

## SS Credit 8: Light Pollution Reduction

### 1 Point

#### Intent

Minimize light trespass from the building and site, reduce sky-glow to increase night sky access, improve nighttime visibility through glare reduction, and reduce development impact on nocturnal environments.

#### Requirements

##### FOR INTERIOR LIGHTING

The angle of maximum candela from each interior luminaire as located in the building shall intersect opaque building interior surfaces and not exit out through the windows.

OR

All non-emergency interior lighting shall be automatically controlled to turn off during non-business hours. Provide manual override capability for after hours use.

AND

##### FOR EXTERIOR LIGHTING

Only light areas as required for safety and comfort. Do not exceed 80% of the lighting power densities for exterior areas and 50% for building facades and landscape features as defined in ASHRAE/IESNA Standard 90.1-2004, Exterior Lighting Section, without amendments.

All projects shall be classified under one of the following zones, as defined in IESNA RP-33, and shall follow all of the requirements for that specific zone:

##### **LZ1 — Dark (Park and Rural Settings)**

Design exterior lighting so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 0.01 horizontal and vertical footcandles at the site boundary and beyond. Document that 0% of the total initial designed fixture lumens are emitted at an angle of 90 degrees or higher from nadir (straight down).

##### **LZ2 — Low (Residential areas)**

Design exterior lighting so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 0.10 horizontal and vertical footcandles at the site boundary and no greater than 0.01 horizontal footcandles 10 feet beyond the site boundary. Document that no more than 2% of the total initial designed fixture lumens are emitted at an angle of 90 degrees or higher from nadir (straight down). For site boundaries that abut public rights-of-way, light trespass requirements may be met relative to the curb line instead of the site boundary.

**LZ3 — Medium (Commercial/Industrial, High-Density Residential)**

Design exterior lighting so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 0.20 horizontal and vertical footcandles at the site boundary and no greater than 0.01 horizontal footcandles 15 feet beyond the site. Document that no more than 5% of the total initial designed fixture lumens are emitted at an angle of 90 degrees or higher from nadir (straight down). For site boundaries that abut public rights-of-way, light trespass requirements may be met relative to the curb line instead of the site boundary.

**LZ4 — High (Major City Centers, Entertainment Districts)**

Design exterior lighting so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 0.60 horizontal and vertical footcandles at the site boundary and no greater than 0.01 horizontal footcandles 15 feet beyond the site. Document that no more than 10% of the total initial designed site lumens are emitted at an angle of 90 degrees or higher from nadir (straight down). For site boundaries that abut public rights-of-way, light trespass requirements may be met relative to the curb line instead of the site boundary.

**Potential Technologies & Strategies**

Adopt site lighting criteria to maintain safe light levels while avoiding off-site lighting and night sky pollution. Minimize site lighting where possible and model the site lighting using a computer model. Technologies to reduce light pollution include full cutoff luminaires, low-reflectance surfaces and low-angle spotlights.

## SS Credit 7

## Light Pollution Reduction

### 1 Point

#### Intent

Eliminate light trespass from the building and site, improve night sky access and reduce development impact on nocturnal environments.

#### Requirements

##### Option A

- Light to the Night Sky
  - Shield all outdoor luminaries 50 watts and over so that they do not directly emit light to the night sky.
- OR
- Provide calculations showing that less than 5% of light emitted by all outdoor lighting reach the night sky on an annual basis.
- Light Trespass
  - With the building interior, exterior and site lights on and off, measure the illumination levels at the same locations at regular intervals around the perimeter of the property. At least eight measurements are required with documentation that the measurements made are sufficient in quantity to be representative of the illumination levels on the perimeter of the property. The property perimeter illumination levels measured with the lights on must not be more than 10% above the levels measured with the lights off.
- Performance
  - Provide records and results of quarterly inspections to determine if required features are being maintained.

##### Option B

- Light to the Night Sky
  - Shield all outdoor luminaries 50 watts and over so that they do not directly emit light to the night sky.
- OR
- Provide calculations showing that less than 5% of light emitted by all outdoor lighting reach the night sky on an annual basis.
- Light Trespass
  - Provide calculations showing that the maximum candela value of all interior lighting falls within the building (not out through windows) and the maximum candela value of all exterior lighting falls within the property. Provide documentation that all luminaires within a distance of 2.5 times their mounting height from the property line have shielding that allows less than 5% of the light from these fixtures to cross the property boundary.
- Performance
  - Provide records and results of quarterly inspections to determine if required features are being maintained.

### **Submittals – Initial LEED-EB Certification**

#### **Option A**

- Provide documentation showing that the requirements for Option A have been met.

#### **Option B**

- Provide documentation showing that the requirements for Option B have been met.

### **Submittals – LEED-EB Re-Certification**

Provide an update of previous filings:

- If changes have occurred that affect the site or building lighting, provide updated documentation that the site or building lighting continues to meet the certification submittal requirements for Option A or B.

Provide performance documentation:

- Provide records and results of quarterly inspections over the performance period to show that the requirements for Option A or B continue to be maintained.

### **Potential Technologies & Strategies**

Implement site lighting criteria to maintain safe light levels while avoiding off-site lighting and night sky pollution. Minimize site lighting where possible and model the site lighting using a computer model to predict impacts when changing lighting. Technologies to reduce light pollution include full cutoff luminaires and low-reflectance surfaces.