

Light Pollution

Aim of the Credit

To reward projects that minimise light pollution.

Credit Criteria

1	Control of the Obtrusive Effects of Outdoor Lighting	1 point is awarded for project where the lighting design must complies with AS 4282 'Control of the Obtrusive Effects of Outdoor Lighting'
2	Reduction in Light Pollution	<p>1 point is awarded where a reduction in light pollution where it can be demonstrated that either:</p> <p>2a Relative to its particular mounting orientation, no external luminaire has an Upward Light Output Ratio that exceeds 5%;</p> <p>OR</p> <p>2b Direct illuminance from external luminaries produces a maximum initial point illuminance value no greater than 0.5 Lux to the site boundary and no greater than 0.1 Lux to 4.5 metres beyond the site into the night sky, when modelled using a calculation plane set at the highest point of the building.</p>

Compliance Requirements

1 - Control of the Obtrusive Effects of Outdoor Lighting

AS 4282 'Control of the Obtrusive Effects of Outdoor Lighting' provides guidance on how to achieve this credit.

2 – Reduction in Light Pollution

2a Upward Light Output Ratio

"Upward Light Output Ratio" is defined as per AS1158.0:2005 as: The ratio of the luminous flux emitted by a luminaire above the horizontal to that emitted by the lamp.

Project teams must show that the Upward Light Output Ratio (ULOR) provided in the compliance documentation, is given relative to the mounting orientation of the luminaire. A

luminaire with an ULOR ratio as nominated in a manufacturer's data sheet will have a different ULOR ratio when the mounting orientation of the luminaire is changed. In the event that any external luminaire is mounted in an orientation other than the one assumed by the manufacturer, the ULOR must be recalculated and provided to Green Star Certified Assessors.

2b Direct Illuminance

Calculation Plane

The calculation plane must cover the area between the site boundary and building façade or vertical service to be illuminated. The horizontal calculation plane should be set at top of the building fabric – excluding spires. Calculation plane grid points to be in 0.5m spacing. All illumination results to be reported to 2 decimal places. Calculation plane 1 to extend to site boundary – maximum 0.50 Lux direct illumination at any point using initial lamp lumens. Calculation plane 2 to extend from the site boundary to 4.5m beyond the site boundary – maximum 0.10 Lux direct illumination at any point using initial lamp lumens.

Awnings

Awnings can be used as a means of achieving compliance with the 5% ULOR requirement where a section drawing showing the light output of the luminaire can be provided, and where the awning has the effect of blocking 95% of the output of the lamp above the horizontal. Where it is not clear that the awning is a permanent structure, points of this credit may not be awarded.

Emergency Lighting

The following may be excluded from the requirements of this credit:

- Signage related to emergency exits; and
- Emergency lighting (external) that only illuminates in the event of an emergency/power failure.

External emergency lighting that is integrated into the general external lighting scheme must comply with the requirements of the credit. E.g. lights that act as general lighting but have a battery pack to ensure that they stay on in the event of a power failure.

External lighting

In addition to other types of external lighting, luminaries in the following locations are considered to be external for the purposes of this credit:

- Inside glazed atria; and
- On the uppermost (uncovered) deck of an outdoor car park.

Documentation Requirements

‘Design Review’ Submission (Optional)

Project teams are to submit the documentation marked with an asterisk* for ‘design review’

As Built Submission

All project teams are to submit the following documentation:

Submission Template*

- Description of how the credit criteria have been met*
- Confirmation that the lighting has been designed in accordance with AS 4282*
- Confirmation that the no external luminaire has an Upward Light Output Ratio that exceeds 5% **or** Direct illuminance from external luminaires produces a maximum initial point illuminance value no greater than 0.5 Lux to the site boundary and no greater than 0.1 Lux to 4.5 metres beyond the site into the night sky

Project teams are required to provide documentation supporting credit compliance. The following documents may be used to demonstrate compliance:

- **As Built Site plan** indicating the location of all external luminaires and showing the aiming point and mounting orientation of all external luminaires.
- **Luminaire schedule** for all external lighting, nominating the type, lighting distribution and quantity of each luminaire and including the relevant photometric data showing that the luminaires do not have an upward light output ratio that exceeds 5%.
- **Calculation Plots** for all external lighting, showing that all grid points on the calculation plane return a maximum reading of 0.5 Lux to the site boundary and no greater than 0.1 Lux to 4.5m beyond the site into the night sky.

Please provide feedback on the technical content of this credit: