APRIL 2025

GUIDANCE NOTE
GREEN FACTOR TOOL

CITY OF MELBOURNE

Acknowledgement of Traditional Owners

The City of Melbourne respectfully acknowledges the Traditional Owners of the land we govern, the Wurundjeri Woi Wurrung and Bunurong Boon Wurrung peoples of the Eastern Kulin and pays respect to their Elders past, present and emerging.

We acknowledge and honour the unbroken spiritual, cultural and political connection the Wurundjeri, Bunurong, Dja Dja Wurrung, Taungurung and Wadawurrung peoples of the Eastern Kulin have to this unique place for more than 2000 generations.

We are committed to our reconciliation journey, because at its heart, reconciliation is about strengthening relationships between Aboriginal and non-Aboriginal peoples, for the benefit of all Victorians.

CONTENTS

29 April 2025

INTRODUCTION

Purpose of this Document

The Green Factor Tool Guidance Note has been prepared by the City of Melbourne to explain how the Green Factor tool works.

The Guidance Note provides:

- An overview of green infrastructure and its key concepts.
- A detailed explanation of the Green Factor tool.
- An explanation of how the parameters, weightings and workings of the Green Factor tool scoring regime achieve a final Green Factor score.

The Guidance Note will support the use of the Green Factor tool in accordance with the Melbourne Planning Scheme.
The audience of the Guidance Note comprises planners, landscape architects, designers and Environmentally Sustainable Design consultants.

The City of Melbourne encourages applicants to discuss their use of the Green Factor tool during pre-application meetings.

How to Use this Document

The **Green Infrastructure Matters** section provides a simple explanation of the key concepts of green infrastructure fundamental to the Green Factor tool.

The **Green Factor Tool** section explains the purpose of the Green Factor tool, how it was developed and how it is used.

The following two sections are intended for users of the Green Factor tool. These sections step out the inputs required and explain how they relate to the scoring regime:

- **Basic Inputs** steps through the inputs on the About Your Site page.
- **How Scoring Works** provides an explanation of how the Green Factor score is calculated with reference to a simple example.

GREEN INFRASTRUCTURE MATTERS

Green Infrastructure

As Melbourne becomes a denser city, green infrastructure such as green roofs, walls and facades can provide greening where space is constrained.

Green infrastructure comprises the vegetation, soil and irrigation elements of a development.

This can include trees, plants, soil and raingardens for drainage.

Green infrastructure is an important component of the City of Melbourne's response to climate change because it cools buildings and public spaces, reduces the risks of flooding and provides habitat for animals.

Green infrastructure also supports the economy by providing attractive and memorable places for people – boosting local business, attracting visitors and improving liveability for residents.

The greening of cities is a pressing concern in Australia and worldwide. Despite growing evidence for the need for urban nature globally, urban flora and green coverage in cities are declining (Bush 2021). While local governments can engage in the management of parks, gardens, streets and other public spaces, much of the loss of urban greenery has occurred in the private realm. Two-thirds of land within the City of Melbourne is privately owned.

To achieve goals of increasing biodiversity, habitats and ecosystem health, it is necessary for nature to be continuous over both private and public land. This continuity creates greater ecosystem function benefits than fragmented e elements. To improve urban greenery on private land, several cities have created green infrastructure assessment tools for use in the planning and design of new buildings and developments.

Bush, J, et all 'Integrating Green Infrastructure into Urban Planning: Developing Melbourne's Green Factor Tool' in Urban Planning, Vol 6, Issue 1, pp. 20-25. (2021)

Ecosystem Functions

Research into green infrastructure has categorised its benefits into the following ecosystem functions:

Urban temperature regulation

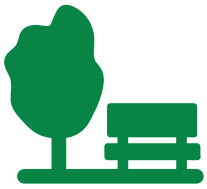
Vegetation can reduce urban heat and contribute to human thermal comfort

Habitat for biodiversity

Vegetation provides habitat for biodiversity

Stormwater runoff mitigation

Vegetation and soil can reduce the quantity of stormwater runoff



Recreation

Vegetation and green space can provide opportunities for recreation

Place values and social cohesion

Vegetation and green space can contribute to the 'sense of place' and facilitate social connections

Aesthetic benefits

Vegetation and green space can contribute to the aesthetics and beauty of a place

Food supply

Vegetation can produce food

Image 1: Australia 108

THE GREEN FACTOR TOOL

What is the Green Factor Tool?

The Green Factor tool allows designers to quantify and benchmark the quality of greening on a building.

The Green Factor tool provides a score which represents the quantity and quality of the green infrastructure of a development, in proportion to the site area. The weighted scoring system allows for the comparison and assessment of projects with a varying design features.

Green infrastructure elements are rated according to their ability to achieve the City of Melbourne's policy objectives which span sustainable building performance, urban ecology and biodiversity, and social health and wellbeing.

The tool's scoring regime is the culmination of research by a team of ecologists, landscape architects and urban forestry experts from the City of Melbourne, the University of Melbourne and expert consultants. The research drew upon international best practice and local data. The capacity for vegetation elements to achieve outcomes in line with City of Melbourne objectives was defined by the ecosystem functions they provide. The tool is non-prescriptive and allows flexibility for designers across different projects.

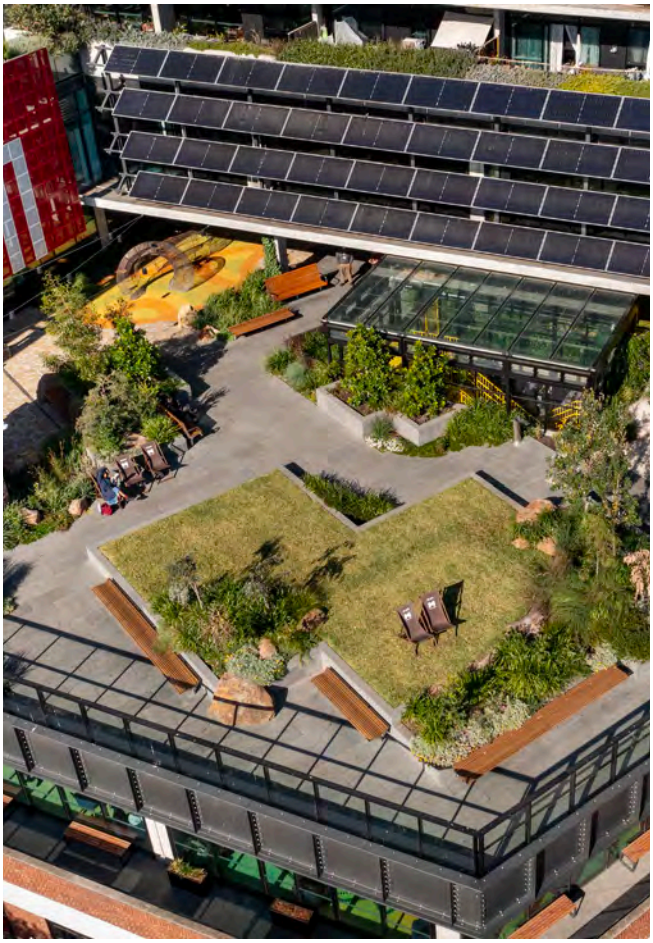


Image 2: narrm ngarrgu library rooftop

How Was the Tool Designed?

The Green Factor tool was designed in collaboration with Hip V. Hype environmental sustainability consultants, with tool and website design by Little Sketches, and input from University of Melbourne and University of Helsinki researchers.

The research process undertook six key steps, as detailed in (Bush, 2021).

1. Identifying key infrastructure functions and types

Vegetation was identified in terms of the ecosystem functions that it provides and by the following types:

- large tree
- medium tree
- small tree
- large shrub
- small shrub
- ground cover
- lawn or turf.

2. Prioritising functions

Researchers held workshops with City of Melbourne staff to identify the role of urban greening alongside existing priorities and objectives, and how to incorporate greening objectives into developments.

3. Researching the evidence base

The researchers created an evidence base for the scores from existing data. Evidence gathered from Melbourne and South East Australia was given a higher weighting to create a context specific dataset.

Rating the vegetation elements for relative delivery of functions

Vegetation was rated from zero (no contribution) to three (major contribution) in terms of its ability to provide functions in the local context. Higher rated vegetation provides higher levels of amenity relative to its size than lower rated vegetation. Examples of relevant factors include being indigenous, providing shade, or providing habitat to fauna.

5. Peer review

The outputs of the research were refined through several workshops with landscape architects, urban ecology researchers, and City of Melbourne staff from landscape and planning teams.

6. Finalisation of tool design and piloting

The tool was released in 2020 ahead of the finalisation of Planning Scheme Amendment C376: Sustainable Building Design to the Melbourne Planning Scheme. At the time of release, the use of the tool was voluntary.

BASIC INPUTS

This section steps out the basic inputs prompted by the Green Factor tool about the site and the project. The inputs relating to the green infrastructure elements are covered in the following section.

Before entering the basic inputs, the user should:

- Understand the exact site area and location. If the project is associated with a planning application, it must be the same site area as the planning application.
- Have a draft landscape plan including a schedule of green infrastructure elements, with the following information:
  - Quantity
  - Area
  - Location on the site
  - Species type (indigenous, native, exotic or productive)
  - Canopy width of trees
  - Height of shrubs
  - Depth of soil or substrate.

Locate Your Site

Select a local government area

Select City of Melbourne

The tool will prompt the user to select a local government area.

This will provide the user the opportunity to upload the project save file directly to the City of Melbourne to assist with assessment of a planning application.

Select 'Start Assessment' to continue

Select 'About your site' to continue

About Your Site

Address or block / lot ID (description of site)

Enter the site. This should be the same site as the planning application

Suburb in City of Melbourne

Select the suburb the site is located in

Site area (in square metres)

Enter the site area (see following page)

Land use and building typology

Select the typology

Planning application number

Enter if known. This may be left blank if the planning application has not been lodged

Urban forest fund application number

Enter if known

Description

Describe the proposal. This description should match the proposal of the planning application.

Entering the Site Area

Depending on the situation, your site area will be the site area of the planning application, the area of the planning unit or the project area.

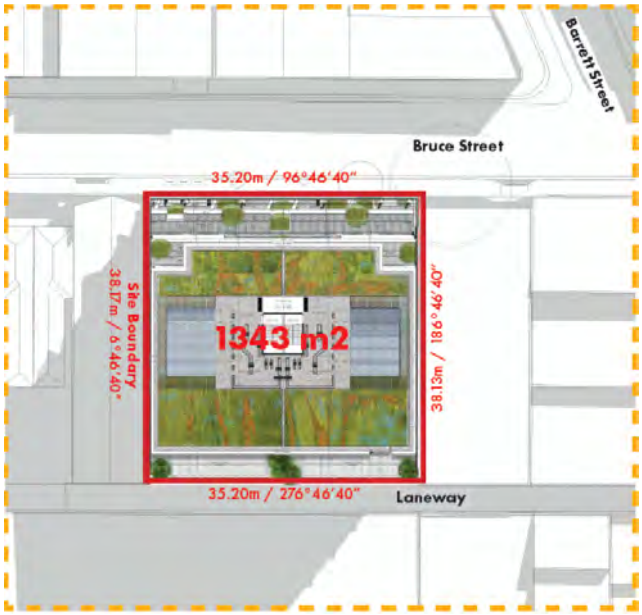
Planning permit application

If the project is associated with a planning permit application, use the site area of the planning application. If the site area is not provided with the certificate of title, then calculations showing site boundary lengths (in metres) and calculated site area (in square metres) should be provided with the application.

If the planning application applies to a smaller area of a larger site then the planning unit should be used and the area (in square metres) should be provided with the application.

Not associated with a planning permit

If the project is not associated with a planning permit application, use the area of the project. If the project area is not the same as the site area on the certificate of title, provide adequate information including the length of project boundaries (in metres), calculated project area (in square metres) and a justification in the 'Description' text box that explains why the project is not using the same site area as on the certificate of title.



Use the same site area as that of the planning application

Project information

No
Yes
Select yes or no to answer questions about the project

The information assists the City of Melbourne's understanding of the application.

User details

Enter the contact details of the user of the Green Factor tool on this page, rather than the applicant of the associated planning application

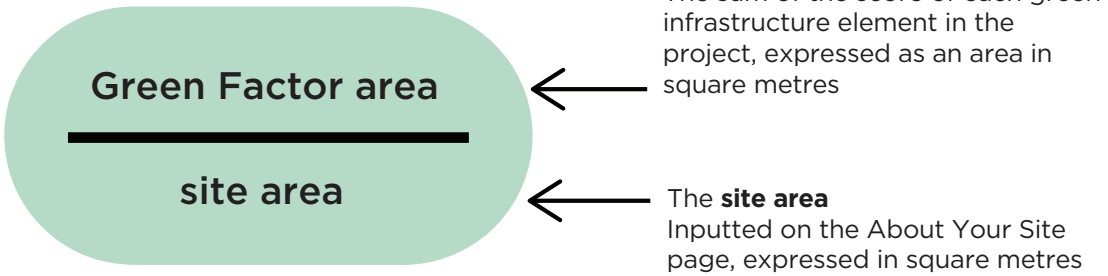
Select 'Assessment Menu' to continue

Image 3: Bruce St, Kensington

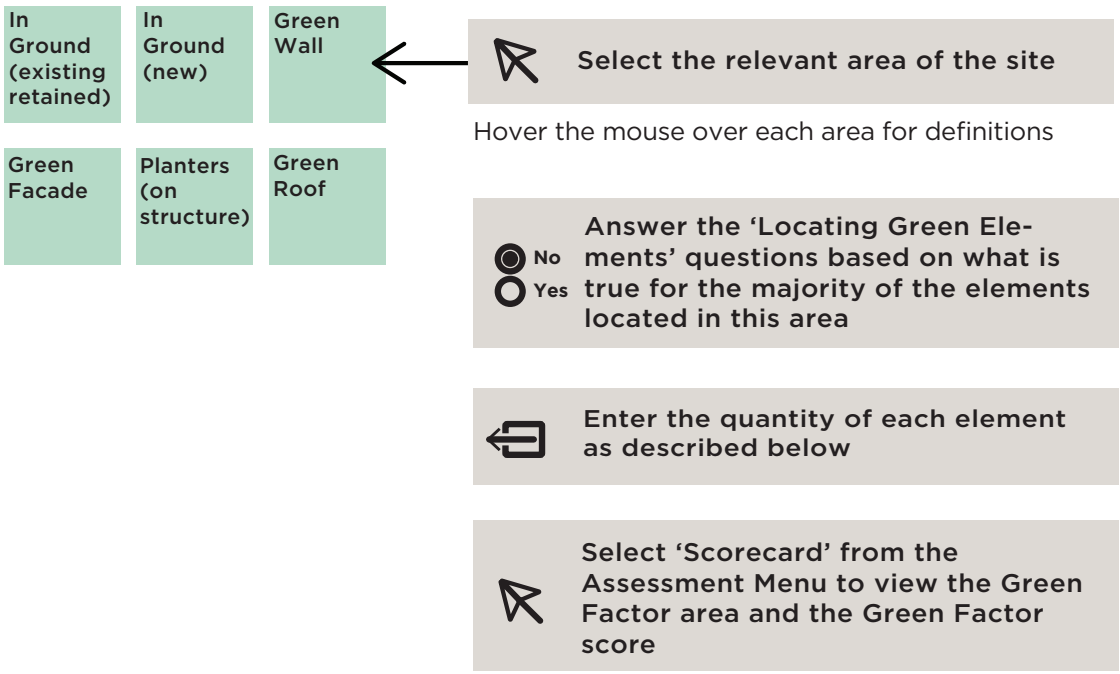
HOW SCORING WORKS

The Green Factor Score

The Green Factor score is a fraction as shown below. The minimum score required is 0.55.



Specifying Green Infrastructure Elements (vegetation and soil)



Specify a vegetation element by its species type:

- Enter trees by unit (i.e. per tree)
- Enter other vegetation elements by area (square metres)

Specify a soil or substrate element by its depth and area (in square metres).

The section below explains the process by which the green infrastructure elements are scored and the Green Factor area is calculated.

How Each Green Infrastructure Element is Scored

The tool assesses each green infrastructure element (vegetation and soil) and assigns the element seven raw scores for its ability to perform each of the seven ecosystem functions.

The tool derives the raw scores from the base scores of each element and modifies them by further parameters based on their impact on the delivery of ecosystem functions.

Base Scores

Base scores are inherent to the vegetation element itself - i.e. large tree or small shrub (Table 1).

In the case of soil or substrate, a base score is provided only for the stormwater runoff mitigation function (Table 2). No score is assigned for any other ecosystem function for soil or substrate.

ECOSYSTEM FUNCTION	LARGE TREE - CANOPY >10M	MEDIUM TREE - CANOPY 6M-10M	SMALL TREE - CANOPY 3M-6M	CLIMBERS	LARGE SHRUB - HEIGHT >1.5M	SMALL SHRUB - HEIGHT <1.5M	GROUND COVER	LAWN AND TURF
Urban temperature regulation	3	3	2.5	2.5	2	2	1.5	1.5
Habitat for biodiversity	3	3	2.5	2.5	2	2	1.5	0.5
Stormwater runoff mitigation	1	1	1	0.5	0.5	0.5	0.5	0.5
Recreation	3	3	2.5	2.5	1	1	1	2
Place values and social cohesion	3	3	3	3	2	2	2	1
Aesthetic benefits	3	3	3	3	2	2	2	2
Food supply*	2	2	2	2	2	2	3	N/A
	*Food supply scores only apply if the user selects “Productive” species type							

Table 1: Vegetation element base scores for each ecosystem function

SOIL ELEMENT	BASE SCORE FOR STORMWATER MITIGATION FUNCTION
Raingarden	3
Soil or substrate (over 200mm depth)	2
Soil or substrate (under 200mm depth)	0.5

Table 2: Soil or substrate base scores for the stormwater mitigation function

Further Parameters

Further parameters influence the delivery of each ecosystem function by the user:

- Selecting the vegetation species type - i.e. indigenous or exotic (Table 3)
- Answering the 'Visibility and accessibility' questions (Table 4)
- Selecting the height of the element (Table 5).
- Answering whether a vegetation element on a green wall or green façade is part of a shading strategy (Table 6). Green elements are considered part of the shading strategy if 25% or more of the window area is shaded by greenery.

ECOSYSTEM FUNCTION	VEGETATION SPECIES TYPE	SCORING IMPACT ON BASE SCORE
Urban temperature regulation	Any	None
Habitat for biodiversity	Indigenous	None
	Native	Reduces score by 0.5
	Exotic	Reduces score by 1
	Productive	Reduces score by 0.5
Stormwater runoff mitigation	Non productive	None
	Productive	Increases climber score by 0.5
		None for all other elements
Recreation	Any	None
Place values and social cohesion	Indigenous	None
	Native	None
	Exotic	Reduces tree and climber scores by 1.5
		Reduces ground cover score by 1
		Reduces a shrub score by 1
		None for lawn and turf
	Productive	Reduces tree and climber score by 1
		Increases ground cover score by 0.5
		None for all other elements
Aesthetic benefits	Any	None
Food supply	Any except productive	Score of zero for all elements
	Productive	Enables food supply score as per Table 1

Table 3: Score impact of selecting vegetation species type

ECOSYSTEM FUNCTION	VISIBILITY AND ACCESSIBILITY	SCORING IMPACT ON BASE SCORE
Recreation	Available for occupant use?	If yes, enables the recreation score in Table 1. If no, the recreation score is zero
Place values and social cohesion	Available for general public use?	If yes, enables the place values and social cohesion score in Table 1 If no, the place values and social cohesion score is zero
Aesthetic benefits	Visible to the general public?	If yes, enables the aesthetics score in Table 1. If no, the aesthetics score is zero

Table 4: Scoring impact of the locating green elements question

ECOSYSTEM FUNCTION	HEIGHT OF THE ELEMENT	SCORING IMPACT ON BASE SCORE
Urban temperature regulation	Ground level or low rise	None
	High rise	Reduces score by 0.5
Habitat for biodiversity	Ground level or low rise	None
	High rise	Reduces score by 0.5

Table 5: Scoring impact of the height of the element selection

ECOSYSTEM FUNCTION	PART OF A SHADING STRATEGY QUESTION	SCORING IMPACT ON BASE SCORE
Urban temperature regulation	No	None
	Yes	For climbers and ground cover, increases score by 1 For small shrubs, increases score by 0.5

Table 6: Scoring impact of shading strategy question

Image 4: St Patricks Cathedral

Example

A single new tree is inputted by the user as:

- Located in ground (new) area
- That area is
    - Available for occupant use
    - Visible to the general public
    - Available for use by the general public
- The element is a large tree (canopy width > 10 m)
- Indigenous
- One tree

For the purpose of this simple example, no soil or substrate data is entered. However, the type and depth of the soil or substrate should also be selected and its area entered. This will contribute to the stormwater runoff mitigation score as per Table 2. A prompt will notify the user if soil or substrate has not been entered in the area.

The raw scores for this indigenous tree example are shown in Table 7.

Weighting of Ecosystem Functions

The tool multiplies each raw score by the weighting of each respective ecosystem function. These weightings are listed in Table 8.

The tool adds each of the weighted ecosystem function scores together to form a single ‘weight’.

For the tree example, applying the weightings shown in Table 8 to the raw scores (Table 7) results in the weighted scores shown in Table 9.

In this case, the weight totals 2.3.

FOOD SUPPLY	URBAN TEMPERATURE REGULATION (COOLING)	RECREATION	AESTHETIC BENEFITS	PLACE VALUES AND SOCIAL COHESION	HABITAT FOR BIODIVERSITY	STORMWATER RUNOFF (QUANTITY)
0	3	3	3	3	3	1

Table 7: Raw scores for ecosystem functions for the tree example

ECOSYSTEM SERVICE	WEIGHTING
Urban temp regulation (cooling)	25%
Habitat for biodiversity	20%
Stormwater runoff (quantity)	20%
Food supply	10%
Recreation	10%
Place values and social cohesion	10%
Aesthetic benefits	5%
Total	100%

Table 8: Weighting of ecosystem functions

FOOD SUPPLY	URBAN TEMPERATURE REGULATION (COOLING)	RECREATION	AESTHETIC BENEFITS	PLACE VALUES AND SOCIAL COHESION	HABITAT FOR BIODIVERSITY	STORMWATER RUNOFF (QUANTITY)
0	0.75	0.3	0.15	0.3	0.6	0.2

Table 9: Weighting of ecosystem functions for example tree

Green Factor Area

The tool provides a Green Factor area score by multiplying the weight by the area of the element.

The tool assumes trees have the canopy areas as shown in Table 10. The assumed canopy sizes cannot be altered by the user. For all elements other than trees, the area is entered by the user.

For climbers located in ground (existing retained) or on a green facade, the Green Factor area score is multiplied by 0.4 to reflect the lower benefit of climber vegetation in these areas. No reduction is applied to a climber on a green wall.

AREA	TREE SIZE	ASSUMED CANOPY AREA
In ground (existing retained)	Small Tree	12sqm
	Medium Tree	24sqm
	Large tree	40sqm
In ground (new) Planters (on structure)*	Small tree	6sqm
	Medium tree	10sqm
	Large tree	15sqm
	*Only small trees and medium trees may be selected in the planters (on structure) area	

Table 10: Weighting of ecosystem functions for example tree

Image 5: Skypark

How the Green Factor Score is Calculated

The total Green Factor score is the sum of the Green Factor area scores for each element, divided by the total site area, rounded to the nearest two decimal places. It is expressed as a decimal.

See the following calculations for how the inputs for a single indigenous large tree achieve a Green Factor score.

Inputs

The user inputs the information below about the single indigenous large tree.

Site Information

100 square metre site area

Locating Green Elements

In Ground (New)

- Available for occupants use
- Visible to the public
- Available for use by the general public

Specify Green Infrastructure Elements

Large Tree (15sqm)

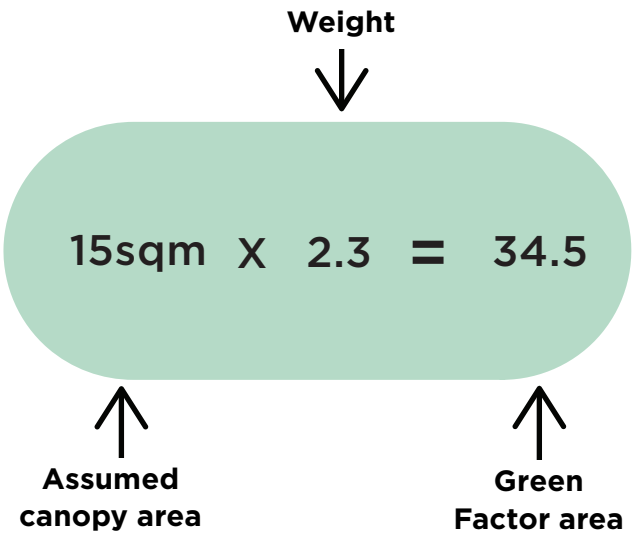
- Indigenous
- One piece

Scoring

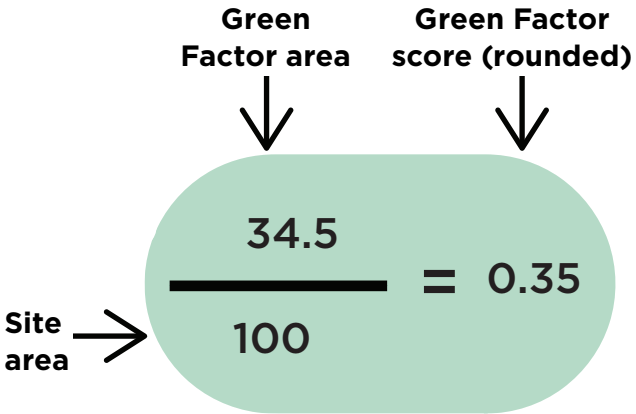
This table shows the raw scores for each ecosystem function of the tree in the first row, and the weighted raw scores in the second row. The sum of the weighted raw scores forms the weight.

	FOOD SUPPLY	URBAN TEMPERATURE REGULATION (COOLING)	RECREATION	AESTHETIC BENEFITS	PLACE VALUES AND SOCIAL COHESION	HABITAT FOR BIODIVERSITY	STORMWATER RUNOFF (QUANTITY)	TOTAL
RAW SCORE	0	3	3	3	3	3	1	16
WEIGHTED SCORE	0	0.75	0.3	0.15	0.3	0.6	0.2	Weight: 2.3

The weight is multiplied by the area of the element to form the Green Factor area. In this case, the area is the assumed canopy size of a large tree, 15sqm.



The Green Factor score is formed by the total of the Green Factor area scores of all elements (in this case, just the one tree) divided by the site area.



How to contact us

Online:
melbourne.vic.gov.au

In person:
Melbourne Town Hall - Administration Building
120 Swanston Street, Melbourne
7.30am to 5pm, Monday to Friday
(Public holidays excluded)

Telephone:
03 9658 9658
7.30am to 6pm, Monday to Friday
(Public holidays excluded)

Fax:
03 9654 4854

In writing:
City of Melbourne
GPO Box 1603
Melbourne VIC 3001
Australia

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