Plan Change 12

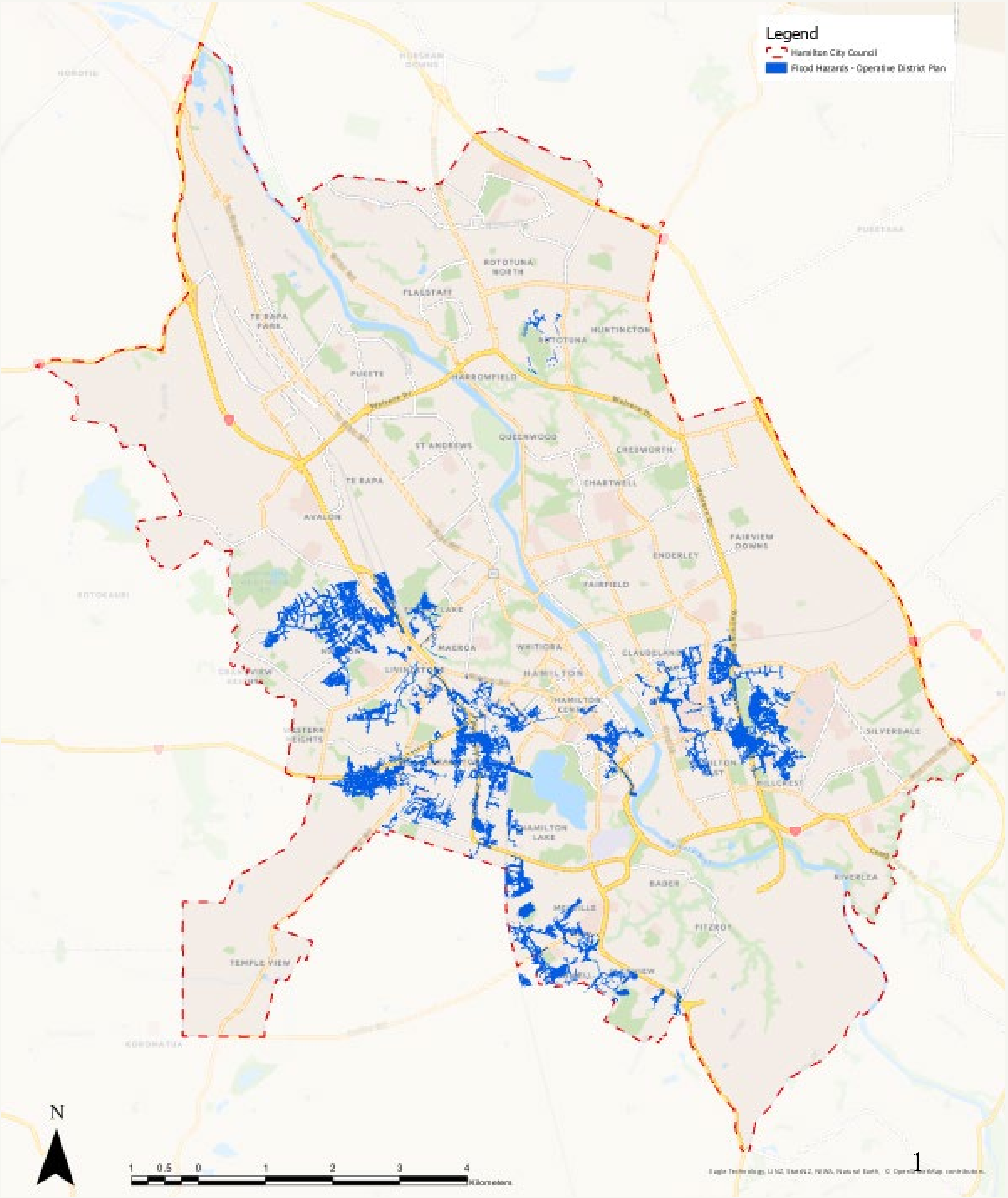
Flood Hazards & Green Policies

Hamilton City Council
Te kaunihera o Kirikiriroa

Flood Hazards

Operative District Plan

Around **14%** of Hamilton's area has flood hazards mapped in the ODP

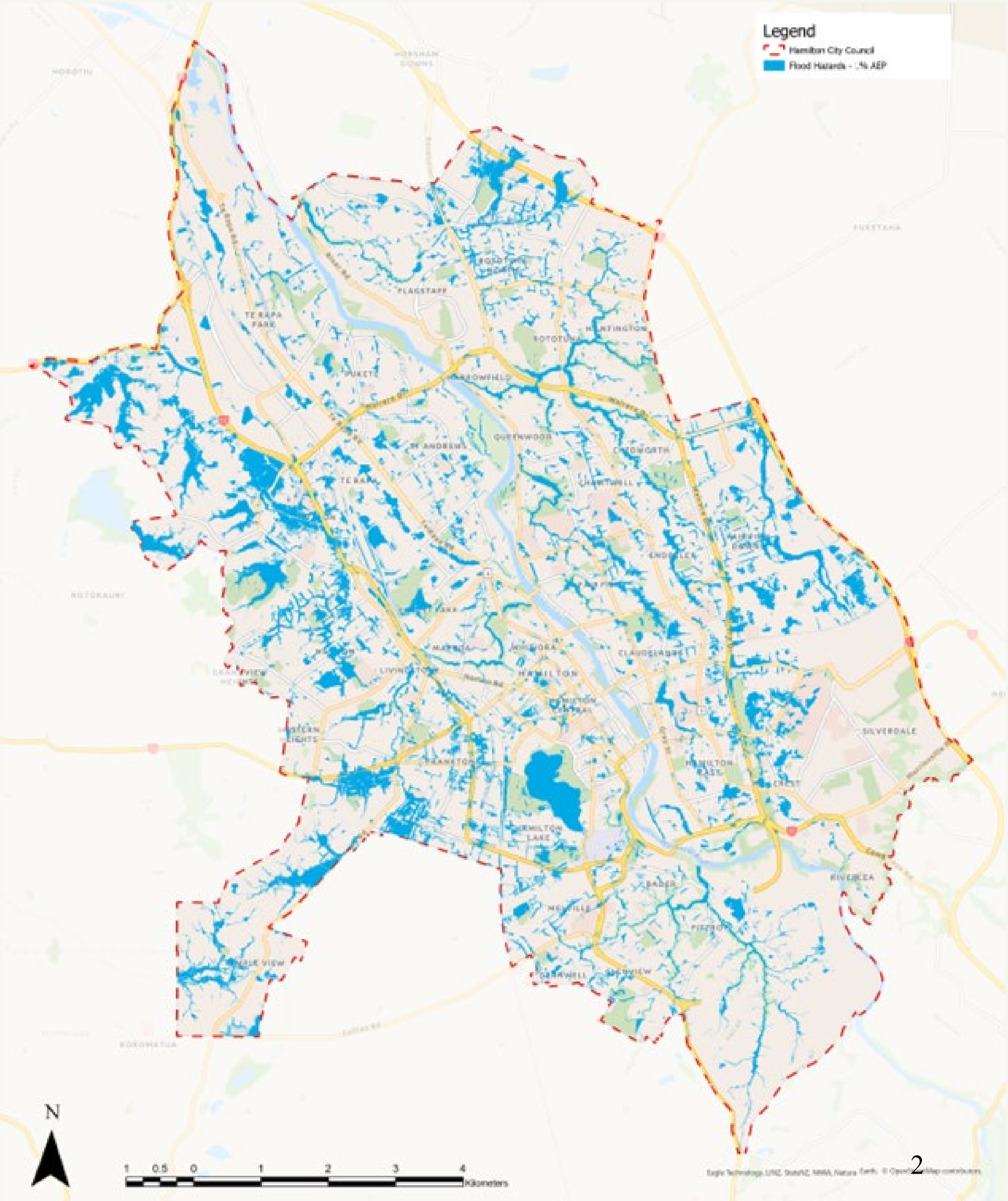


Flood Hazards

Floodviewer information

Over **90%** of Hamilton's area has flood hazards mapped on Floodviewer.

100% of overland flow paths and depression areas are also mapped on Floodviewer.



Flood Hazards

Assessing best available flood information under PC12

New residential developments - Site in an identified flood hazard area using best available information

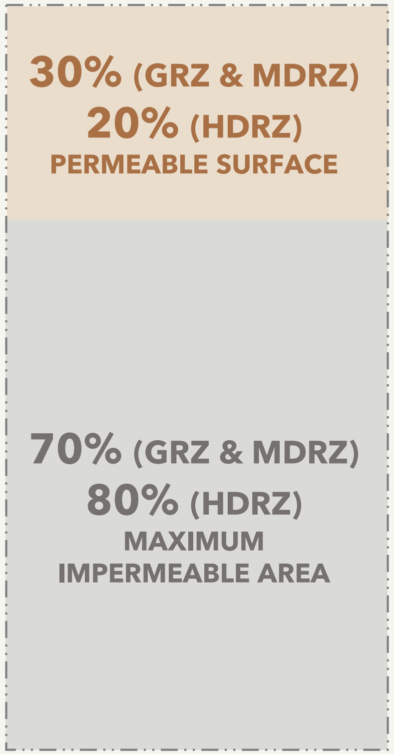
Permitted Activity	→	Flood-related matters assessed only as part of the building consent application
Restricted Discretionary Activity	→	Appendix 1.3 Assessment Criteria B – Design and Layout (including B4.h) F – Hazards and Safety
Discretionary Activity or Non-complying Activity	→	Flood-related matters can be assessed

Green Policies

Summary

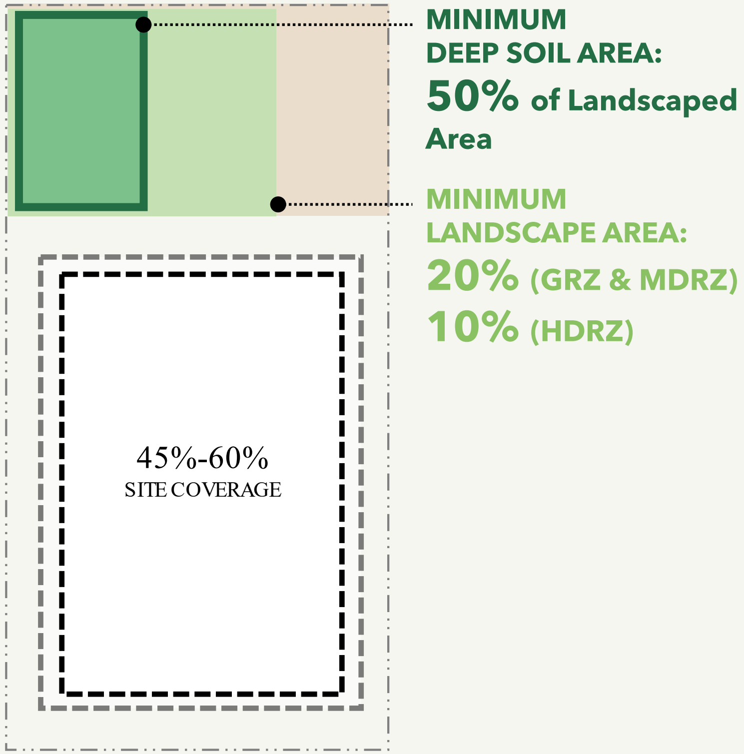
Surface Treatment

Each site is divided into permeable and impermeable surface treatments.



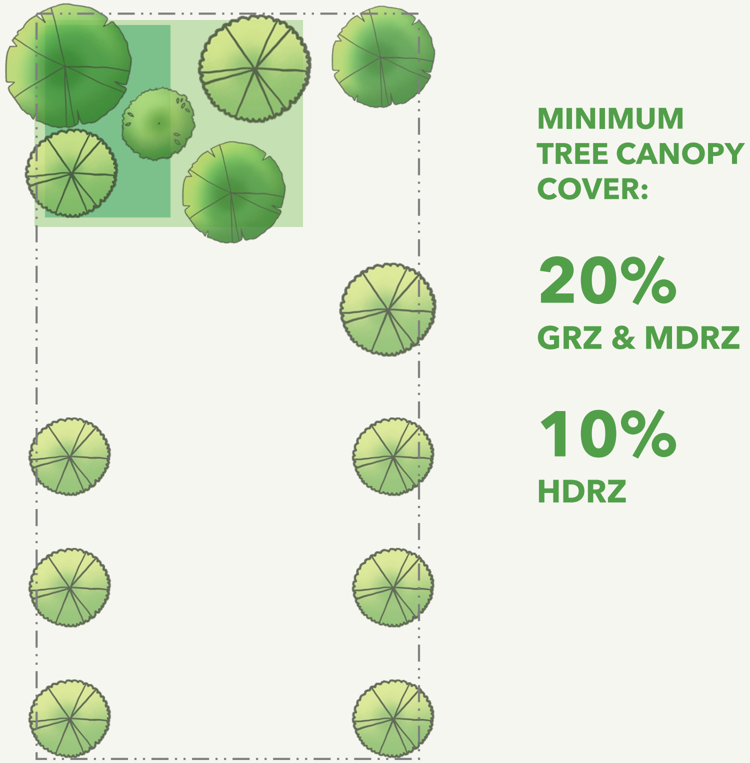
Permeable Surface distribution

Landscaped area and deep soil areas can be located within the required permeable surface area.



Tree Canopy Coverage

Measured along the widest section of the tree crown circumference at maturity, projected unto the ground



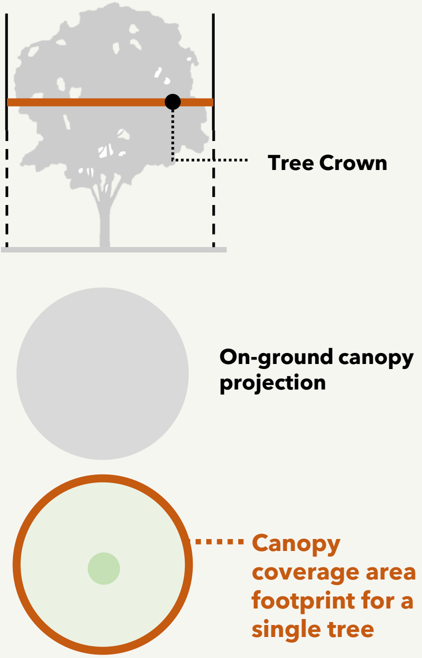
Green Policies

Tree Canopy Coverage

Depending on the residential zone, a percentage of the total site area is required for tree canopy cover and ideally be located within the permeable surface area.

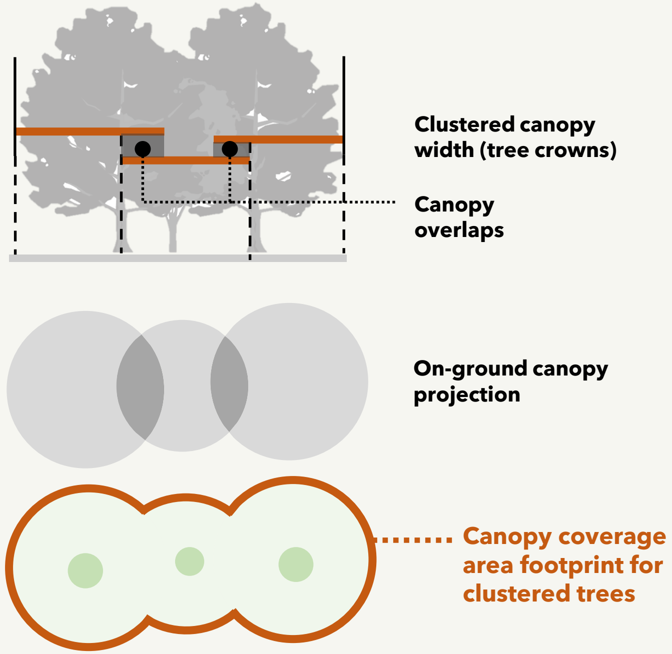
Single tree canopy coverage

Measured along the widest section of the Tree Crown circumference, projected unto the ground



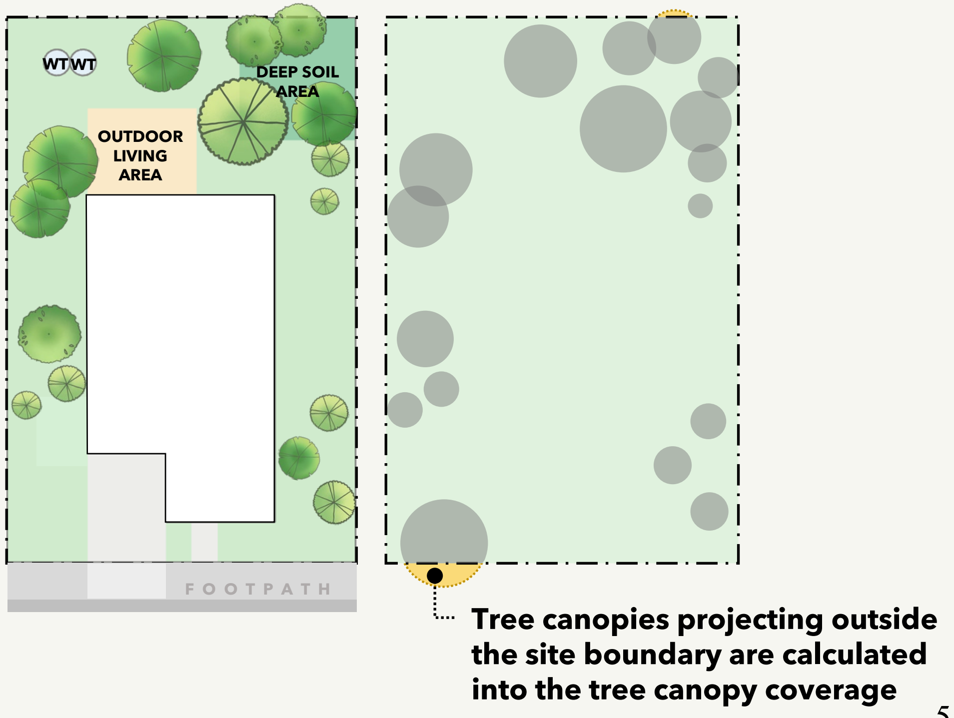
Clustered tree canopy coverage

Measured along the widest section of each individual Tree Crown circumference, including intersections of the projection unto the ground.



20% for General and Medium density Residential Zone, 10% for High density Residential Zone

The tree canopy coverage requirement is determined by what zone a site is located and is calculated by taking the total area of tree crowns planted within a site.



Green Policies

Tree sizes

It is crucial to assess if a site has capacity to accommodate trees, which will depend on the size of both the site and the selected trees. Tree canopy cover at maximum height and maturity:

Smaller sites, smaller trees

It is recommended that small trees are used on sites with tight size constraints to ensure the trees grow properly and with enough space for their root structure.

	SMALL	MEDIUM	LARGE	VERY LARGE
Canopy Cover	$10m^2$	$67m^2$	$186m^2$	$250m^2$
Land Area required	$3.8m^2$	$25.5m^2$	$70.8m^2$	$95.4m^2$

Green Policies

Tree canopy coverage

The tree canopy may extend over the outdoor living areas, driveways, and other elements within a development.

Over Outdoor Living Areas
provided that there is sufficient height underneath the tree crown and its branches

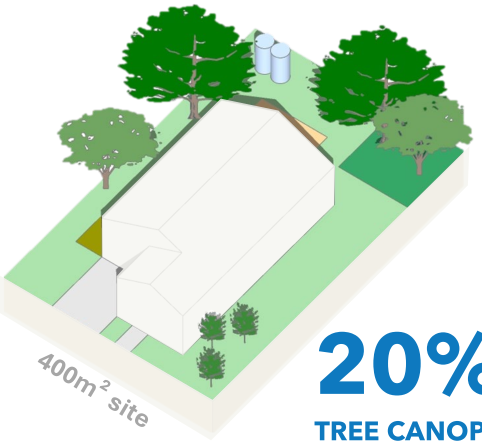
Over Driveways
provided that any portion of the tree does not impede on vehicular nor pedestrian circulation

Green Policies

Varying density

The following scenarios illustrate how, where, and how much of a property's space should be allocated to green, depending on the residential zone it belongs to.

- Impermeable Area (Driveway)
- Semi Permeable Area (Parking)
- Permeable Area (Landscape)
- Deep Soil Area
- Service Area
- Outdoor Living Area



20%
TREE CANOPY COVER

20%
TREE CANOPY COVER

10%
TREE CANOPY COVER

GENERAL RESIDENTIAL ZONE

- Detached
- Duplex
- Terraces

MEDIUM DENSITY RESIDENTIAL ZONE

- Terraces
- Apartment Building

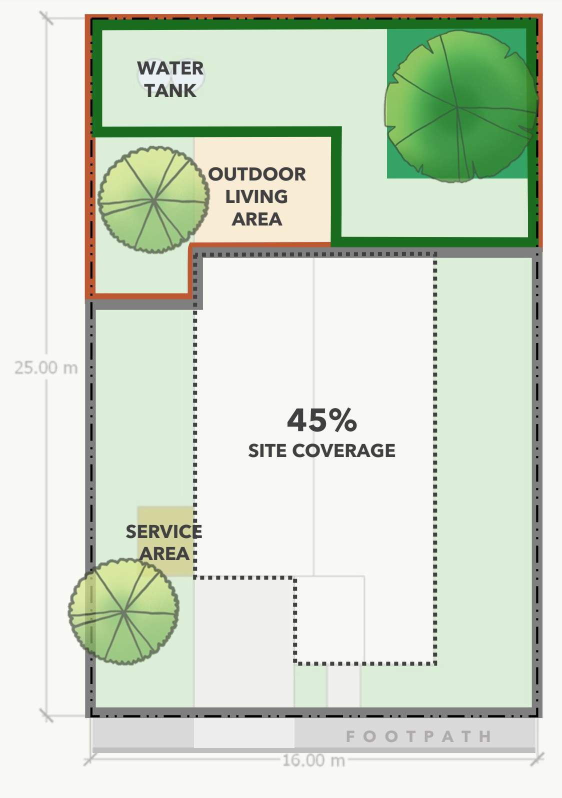
HIGH DENSITY RESIDENTIAL ZONE

- Apartment Building

On smaller sites

Scenarios exploring where and how many trees at the minimum are achievable in typical residential lot cuts ranging from 100m² to 400m² in the General Residential Zone.

SCENARIO: **400m² SITE AREA, Detached, 1-storey (180m² GFA)**

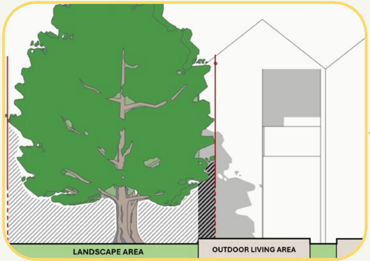


40m²
10% DEEP SOIL AREA

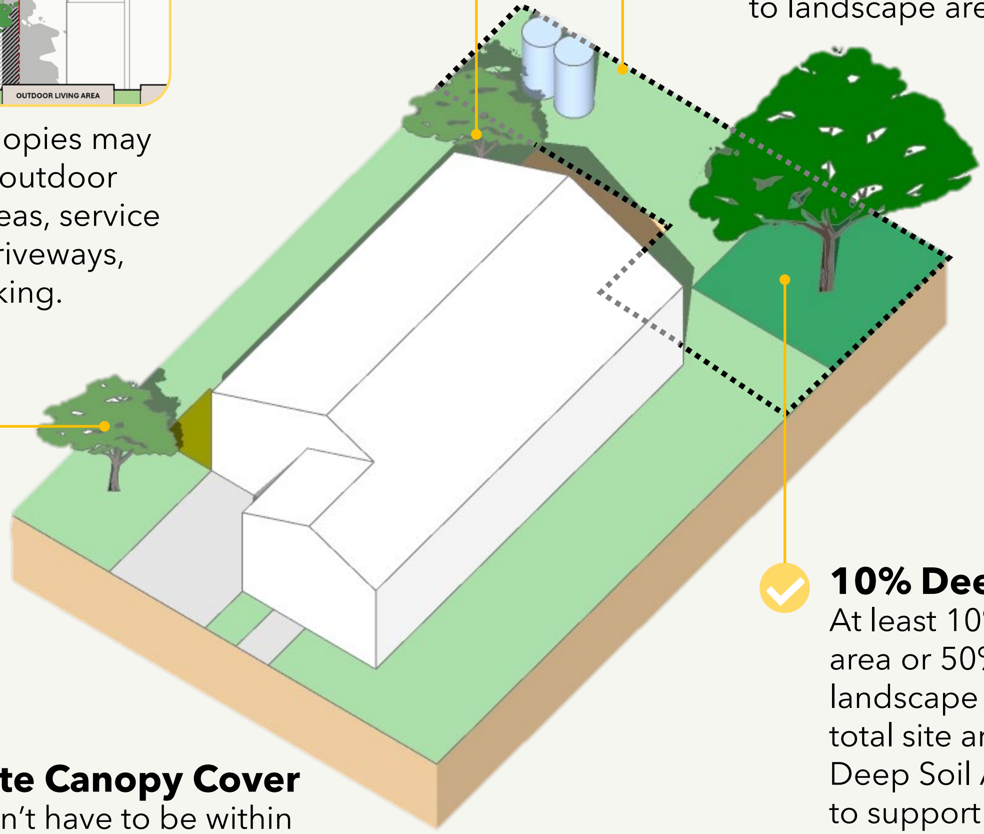
80m²
20% LANDSCAPE AREA

120m²
30% MINIMUM PERMEABLE SURFACE AREA

280m²
70% MAXIMUM PERMEABLE SURFACE AREA



Tree canopies may overlap outdoor living areas, service areas, driveways, and parking.



20% Landscape Area
Does not have to be contiguous, at least 20% of the total site area will be dedicated to landscape area.

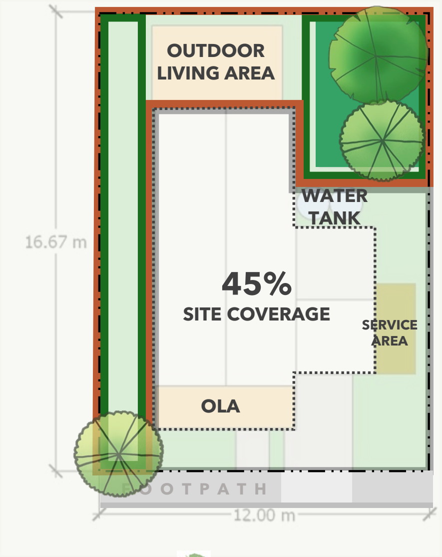
10% Deep Soil Area
At least 10% of the total site area or 50% of the landscape area (20% of total site area) dedicated to Deep Soil Area at 400mm to support tree growth.

20% Site Canopy Cover
Trees don't have to be within the landscape area, given that their canopy projections add up to 20% of the total site area.

LANDSCAPE AREA

GENERAL RESIDENTIAL ZONE

200m² SITE AREA
Detached, 2-storey (180m² GFA)



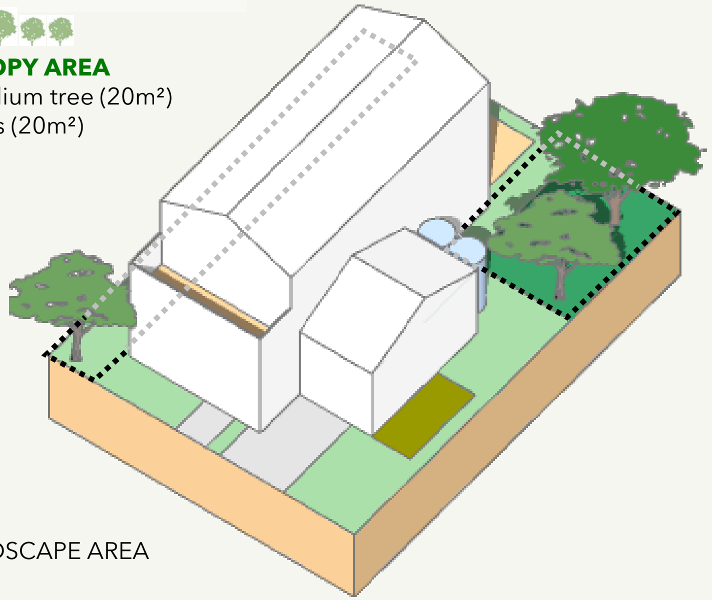
20m²
10% DEEP SOIL AREA

40m²
20% LANDSCAPE AREA

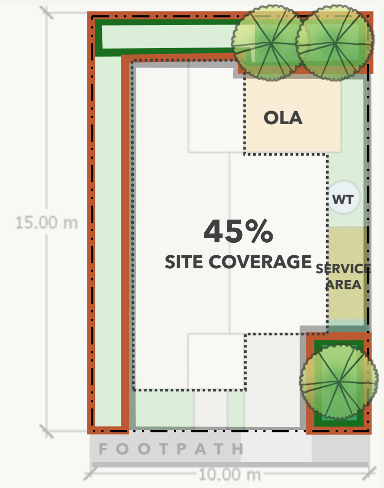
60m²
30% MINIMUM PERMEABLE SURFACE AREA

140m²
70% MAXIMUM PERMEABLE SURFACE AREA

40m²
TREE CANOPY AREA
1 small-medium tree (20m²)
2 small trees (20m²)



150m² SITE AREA
Detached, 1-storey (67.5m² GFA)



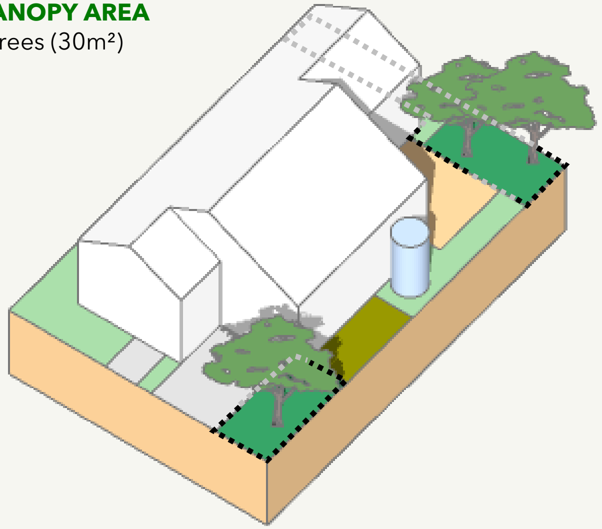
15m²
10% DEEP SOIL AREA

30m²
20% LANDSCAPE AREA

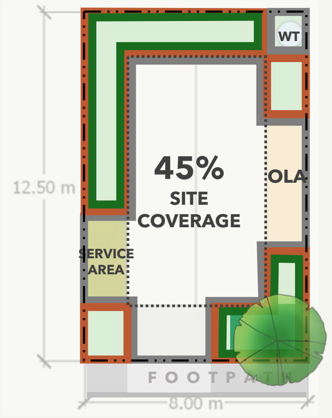
45m²
30% MINIMUM PERMEABLE SURFACE AREA

105m²
70% MAXIMUM PERMEABLE SURFACE AREA

30m²
TREE CANOPY AREA
3 small trees (30m²)



100m² SITE AREA
Detached, 2-storey (90m² GFA)



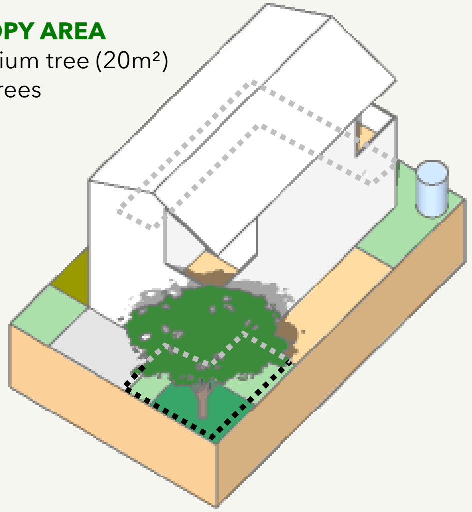
10m²
10% DEEP SOIL AREA

20m²
20% LANDSCAPE AREA

30m²
30% MINIMUM PERMEABLE SURFACE AREA

70m²
70% MAXIMUM PERMEABLE SURFACE AREA

20m²
TREE CANOPY AREA
1 small-medium tree (20m²)
OR 2 small trees



LANDSCAPE AREA

Larger sites

While there is a requirement for 20% of the site for tree canopy cover, there is space for more trees on larger sites.

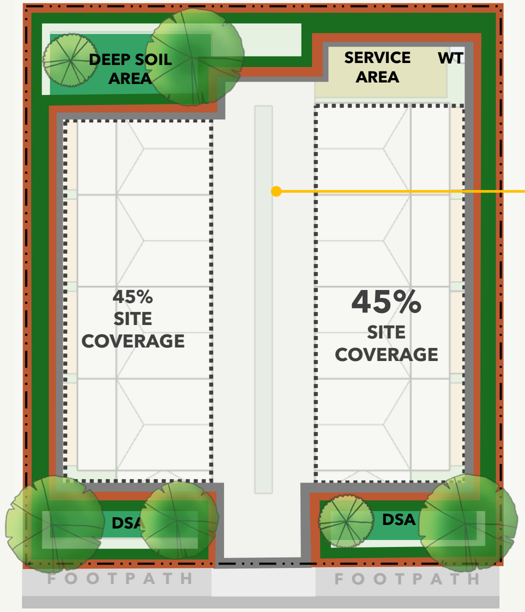
SCENARIO: **1200m² SITE AREA, Terraces**

120m²
10% DEEP SOIL AREA

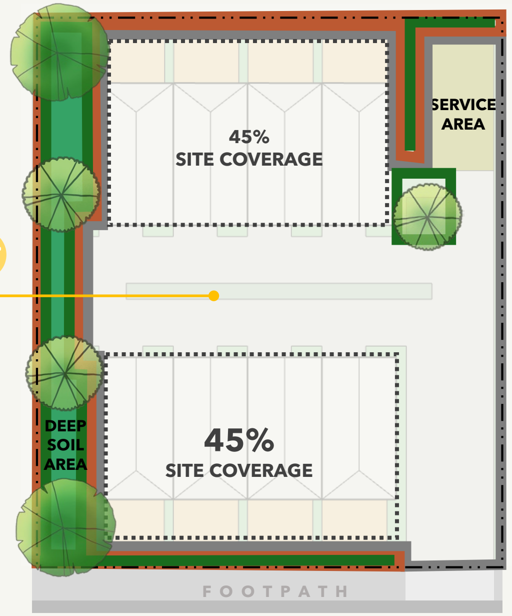
240m²
20% LANDSCAPE AREA

360m²
30% MINIMUM PERMEABLE SURFACE AREA

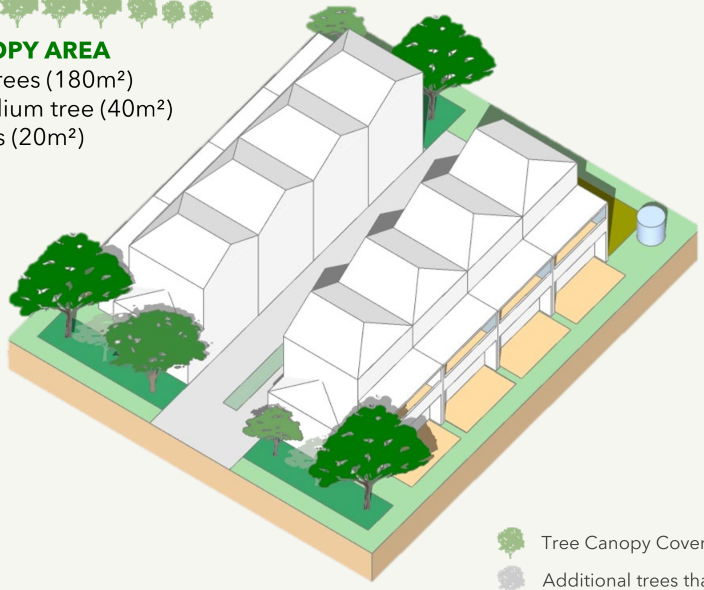
840m²
70% MAXIMUM PERMEABLE SURFACE AREA



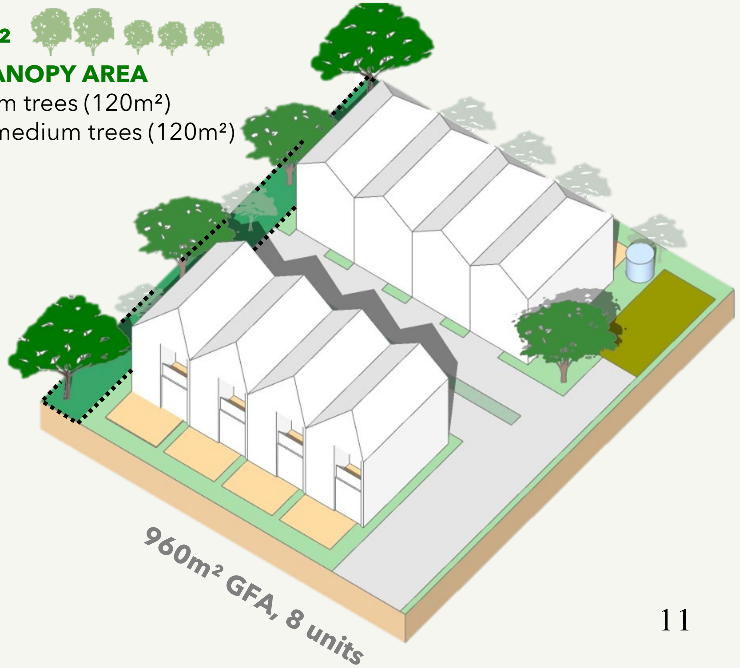
Semi-Permeable surface areas
Can be incorporated to break up continuous impermeable surfaces such as shared driveways.



240m²
TREE CANOPY AREA
3 medium trees (180m²)
1 small-medium tree (40m²)
2 small trees (20m²)



240m²
TREE CANOPY AREA
2 medium trees (120m²)
3 small-medium trees (120m²)



Tree Canopy Cover recommended
Additional trees that can fit on site

Green Policies

More examples

20% Tree canopy cover

Developments in the medium density residential zone are required to have 20% tree canopy coverage in site area.

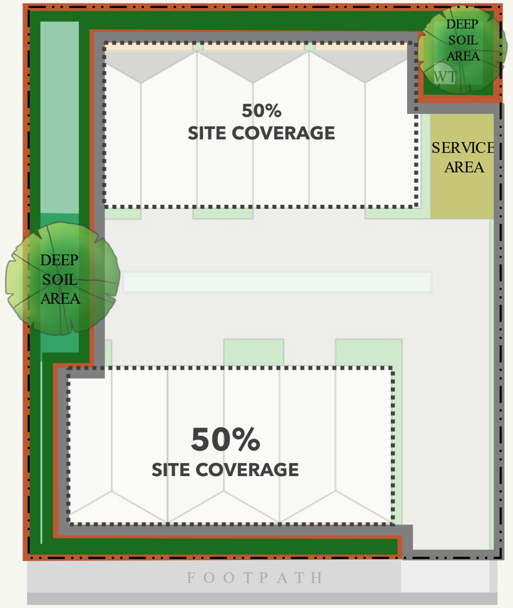
SCENARIO: **1200m² SITE AREA, Terraces**

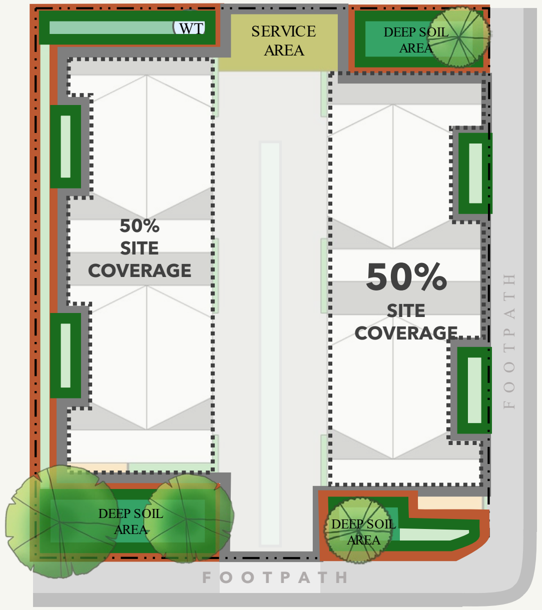
120m²
10% DEEP SOIL AREA

240m²
20% LANDSCAPE AREA

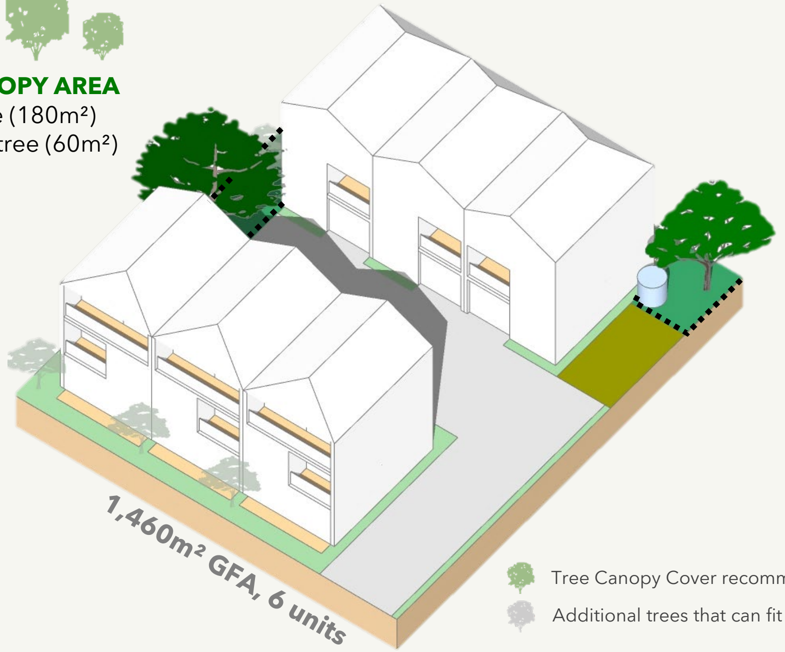
360m²
30% MINIMUM PERMEABLE SURFACE AREA

840m²
70% MAXIMUM PERMEABLE SURFACE AREA

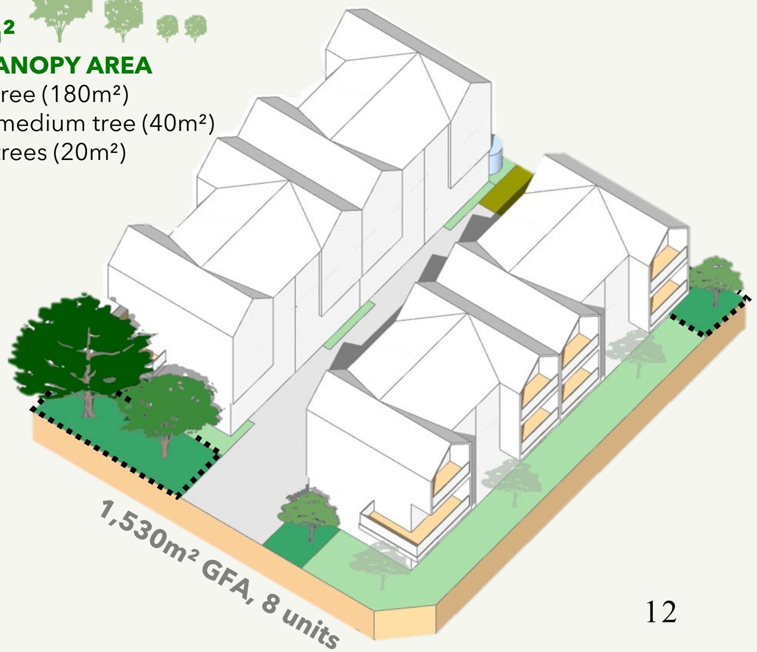




240m²
TREE CANOPY AREA
1 large tree (180m²)
1 medium tree (60m²)



240m²
TREE CANOPY AREA
1 large tree (180m²)
1 small-medium tree (40m²)
2 small trees (20m²)



Tree Canopy Cover recommended
Additional trees that can fit on site

Increasing density

Higher density developments often mean Apartment buildings which have consolidated parking areas; where there is great potential for more trees and semi-permeable surfaces to aid in stormwater management.

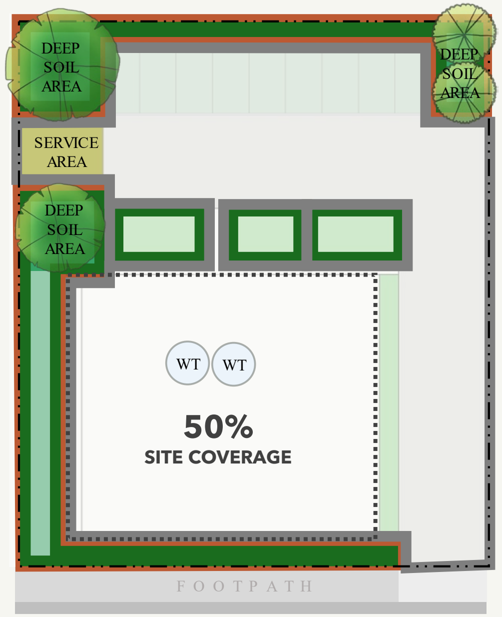
SCENARIO: **1200m² SITE AREA, Apartment building**

120m²
10% DEEP SOIL AREA

240m²
20% LANDSCAPE AREA

360m²
30% MINIMUM PERMEABLE SURFACE AREA

840m²
70% MAXIMUM PERMEABLE SURFACE AREA



240m²
TREE CANOPY AREA
1 large tree (180m²)
1 small-medium tree (40m²)
2 small trees (20m²)

Tree Canopy Cover recommended
Additional trees that can fit on site

Maximizing the site

Larger sites with extensive landscape areas have the opportunity to introduce more trees enhancing amenity benefits.

10% Tree canopy cover

With the highest site coverage (60%), high density residential developments often won't have space for extensive landscape areas and will have the least tree canopy cover requirement.

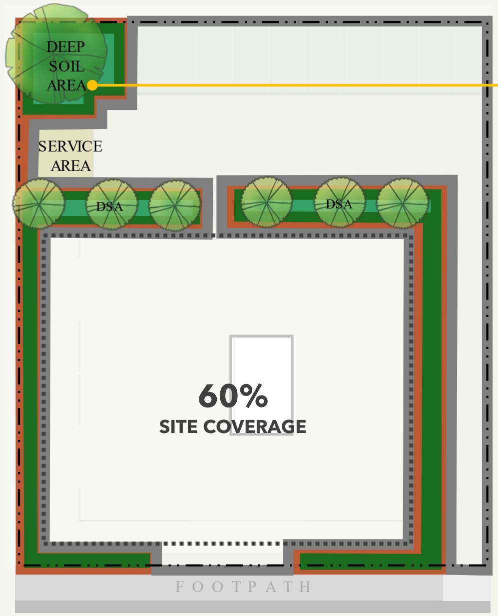
SCENARIO: **1200m² SITE AREA, Apartment building**

60m²
10% DEEP SOIL AREA

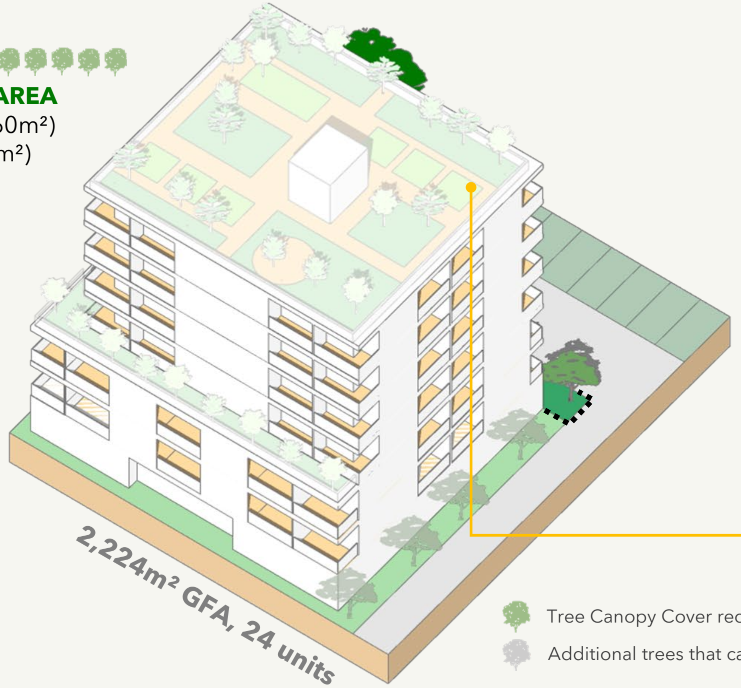
120m²
20% LANDSCAPE AREA

180m²
30% MINIMUM PERMEABLE SURFACE AREA

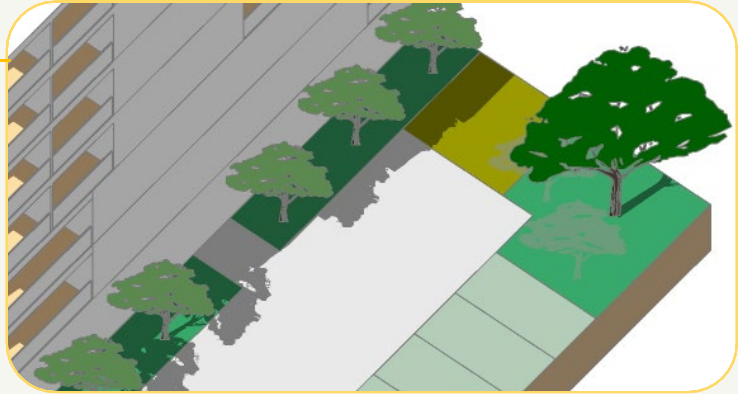
420m²
70% MAXIMUM PERMEABLE SURFACE AREA



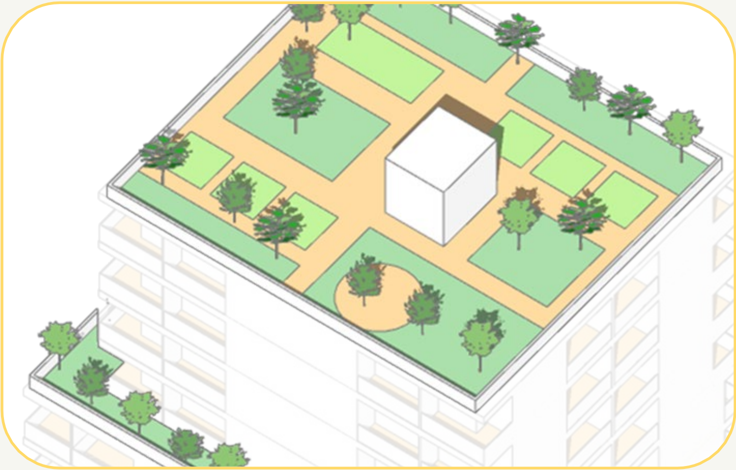
120m²
TREE CANOPY AREA
1 medium tree (60m²)
6 small trees (60m²)



Tree Canopy Cover recommended
Additional trees that can fit on site



Think viability
Placing larger trees in consolidated **deep soil areas** will help a site with tight landscape space achieve the required tree canopy cover.



Green Roofs
Maximize space within the site.

Green Policies

Tree selection

A list of suggested tree species for planting within private property is available in a guidance document as part of improving Green Policies within Plan Change 12.

- Deep Soil Areas
- Frontages
- Fencing treatment
- Tree placement, planting, and maintenance

Tree Planting List

APPENDIX 1: SUGGESTED TREE LIST

The following table lists suggested tree species for planting within private property, not including planting areas within the public transport corridor such as a berm. Any trees not shown in the table can be submitted to council for determination of what canopy size they belong to.

Botanical Name	Common Name	Height	Size	Native/Exotic	Evergreen/Deciduous
Abies concolor	White Fir	25	Very Large	Exotic	Evergreen
Abies koreana	Korean Fir	15	Large	Exotic	Evergreen
Acer griseum	Paperbark maple	12	Medium	Exotic	Deciduous
Acer platanoides Globosum	Norway Maple	5	Small	Exotic	Deciduous
Acer platanoides	Norway Maple	15	Large	Exotic	Deciduous
Aesculus hippocastanum	Common Horse Chestnut	30	Very Large	Exotic	Deciduous
Aesculus x carnea	Red Horse Chestnut	15	Large	Exotic	Deciduous
Agathis australis	Kauri	30	Very Large	Native	Evergreen
Alectryon excelsus	Titoki	10	Medium	Native	Evergreen
Alnus cordata	Italian Alder	20	Large	Exotic	Deciduous
Alnus rubra	Red Alder	25	Very Large	Exotic	Deciduous
Amelanchier canadensis	Shad Bush	7	Medium	Exotic	Deciduous
Aristotelia serrata	Wineberry	10	Medium	Native	Deciduous
Azara microphylla	Vanilla Tree	10	Medium	Exotic	Evergreen
Beilschmiedia tarairi	Taraire	22	Very Large	Native	Evergreen
Beilschmiedia tawa	Tawa	35	Very Large	Native	Evergreen
Betula pubescens	White Birch	25	Very Large	Exotic	Deciduous
Brachyglottis repanda	Rangiora	7	Medium	Native	Evergreen
Camellia sasanqua	Camellia	4	Small	Exotic	Evergreen
Carpinus betulus	European Hornbeam	20	Large	Exotic	Deciduous
Carpodetus serratus	Putaputaweta	10	Medium	Native	Evergreen
Catalpa bignonioides	Indian Bean Tree	15	Large	Exotic	Deciduous
Cedrus atlantica 'Glauca'	Atlas Cedar	8	Medium	Exotic	Evergreen
Cedrus deodara	Himalayan Cedar	25	Very Large	Exotic	Evergreen
Cercis canadensis	Eastern Redbud	8	Medium	Exotic	Deciduous
Citrus limon	Lemon Tree	3	Small	Exotic	Evergreen
Citrus sinensis	Navel Orange	5	Small	Exotic	Evergreen

Landscape delineation

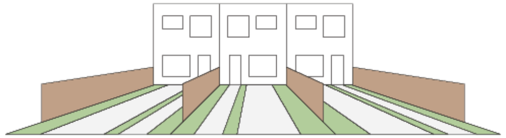


Figure 16. Thin strips of landscaping between hardscape doesn't support robust vegetation. Fences along property lines create harsh divisions

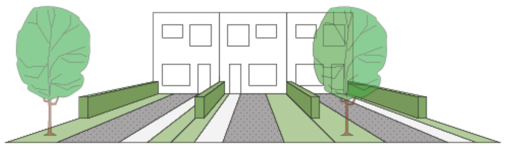


Figure 17. Grouping landscaping provides space for trees. Contrasting materials highlights driveway and pedestrian pathway. Low hedges set back from the property edge define boundaries more softly

Façade treatment

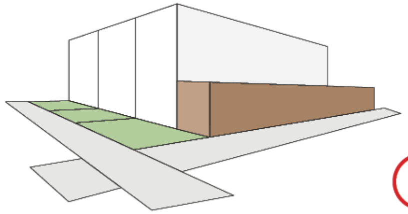


Figure 20. Tall fence creates unfriendly streetscape

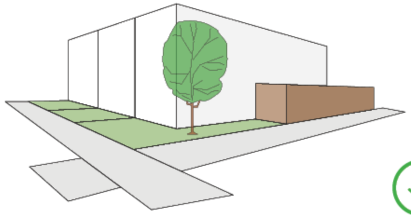


Figure 21. Set back fence softens corner and provides an openness to the street.

Planting Layouts

Rectangular planting gives a formal effect to planting and should be used sparingly

Triangular planting is recommended in most situations. It gives a fuller, more natural appearance

Figure 11. An example of different planting layouts