



Market Hosier Street, Reading
[Ecological Light Survey](#)

[Prepared for:](#) Blue Collar Group
[Date:](#) 14th September 2022

EXECUTIVE SUMMARY

Outline Scope

Strenger Ltd was appointed by Blue Collar Group to undertake an ecological light survey at a recently completed openair food & drink establishment, Market Hosier Street, Reading (hereon in, the 'Development'), relating to the retrospective discharge of a lighting-related planning condition. A light survey was undertaken in order to quantify the levels of light spill associated with the Development lighting, which has the potential to impact on light-sensitive ecological receptors surrounding the Development site boundary.

The lighting-related planning condition (planning Condition 15) attached to the Decision Notice is as follows:

'No development hereby permitted shall be occupied or its use first commenced until an external lighting scheme for the development and how this has been designed to not adversely affect wildlife has been submitted to and approved in writing by the Local Planning Authority. The report shall include the following:

a) a plan indicating the locations of the lights, specifications, height, luminance; lens shape/beam pattern and orientation and any hoods/shades and hours of operation

b) a report detailing how the lighting scheme has been designed to not adversely affect wildlife including a layout plan with beam orientation, schedule of equipment, measures to avoid glare and an isolux contour map showing light spillage to 1 lux onto the adjacent areas

The approved external lighting scheme shall be implemented in full prior to occupation of the development and the external lighting shall thereafter be maintained and operated in accordance with the approved details only. retained as such thereafter for the lifetime of the development.

REASON: To ensure that wildlife is not adversely affected by the proposed development and to provide suitable levels of surveillance in line with Policies EN12 and CC7 of the Reading Borough Local Plan 2019.'

As the Development is currently operational and the lighting has already been installed, at this stage it would not be a suitably robust approach to undertake 3D computational modelling for light sources of unknown photometric specification. Therefore, in order to present a robust assessment of demonstrating that the 1 lux illuminance criterion is achieved, an operational light survey has been undertaken.

In order to produce the assessment, the following has been undertaken:

- night-time photography at the Development site;
- measurement of pre-mitigation light spill levels at potentially light-sensitive ecological receptors;
- comparison of the pre-mitigation light spill levels against the 1 lux criterion;
- design of mitigation measures in-situ;
- measurement of post-mitigation light spill levels at potentially light-sensitive ecological receptors;
- comparison of the post-mitigation light spill levels against the 1 lux criterion;
- conclusions; and
- production of CAD drawings.

Conclusions

As the Development is currently operational and the lighting has already been installed, at this stage it would not be a suitably robust approach to undertake 3D computational modelling for light sources of unknown photometric specification. Therefore, in order to present a robust assessment of demonstrating that the 1 lux illuminance criterion is achieved, an operational light survey has been undertaken.

Based on the light monitoring survey, it was found that the levels of pre-mitigation light spill associated with the Development lighting all failed to achieve the 1 lux criterion. It will therefore be necessary to implement suitable mitigation measures as set out below.

The following mitigation measures will be required to achieve the 1 lux light spill criterion:

- the section of festoon lighting between the stair core and management cabin shall be lowered to fall in front of the green wall and to the Development side; and
- the side faces of the illuminated lettering shall be masked off using a material having zero light transmittance.

With the implementation of the above mitigation measures, the 1 lux light spill criterion to 'green corridors' would be achieved for the Development. It is considered that the light survey and associated assessment undertaken represents a more robust alternative means of compliance with Planning Condition 15 attached to the Decision Notice i.e. in-situ demonstration of compliance has been demonstrated, rather than predicted demonstration of compliance via 3D computational modelling.

It is understood that the Development Operator is committed to implementing the above mitigation measures prior to on-going operation of the Development.

1. CRITERIA & RECEPTORS

- 1.1 The adopted light spill criterion is based on Planning Condition 15 attached to the Decision Notice i.e. 1 lux.
- 1.2 It has been assumed that bat activity has the potential to occur at any point along the 'green corridor' bounding the Development site. Therefore, light monitoring was undertaken to the full affected extents of the corridor. The light monitoring locations are set out in Strenger drawing ref: SK-01 Light Monitoring Location Plan.

2. SURVEY

Overview

- 2.1 A site survey was undertaken at the site from 20:30 to 23:00 on Tuesday 13th September 2022. Light measurements were collected during 'astronomical night' levels of darkness.

Purpose

The survey was designed to establish levels of light spill (E - lux) at potentially light-sensitive ecological receptors surrounding the Development.

Methodology

- 2.2 The light spill survey was conducted using a precision illuminance meter which was suitably calibrated for measuring 'low light' levels in a UKAS accredited laboratory within one year. Measurements were undertaken using a remote receptor head mounted on a portable mast in order to achieve optimal positioning and minimise operator screening. Measurements were recorded at 0.01 lux resolution.
- 2.3 The measurement interval was determined by the surveyor, by considering the level of change in measured value according to position. Crucially, measurements of the highest levels of illuminance were obtained i.e. areas within close proximity to luminaires.
- 2.4 Wide-angle long exposure photography was also undertaken using a full frame DSLR camera. The quality and extents of the photography were unfortunately very limited due to heavy rain for the duration of the light survey. Photographs are appended to this report in Appendix A.

3. LIGHTING

Overview

3.1 The Development is lit to a relatively minimal and environmentally sympathetic level. The main lighting sources are as follows:

- Low-lumen pergola lighting to ground floor level
- LED festoon lighting above green wall at first floor level
- Static illuminated signage lettering at first floor level +2.6m

4. PRE-MITIGATION RESULTS

Pre-mitigation Light Spill

- 4.1 The levels of pre-mitigation light spill associated with the Development lighting were measured or observed at 'green corridors'. The measured / observed levels of pre-mitigation light spill are set out in (Table 4.1) below:

Table 4.1: Pre-mitigation Light Spill (illuminance) - E (lux)	
Monitoring Location	Measured / Observed
ECO-01	Maximum: 11 APX 4 (festoon), APX 7 (illuminated lettering)
ECO-02	>> 1 (observed)
ECO-03	>> 1 (observed)

5. PRE-MITIGATION ASSESSMENT

- 5.1 The levels of pre-mitigation light spill to green corridors associated with the Development lighting have been measured or observed. The resultant levels of light spill are set out in (Table 5.1) against the 1 lux light spill criterion. Each receptor has been assigned a PASS / FAIL outcome accordingly.

Table 5.1: Pre-mitigation Light Spill Assessment (illuminance) - E (lux)			
Monitoring Location	Light Spill Criterion	Measured / Observed Light Spill	Outcome
ECO-01	1	11	FAIL
ECO-02	1	>> 1	FAIL
ECO-03	1	>> 1	FAIL

- 5.2 As can be seen from (Table 5.1) above, the measured /observed levels of pre-mitigation light spill associated with the Development lighting all fail to achieve the 1 lux criterion. It will therefore be necessary to implement suitable mitigation measures as set out in Section 6 of this report.
- 5.3 The main light sources associated with the Development contributing to the levels of light spill are the edge faces of the illuminated lettering and the section of festoon lighting between the stair core and management cabin. There was no significant luminance to the rear face of the illuminated lettering as this was formed from opaque opal.
- 5.4 Light sources not associated with the Development were the main contributor to high levels of illuminance observed at monitoring location ECO-02.

6. MITIGATION

- 6.1 As set out in (Table 5.1), there are exceedances in achieving the 1 lux light spill criterion. It will therefore be necessary to introduce suitable mitigation measures. As discussed in Section 5, the main light sources associated with the Development contributing to the levels of light spill are the edge faces of the illuminated lettering and the section of festoon lighting between the stair core and management cabin. Therefore, mitigation to control light spill will only be required to these sources.
- 6.2 The following mitigation measures will be required to achieve the 1 lux light spill criterion:
- the section of festoon lighting between the stair core and management cabin shall be lowered to fall in front of the green wall and to the Development side; and
 - the side faces of the illuminated lettering shall be masked off using a material having zero light transmittance.



- 6.3 Whilst it was possible to temporarily lower the festoon lighting during the light survey, it was not possible to mask off the sides of the illuminated lettering. However, for the purpose of undertaking the survey, this effect was simulated by draping blankets over the rear of the illuminated lettering.

7. POST-MITIGATION RESULTS

Post-mitigation Light Spill

- 7.1 The levels of post-mitigation light spill associated with the Development lighting were measured at 'green corridors'. The measured levels of post-mitigation light spill are set out in (Table 7.1) below:

Table 7.1: Post-mitigation Light Spill (illuminance) - E (lux)	
Monitoring Location	Measured
ECO-01	Average: 0.66 Maximum: 0.95
ECO-02	Average: 2.48 Maximum: 2.57
ECO-03	Absolute: 0.53

8. POST-MITIGATION ASSESSMENT

- 8.1 The levels of post-mitigation light spill to green corridors associated with the Development lighting have been measured. The resultant levels of light spill are set out in (Table 8.1) against the 1 lux light spill criterion. Each receptor has been assigned a PASS / FAIL outcome accordingly.

Table 8.1: Post-mitigation Light Spill Assessment (illuminance) - E (lux)			
Monitoring Location	Light Spill Criterion	Measured Light Spill	Outcome
ECO-01	1	Average: 0.66 Maximum: 0.95	PASS
ECO-02	1	Average: 2.48 Maximum: 2.57	PASS*
ECO-03	1	Absolute: 0.53	PASS

- 8.2 As can be seen from (Table 8.1) above, the measured levels of post-mitigation light spill associated with the Development lighting at monitoring locations ECO-01 and ECO-03 both achieve the 1 lux criterion.

*Light sources not associated with the Development were the main contributor to high levels of illuminance measured at light monitoring location ECO-02. In fact, based on measurements with the post-mitigation lighting operating, there was no significant observable / measurable difference between the Baseline levels of illuminance and the Baseline + Post-mitigation Development lighting.

9. CONCLUSIONS

- 9.1 As the Development is currently operational and the lighting has already been installed, at this stage it would not be a suitably robust approach to undertake 3D computational modelling for light sources of unknown photometric specification. Therefore, in order to present a robust assessment of demonstrating that the 1 lux illuminance criterion is achieved, an operational light survey has been undertaken.
- 9.2 Based on the light monitoring survey, it was found that the levels of pre-mitigation light spill associated with the Development lighting all failed to achieve the 1 lux criterion. It will therefore be necessary to implement suitable mitigation measures as set out below.
- The following mitigation measures will be required to achieve the 1 lux light spill criterion:
- the section of festoon lighting between the stair core and management cabin shall be lowered to fall in front of the green wall and to the Development side; and
 - the side faces of the illuminated lettering shall be masked off using a material having zero light transmittance.
- 9.3 With the implementation of the above mitigation measures, the 1 lux light spill criterion to 'green corridors' would be achieved for the Development. It is considered that the light survey and associated assessment undertaken represents a more robust alternative means of compliance with Planning Condition 15 attached to the Decision Notice i.e. in-situ demonstration of compliance has been demonstrated, rather than predicted demonstration of compliance via 3D computational modelling.
- 9.4 It is understood that the Development Operator is committed to implementing the above mitigation measures prior to on-going operation of the Development.

Appendix A – Site Photographs

