

Lighting Assessment

Project Name	Land East of Woodgate Road, Woodgate, West Sussex	Date	04/08/2021
Project Number	100255	Rev	1

1. Assessment Brief

- 1.1. Provide a lighting impact study showing the extent and amount of illumination on the ground and an analysis of light spillage outside the site and/or into the sky. The assessment shall include details of the number, type, location, height, cowling and intensity of the installation including hours of illumination.

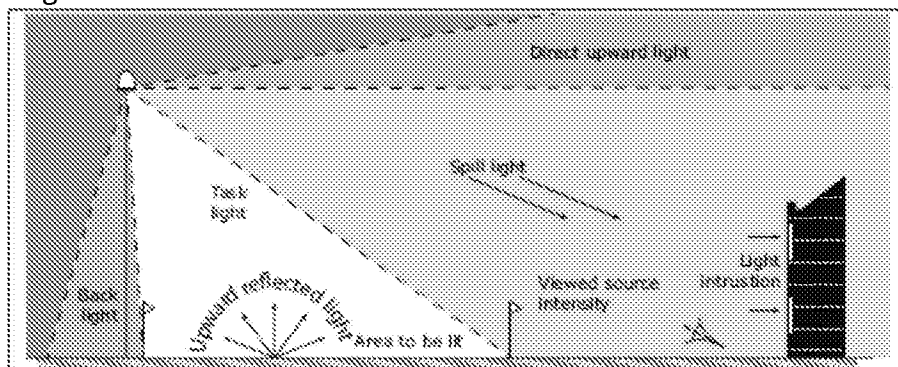
2. Lighting impact study

- 2.1. This report has been produced in support of drawing 100255-J LD-AS MT-DR-0001 which illustrates the horizontal lighting spillage outside of the site including an outline lighting layout and equipment specification.

3. Light pollution

- 3.1. Light pollution relates to artificial lighting that creates excessive glare, skyglow and light trespass.
- 3.2. Glare - The uncomfortable brightness of a light source when viewed against a dark background.
- 3.3. Skyglow - The brightening of the night sky which limits our ability to view the sky at night.
- 3.4. Light trespass - Light spill beyond a boundary of the area being lit.
- 3.5. The types of pollution and obtrusive light are depicted in diagram 1 below taken from the ILP Guidance Note 01/20 - Guidance Notes for the Reduction of Obtrusive Light.

Diagram 1



4. Sources of light pollution

- 4.1. Street lighting, industrial lighting, domestic lighting, sports lighting and building illumination.

5. Development light sources

- 5.1. Public street lighting, privately maintained street lighting and domestic exterior lighting.

6. Public street lighting

- 6.1. All adoptable roads will be lit using a specification and/or design brief issued by West Sussex Council (WSC) with the lighting levels normally based on the selection criteria found in the tables of this document.
- 6.2. The Developer has no control over the type of street lighting on the highway but the Lighting Authority will specify modern LED luminaires.
- 6.3. The LED luminaires have 0% direct upward light (skyglow control) and are commonly required to have a minimum luminous intensity class of G3 (glare control).
- 6.4. The Designer will seek to use this equipment in an arrangement to reduce light trespass i.e., avoid placing columns in front of first floor windows where possible

7. Privately maintained street lighting

- 7.1. In areas where the lighting is not to be adopted such as private driveways and courtyards, the Developer can provide additional 'private' lighting to these areas for security. These can take the form of street lighting columns, bollards and wall mounted bulkhead units in confined apartment block courtyards.
- 7.2. Although there is more freedom in specifying equipment types, the lighting should still adopt the same lighting principles as the adoptable lighting and minimise light pollution.
- 7.3. The use of column mounted lighting can achieve the criteria set out in the BS 5489 road lighting standard in terms of horizontal illuminance as well as vertical illuminance where required.
- 7.4. Vertical illuminance for facial recognition is normally required where enhanced surveillance is deemed necessary.
- 7.5. Bollards are predominantly used to highlight pathways and are not relied upon to provide vertical illuminance thus not meeting the criteria set out in the BS 5489.

7.6. Used correctly, bollards can offer improved guidance and safe passage along footways and very low speed roadways set off the highway.

7.7. Lighting should be used sparingly in these often peripheral and confined locations around a new development but should also strike a balance with providing improved feeling of safety.

8. Domestic exterior lighting

8.1. It is quite common for each new property to be built with porch lighting. In these circumstances the specifier should seek to use fixtures with no upward light output. If in doubt, guidance can be sought in the ILP Publication - Guidance Note 9 Domestic exterior lighting: getting it right.

9. Street lighting design class selection

9.1. The majority of Lighting Authorities within the UK apply the BS 5489 road lighting standards to determine the levels of illumination.

10. Environmental Zone

10.1. Firstly, the appropriate environmental zone is chosen. The Woodgate Road site is located in a rural location and would likely be situated in the E2 zone highlighted in green below.

Environmental Zone			
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 of suburban locations
E4	Urban	High district brightness	Town / City centres with high levels of night-time activity

Table 1

11. Lighting Classes

- 11.1. Once the environmental zone has been established the lighting class can be determined based on the traffic composition and speed limit of the road.
- 11.2. The proposed lighting class for the spine road (housing estate access) would be P5 as highlighted in table 2 below.
- 11.3. For private lighting within areas such as shared driveways, the Designer may apply a risk assessment to support reducing the lighting levels by one class. The shared surface or private areas can therefore be reduced to P6.

BS5489-1:2020 - Table A.5 - Lighting Classes for subsidiary roads			
Traffic Flow	E1 to E4	E1 to E2	E3 to E4
	Pedestrian and cyclists only	Speed limit v $\nless30$ mph	Speed limit v $\nless30$ mph
Busy (Local amenities, bus route)	P5	P4	P3
Normal (Housing estate access)	P5	P5	P4
Quiet (Residential road)	P6	P5	P4

Table 2

12. Lighting Equipment

12.1. Table 3 below lists the equipment specified on the lighting assessment drawing 100255-J LD-AS MT-DR-0001 submitted with this report.

Location	Type	Luminaire	Switching	Dimming	Cowling
Adoptable highway	6m column	West Sussex LED Road lighting unit	Dusk til dawn - Photocell or CMS	West Sussex Council specification	None. Flat glass and directional LED optic alternative
Adoptable shared surface	5m column	West Sussex LED Road lighting unit	Dusk til dawn - Photocell or CMS	West Sussex Council specification	None. Flat glass and directional LED optic alternative.
Boundary Areas	5m column	LED road lighting unit with rear shield	Dusk til dawn - Photocell or CMS	West Sussex Council specification	Luminaire or column mounted shield
Private Drives	Bollard or building mounted domestic	LED	Dusk til dawn	None.	No upward light fixtures recommended

Table3

13. Calculation and software

13.1. Lighting Reality version 2.2.0 has been used to plot the horizontal illuminance values as illustrated on the lighting assessment drawings.

13.2. AGI32 version 20.3 has been used to confirm the direct upward light from the luminaires. The maximum allowable for an E2 zone is 2.5%.

14. Results

14.1. It can be seen on the lighting assessment drawing that no light spill over 1 lux occurs in the horizontal plane beyond the boundary of the site.

14.2. The luminaires used in the production of this assessment have been confirmed as giving no direct upward light into the sky.

15. Recommendations

15.1. Across the development, specifiers and occupants should collectively seek to reduce the amount of light used. This can be achieved by some simple measures:

- ¿ Use only the necessary amount of light for the task
- ¿ Use fixtures with no direct upward light emission
- ¿ If optimum positions cannot be found, consider use of shields
- ¿ Switch off unnecessary lighting late at night

16. References

BS 5489:2013-1 Code of practice for the design of road lighting

EN 13201:2015 Guidelines on the selection of lighting classes

ILP Guidance Note 01/20 - Guidance Notes for the Reduction of Obtrusive Light

ILP Guidance Note 9 Domestic exterior lighting: getting it right