Heat Resilience

Resilient

Credit: 19

Points: 1

Outcome

The building reduces its impact on heat island effect.

Criteria

Credit Achievement	**1 points**	• At least 75% of the whole site area comprises of one or a combination of strategies that reduce the heat island effect.

Additional information

Stage implementation

Strategy | Brief | Concept | **Design** | **Tender** | **Construction** | Handover | Use

Synergies with other credits

- Contribution to Place
- Enjoyable Places
- Climate Change Resilience
- Operations Resilience
- Community Resilience

Sustainable Development Goals

- Goal 11 (Sustainable Cities and Communities)

Relevant reporting initiatives

- TCFD

Requirements

Credit Achievement

The project must comply with the following criteria:

- Heat Island Reduction

Heat Island Reduction

The strategies that can be used to reduce the heat island are:

- Vegetation
- Green roofs
- Roofing materials, including shading structures, having the following:
  - For roof pitched <15°– a three-year SRI of minimum 64
  - For roof pitched >15°– a three-year SRI of minimum 34
- Unshaded hard-scaping elements with a three-year SRI of minimum 34 or an initial SRI of minimum 39
- Hardscaping elements shaded by overhanging vegetation
- Water bodies and/or water courses

The area of the site that is shaded by permanent structures (e.g., part of a car park to the south of a tall building) at noon local time at the summer solstice are also deemed compliant.

Submission content

Submissions for this credit must contain:

- **Submission form**
- **Evidence** to support claims made in the submission

Recommended evidence:

- Site Plan highlighting all relevant areas as referenced within the area schedule
- Area Schedule listing the areas of each of the relevant site elements and where relevant, the SRI values and referencing plan drawings for the site
- Supplier Documentation material data sheet for compliant roofing and hardscape materials

Alternate documentation can also be used by project teams to demonstrate compliance.

The recommended evidence listed above is applicable to the as built submission. See the Design Assessment Design Assessment section in the Introduction for more information on submitting evidence for the Design assessment.

The key requirement is that evidence is provided to support each claim made within the Submission form.

Guidance

Selection of hardscape materials

Hardscape paving materials are defined as all materials in roads, plazas, paths, and open unshaded car parks. Typical initial SRI values are provided below for reference. These typical SRI values are provided as a guide only and cannot be used to demonstrate compliance with this credit.

- Grey concrete: 35
- White concrete: 86
- Standard white paint: 100
- Standard black paint: 5
- New asphalt: 0

Project-specific SRI values must be identified for the materials used in the project.

Where the three-year Solar Reflectance Index (SRI) for products is not available, use the following:

- For roof pitched <15° – an initial SRI of minimum 82
- For roof pitched >15° – an initial SRI of minimum 39

Solar hot water and Photovoltaic panels

Although these roof structures have low SRI values, given the nature of their function, they provide a source of low-emission energy production which results in flow-on sustainability benefits. These features are to be excluded from the calculation of site area percentages for both compliant and non-compliant areas.

The surface area in plan view covered using solar hot water or photovoltaic panels should be subtracted from the total site area of the project. At least 75% of the remaining site area must meet the compliance requirements for this credit to be claimed.

Shaded at summer solstice

This is an accepted pathway because the sun tracks North in the Southern hemisphere, causing buildings to cast shadows to the South. Any areas that are shaded by the building at noon local time at the summer solstice can be included in the calculation as the shadows will be the shortest on this day.

Overhanging vegetation

For overhanging vegetation to qualify, it must provide shading all year round. Vegetation that provides seasonal shading cannot count towards compliance.

Green roof

Only areas of the roof that are covered by plants or vegetation (either through landscaping or planter boxes) may contribute towards the compliant areas. In the case of planter boxes, evidence of their installation or purchase must be provided at the time of submission.

Accessible roof terrace or balcony

Where a roof terrace or balcony is expected to be occupied or have pedestrian traffic, the roof terrace or balcony must be classified as a hardscape element on the ground floor.

Skylights

Project teams may exclude the skylights from the calculations of the area when assessed in a plan view. Glazing over an atrium or void qualifies as a skylight. These features are to be excluded from the calculation of site area percentages for both compliant and non-compliant areas.

Translucent polycarbonate roof sheeting

Translucent polycarbonate roof sheeting can be excluded from the calculation of site area percentages. The surface area in plan view covered by translucent roof sheeting may be subtracted from the total site area of the project for both the compliant and non-compliant areas. This is on the following condition(s):

- The translucent roof area is to comprise no more than 20% of the overall roof area

- At least 75% of the remaining site area must meet the compliance requirements for this credit to be claimed
- The project team must demonstrate how the translucent roof sheeting has other flow-on sustainability benefits that make it equivalent to solar hot water and photovoltaic panels

Definitions

Green Roofs

A green roof is defined as a roof of a building that is partially or completely covered with vegetation and a growing medium.

Heat Island Effect

The heat island effect describes the condition where built-up areas have a higher average temperature than its rural surroundings owing to the make-up of the built environment.

Solar Reflectance Index (SRI)

The Solar Reflectance Index (SRI) is a composite measure of a material's Total Solar Reflectance (TSR) and thermal emittance. It is calculated in accordance with ASTM E1980-11. To calculate the SRI, the material or product's emittance values and total solar reflectance must be known. Material suppliers often provide the SRI data for products.

There are several online calculators following ASTM standard E1980-11 that can be used.

An initial SRI refers to the SRI of a new product. Over time the SRI of a product or surface will be reduced due to the material's exposure to the elements. The rate of degradation over time from such exposure is measured by the SRI of the product at three years.

Unshaded hardscape

Unshaded hardscape is defined as hardscape that is not shaded by vegetation or roof structures and includes roads, plazas, paths and open unshaded car parks and sports fields. Hard scaping excludes roof areas.

Vegetation

Vegetation is defined as landscaped areas, parkland, green space, and trees, whether new or pre-existing on the site. Shading from newly planted trees is measured based on predicted spread at five years after planting.

Water bodies and water courses

Water bodies and other permanent (non-ephemeral) watercourses are to be measured to the highest level of the water body or watercourse. Artificial pools are considered a water body.

Supporting information

The following resource supports this credit:

- ASTM E1980-11 Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces