proposal is for a new Certas Energy fuel storage and distribution depot.

1.2 Aim of the Report

This report presents the findings of an assessment of existing / baseline artificial lighting levels in the area of the development and the predicted effects of new artificial lighting installed as part of the proposed scheme on the existing potentially sensitive receptors (e.g residential properties and wildlife) present in the locality.

2 PLANNING POLICY CONTEXT

2.1 National Planning Policy Framework

In February 2019 The National Planning Policy Framework (NPPF) was revised, superseding the bulk of previous Planning Policy Statements with immediate effect. The National Planning Policy Framework was intended to simplify the planning system and includes a presumption in favour of sustainable development.

Section 15 of the NPPF deals with Conserving and Enhancing the Natural Environment, and states that the intention is that the planning system should prevent new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans. The document also states that 'new development [should be] appropriate for its location' and 'the effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account'.

2.2 The Cherwell Local Plan 2011 to 2031 Adopted July 2015

Policy ESD15: The Character of the Built and Historic Environment

Successful design is founded upon an understanding and respect for an area's unique built, natural and cultural context. New development will be expected to complement and enhance the character of its context through sensitive siting, layout and high-quality design. All new development twill be required to meet high design standards. Where development is in the vicinity of any of the District's distinctive natural or historic assets, delivering high quality design that complements the asset will be essential.

New development proposals should:

- Limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation

3 SITE LOCATION

3.1 Introduction

The proposed development site is located adjacent to the existing Hornton Grounds Quarry stone yard. The site is bordered by fields to the North, East and South with the closest residential buildings at Hornton Grounds to the South East of the site. The existing stone yard is adjacent to the west boundary of the site. The development is surrounded by bunds, hedgerows and trees to the North, East and South, giving a natural barrier to artificial light that may spill beyond the site boundary. Due to the landscaping and new planting around the site and the changes in elevation around the area, no residential properties have a direct line of sight to the proposed development lighting.

A location plan of the current site can be seen in Appendix A, with the proposed development in Appendix B.

4 ASSESSMENT SCOPE AND METHODOLOGY

4.1 Approach

In order to assess the baseline artificial lighting levels in the area, a site visit was conducted by RSK on Wednesday 19th August 2020. Measurements were taken at a height of 1.5m above ground level under an overcast sky between 21:30and 22:30 hours using an Isotech ILM 01 Digital Light Meter at the position of each measurement location identified (see section 5.0 baseline conditions). The measurement locations where the baseline measurements were taken are shown in Appendix C.

A computer model has been constructed of the proposed development using Relux Pro lighting software version 2016.1.2.0 using a detailed lighting scheme to assess the potential effect of the development on the existing area.

4.2 Lighting Assessment Guidance

The Clean Neighbourhoods and Environment Act 2005 made light pollution a statutory nuisance under the Environmental Protection Act 1990, which came into force on 6th April 2006. Section 79 of the Environmental Protection Act 1990 has been amended to include artificial light emitted from premises that potentially could be prejudicial to health or a nuisance.

No prescriptive limits or rules are set for such assessments, but the following guidance documents have been referred to while compiling this assessment:

- The SLL Lighting Handbook – The Society of Light and Lighting (SLL), this provides guidance on maximum recommended vertical illuminance levels measured at the sensitive receptors windows.
- Lighting Guide 6 The Outdoor Environment – The Society of Light and Lighting (SLL), this gives minimum safe lighting levels for the footpaths.
- ILP Guidance Notes for the Reduction of Obtrusive Light (2011) provides measurable design guidance limits and recommendations to ascertain acceptability of obtrusive light levels at night.
- CPRE _ Night Blight: Mapping England's light pollution and dark skies, provides maps of Great Britain's light pollution and dark skies.

Table 1 from the SLL Handbook shows the five qualitative environmental zones identified by the International Commission on Illumination (CIE) which reflect differing levels of light pollution which can affect an area. The limits recommended by the SLL for limiting light trespass are given in Table 2.

Table 1 - The Environmental Zoning system of the CIE

Environmental Zones	Zone description and examples of sub-zones
E0	Areas with dark landscapes: UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Areas with intrinsically dark landscapes: National Parks, areas of outstanding natural beauty (where roads are usually unlit)
E2	Areas of 'low district brightness': outer urban and rural residential areas (where roads are lit to residential road standard)
E3	Areas of 'middle district brightness': generally urban residential areas (where roads are lit to traffic route standard)
E4	Areas of 'high district brightness': generally, urban areas having mixed recreational and commercial land use with high night-time activity

Table 2 - Maximum vertical illuminance on windows, maximum luminous intensity for obtrusive luminaires and maximum building luminance produced by floodlighting, for five environmental zones

Environmental Zones	Maximum vertical illuminance on windows (Lux)		Maximum luminous intensity (cd)		Maximum building luminance (cd/m^2)
	Before curfew	After Curfew	Before curfew	After curfew	
E0	0	0	0	0	0
E1	2	1	2500	0	0
E2	5	1	7500	500	5
E3	10	2	10000	1000	10
E4	25	5	25000	2500	25

4.3 Measurement Locations

Measurement Locations are initially physical measuring positions in and around the development site. These locations are chosen to give a general idea of lighting levels across the site, but also at potentially sensitive receptors (residential properties, wildlife, etc) in and outside of the development boundary. All measurement locations are then uploaded into the software model as virtual surfaces that are used to calculate illuminance of the development post construction.

Measurements were taken around the whole perimeter of the site, with particular interest at sensitive locations close to the site boundary. All measurements outside of the site boundary were taken from publically accessible footpaths and roads.

Please refer to Table 3 for a full list of measurement locations and identified potentially sensitive receptors. A plan view of the site showing the measuring element locations is shown in Appendix C.

5 BASELINE CONDITIONS

5.1 Within the Site

The site is currently unlit with no existing sources of artificial light present, however the adjacent quarry yard has security lighting on the buildings and around the site. The lighting on the site office was in use at the time of the survey. These sources of light do spill onto the site.

5.2 Surrounding Area

Sixteen measurement locations were identified around the site boundary and surrounding area. The minimum recorded level across the whole site was 0.15 Lux (at measurement locations 8-12), and a maximum reading of 4.50 Lux was taken at measurement location 16 adjacent to existing security lighting on the quarry site office.

Table 1 above, indicates that the area would be classified as E1, Areas with intrinsically dark landscapes and in line with the SLL guidelines, the vertical illuminance on windows of identified receptors must be less than 2 Lux before and 1 Lux after curfew as indicated in Table 2. The locations of the measuring points are presented in Appendix C.

Table 3 –Baseline Lighting Levels

Measurement Location	Measuring Element	Measured Illuminance (Lux)
1	MP1	1.30
2	MP2	1.20
3	MP3	0.70
4	MP4	0.50
5	MP5	0.50
6	MP6	0.30
7	MP7	0.20
8	MP8	0.15
9	MP9	0.15
10	MP10	0.15
11	MP11	0.15
12	MP12	0.15
13	MP13	0.30
14	MP14	0.50
15	MP15	0.70
16	MP16	4.50

The results in table 3 above show that although the development site itself is unlit, that there is some light spill into the site from nearby security lighting on the quarry site office. Measurement locations 1, 2 and 16 all had readings of over 1 Lux (maximum 4.50 Lux), all of which are located close to the existing security lighting.

The locations of the measuring points are presented in Appendix C. When considering direct Sky Glow, as a result of direct upwards light, there is the possibility of a site wide effect being visible from darker environments, however, direct Sky Glow cannot be measured. The baseline is assessed relative to visual baseline survey conditions and published Campaign to Protect Rural England (CPRE) – Night Blight data. Taken on a local scale, existing saturated Sky Glow was not noticeable at the time of the site visit.

6 DEVELOPMENT LIGHTING

6.1 Detailed Lighting Design

A detailed lighting scheme has been developed for the site by a lighting contractor and the lighting drawing can be seen in Appendix D. LED lighting has been specified throughout the site. General recommendations for the detailed lighting scheme have been followed and these include:

- Lighting throughout the site has been designed to minimise horizontal spill of light to the site border.
- Lighting is directed away from site border.
- Backing plates have been incorporated on the lighting columns.
- Lighting is fixed at a height of 5m below the height of the bunds and new planting surrounding the site.
- Lighting has been designed in accordance with ILP Guidance Notes for Reduction of Obtrusive Light and CIE 126 (1997) Guidelines for Minimising Sky Glow.

7 ASSESSMENT OF IMPACTS

7.1 Surrounding Area

Table 4 shows the results of the calculations and the predicted light levels at all measurement locations including at the identified potentially sensitive receptors. This has been presented as an after-curfew scenario, where light levels are recommended not to exceed 1 Lux. For the purpose of this report, the calculations have been performed with all development lighting on across the site to show the potential worst-case effect. The increase in illuminance column represents the increase on the baseline results as a result of the development. The maximum illuminance column represents the maximum lighting levels at that specific measurement location. Calculation results for all measurement locations are shown in Table 4 below. The measurement locations are presented in Appendix C.

Table 4 – Results For Proposed Scheme

Measurement Location	Increase in Illuminance (Lux)	Maximum Illuminance (Lux)	Maximum Recommended Illuminance (Lux)
1	0.30	1.60	1
2	0.55	1.75	1
3	0.23	0.93	1
4	0.40	0.90	1
5	0.48	0.98	1
6	0.61	0.91	1
7	0.67	0.87	1
8	0.54	0.69	1
9	0.29	0.44	1
10	0.63	0.78	1
11	0.80	0.95	1
12	0.83	0.98	1
13	0.49	0.79	1
14	1.28	1.78	1
15	2.01	2.71	1
16	1.45	5.95	1

The results presented in Table 4 indicate that light spillage from the development is predicted at measuring positions 1, 2, 14, 15 and 16 which are adjacent to the existing stone yard to the West and are impacted by the existing security lighting. There is only a relatively small increase predicted across the rest of the site with a maximum predicted increase of 0.83 Lux at measuring position 12. The measuring locations to the north, east and south all have predicted levels of less than 1 lux with the development in place. The predicted increase at measuring locations 1 to 13 is considered to be negligible and the three locations that are predicted to be impacted are within the existing stone yard to the West which has its own external lighting. The scheme will not cause significant light spillage beyond the developed area at Hornton Grounds.

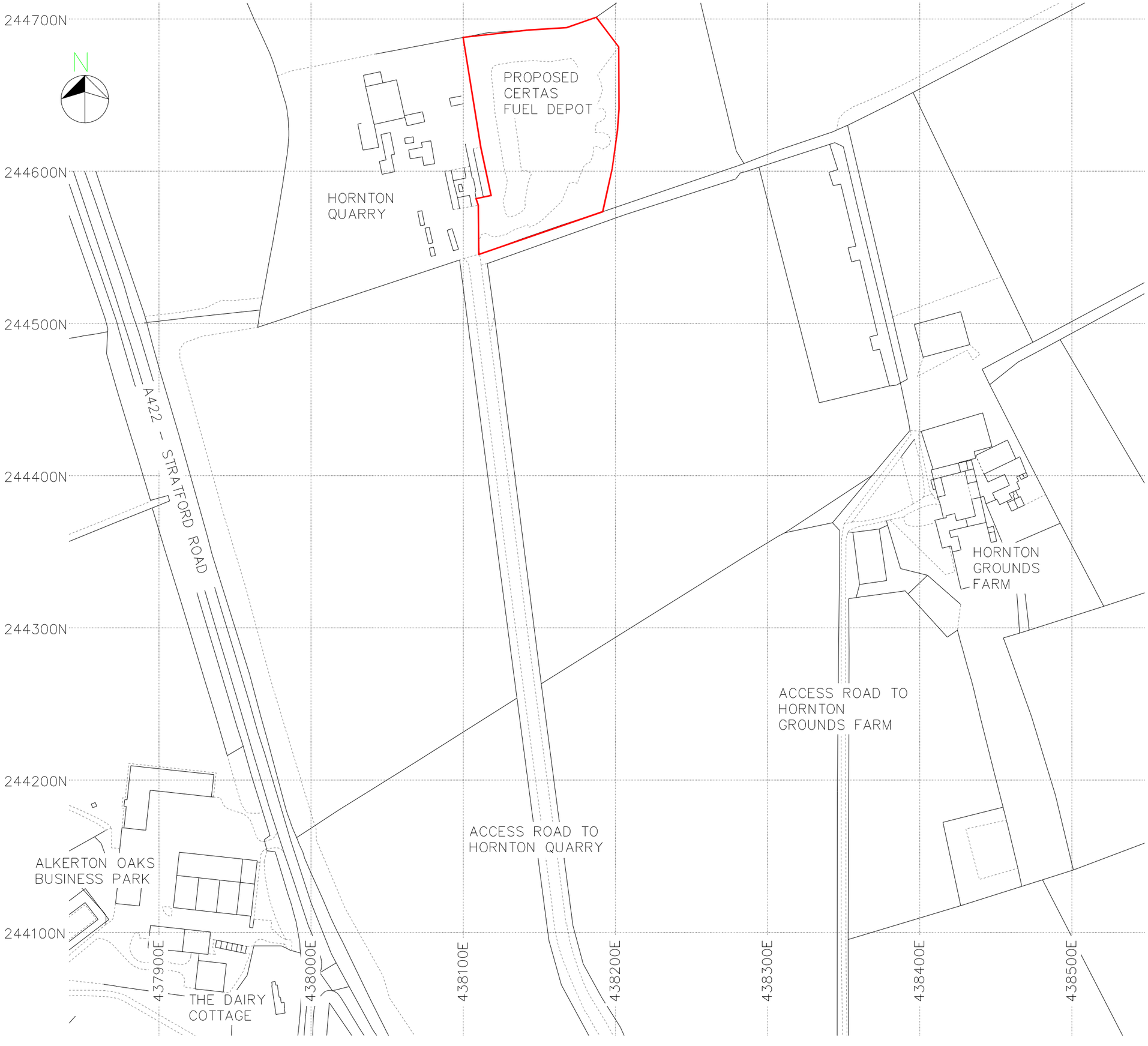
8 CONCLUSION

The proposed development will have a negligible impact on the area surrounding the site. Although light spill from the site will increase in some locations as a result of the development, the existing security lighting close to these locations is significant enough that the impact of the new development will be negligible in these locations.

The assumed luminaires to be installed on the site have minimal light spill due to housings that direct the light down and minimise unwanted sideways illumination. This results in a development that will have little or negligible impact on the surrounding area in line with the SLL recommendations.

In summary it has been shown that the proposed development will have an insignificant effect on the immediate environment with respect to lighting pollution. Although light spill has increased illuminance levels at some locations, the potential increase in illuminance is considered negligible.

APPENDIX A: SITE LOCATION PLAN



Rev:	Date:	Revision Details:	Rev By:	Chk:	Appr:
A	14.11.19	FIRST ISSUE	SMont	CH	NM

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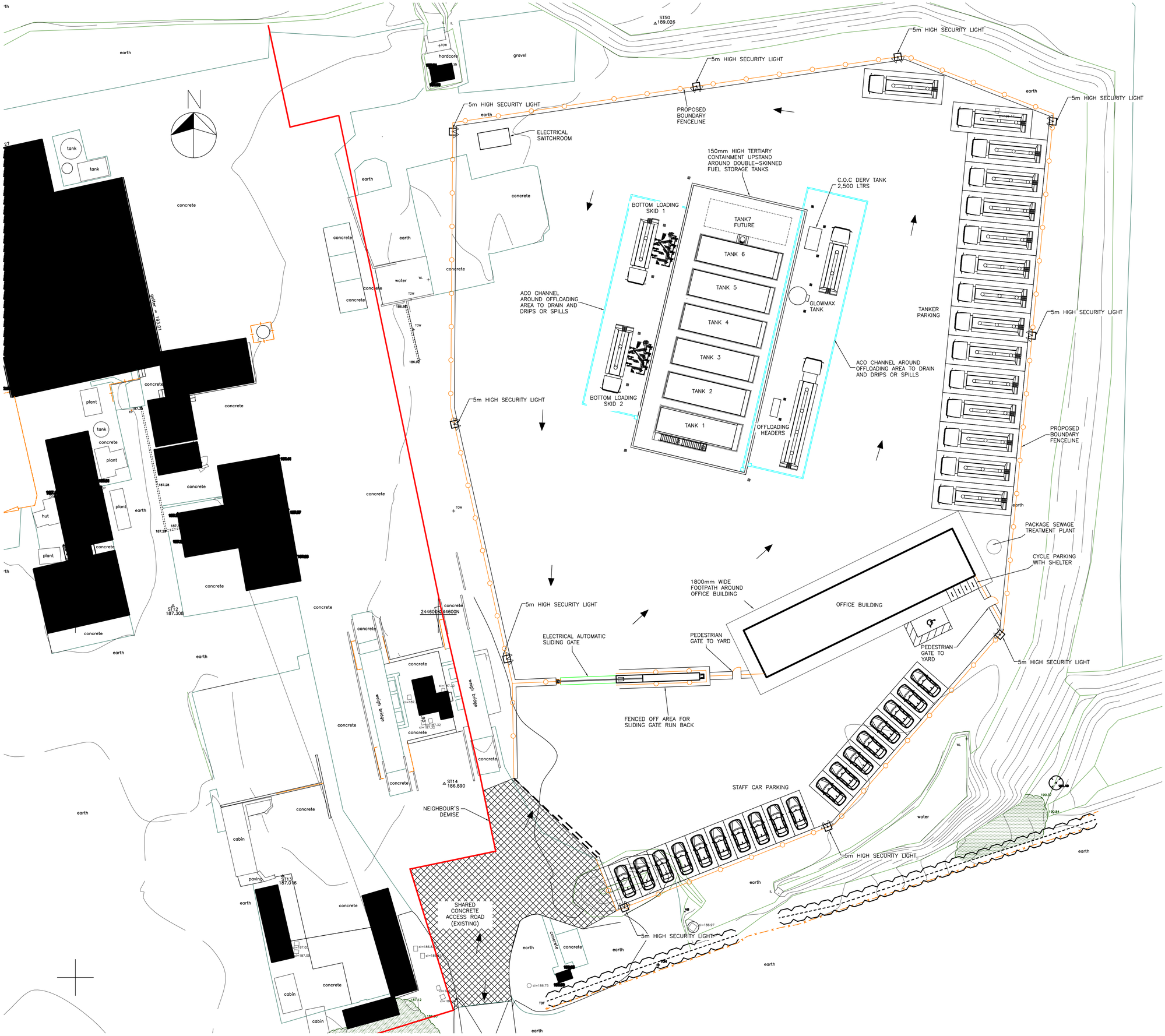
Site: BANBURY – HORNTON QUARRY

Title: LOCATION PLAN

Dwg By: SMont **Date:** 14.11.19
Checked: CH **Date:** 14.11.19
Approved: NM **Date:** 14.11.19

Scale: 1:2500 @ A3
Drawing No: 6289–803
Rev: A

APPENDIX B: DEVELOPMENT PLAN



Rev:	Date:	Revision Details:	Rev By:	Chk:	Appr:
F	16.07.20	CYCLE PARKING SHOWN	YF	CH	NM
E	12.06.20	BOUNDARY WALL REMOVED	YF	CH	NM
D	04.06.20	FENCE LINE AND KERBKINE ADDED	YF	CH	NM
C	04.06.20	NEIGHBOUR'S DEMISE SHOWN	YF	CH	NM
B	21.05.20	INTERNAL BOUNDARY WALL ADDED SITE DEMISE REVISED LIGHTING COLUMN ADDED	YF	CH	NM
A	02.12.19	FOR COMMENT	YF	CH	NM

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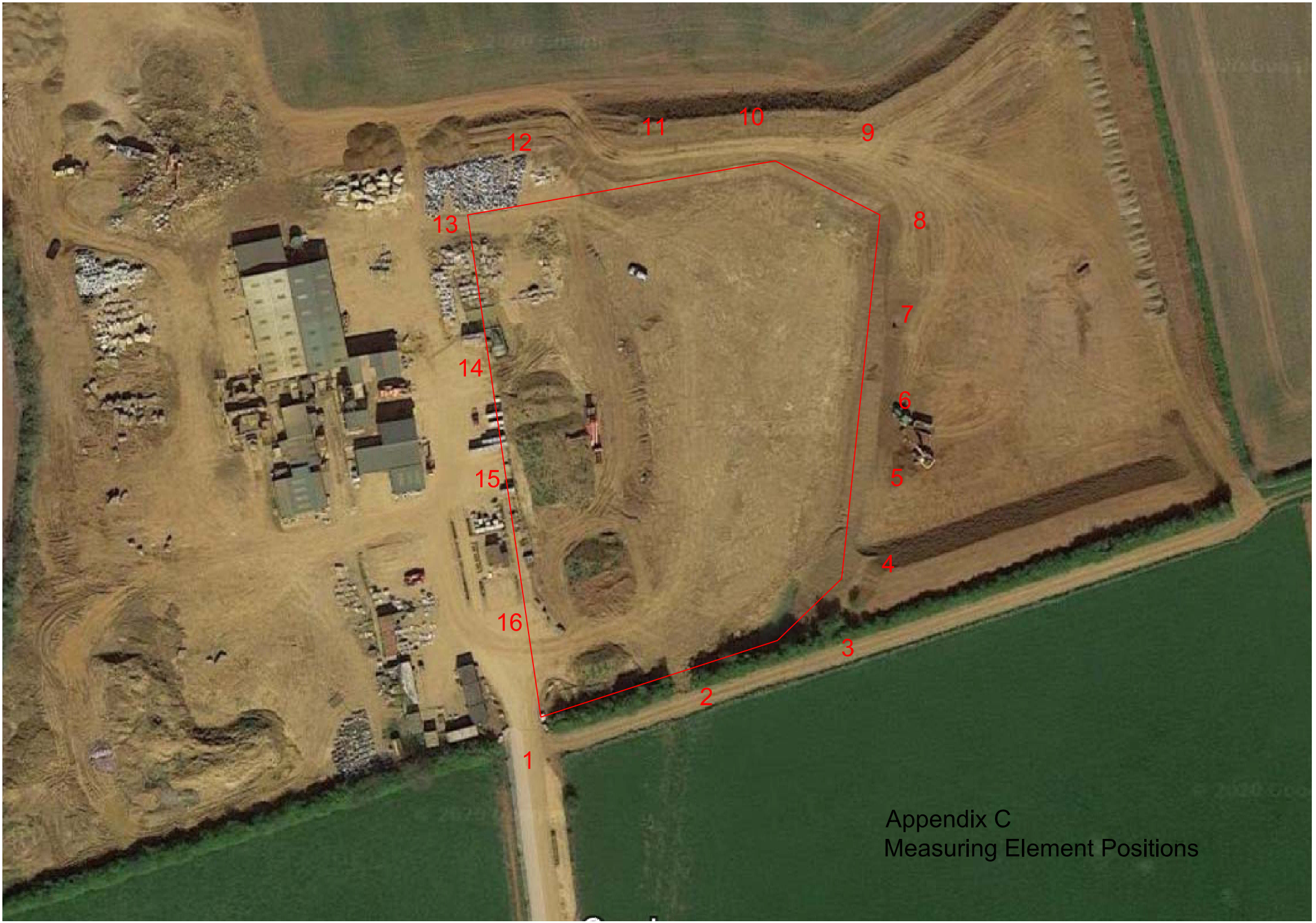
Site: BANBURY HORNTON QUARRY

Title: PROPOSED SITE LAYOUT

Dwg By:	Checked:	Approved:
SMont	CH	NM
Date: 08.11.19	Date: 08.11.19	Date: 08.11.19

Scale:	Drawing No:	Rev:
1:250 @ A1	6289-801	F

APPENDIX C: MEASURING ELEMENT LOCATIONS



Appendix C
Measuring Element Positions

APPENDIX D: LIGHTING DESIGN

NOTES:

1. LIGHTING COLUMNS WILL BE 6m HIGH ABACUS MEDIUM DUTY, FOLDABLE, FLANGE PLATE MOUNTED AND COMPLETE WITH MOUNTING T-BRACKETS TO ACCOMMODATE FLOODLIGHTS.
2. FLOODLIGHTS ON LIGHTING COLUMNS WILL TO BE 750W HQI (OR LED EQUIVALENT) POSITIONED 0° (HORIZONTAL) TO A MAXIMUM OF 30°.
3. FLOODLIGHTS ON TANKS WILL BE INSTALLED ON 2m EXTENSION FROM TANK TOP AND POSITIONED 0° (HORIZONTAL) TO MAXIMUM OF 45°. TANKS ARE 3.65m HIGH.
4. TARGET LEVEL OF ILLUMINANCE IS 20 LX TO ENSURE COMPLIANCE WITH CERTAS ENERGY LIGHTING SPECIFICATION REQUIREMENTS.

ISOLINES

- 0.5 lx
- 1.0 lx
- 5.0 lx
- 10.0 lx
- 20.0 lx
- 30.0 lx
- 40.0 lx
- 50.0 lx
- 100.0 lx

10 5 0 5 10 15 20 metres

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Site: BANBURY HORNTON QUARRY

Title: LIGHTING & LUX LEVEL LAYOUT

Dwg By:	Checked:	Approved:
LW	RS	CIM
Date: 24.08.20	Date: 24.08.20	Date: 24.08.20

Scale: 1:250 @ A1 **Drawing No:** 6289–501 **Rev:** A

APPENDIX E: PREDICTED LIGHT SPILLAGE