

Cambridge Cool Factor Guidance

Strategies Definitions and Prerequisites

This document provides definitions and prerequisites of each strategy on the Cool Factor Score Sheet. It is intended to aid the applicant in choosing and implementing Cool Factor strategies in their site and building design. This document is organized by the same categories and order as the Cool Factor Score Sheet. Categories and strategies are numbered as follows Category:Strategy (A:1, A:2; B:1, B:2). Strategies are in blue.

A: PRESERVATION of EXISTING TREES

Existing trees are trees that are preserved and protected onsite during the construction process. Because of their maturity, existing trees often provide more shade than young trees, which is why they receive a relatively high multiplier on the score sheet. In order to receive credit, existing trees must be in good health. Existing tree size is defined by the canopy width at the time of score sheet submittal

A1: Existing Tree, less than 6' canopy spread

A2: Existing Tree, 6'-15' canopy spread

A3: Existing Tree, 15' + canopy spread

A: NEW and TRANSPLANTED TREES

New trees and transplanted trees are brought from offsite and planted. Because these are young trees, it may be several years before they form a mature canopy which contributes to shading of the site. Therefore, they receive a smaller multiplier than preserved existing trees.

A4: Small New and Transplanted Trees: canopy spread 8' to 15' at maturity. Assumed area of 75 sq ft per tree.

Prerequisite: 400 cu ft of soil/tree. Examples include Serviceberry (*Amelanchier Canadensis*), Eastern Redbud (*Cercis Canadensis*), Cornelian-cherry dogwood (*Cornus mas*)

A5: Medium New and Transplanted Trees: canopy spread 16" to 24' at maturity. Assumed area of 250 sq ft per tree.

Prerequisite: 600 cu ft of soil/tree. Examples include American hornbeam (*Carpinus caroliniana*), Golden Raintree (*Koelreutaria paniculara*), Red Horsechestnut (*Aesculus x carnea*)

A6: Large New and Transplanted Trees: canopy spread 25' to 30' at maturity. Assumed area of 500 sq ft per tree.

Prerequisite: 800 cu ft of soil/tree. Examples include Pin oak (*Quercus palustris*), Kentucky Coffeetree (*Gymnocladus dioicus*), American Linden (*Tilia Americana*)

B: PLANTING AREAS

Planting areas may include lawn, perennials or groundcovers, or woody plants, such as shrubs. Planting areas are divided into categories based on the plants' mature height. Taller plants contribute more to relative temperature reduction, which is why plants taller at maturity receive a higher multiplier. Permanent above grade planters may be counted for credit. Movable planters may not be counted for credit.

Examples of herbaceous plants (plants without persistent woody stems) include Little Blue Stem (*Schizachyrium scoparium*), New England Aster (*Aster novae-angliae*), Foamflower (*Tiarella cordifolia*). Examples of woody plants (plants with hard stems) include Winterberry (*Ilex verticillata*), Summersweet (*Clethra anifolia*), Oakleaf hydrangea (*Hydrangea quercifolia*)

B1: Lawn Area: Sod or tall grasses, 8" soil depth or less

B2: Low Planting Area: Herbaceous or woody plants less than 2' tall at maturity, 12" soil depth is required.

B3: Planting Area: Herbaceous or woody plants more than 2' tall at maturity can include intensive green roof, 18" soil depth is required.

C: GREEN FACADE + LIVING WALL

Green facades and living walls are living vertical systems that contain plant species or planting medium.

C1: Green Facade: are usually vines or climbing species that attach themselves to a lattice, cable, mesh, or existing wall. Some species need vertical support structures while others do not. These support systems are usually in addition to the façade itself.

Minimum requirements to receive credit:

- **Provide a minimum 15' wide and 10' tall structure for vines that need a support system.**
- **Plant species based on their recommended spacing to cover at least 15' wide wall segment for vines that do not need support.**
- **Green facades can receive a maximum credit equivalent to the expected coverage over a 5 to 10-year period or the area of the support structure, whichever is smaller.**
- **Soil requirements: minimum 6 cu ft per plant**

C2: Living Wall: are comprised of plants that are potted growth medium. These systems are usually more intensive because they require special structures to hold the soil volume. **An irrigation system is required to receive the credit.**

C: GREEN ROOFS

Green Roof: “lightweight with a shallow layer of growing substrate of less than 8” deep, requiring minimal maintenance. They generally have lower water requirements and use small, low-growing plant species, particularly succulents.” (*Growing Green Guide*)

Intensive Green Roof: “generally heavier, with a deeper layer of growing substrate, and support a wider variety of plant types. Intensive green roofs need more irrigation and maintenance than extensive roofs, and are highly engineered landscapes, often built directly on structures with considerable weight load capacity.” (*Growing Green Guide*)

C3: Green Roof: low soil volume planting such as succulents and grasses, minimum 4” soil depth

C4: Short Intensive Green Roof: less than 2’ tall at maturity, herbaceous and woody plants, minimum 18” soil depth

C5: Intensive Green Roof: greater than 2’ tall at maturity, herbaceous and woody plants, minimum 24” soil depth (trees counted separately)

D: PAVING

Cool Paving: “Solar reflective cool pavements stay cooler in the sun than traditional pavements. Pavement reflectance can be enhanced by using reflective aggregate, a reflective or clear binder, or a reflective surface coating.” (*Berkeley Lab, Heat Island Group*)

Solar Reflective Index: “The SRI is a composite score of solar reflectance and thermal emittance. Solar reflectance, or albedo, is the percentage of solar energy reflected by a surface (Hui Li Ph.D., P.E., In *Pavement Materials for Heat Island Mitigation*, 2016). Thermal emittance characterizes the surface capability to reemit the previously absorbed heat away from itself (A.L. Pisello, in *Eco-Efficient Materials for Mitigating Building Cooling Needs*, 2015).

D1: High-SRI Paving: Paving with SRI 39 or higher (LEED, V4)

D: SHADE STRUCTURES

D2: High-SRI Shade structures may include fabric, tensile shade structures as well as hard-material structures. **The shade structure material must meet a requirement of SRI 39 or higher (LEED, V4).**