

## LS-R4: Light Pollution Mitigation

### Intent

To reduce night time light pollution and its associated impacts on human and ecological health.

### Credit Requirements

#### GENERAL

Demonstrate that the following lighting requirements are met:

#### Exterior lighting:

- All non-safety and non-security public realm lighting must be automatically switched off between 23.00hrs and 07.00hrs and outside these hours if daylight levels are sufficient.
- If safety lighting is provided and will be used between 23.00hrs and 07.00hrs, this part of the lighting system must comply with the lower levels of lighting recommended during these hours by IESNA RP-33-99 and IES RP-8. For example by using an automatic switch to reduce the lighting levels at 23.00hrs or earlier.
- If security lighting is provided, it must be activated using motion sensors with threshold and time-off adjustment so that luminaires only activate when someone is in the immediate area and turn off a reasonable time after motion is no longer detected.

#### Lighting levels at the site boundary and beyond:

- All projects must be classified under one of the zones defined in the IECC 2009 Exterior Lighting Table 505.6.2(1). The exterior lighting must be designed to meet the following requirements:

Table LS-R4a: Lighting Design Requirements

Lighting Zone**	Max Initial Illuminance at site boundary (Lux)	Max Initial Illuminance at specified distance beyond site boundary (Lux)	Max % direct up-light	Max Light Trespass into windows (vertical Lux)		Max Luminaire Source Intensity (kcd)		Max Surface Luminance (cd/m <sup>2</sup> )
				07.00 to 23.00 hrs.	23.00 to 07.00 hrs.	07.00 to 23.00 hrs.	23.00 to 07.00 hrs.	Average
LZ1	<1	n/a	0%	2	1*	2.5	0	2.5
LZ2	1.1	<1 at 3m	2%	5	1	7.5	0.5	5
LZ3	2.2	<1 at 4.5m	5%	10	2	10	1	10
LZ4	5	<1 at 7.5m	15%	25	5	15	2.5	15

\* Allowed from public road lighting installations only.

\*\* Where the site boundary lies adjacent to a Lighting Zone of a lower category, the requirements of the lower category must be met at and beyond that boundary.

#### ADDITIONAL REQUIREMENT/CLARIFICATIONS

High structure aircraft hazard lights are excluded from the calculations.

Feature lighting may be excluded from these requirements where a specialist lighting consultant has recommended their inclusion in order to protect illuminated visual elements/character as part of artwork. Any exemption from the credit requirements is subject to UPC approval.

#### Sports and Recreational Public Open Spaces

Floodlighting for sports facilities, that is only activated during sporting events between 07.00hrs and 23.00hrs only need to comply with the Max Light Trespass into windows (vertical lux) requirements of Table LS-R4a for residential buildings in line of sight of the sports facility.