

2	SITE ASPECTS	2.3 EMISSIONS FROM THE SITE
		SA 15 LIGHT POLLUTION
	EXCLUSIONS	None.
	OBJECTIVE	Ensure that exterior lighting does not create unwanted and unnecessary light pollution.
	CREDITS ATTAINABLE	1
	PREREQUISITES	None.
	CREDIT REQUIREMENT	1 credit for demonstrating that obtrusive light from exterior lighting meets the specified performance for the environmental zone in which the building development is located.
	ASSESSMENT	<p data-bbox="502 701 1374 813">The Client shall provide evidence that the site and building lighting installations comply with the criteria given in the reference publications through submission of detailed measurements, calculations and/or modelling studies carried out by a suitably qualified person. 1</p> <p data-bbox="502 835 1374 947">Compliance is achieved when the designs are within the maximum figure for each parameter (sky glow, light into windows, source intensity, and building luminance), taken from Tables 2.1 to 2.6 in CIE 150 [1], Table 1 in CIBSE Factfile7 [2], or Table 1 in ILE Guidance Notes [3]. 2</p>
	BACKGROUND	Outdoor and public area lighting is necessary for illuminating public connections between premises, buildings and facilities to ensure the security and safety of users. Light pollution [4,5] may be regarded as waste light from lighting schemes that produces glare, obscures the night sky, adversely effects nocturnal ecosystems, and may intrude on neighbouring properties.

- 1 International Commission on Illumination. Guide on the limitation of the effects of obtrusive light from outdoor lighting installations. Technical Report CIE 150:2003.
- 2 Chartered Institution of Building Services Engineers. Environmental Considerations for Exterior Lighting. Factfile No.7, 2003. <http://www.cibse.org/pdfs/fact72003.pdf>
- 3 The Institution of Lighting Engineers. Guidance notes for the reduction of obtrusive light . <http://www.britastro.org/dark-skies/pdfs/ile.pdf>
- 4 International Dark-sky Association. Information Resource. <http://www.darksky.org/resources/>
- 5 International Commission on Illumination. Guidelines for Minimising Sky Glow. Technical Report CIE 126: 1997.

The brightness of advertising signs is also a concern [6]. The following table is taken from CIBSE Factfile 7 [2] :

Obtrusive light limitations for exterior lighting installations

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Environmental Zone	Sky Glow ULR (Max %)	Light into Windows Ev (Lux) (1)		Source Intensity I (kcd) (2)		Building Luminance Before curfew (3)
		Before curfew	After curfew	Before curfew	After curfew	Average L (cd/m ²)
E1	0	2	1(4)	2.5	0.5 (4)	0
E2	2.5	5	1	7.5	0.5	5
E3	5	10	2	10	1	10
E4	15	25	5	25	2.5	25

The definitions of the four zones are:

E1: Intrinsically dark areas: National Parks, Areas of Outstanding Natural Beauty, etc.

E2: Low district brightness areas: rural or small village locations.

E3: Medium district brightness areas: small town centres or urban locations.

E4: High district brightness areas: town/city centres with high levels of night-time activity.

ULR = Upward Light Ratio of the Installation and is the maximum permitted percentage of luminaire flux for the total installation that goes directly into the sky.

Ev = Vertical Illuminance in Lux normal to window glazing

I = Light Intensity in Kilo-Candelas

L = Luminance in Candelas per Square Metre

Notes:

(1) These values are suggested maximums for any window. So any new lighting will have to produce less than this value if there is any existing light trespass at a specific window.

(2) This is the intensity going beyond the area being lit from any single source in the potentially obtrusive direction. The figures given are for general guidance only and for some large sports lighting applications with limited mounting heights may be difficult to achieve.

(3) This should be limited to avoid over lighting, and relates to the general district brightness. In this reference building luminance is applicable to buildings directly illuminated as a night-time feature as against the illumination of a building caused by spill light from adjacent floodlights or floodlights fixed to the building but used to light an adjacent area although this should be kept to a minimum.

(4) Acceptable from public road lighting and other safety lighting installations only, zero for all other lighting types.

Q32. SA 14 and SA 15, For BEAM Plus New Buildings Version 1.1 and 1.2, for developments with more than one building, if the neighbouring building(s) within the site is/are regarded as sensitive receiver(s), shall it/they be considered in the above assessments?

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Yes. (Released on 1 June 2015)

Q33. SA 15, For BEAM Plus New Buildings / Existing Buildings Version 1.1 and 1.2, what should be submitted during the provisional Assessment stage to demonstrate the compliance for this credit?

Tender specification, preliminary lighting simulation, justification for the chosen environmental zone, detailed strategy and methodology should be provided to demonstrate that obtrusive light from exterior lighting meets the specified performance for the environmental zone. (Released on 27 October 2014)

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Q34. SA 15 – For BEAM Plus New Buildings Version 1.1 & 1.2, projects being located at urban fringe areas with more than 50% of their project boundaries facing rural context, will the environmental zones be considered as E2 or E3?

Environmental zones shall be regarded as E2 for projects being located at urban fringe areas with more than 50% of their project boundaries facing rural context. (Released on 13 May 2016)

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