

Step 1

Plan

Start planning your garden while you plan your house to maximise the short and long term benefits.

Key considerations:

- Site orientation
- Retention of mature trees
- Placement of new trees
- Adequate soil provision
- Soft landscaping

This section includes:

- A planning checklist
- 3D visualisations of how to achieve greening success
- Case studies of common infill housing types including how to meet the minimum Planning and Design Code tree planting and soft landscaping policies, plus how to achieve better greening outcomes





Plan checklist

Start planning your garden while you plan your house to maximise the short and long term benefits.

Retain existing mature trees where possible

Mature trees provide more shade, store more carbon and provide more habitat and shelter to enhance biodiversity than new or smaller trees. It will take many years for a newly planted tree to provide similar benefits to an established mature one.

A single mature tree can absorb as much as 21 kilos of CO₂ in a year⁹.

- Identify if your site has a regulated or significant tree.
- Speak to an arborist to give advice on the tree's health, structure and **Tree Protection Zone (TPZ)** requirements. The TPZ is a designated area around a tree that is protected when nearby works are being undertaken to preserve the soil and tree.



- Design your house to accommodate the TPZ of the tree, maintaining soil volumes, levels and a healthy root system.
- Your structural engineer will design the footings for your house to accommodate the roots of the existing tree.
- Check with your council to see what assistance they can provide and whether they offer incentives to retain mature trees.
- Ensure your development meets **Australian standard AS 4970-2009: Protection of trees on development sites**. This can be accessed through your builder, developer or council.
- Consider retaining and planning to incorporate areas of established soft landscaping (hedges, plants) into your new development that can provide continued benefits for cooling, visual appeal, biodiversity and stormwater filtration.
- Work with your demolition company to plan which areas of vegetation will be retained. This can be cheaper than simply clearing your entire block.
- Ensure the extent and reach of roots for all existing trees are inspected to ensure there is no risk of damaging buildings or structures. The root can be trimmed (if required) and dammed with root barriers to prevent further growth and potential damage (under the guidance of an arborist if the tree is regulated).

For further information visit:

- [Protecting regulated and significant trees \(FAQ\), PlanSA](#)
- [Tree Protection Australian Standards and the Law: Getting it Right, TreeNet](#)
- Your local council Urban Forest/Tree Strategy
- How to achieve better greening outcomes for retaining a mature tree ([see page 30](#)).

Maximise efficient solar access and shading to house and garden spaces

An integrated approach to planning your home and garden with optimal solar access and shade can contribute to greatly improving energy efficiency.

For example, shading the western facade of a dwelling with trees can drop total heating and cooling energy costs by between 5 and 10%⁷.

- Locate the living areas of your house and garden areas to the north and east where possible.
- Create spaces to plant evergreen trees to provide shade to your walls, roof and hard pavements from the hot western sun.
- Locate your vegetable and herb garden and fruit trees in north-facing sunny areas.
- Plant trees to shade your driveway, walls and pavements to reduce heat absorption and cool your house and environment.
- Grow vines and climbers on vertical surfaces such as fences and walls to provide shade and cooling.

For further information visit:

- [Passive Design, Your Home](#)
- [What is Passive House? \(FAQs\), Australian Passive House Association](#)

Plan garden areas with space and soil volumes to plant the largest tree possible

Bigger trees provide more benefits like shade and amenity.

- Speak to your council to discuss the tree and landscaping requirements that apply to your development site.
- Ensure your tree has adequate space to grow above and below the ground to promote its health and avoid conflict with infrastructure as it grows.

For further information visit:

- Refer to the Urban Tree Canopy Overlay policies on PlanSA or the Planning and Design Code section ([pages 12-13](#)) of this guide.
- How to achieve better greening outcomes for small trees compared to medium trees ([see pages 32-33](#)).



Locate trees and garden spaces adjacent to indoor and/or outdoor living spaces where possible

Green leafy trees can provide sensory relief in urban environments, generating a sense of calm.

- Create attractive views looking onto gardens areas and plantings.
- Create outdoor spaces for relaxation, socialising, entertaining, connecting with nature and a better sense of wellbeing.
- Discuss the design of your house with your builder/designer to include spaces for planting to create attractive outdoor spaces.

For further information visit:

- How to achieve better greening outcomes for courtyards ([see page 26](#))
- How to achieve better greening outcomes for side setbacks ([see page 27](#))

Plan for access to the garden spaces to construct landscape elements and plantings after your house is built

Avoid unnecessary costs and poor outcomes by thinking ahead.

- Ensure the soil in your garden is suitable for planting. It may need to be removed and replaced with good quality soil for your trees and plants to thrive.
- Check there is sufficient access to the garden for machinery (i.e. if you will need an excavator or delivery of soil, mulch etc.)

Ensure there is sufficient room for trees to develop and grow

Allow space for trunks, roots and branches to grow to ensure your trees and plants can mature and adjacent infrastructure and footings are protected.

- Ensure trees are planted a suitable distance away from buildings and structures to avoid damage to neighbouring properties, walls, fences and footings. Most root systems of trees have a spread that is 2-3 times the radius of the canopy. For example, if the tree canopy radius is 2m, its roots can be expected to reach 4-6m from the trunk. Avoid selecting trees and plants that are known to have aggressive, or highly invasive roots.
- Avoid selecting trees and plants that are known to have aggressive, or highly invasive roots.
- Choose the right plant for the right space. When planting in a confined space, like an atrium or side setback, check the mature height/size, the soil conditions, sunlight intensity and shade to ensure your plants thrives.

Coordinate the location of garden spaces with other household services and facilities

A practical approach to planning for trees and household services will help integrate services and planting.

- **Parking/driveways:** Integrate trees and planting with hard surfaces to provide shading and cooling.
- **Bins:** Integrate screens and plantings into your design to hide bins at the side and rear of the property.
- **Services:** Coordinate service locations with your builder and providers to create spaces to plant trees and gardens.
- **Clothes lines:** Locate the clothes line in a sunny position preferably at the side or rear outside of attractive garden or entertaining spaces. Consider lawn or porous surface material (gravel, permeable paving) underneath to allow for more efficient water infiltration and reduced run-off.
- **Solar panels:** Carefully consider the location of large trees to ensure that they won't cause shade over solar panels or shading is minimised.

- **Rainwater tanks:** Incorporate required rainwater tank/s preferably abutting dwelling walls or boundary fences to minimise conflicting with the space available for trees, planting, paths and outdoor living. Connect your tanks to your irrigation system or investigate a grey water treatment system to save on water bills.
- **Water supply and irrigation:** Include taps in your front and back garden for easy watering. Preferably plan to install an irrigation system at the time of construction to enable easy and efficient watering. Consider provisions for both recycled and potable water connections, including controllers and conduits to garden beds.
- **Roofs and gutters:** Consider the design of the roof, gutters and downpipes to ensure easy maintenance and avoid collection of fallen leaves. For example, using gutter guards, especially for flat roofs and box gutters.

For further information:

- [Narrow Single Storey Homes: Design Guidelines, City of Salisbury](#)
- How to achieve better greening outcomes for common driveways ([see page 24-25](#))
- How to achieve better greening outcomes for front garden trees and services ([see page 28-29](#))



Carefully consider the proposed location for trees and garden spaces in coordination with existing and proposed services and relevant requirements

Holistic consideration of trees and services locations will allow healthy growth of trees and avoid costly maintenance, repairs and safety risks. It is important to understand the mature height and radius of your chosen tree(s) to ensure it is appropriate for its intended location.

- Understand where your services, utilities and powerlines are located to enable you to plant in the correct locations to reduce any future damage.
- Footings:** Consult a structural engineer to seek advice about the best placement of your tree(s) in relation to you and your neighbours' foundations and the most appropriate footing design required for your dwelling
- Sewer and water:** Consult clearance requirements and select trees from approved planting lists when planting adjacent to services.
- Overhead powerlines:** If you're planting near powerlines ensure the height of your mature tree(s) will meet the clearance requirements and select trees from approved planting lists.
- Communications:** Be aware of the locations of conduits to avoid damage through digging or excavations.

- Gas:** Do not plant large trees adjacent to in-ground gas services.
- Stormwater drainage:** Consider the location of drainage infrastructure to avoid conflict with space available for tree planting across development sites. Consider integrating water sensitive urban design solutions to achieve better environmental outcomes.

For further information:

- [House footings and the tree effect \(see page 34 and 35\)](#)
- [Trees and powerlines, Office of the Technical Regulator](#)
- [Powerline Friendly Trees, SA Power Networks](#)
- [Tree Planting Guide \(2021\), SA Water](#)
- [Dial Before You Dig](#)
- [WSUD policy for small-scale infill, Water Sensitive SA](#)
- [How to achieve better greening outcomes for front garden trees and services \(see page 28\).](#)





How to achieve better greening outcomes

Common driveway

1. Shade the driveway to create a cooler ambient temperature and reduced need for internal air conditioning.
2. Plant low vegetation to soften view of the driveway from internal living spaces and the street.
3. Ensure footings consider abutting soil and water from soft landscaping zones.
4. Plant small trees approximately 6.5m apart along the driveway.
5. Plan for water sensitive methods such as directing stormwater run-off into garden beds and using more porous surface materials over soil areas for more efficient watering and less reliance on irrigation.
6. Extend soil volumes 0.5m below the driveway surface to achieve the minimum width (1.5m) required for the 10m² soil area for a small tree. Permeable driveway surfaces should be located over soil area for increased water infiltration.
7. Tree canopy (if planted) will provide more privacy for upper storey living spaces and neighbours.



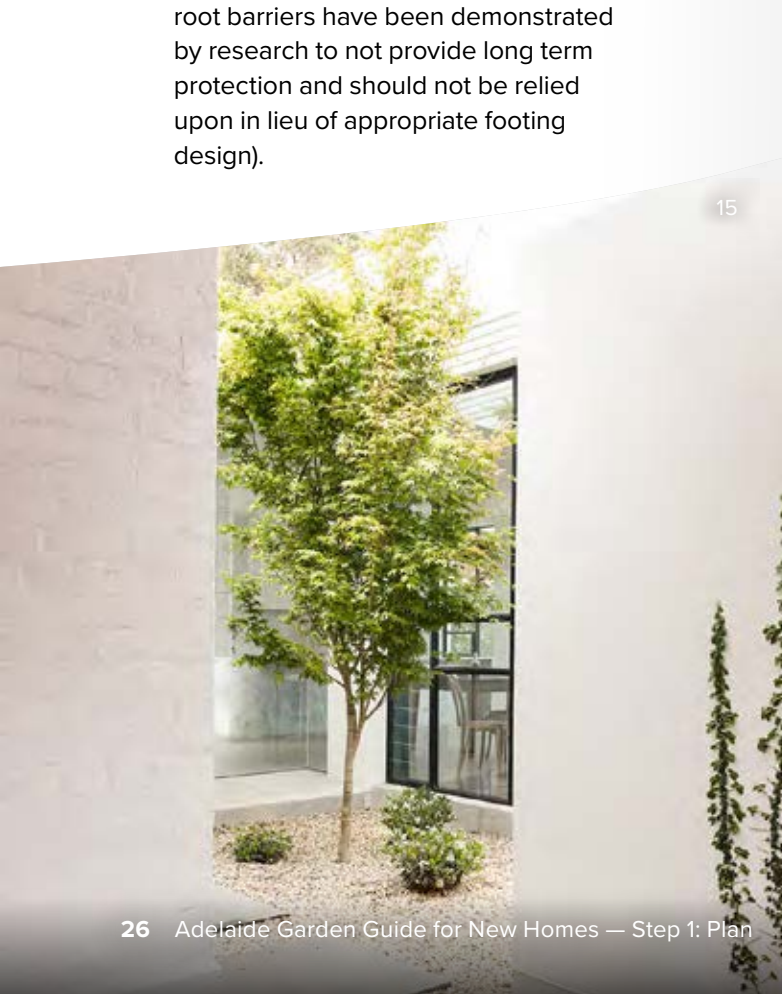


Courtyards

1. Create a niche in the building which creates an internal atrium space.
2. Ensure the atrium allows light to penetrate into the centre of the house where large windows may not be possible.
3. Consider incorporating greening into the garden space including a small ornamental tree (10m² of soil area), climbers and understorey plants.

When choosing plants consider the mature height/size, shading from other structures, soil and weather conditions to ensure the plant will thrive.

4. Windows or louvres in this area could also assist with ventilation, air quality and cooling throughout the house.
5. This space could become an architectural feature adding value to your property.
6. Consult a structural engineer and/or landscape architect about whether a tree root barrier could help reduce the effect on the footing system. (Note: Tree root barriers have been demonstrated by research to not provide long term protection and should not be relied upon in lieu of appropriate footing design).



Side setbacks

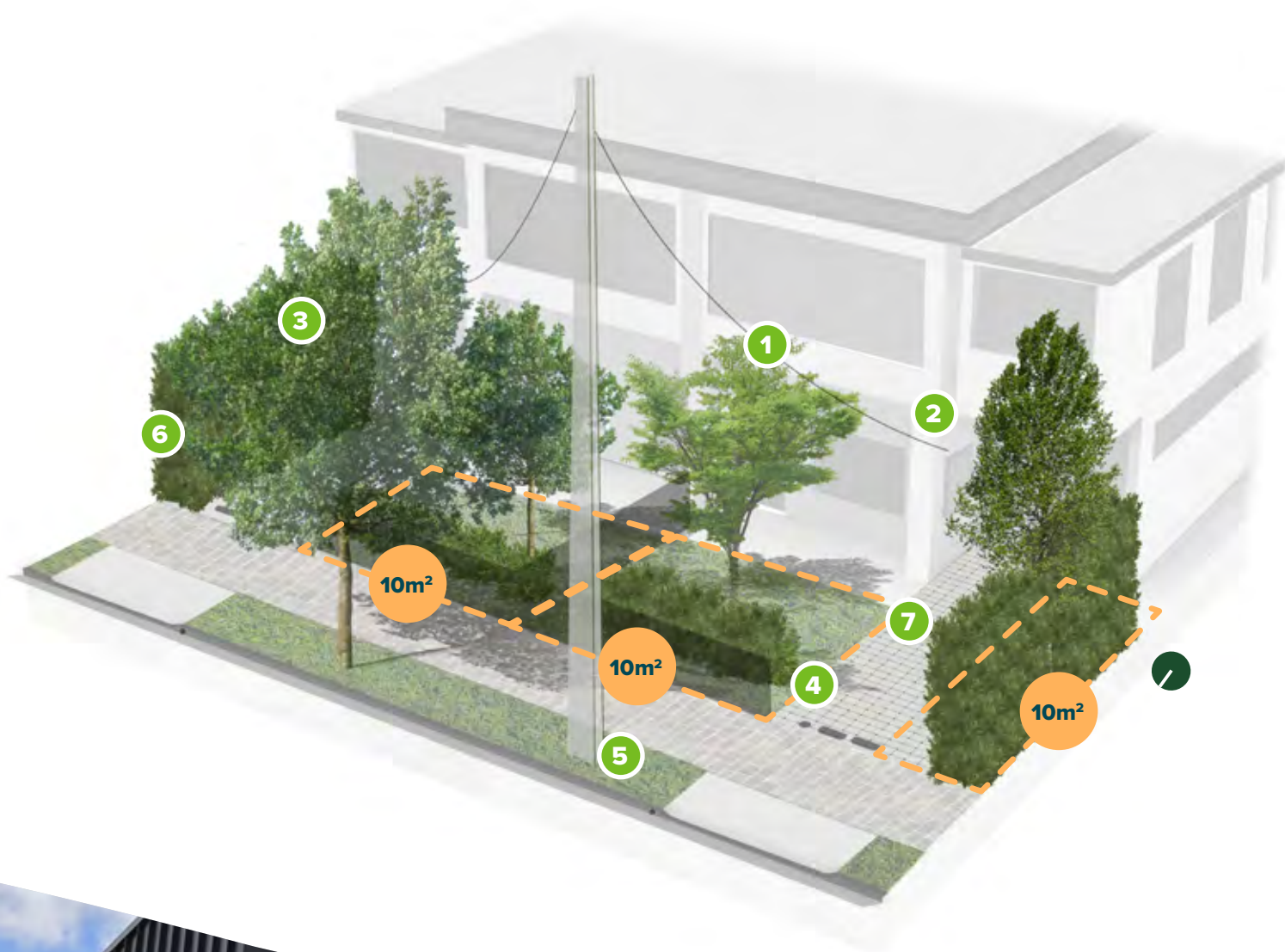
1. Create a niche and garden area with a 2m setback in the building to allow light to penetrate into the centre of the house where large windows may not be possible.
2. Incorporate greening into the garden space including a small ornamental tree (10m² of soil area) and understorey planting.
3. Consider windows or louvres in this area to assist with ventilation, air quality and cooling throughout the house.
4. Use paving to create a perimeter (extending appropriately 1m from the foundation edge) so that rain and surface water will runoff and away from the building into the adjacent garden.



Front garden trees and services

1. Ensure that front garden trees are an appropriate species and size and are located so to avoid clashes with overhead and underground services
2. Well locate services so that they do not clash with soil areas for trees and plants (e.g. integrated into a wing wall next to driveway).
3. Retain existing street trees (where possible) with driveway access designed to accommodate (i.e. 2m setback to street trees).
4. Locate water and sewer service pits in the driveway to avoid clashes with trees and soft landscaping, provide easy access and reduce visual clutter.
5. Locate the stormwater outlet next to the driveway to avoid clashes with proposed and existing tree locations.
6. Provide a minimum 0.7m wide garden bed alongside the driveway to provide opportunity for soft landscaping (e.g. screening hedge for privacy).
7. Use permeable paving or porous material over the driveway to provide soil volume for an extra small tree to enhance amenity, shade and privacy.





Retain a mature tree

1. Retain a mature tree with adequate soil area (60m²) to shade the house and garden from the sun, provide more comfortable spaces and reduce the need for air-conditioning.
2. Design the dwelling with a side setback to allow retained soil volume to wrap the building and provide an opportunity for an alfresco area.
3. Use permeable surfaces, such as gravel and steppers around the house to not disturb the root zone and allow water to infiltrate.
4. Carefully consider soft landscaping under larger trees. Select species that are tolerant of reduced light conditions and are shallow rooted so as not to compete with the existing tree roots. Native groundcovers are usually a good choice.
5. Design your house to accommodate the tree protection zone (TPZ) of the tree.

The **Tree Protection Zone (TPZ)** is the key method of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area protected from construction disturbance, so that the tree remains healthy.

The radius of the TPZ is calculated for each tree using the below formula:

$$\text{Radius of TPZ} = \text{DBH} \times 12$$

DBH = the trunk diameter (metres), measured at 1.4m above the ground level (or diameter at breast height)

The **Structural Root Zone (SRZ)** is the area around the base of a tree required for the tree's stability in the ground. This zone considers a tree's structural stability only, not the root zone required for a tree's long-term health.

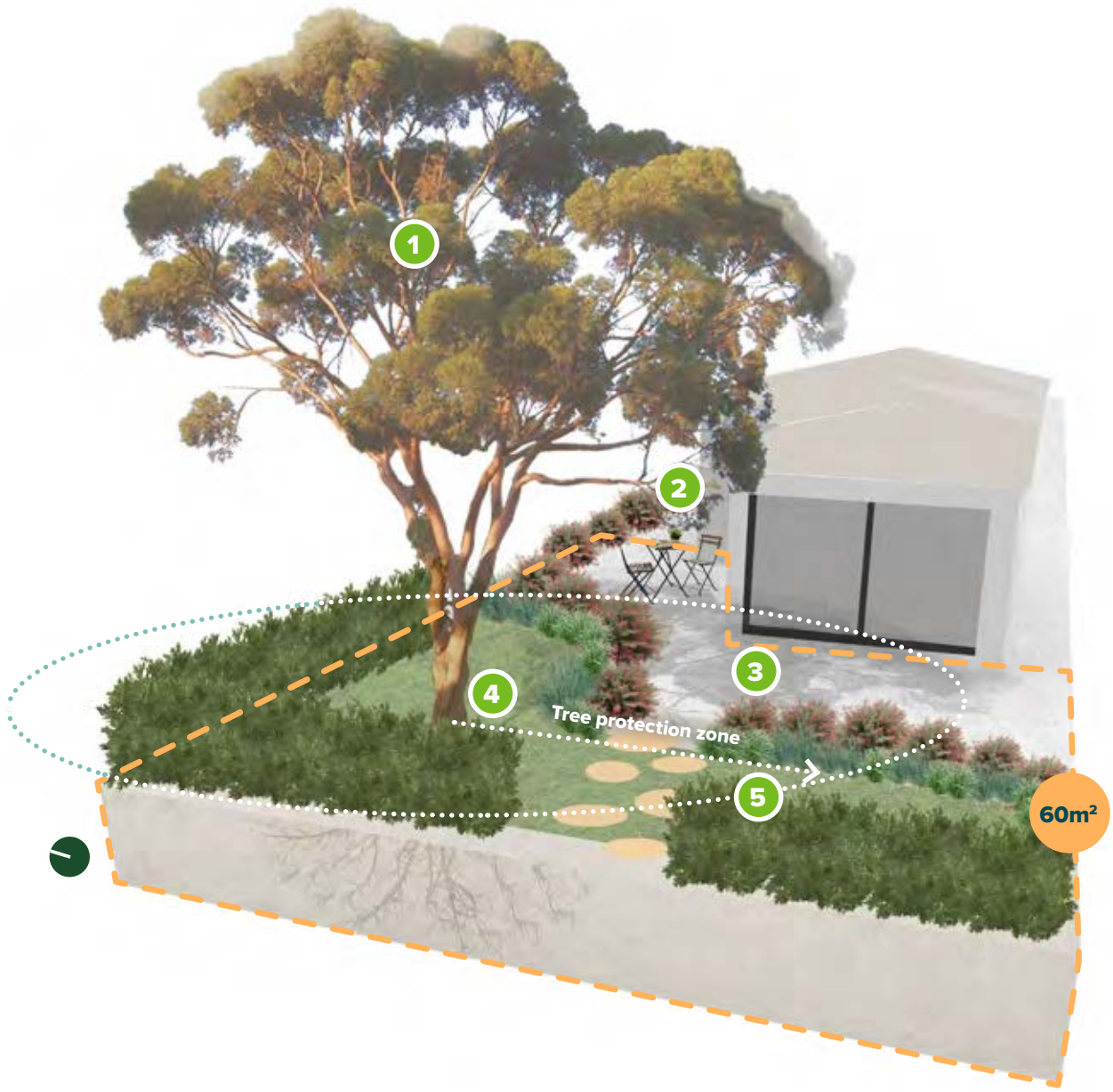
The radius of the SRZ is calculated for each tree using the below formula:

$$\text{Radius of SRZ} = (\text{D} \times 50)^{0.42} \times 0.64$$

D = the trunk diameter (metres), measured above the root buttress

Speak to an arborist to provide advice on the tree's health, structure and TPZ/SRZ requirements.





Small trees compared to medium trees

Accommodating a medium tree with 30m² soil area enhances economic, wellbeing and liveability benefits through extra shading and cooling of your garden and dwelling when compared to a small tree.

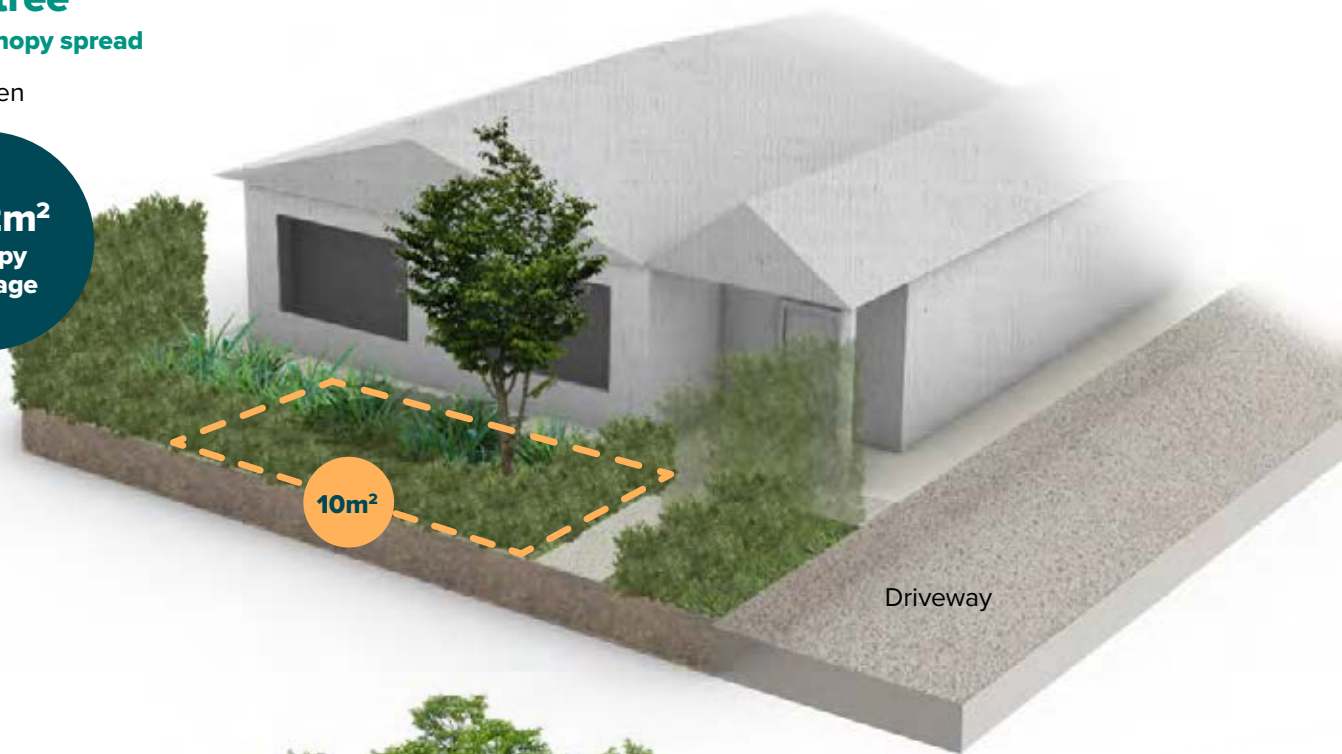
A medium tree can provide up to 16 times more canopy coverage than a small tree.

Small tree

2 – 4m canopy spread

Front garden

3 - 12m²
canopy coverage



Medium tree

4 – 8m canopy spread

Front garden

12 - 50m²
canopy coverage

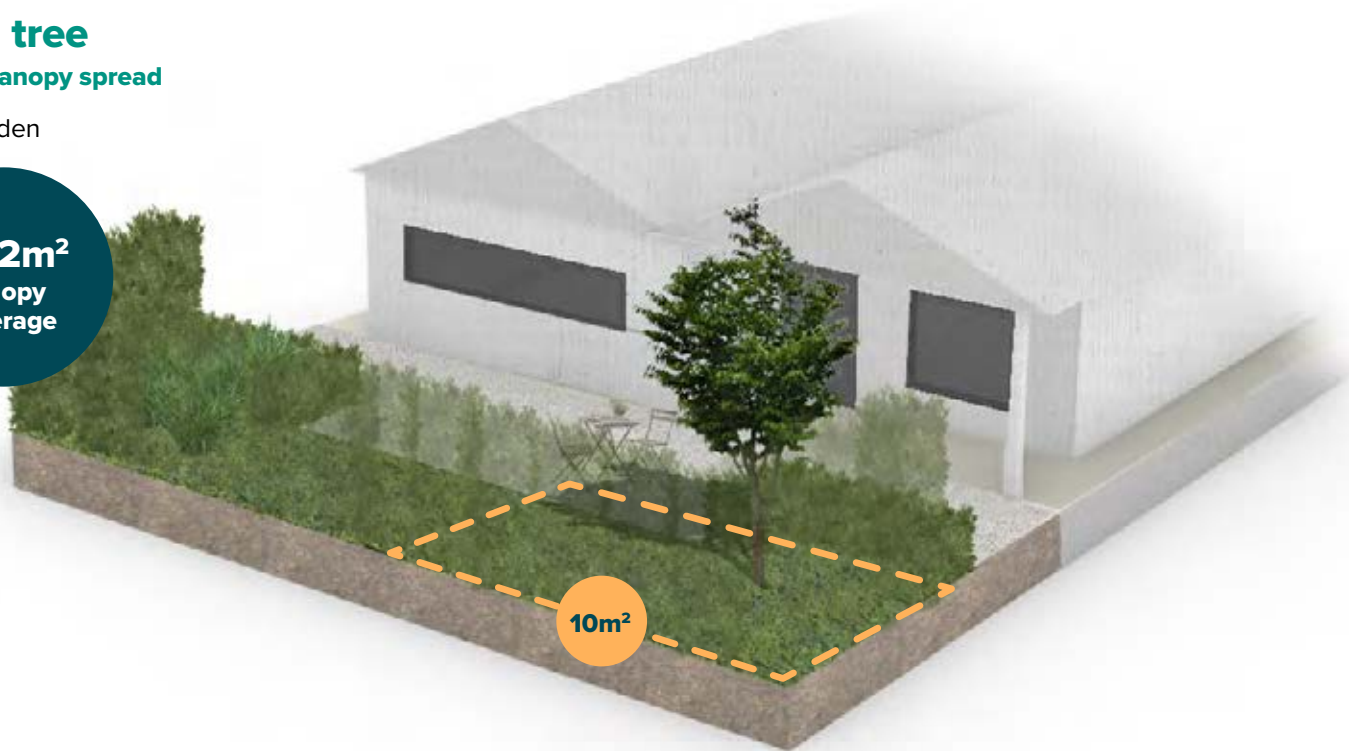


Small tree

2 – 4m canopy spread

Back garden

3 - 12m²
canopy
coverage

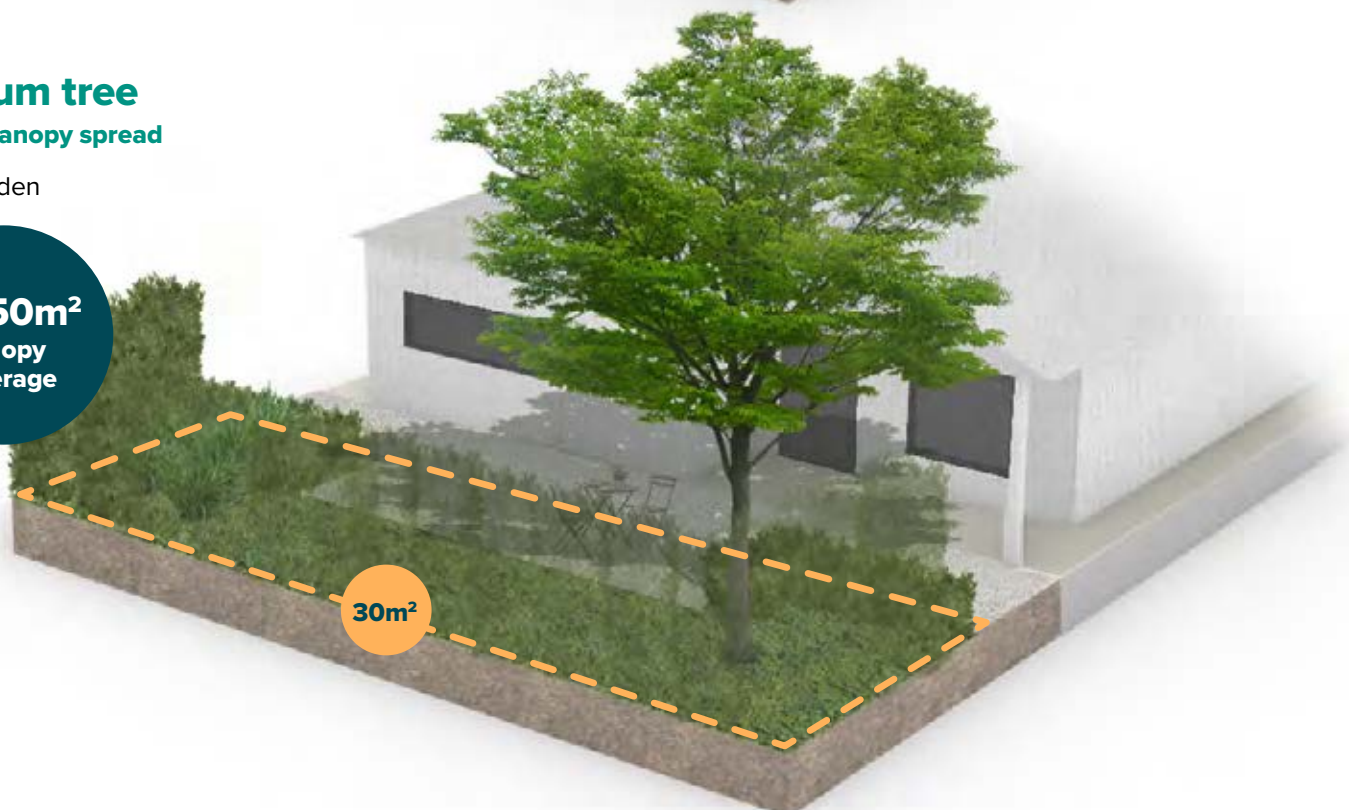


Medium tree

4 – 8m canopy spread

Back garden

12 - 50m²
canopy
coverage



House footings and the tree effect

Structural engineers consider many factors in the design of footings for new buildings (in line with the [Australian Standard 2870-2011 Residential Slabs and Footings](#)). One important factor is existing and proposed new trees depending on their size, number and location in relationship to a new dwelling.

For example, if there are one or 2 trees located within the same distance away from a new dwelling as the mature height of the tree/s, the footings are designed to accommodate a '**single tree effect**'. If there are 3 or more trees located within the same distance away from a new dwelling as 1.5 times the mature height of the trees, footings will be designed to accommodate a '**group of trees effect**'.

The footing depth of a residential footing system can also be influenced by a number of other factors e.g. soil type, construction method, and the type and shape of the footing system. Therefore, the cost impact of trees on footings is highly variable.

It is important to acknowledge that in an established urban neighbourhood, house footings will often already have to be designed to accommodate the impact of nearby offsite trees. This is because there may already be a street tree or trees within one or more neighbouring sites within the 'tree effect' area of the new dwelling.

Therefore, planting a new tree will often not result in additional footing design costs as the new dwelling would have to already accommodate for a 'single tree effect' or 'group of trees effect'.

It is prudent for home builders to consider that new trees may be planted on neighbouring sites or in the public verge outside their house (within the area of effect on their footings) in the future. Therefore, it is important that their house footings are designed for this.

It is recommended that new home builders seek advice from a structural engineer about the optimal location for any new trees to minimise the effect on their and their neighbours' dwelling's footings.

Infill development zones

The **General Neighbourhood** and **Suburban Neighbourhood Zones** have a minimum 5m setback. Infill developments in these zones can usually meet the tree planting policy without incurring any new costs to house footings.

The denser **Housing Diversity** and **Urban Renewal Zones** have a minimum 3m setback. In these zones, households could choose to avoid additional house footing costs by setting their house back further than the minimum, or they can choose to accommodate the 'tree effect' in their house footing design. Due to the small block size and minimum setback, it is likely that many of these developments will already have to consider some form of 'tree effect' from nearby street trees or neighbour's trees.



Impact of soil type on the ‘tree effect’

In Greater Adelaide there are numerous soil types, ranging from least reactive (sandy) to highly reactive (clay). At any given site, soil layers over the depth of moisture change can vary greatly. For example, sand might overlay reactive clay soil. The minimum depth of moisture change in Adelaide for a suburban development is 4 metres. The soil profile and reactivity of its layers determine the reactivity of the site. More reactive sites generally have a higher impact on footings, and less reactive sites a lower impact.

For low reactive sites, a tree (even planted quite close to a house) may have little impact on footing thickness and reinforcement requirements (and therefore cost), while in more reactive soils the implications (and therefore cost) can be considerably higher.

In cases where a new dwelling’s footing construction may need to consider the ‘tree effect’, site reactivity is a significant factor in the magnitude of the cost impact.

Urban Tree Canopy Off-set Scheme

In special instances, where planting a tree can be challenging (e.g. small allotment size or highly reactive soil), the [Urban Tree Canopy Off-set Scheme](#) enables contribution into the Urban Tree Canopy Off-set Fund as an alternative to planting the required tree.

The Scheme operates in the following circumstances:

- Housing Diversity Neighbourhood Zone
- Urban Renewal Neighbourhood Zone
- City Living Zone
- any site with a ‘Designated Soil Type’ as described in the Scheme.

The money from the Fund can be used to plant trees in parks, reserves and nature strips, or to create new parks.

Cost Benefit Analysis in regards to the tree planting policy

In 2020, the State Planning Commission commissioned an [Options Analysis Report](#) to support the development of the tree planting policy for the Planning and Design Code.

This was to identify and understand the costs and benefits (for individuals and for the broader community) of the tree planting policy. Overall, this research found that in most instances the benefits were greater than the costs.

Foundation maintenance and footing performance

The CSIRO released a comprehensive and user-friendly homeowner guide regarding [foundation maintenance and footing performance](#). The guide is designed to help identify causes of soil-related building movement and suggests methods of prevention of resultant cracking. This includes advice about existing trees, new trees and vegetation, and the role of garden layouts, watering and maintenance.

This guide was written in the context of the larger allotment sizes that prevailed in the early nineties and some of the provisions may not be achievable for small allotments.

Your engineer’s soil report and site drainage plan will provide important information and guidance for your site in relation to drainage, landscaping (tree planting), paving protection and garden watering.

For further information:

- How to achieve better greening outcomes for courtyards ([see page 26](#))
- Carefully manage stormwater run-off ([see page 72](#))
- Ensure irrigation and stormwater systems are well installed and maintained ([see page 111](#))

Case studies

The housing types listed below are illustrated on the following pages to provide a diversity of typical infill housing examples. Two plan layouts are provided per example. The first plan illustrates meeting the minimum tree planting and landscaping criteria of the Code. The second shows better greening outcomes for improved environmental, livability and wellbeing benefits.

The following case studies have been chosen as they represent the primary zones where urban infill occurs in metropolitan Adelaide. The most common housing types have also been illustrated.

For a more detailed table comparing all the different zones where the Urban Tree Canopy Overlay applies please see the Glossary section.

No.	Housing type	Density	Zone	Site area
1	Detached	1 dwelling	General Neighbourhood	300m ²
2	Semi-detached	2 dwellings	Suburban Neighbourhood	750m ²
3	Semi-detached	2 dwellings	General Neighbourhood	650m ²
4	Detached ('battle-axe')	2 dwellings	Housing Diversity Neighbourhood	580m ²
5	Residential flat building ('battle-axe')	4 dwellings	Housing Diversity Neighbourhood	940m ²
6	Terrace/row	3 dwellings	General Neighbourhood	750m ²
7	Detached	4 dwellings	General Neighbourhood	1200m ²
8	Residential flat building	5 dwellings	Housing Diversity Neighbourhood	1000m ²



25

Common housing types

Refer to the glossary for further detail about these housing types.



Row dwelling

Also known as terrace housing, 3 or more houses joined together



Detached dwelling

Also known as a freestanding house or standalone dwelling, not joined to any other house



Group dwelling

Also known as units, are a group of 2 or more detached houses that share a common driveway



Semi-detached dwelling

Also known as a townhouse or courtyard home, joined to 1 other house by a common wall



Residential flat building

Also known as apartments, it is a single building which includes 2 or more houses

Meeting minimum greening requirements for a Detached dwelling

This example illustrates meeting minimum requirements for a single detached dwelling in the General Neighbourhood Zone.

Minimum requirements

Site statistics	Code requirements
General Neighbourhood Zone	Front setback is the average of adjoining buildings or 5m 3m rear setback
300m ² site area 1 storey 4 bedroom home	1 small tree per dwelling with min. soil area of 10m ² with minimum diameter of 1.5m ²
	20% soft landscaping
	24m ² Private Open Space behind building line
	Minimum 30% soft landscaping between building line and street

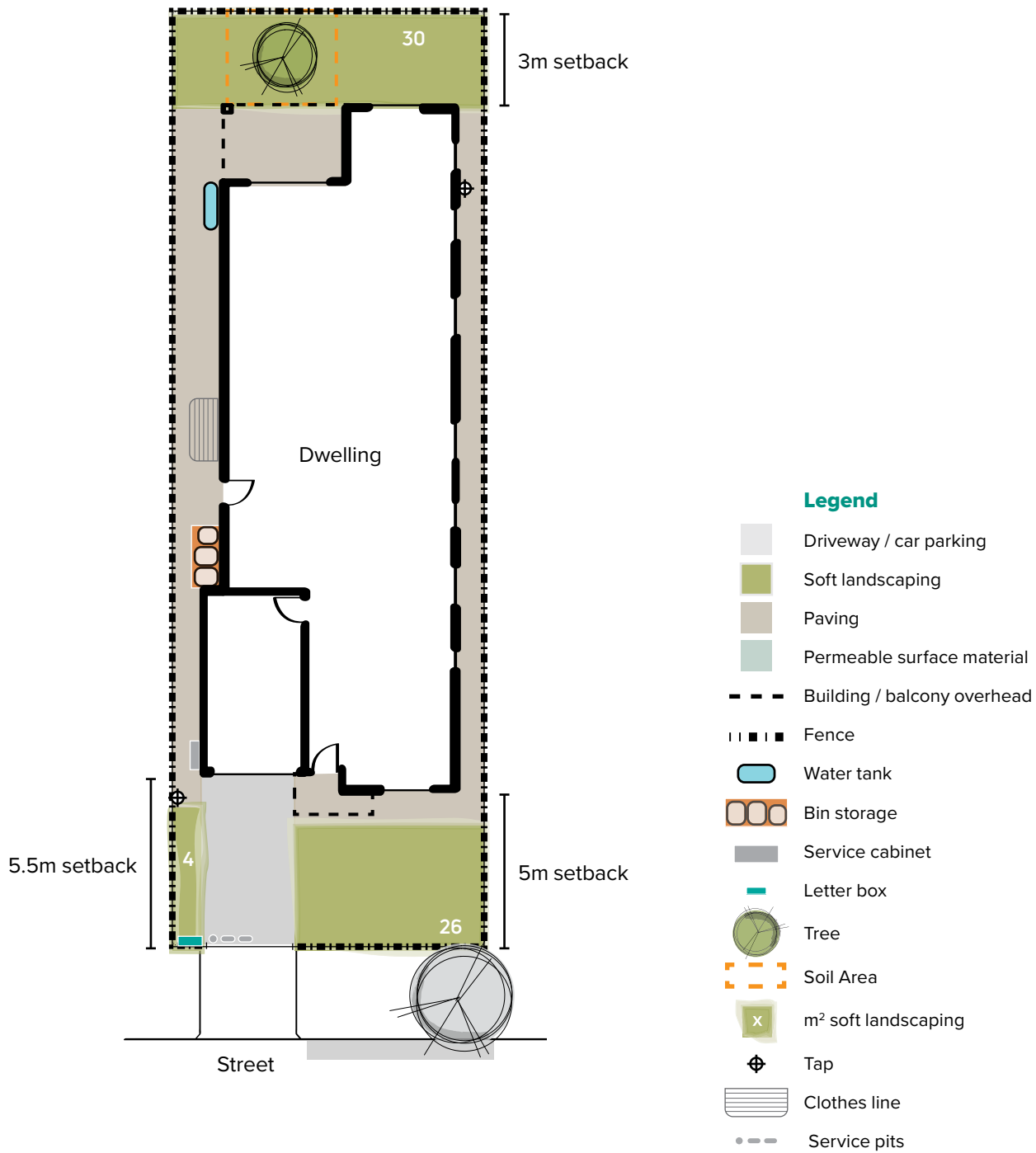
Common examples



31



32



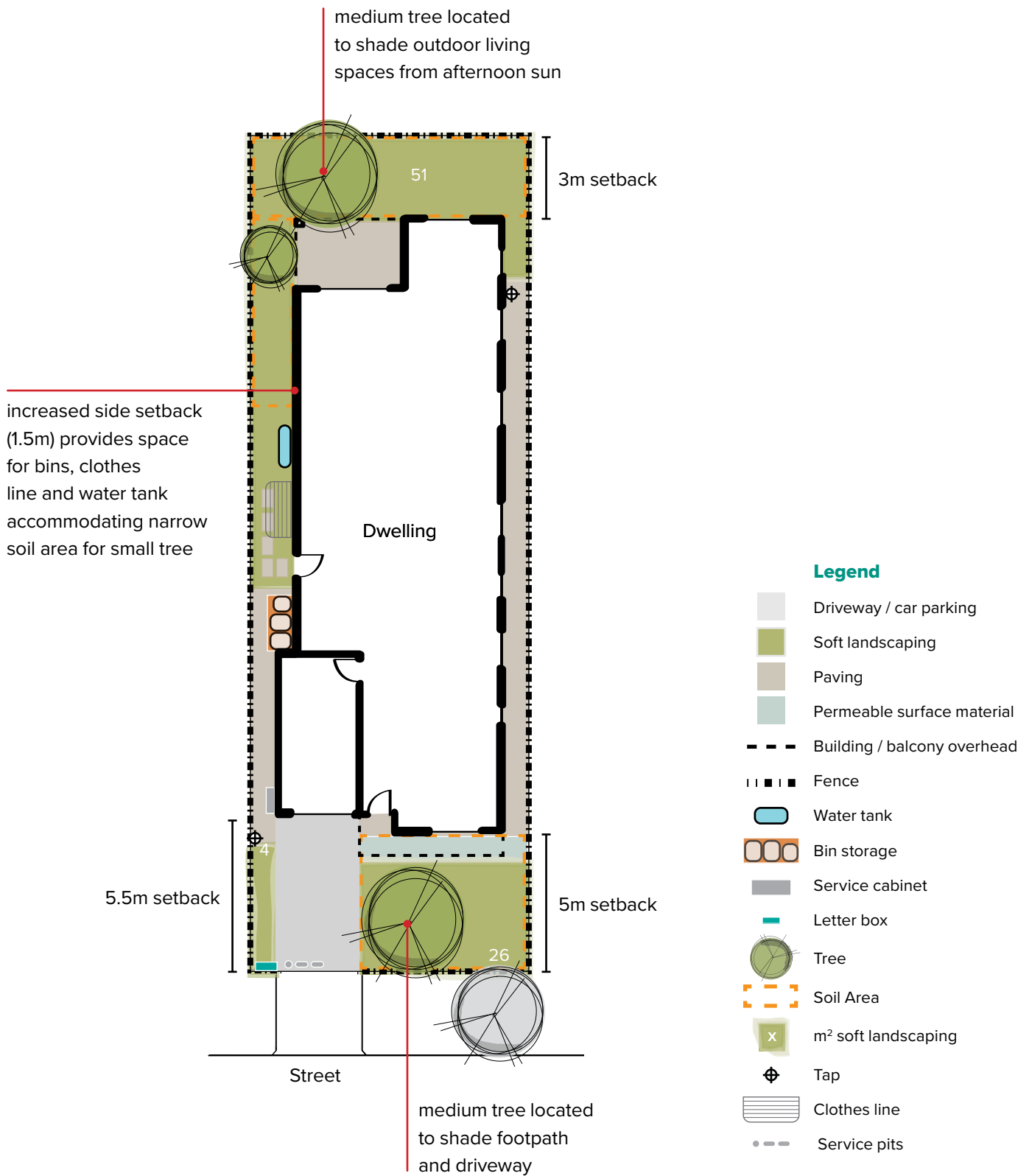
Better greening outcomes for a

Detached dwelling

This example illustrates better greening outcomes for a single detached dwelling in the General Neighbourhood Zone.

Achievable	How	Why
1 small tree	<ul style="list-style-type: none"> • Permeable surface material (decking to rear alfresco area and gravel along rear wall) to achieve soil areas • Narrow soil area (min. 1.5m) for additional small tree along western edge of dwelling 	<ul style="list-style-type: none"> • Improved shading, especially of western side of alfresco area • Improved views from living spaces
2 medium trees	<ul style="list-style-type: none"> • 30m² soil areas retained in front and back gardens • Permeable/ porous surface material e.g. gravel path along front wall of dwelling to achieve front garden medium tree 	<ul style="list-style-type: none"> • Shaded indoor and outdoor living spaces in summer • Contribution to shading and cooling footpath and enhancing neighbourhood amenity and character
25% soft landscaping	<ul style="list-style-type: none"> • Reduced hard surfaces and paving • Planting or lawn with steppers to western side of dwelling 	<ul style="list-style-type: none"> • Enhanced appearance from dwellings and street • Enhanced cooling and minimised heat absorption and reflection • Improved stormwater infiltration • Improved contribution to biodiversity
55m ² Private Open Space	<ul style="list-style-type: none"> • Generous undercover alfresco area to rear of dwelling 	<ul style="list-style-type: none"> • Enhanced indoor/outdoor lifestyle opportunities • Improved connection to nature • Enhanced wellbeing





Meeting minimum greening requirements for a **Semi-detached dwelling** 375m² site

This example illustrates meeting minimum requirements for semi-detached dwellings in the Suburban Neighbourhood Zone.

Minimum requirements

Site statistics	Code requirements
Suburban Neighbourhood Zone	Front setback average of adjoining buildings or 8m 4m rear setback
750m ² parcel of land	1 small tree per dwelling with min. soil area of 10m ² with min. dim of 1.5m ²
2 dwellings with 375m ² site area per dwelling	20% soft landscaping 60m ² Private Open Space behind building line
2 storey 4 bedroom homes	Min. 30% soft landscaping between building line and street

Common examples



34



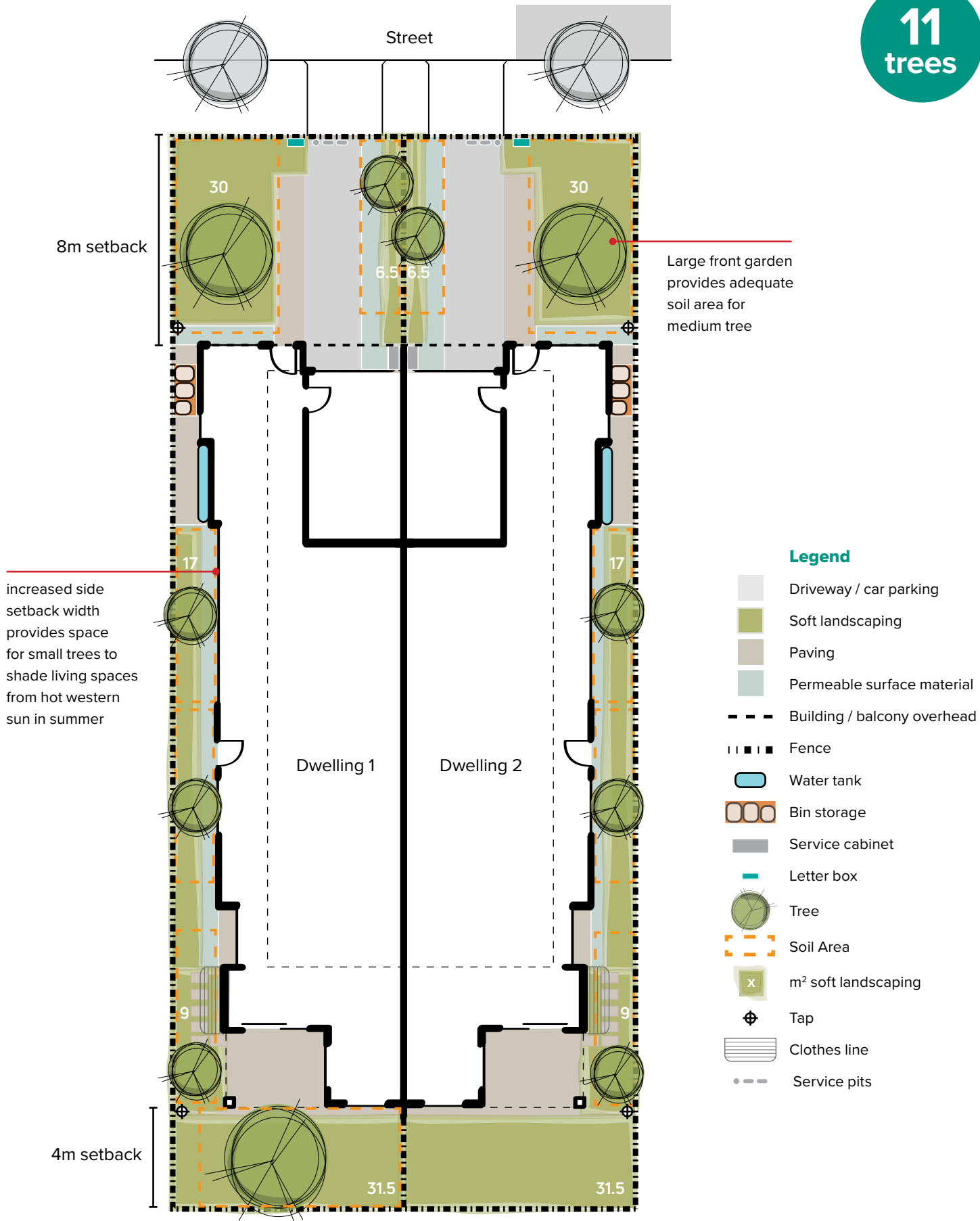
Better greening outcomes for a

Semi-detached dwelling

375m² site

This example illustrates better greening outcomes for semi-detached dwellings in the Suburban Neighbourhood Zone.

Achievable	How	Why
8 small trees	<ul style="list-style-type: none"> • Permeable surface material on driveway over soil area • Trees located in narrow zones alongside house with min. 1.5m width 	<ul style="list-style-type: none"> • Screening for privacy • Improved shading, especially of windows down western side of dwelling 1 • Improved views from living spaces
3 medium trees	<ul style="list-style-type: none"> • Relatively large front and rear garden areas used to achieve 30m² soil area 	<ul style="list-style-type: none"> • Shaded living room in summer • Enhanced cooling • Lower power costs • Improved habitat and biodiversity
25% soft landscaping	<ul style="list-style-type: none"> • Reduced hard surfaces and paving • Planting or lawn with steppers to side setbacks alongside clothes line 	<ul style="list-style-type: none"> • Enhanced appearance from dwellings and street • Enhanced cooling and minimised heat absorption and reflection • Improved stormwater infiltration • Improved contribution to biodiversity
60m ² Private Open Space	<ul style="list-style-type: none"> • Large undercover alfresco area to rear of dwelling 	<ul style="list-style-type: none"> • Enhanced indoor/outdoor lifestyle opportunities • Improved connection to nature • Enhanced wellbeing



Meeting minimum greening requirements for a Semi-detached dwelling 325m² site

This example illustrates meeting minimum requirements for semi-detached dwellings in the General Neighbourhood Zone.

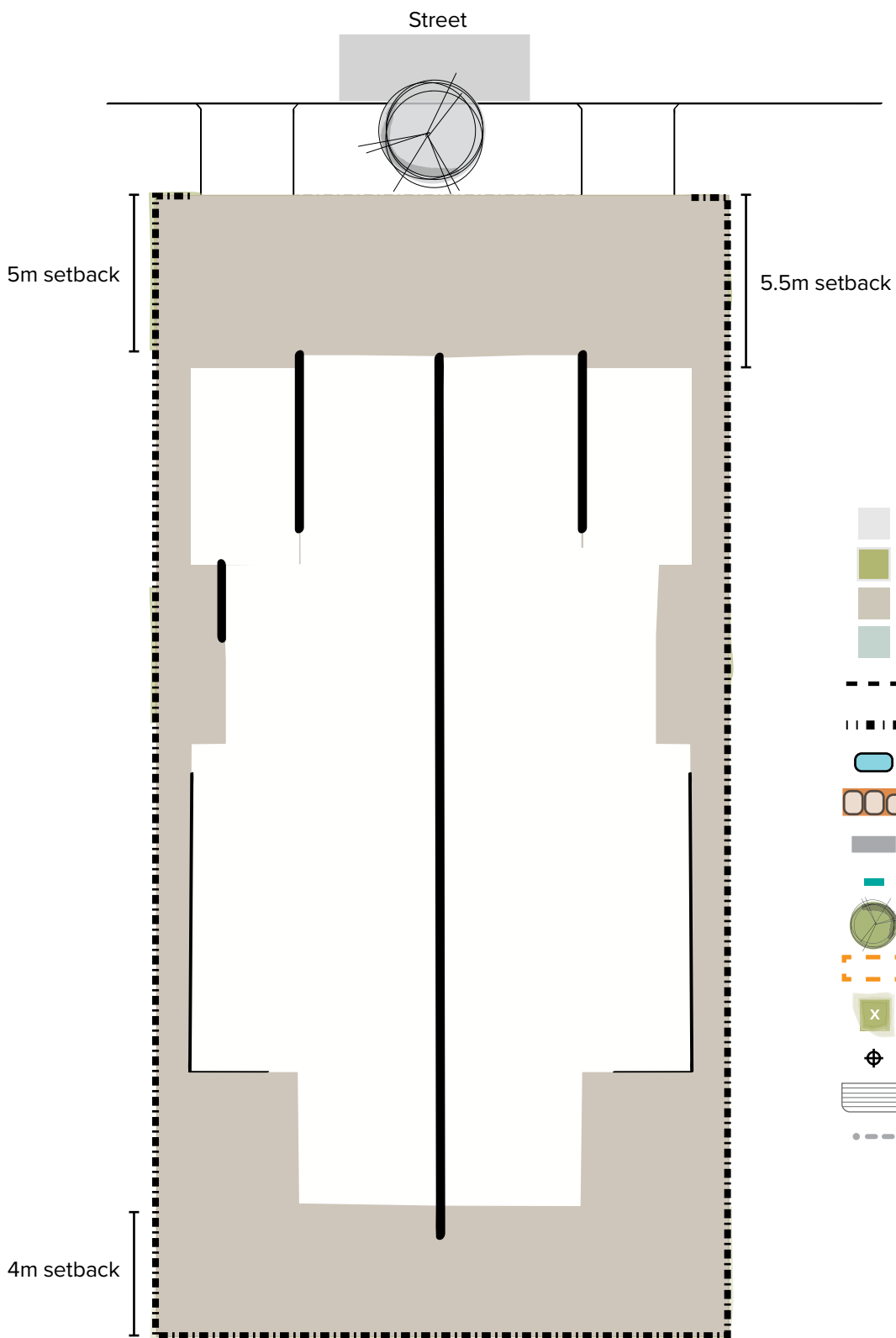
Minimum requirements

Site statistics	Code requirements
General Neighbourhood Zone	Front setback average of adjoining buildings or 5m 4m rear setback
650m ² parcel of land	1 small tree per dwelling with min. soil area of 10m ² with min. dim of 1.5m ²
2 dwellings with 325m ² site area per dwelling	20% soft landscaping 60m ² Private Open Space behind building line
1 storey 3 bedroom homes	Min. 30% soft landscape between building line and street

Common examples



35



Legend

- Driveway / car parking
- Soft landscaping
- Paving
- Permeable surface material
- Building / balcony overhead
- Fence
- Water tank
- Bin storage
- Service cabinet
- Letter box
- Tree
- Soil Area
- m² soft landscaping
- Tap
- Clothes line
- Service pits



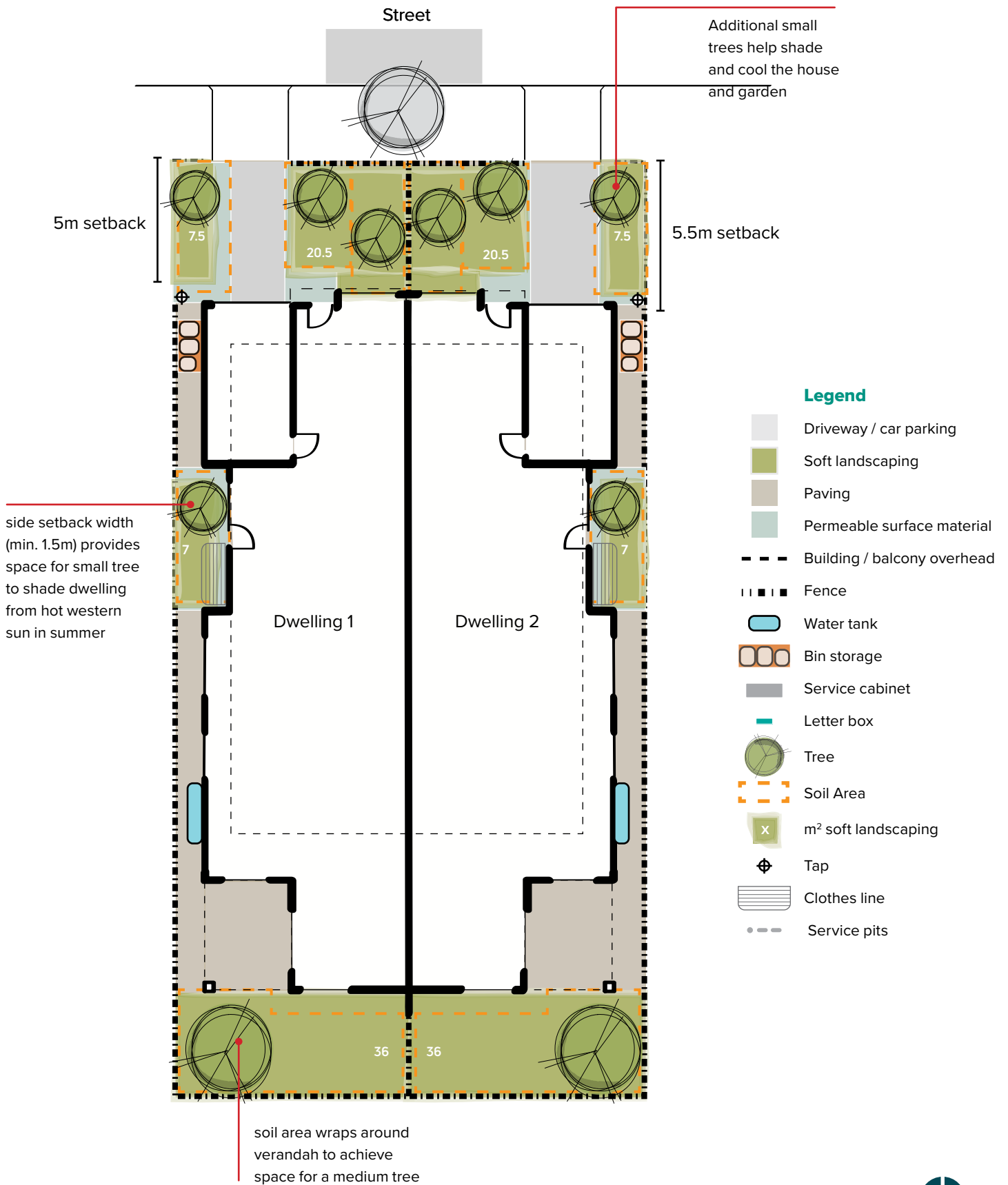
Better greening outcomes for a Semi-detached dwelling 325m² site

This example illustrates better greening outcomes for semi-detached dwellings in the General Neighbourhood Zone.

Achievable	How	Why
8 small trees	<ul style="list-style-type: none"> • Small tree located in narrow landscape zone alongside driveway • Using narrow (2m wide) side setback area to locate a small tree 	<ul style="list-style-type: none"> • Amenity and neighbourhood character • Screening and privacy • Shade and cooling • Enhanced views from living spaces
2 medium trees	<ul style="list-style-type: none"> • Locate tree so 30m² soil area wraps around back verandah 	<ul style="list-style-type: none"> • Enhanced cooling • Increased canopy coverage
22% soft landscaping	<ul style="list-style-type: none"> • Reduced hard surfaces and paving 	<ul style="list-style-type: none"> • Enhanced appearance from dwellings and street • Enhanced cooling and minimised heat absorption and reflection • Improved stormwater infiltration • Improved contribution to biodiversity
60m ² Private Open Space	<ul style="list-style-type: none"> • Generous rear alfresco area 	<ul style="list-style-type: none"> • Enhanced indoor/outdoor lifestyle opportunities



36



Meeting minimum greening requirements for a Detached ('battle-axe')

This example illustrates meeting minimum requirements for detached dwellings on a 'battle-axe' allotment in the Housing Diversity Neighbourhood Zone.

Minimum requirements

Site statistics	Code requirements
Housing Diversity Neighbourhood Zone	3m front setback 3m rear setback
580m ² parcel of land 2 dwellings with 198m ² site area for dwelling 1 and 382m ² site area for dwelling 2 1 storey 3 bedroom homes	1 small tree per dwelling with min. soil area of 10m ² with min. dim of 1.5m ²
	15% soft landscaping (dwelling 1) 20% soft landscaping (dwelling 2)
	24m ² Private Open Space behind building line (dwelling 1) 60m ² Private Open Space behind building line (dwelling 2)
	Min. 30% soft landscaping between building line and street
	1m wide soft landscaping provided between the driveway and site boundary and driveway and dwelling

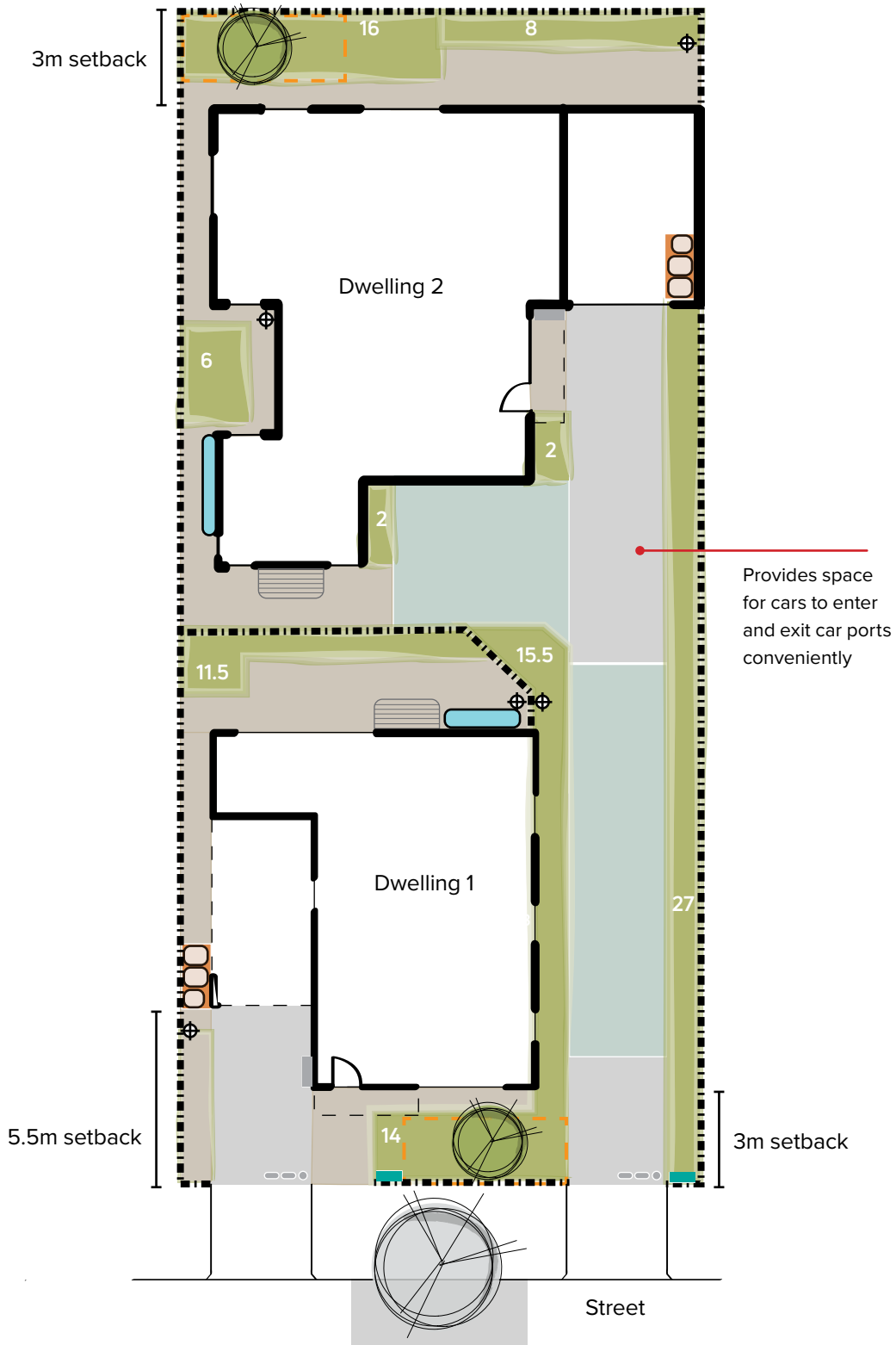
Note:

- Garages, driveways and crossovers/access points must comply with AS/NZS 2890.1:2004.
- 'Battle-axe' allotments should be checked by a traffic engineering professional to ensure turn paths provide appropriate maneuverability.
- It is recommended that you seek assistance from your local council or a professional to ensure your plan complies with all relevant requirements.

Common examples



37



Provides space for cars to enter and exit car ports conveniently

- Legend**
- Driveway / car parking
 - Soft landscaping
 - Paving
 - Permeable surface material
 - Building / balcony overhead
 - Fence
 - Water tank
 - Bin storage
 - Service cabinet
 - Letter box
 - Tree
 - Soil Area
 - m² soft landscaping
 - Tap
 - Clothes line
 - Service pits

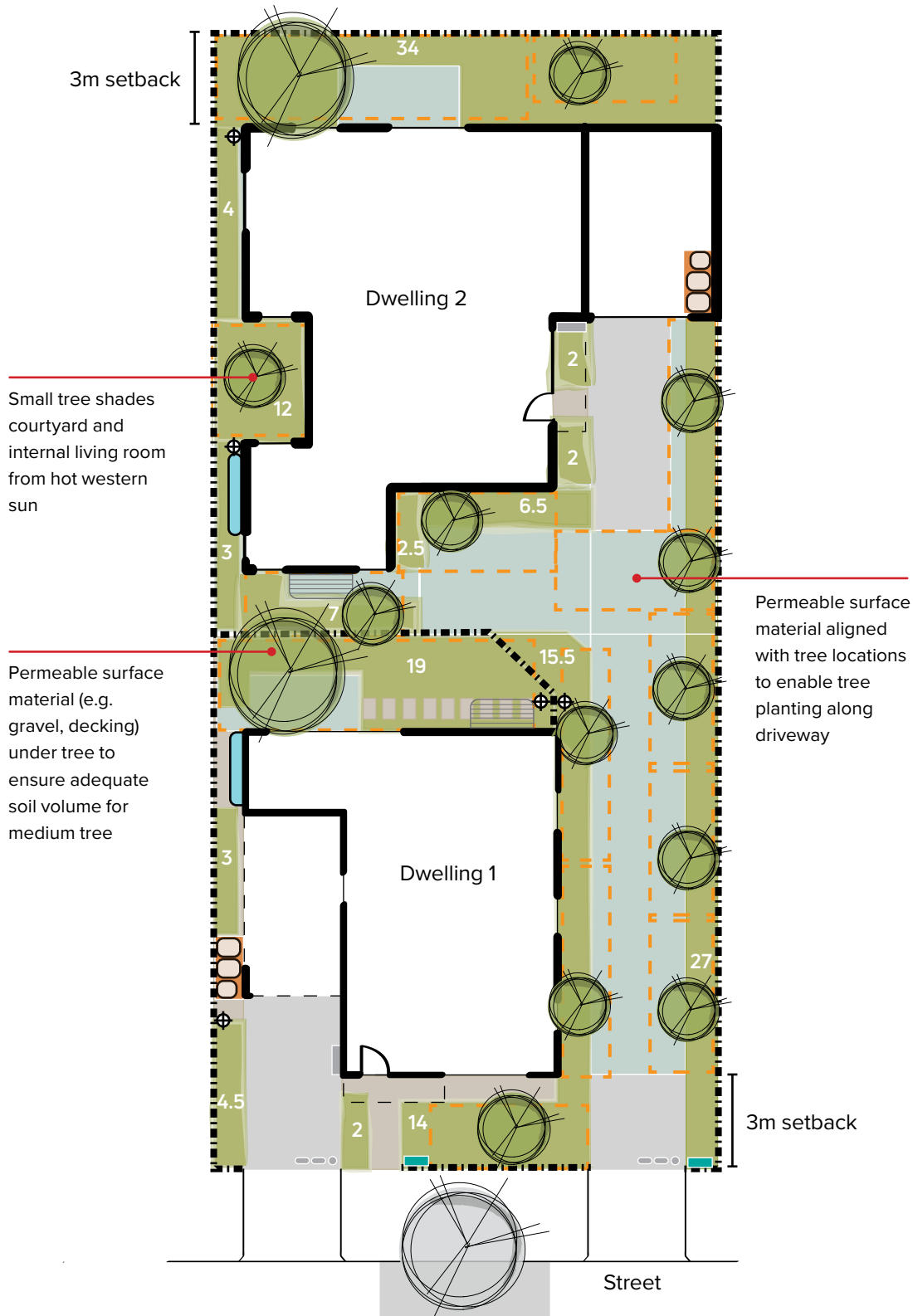


Better greening outcomes for a

Detached ('battle-axe')

This example illustrates better greening outcomes for detached dwellings on a 'battle-axe' allotment in the Housing Diversity Neighbourhood Zone.

Achievable	How	Why
12 small trees	<ul style="list-style-type: none"> Consider permeable surface material on driveway over soil area Consolidated backyard service zones (bin storage, clothes line, water tank) and pathways to achieve soil area required Small tree located in western facing courtyard of dwelling 2 Permeable surface material aligned with tree locations to achieve 7 small trees lining the driveway 	<ul style="list-style-type: none"> Screening trees along the driveway for amenity and privacy Tree in western facing courtyard to provide shade from afternoon sun
2 medium trees	<ul style="list-style-type: none"> 30m² soil areas located in back gardens 	<ul style="list-style-type: none"> Back garden trees provide shade, cooling and amenity to north-facing garden and living spaces Front garden tree provides cooling and shade to the street and neighbourhood amenity and character
21% soft landscaping (dwelling 1) 30% soft landscaping (dwelling 2)	<ul style="list-style-type: none"> Significant reduction in paved spaces Narrow (0.7m wide) soft landscaping to side setbacks along fences, where regular access is not likely required 	<ul style="list-style-type: none"> Enhanced appearance from dwellings and street Enhanced cooling and minimised heat absorption and reflection Improved stormwater infiltration Improved contribution to biodiversity
26m ² Private Open Space (dwelling 1) 60m ² Private Open Space (dwelling 2)	<ul style="list-style-type: none"> Western setback to dwelling 2 to create courtyard space Northern facing, shaded outdoor space accessible from living rooms, to rear of both dwellings 	<ul style="list-style-type: none"> Enhanced indoor/outdoor lifestyle benefits Enhanced wellbeing



Legend

- Driveway / car parking
- Soft landscaping
- Paving
- Permeable surface material
- Building / balcony overhead

- Fence
- Water tank
- Bin storage
- Service cabinet
- Letter box
- Tree

- Soil Area
- x m² soft landscaping
- ⊕ Tap
- Clothes line
- Service pits



Meeting minimum greening requirements for a Residential flat building ('battle-axe')

This example illustrates meeting minimum requirements for a residential flat building on a 'battle-axe' allotment in the Housing Diversity Neighbourhood Zone.

Minimum requirements

Site statistics	Code requirements
Housing Diversity Neighbourhood Zone	3m front setback 3m rear setback
940m ² parcel of land	1 small tree per dwelling with min. soil area of 10m ² with min. dim of 1.5m ²
4 dwellings with average 235m ² site area per dwelling (inc. driveway)	20% soft landscaping per site
	24m ² Private Open Space behind building line
2 storey 3 bedroom homes	Min. 30% soft landscaping between building line and street
Common driveway	Driveway constructed of 50% permeable or porous material

Note:

- This case study assumes that the Urban Transport Routes Overlay and the Major Urban Transport Overlay within the Code do not apply.
- Garages, driveways and crossovers/access points must comply with AS/NZS 2890.1:2004.
- 'Battle-axe' allotments should be checked by a professional to ensure turn paths provide appropriate maneuverability.
- Common driveways servicing a perpendicular parking space should be checked by a traffic engineering professional to ensure turn paths provide appropriate maneuverability.
- It is recommended that you seek assistance from your local council or a professional to ensure your plan complies with all relevant requirements.

Common examples



38

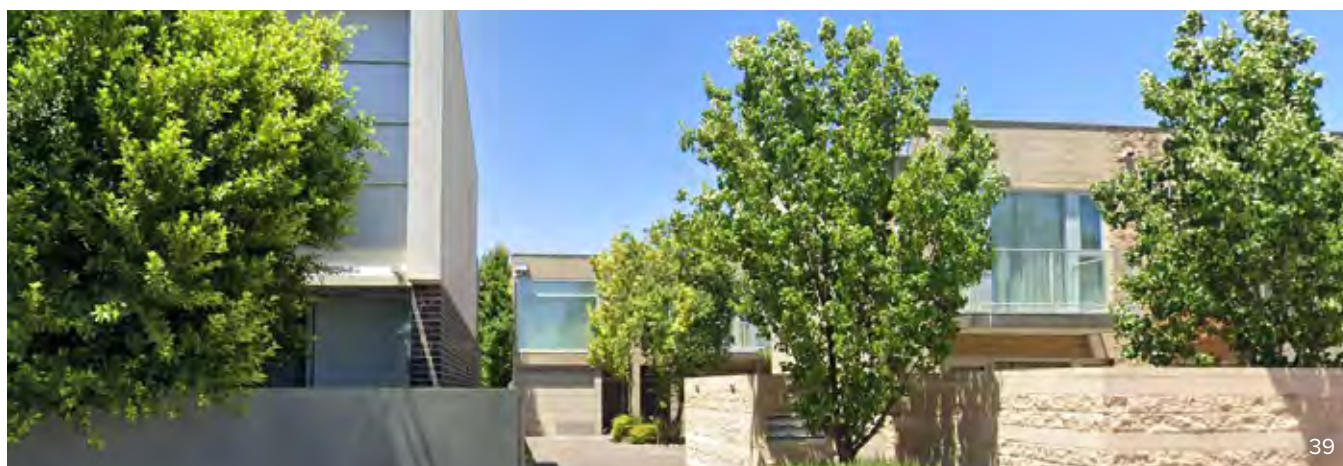


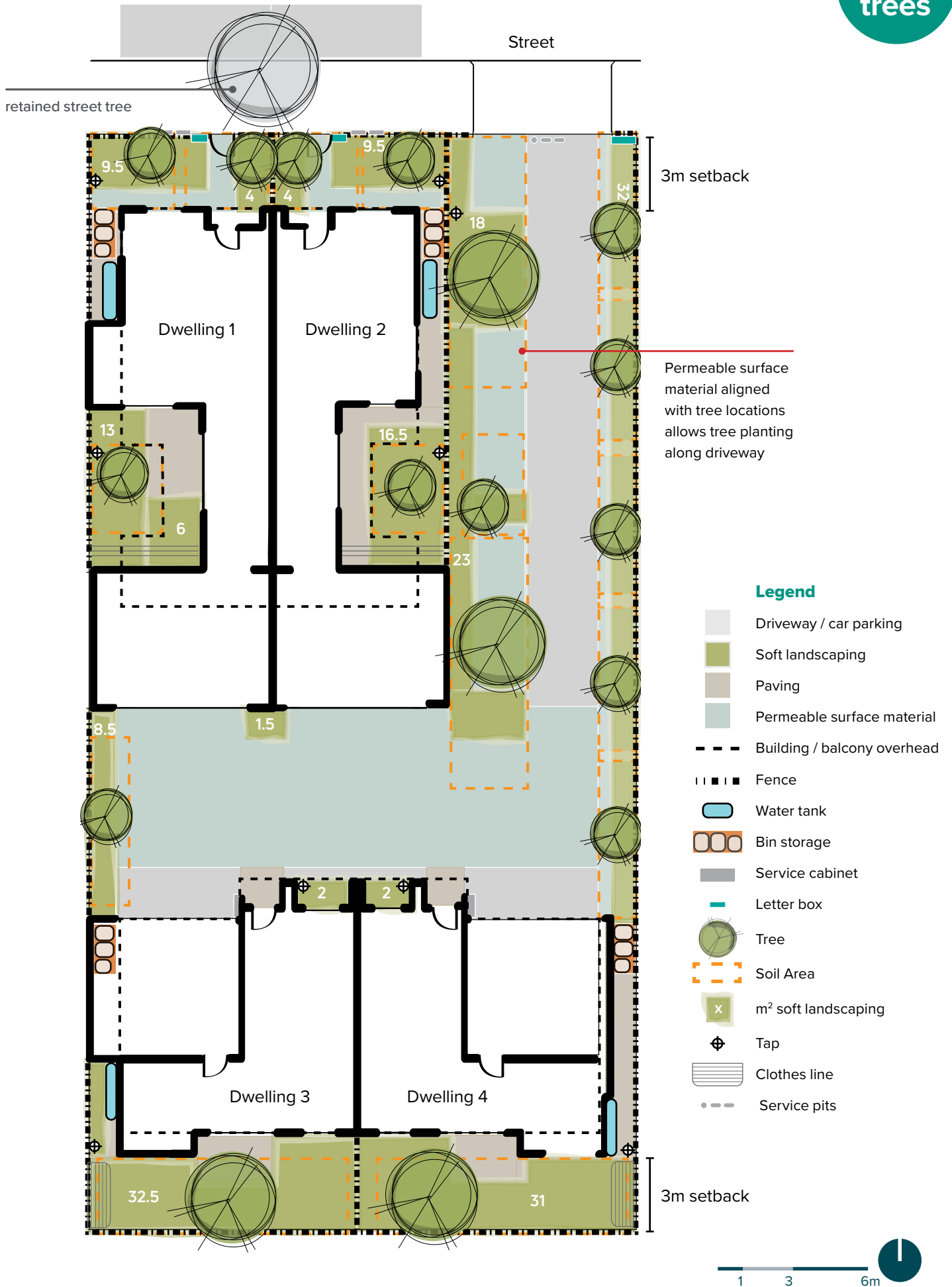
Better greening outcomes for a

Residential flat building ('battle-axe')

This example illustrates better greening outcomes for a residential flat building on a 'battle-axe' allotment in the Housing Diversity Neighbourhood Zone.

Achievable	How	Why
13 small trees	<ul style="list-style-type: none"> Reduced paved area in courtyard in dwellings 1 and 2 to achieve 10m² soil area 	<ul style="list-style-type: none"> Enhanced amenity, lifestyle and wellbeing Shade (especially beneficial for western facing courtyard)
4 medium trees	<ul style="list-style-type: none"> Permeable material for driveway zones over soil area Reduced paved areas in back garden to achieve 30m² soil area 	<ul style="list-style-type: none"> Large increase in canopy coverage Shade and cooling Amenity for back garden and views from living areas
23% soft landscaping	<ul style="list-style-type: none"> Narrowed rear driveway area Reduced paving areas 	<ul style="list-style-type: none"> Enhanced appearance from dwellings and street Enhanced cooling and minimised heat absorption and reflection Improved stormwater infiltration Improved contribution to biodiversity
25m ² Private Open Space (dwelling 1) 24m ² Private Open Space (dwelling 2) 35m ² Private Open Space (dwelling 3 and 4)	<ul style="list-style-type: none"> Courtyard between house and garage (partially covered by 1st floor) for dwelling 1 and 2 	<ul style="list-style-type: none"> Enhanced indoor/outdoor lifestyle opportunities Improved wellbeing





Meeting minimum greening requirements for Terrace/row dwellings

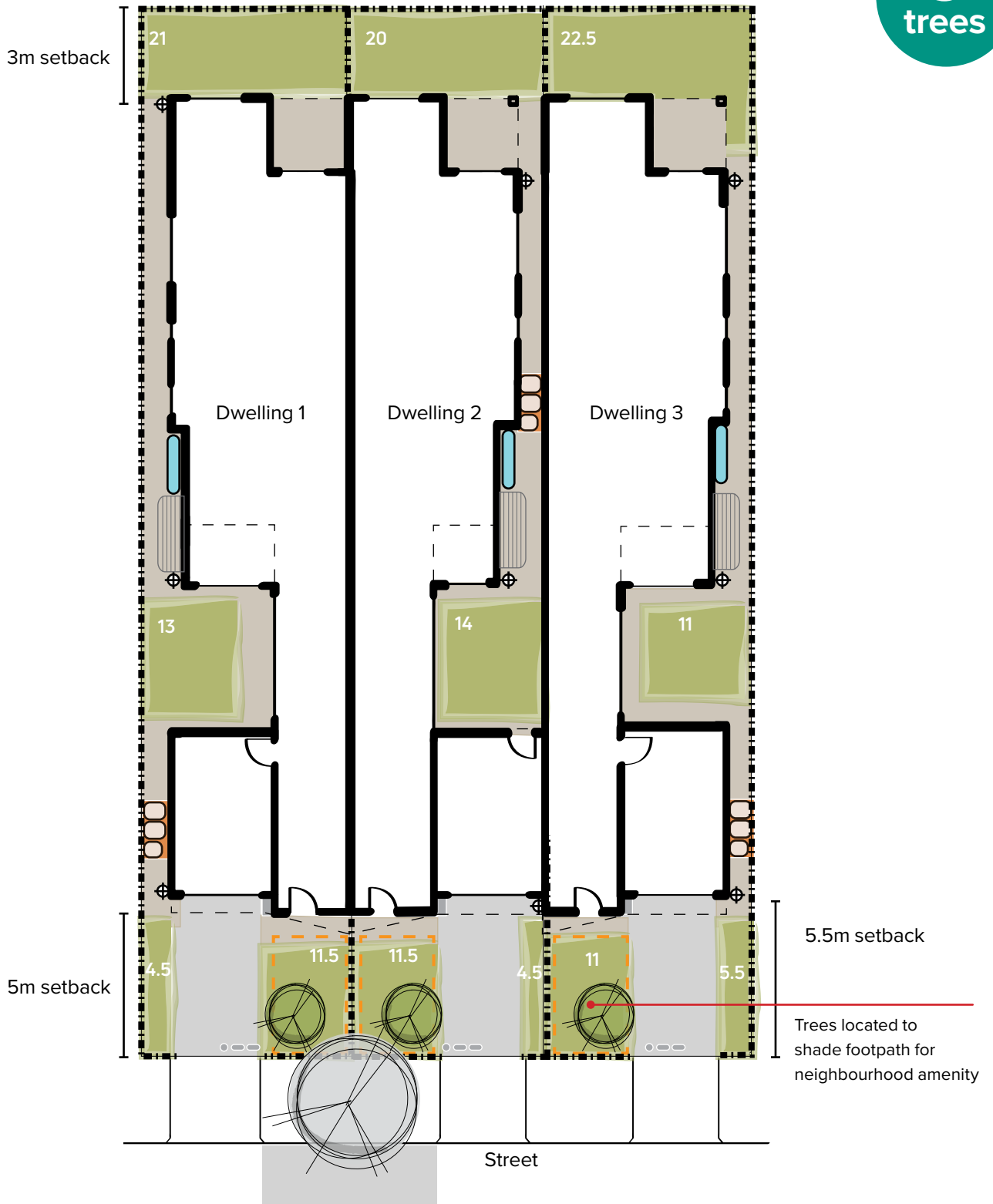
This example illustrates meeting minimum requirements for row dwellings in a terrace arrangement in the General Neighbourhood Zone.

Minimum requirements

Site statistics	Code requirements
General Neighbourhood Zone	Front setback average of adjoining buildings or 5m 3m rear setback
750m ² parcel of land	1 small tree per dwelling with min. soil area of 10m ² with min. dim of 1.5m ²
3 dwellings with 250m ² site area per dwelling	20% soft landscaping
2 storey 3 bedroom homes	24m ² Private Open Space behind building line Min. 30% soft landscaping between building line and street

Common examples





Legend

- Driveway / car parking
- Soft landscaping
- Paving
- Permeable surface material
- Building / balcony overhead

- Fence
- Water tank
- Bin storage
- Service cabinet
- Letter box
- Tree

- Soil Area
- x m² soft landscaping
- Tap
- Clothes line
- Service pits



Better greening outcomes for

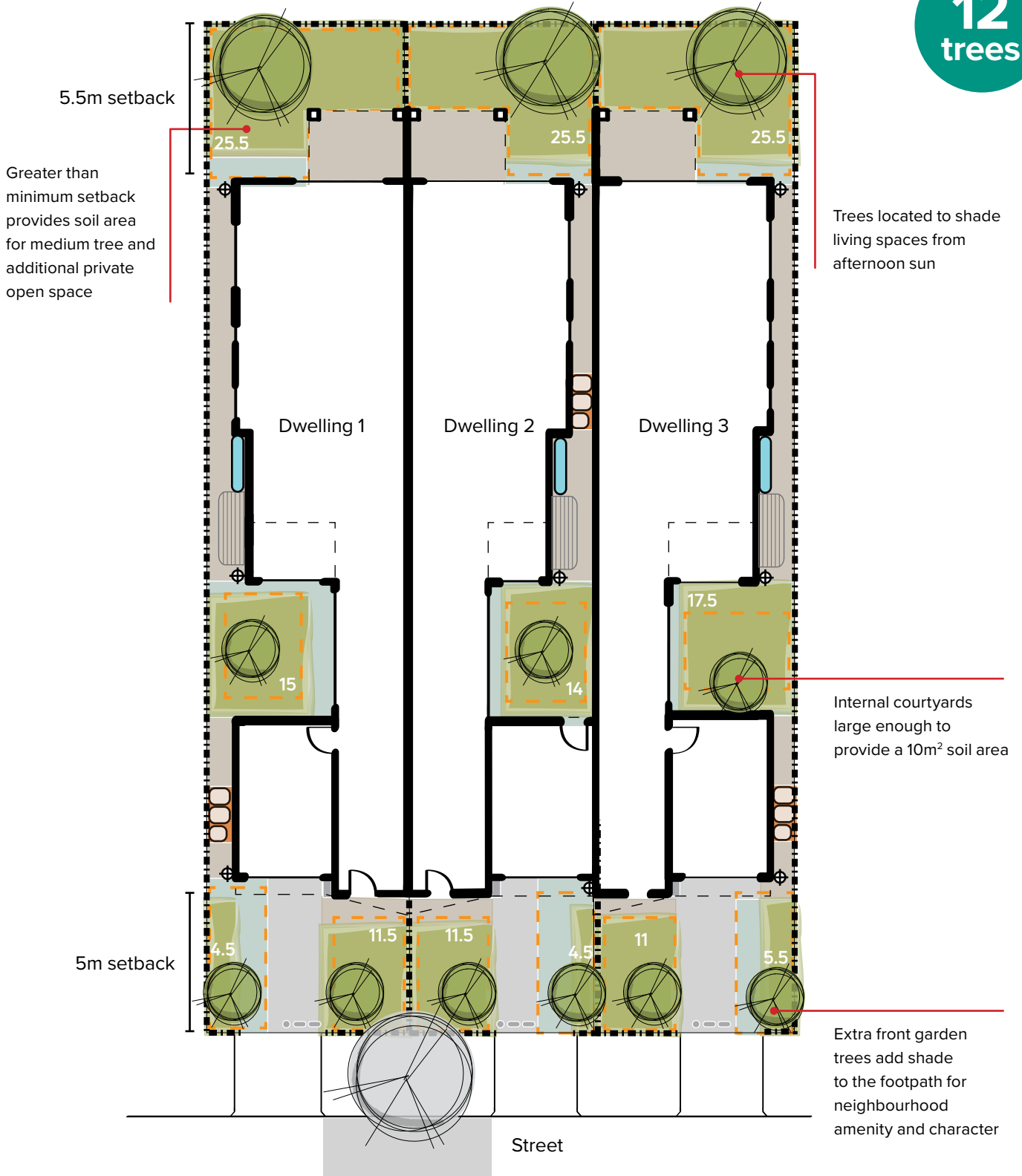
Terrace/row dwellings

This example illustrates better greening outcomes for row dwellings in a terrace arrangement in the General Neighbourhood Zone.

Achievable	How	Why
3 medium trees	<ul style="list-style-type: none"> • Small reduction to width of back verandah to achieve 30m² required soil area 	<ul style="list-style-type: none"> • Increased canopy coverage (compared to two small trees) • Increased shade and cooling
9 small	<ul style="list-style-type: none"> • Small trees added to courtyard spaces 	<ul style="list-style-type: none"> • Enhanced amenity, lifestyle and wellbeing • Shade (deciduous trees in the northern facing courtyards will allow solar access during winter)
23% soft landscaping	<ul style="list-style-type: none"> • Small reduction in paved areas 	<ul style="list-style-type: none"> • Enhanced appearance from dwellings and street • Enhanced cooling and minimised heat absorption and reflection • Improved stormwater infiltration • Improved contribution to biodiversity
59m ² Private Open Space (dwelling 1) 52m ² Private Open Space (dwelling 2) 57m ² Private Open Space (dwelling 3)	<ul style="list-style-type: none"> • Small internal courtyard • Rear alfresco area • Reconfiguration of dwelling to allow for greater than minimum setback (5.5m), which provides soil area for medium tree and additional Private Open Space 	<ul style="list-style-type: none"> • Enhanced indoor/outdoor lifestyle opportunities • Improved wellbeing



42



Legend

- Driveway / car parking
- Soft landscaping
- Paving
- Permeable surface material
- Building / balcony overhead

- Fence
- Water tank
- Bin storage
- Service cabinet
- Letter box
- Tree

- Soil Area
- x m² soft landscaping
- ⊕ Tap
- Clothes line
- Service pits



Meeting minimum greening requirements for Detached dwellings

This example illustrates meeting minimum requirements for low-density detached dwellings in the General Neighbourhood Zone.

Minimum requirements

Site statistics	Code requirements
General Neighbourhood Zone	Front setback average of adjoining buildings or 5m 3m rear setback
1200m ² parcel of land	1 small tree per dwelling with min. soil area of 10m ² with min. dim of 1.5m ² (in example, 1 large has been retained in Dwelling 4 and discount for large tree applied to site, no extra trees required for Dwelling 4)
4 dwellings with 300m ² average site area per dwelling	
1 storey 2 bedroom homes	
	24m ² Private Open Space behind building line
	Min. 30% soft landscaping between building line and street

Common examples



43



Legend

- | | | |
|-----------------------------|-----------------|---------------------|
| Driveway / car parking | Fence | Soil Area |
| Soft landscaping | Water tank | m² soft landscaping |
| Paving | Bin storage | Tap |
| Permeable surface material | Service cabinet | Clothes line |
| Building / balcony overhead | Letter box | Service pits |
| | Tree | |



Better greening outcomes for

Detached dwellings

This example illustrates better greening outcomes for low-density detached dwellings in the General Neighbourhood Zone.

Achievable	How	Why
16 small trees	<ul style="list-style-type: none"> • Adding small trees to areas along-side the dwellings where widths of 1.5m are available for soil area • Permeable material for driveway zones to achieve required soil areas 	<ul style="list-style-type: none"> • Shade house from afternoon sun • Lower power costs • Enhanced views from living rooms
4 medium trees	<ul style="list-style-type: none"> • Reduced paved area in front gardens to achieve 30m² soil area 	<ul style="list-style-type: none"> • Increased canopy coverage and shade
1 large tree retained	<ul style="list-style-type: none"> • 60m² soil area retained - more permeable surface material close to house considered, see page 30-31 for more detail 	<ul style="list-style-type: none"> • Retained canopy coverage • Shaded living room • Lower power costs • Habitat and biodiversity
24% soft landscaping	<ul style="list-style-type: none"> • Reduced areas of paving 	<ul style="list-style-type: none"> • Enhanced appearance from dwellings and street • Enhanced cooling and minimised heat absorption and reflection • Improved stormwater infiltration • Improved contribution to biodiversity
25m ² Private Open Space (dwelling 1) 44m ² Private Open Space (dwelling 2) 45m ² Private Open Space (dwelling 3) 84m ² Private Open Space (dwelling 4)	<ul style="list-style-type: none"> • Wider than minimum requirement setbacks to side and rear of some dwellings 	<ul style="list-style-type: none"> • Enhanced indoor/outdoor lifestyle opportunities • Improved wellbeing



Legend

- Driveway / car parking
- Soft landscaping
- Paving
- Permeable surface material
- Building / balcony overhead

- Fence
- Water tank
- Bin storage
- Service cabinet
- Letter box
- Tree

- Soil Area
- m² soft landscaping
- Tap
- Clothes line
- Service pits



Meeting minimum greening requirements for a Residential flat building

This example illustrates meeting minimum requirements for a residential flat building with a common driveway in the Housing Diversity Neighbourhood Zone.

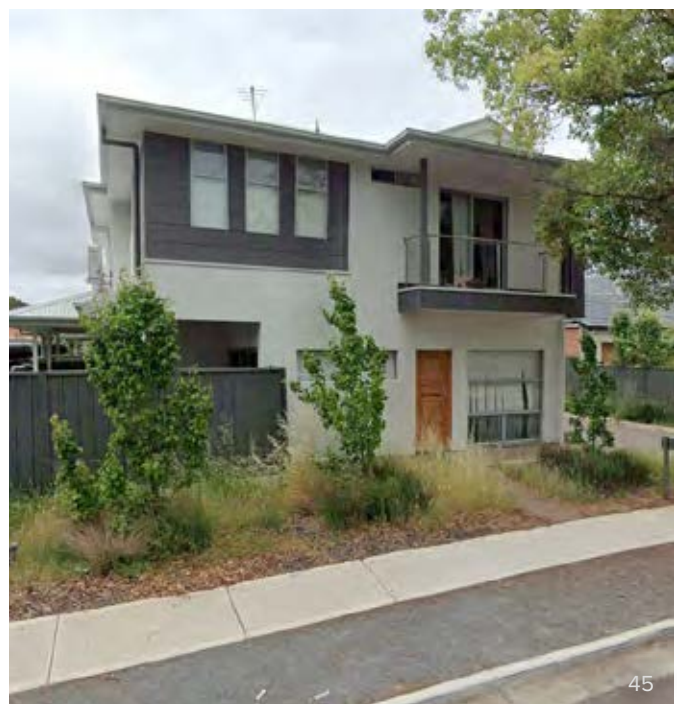
Minimum requirements

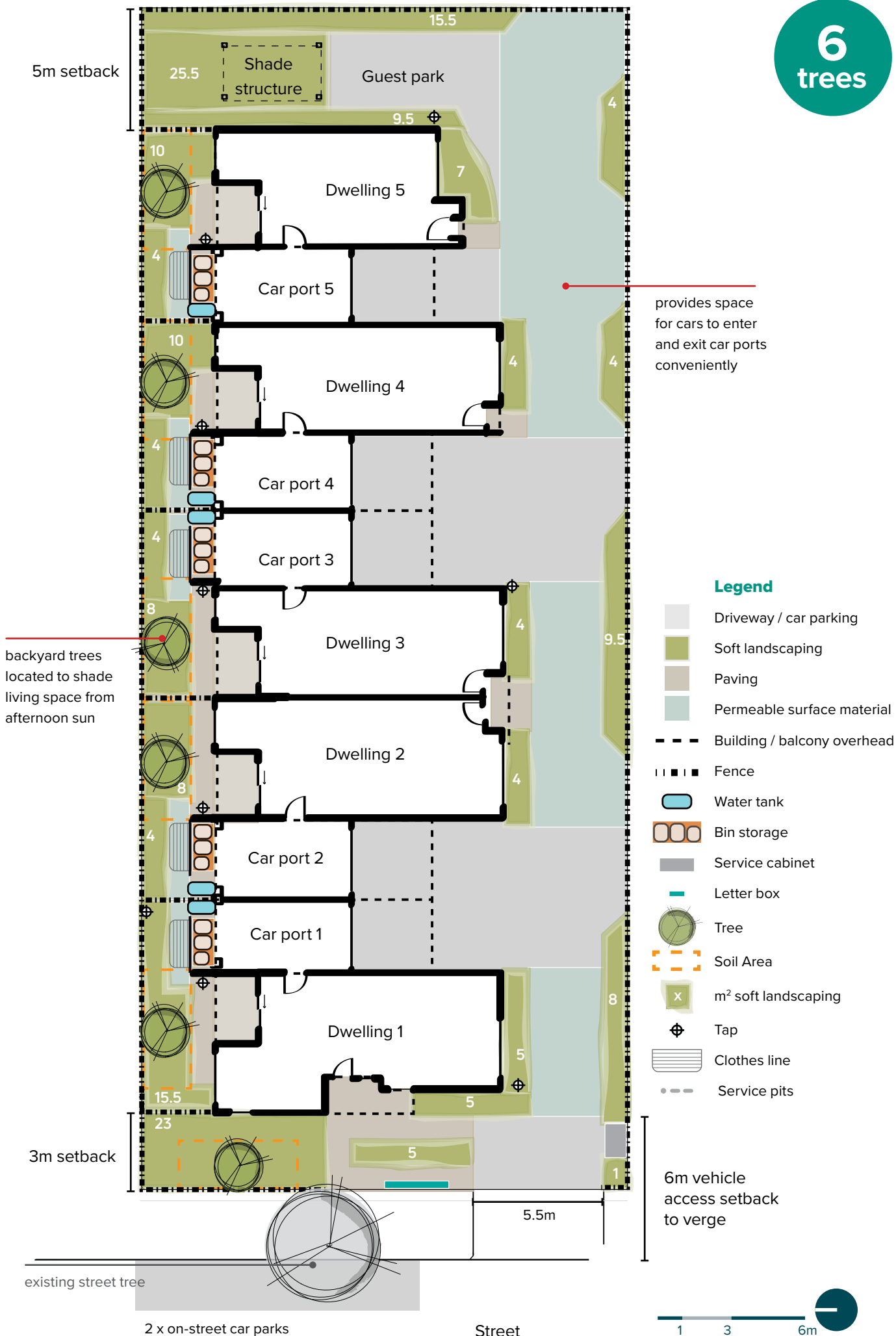
Housing Diversity Neighbourhood Zone	3m front setback 5m rear setback (2 storey)
1000m ² parcel of land	1 tree per dwelling with min. soil area of 10m ² with min. dim of 1.5m ²
5 dwellings with 200m ² average site area per dwelling	15% soft landscaping per site
3 X 2 storey 3 bedroom homes 2 X 2 storey 2 bedroom homes	24m ² Private Open Space per dwelling Min. 30% soft landscape between building line and street Min. 1m wide soft landscaping between common driveway and boundary and driveway and dwellings
Common driveway	Driveway constructed of 50% permeable or porous material

Note:

- This case study assumes the Urban Transport Routes Overlay and the Major Urban Transport Overlay within the Code do not apply.
- Garages, driveways and crossovers/access points must comply with AS/NZS 2890.1:2004.
- Common driveways servicing a perpendicular parking space should be checked to ensure turn paths provide appropriate maneuverability.
- It is recommended that you seek assistance from your local council or a professional to ensure your plan complies with all relevant requirements.

Common examples

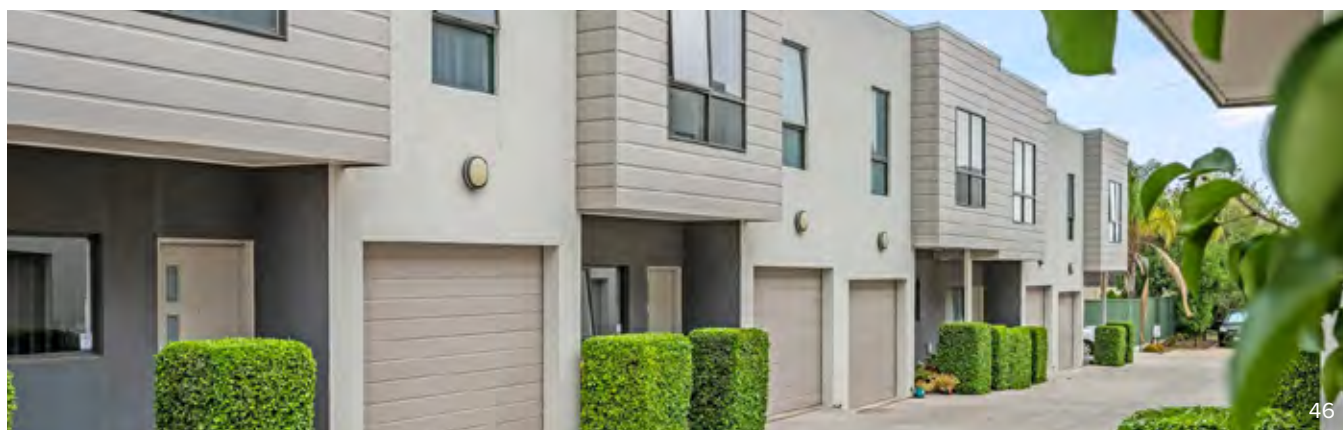




Better greening outcomes for a Residential flat building

This example illustrates better greening outcomes for a residential flat building with a common driveway in the Housing Diversity Neighbourhood Zone.

Achievable	How	Why
12 small trees	<ul style="list-style-type: none"> Consider permeable surface material on driveway over tree planting soil area Consolidated backyard service zones (bin storage, clothes line, water tank) and pathways to achieve soil area required 	<ul style="list-style-type: none"> Screening trees along the driveway for amenity and privacy Small trees in northern facing backyard provide shade and amenity to indoor and outdoor living areas
1 medium tree	<ul style="list-style-type: none"> Reduced hard surfaces and paving, larger soil area in front garden 	<ul style="list-style-type: none"> Shading the western-facing dwelling from hot afternoon sun
1 large tree	<ul style="list-style-type: none"> 5m rear setback and large soil volume area 	<ul style="list-style-type: none"> Provides a shaded communal garden space Larger canopy coverage achieved
21% soft landscaping 21m ² Private Open Space per dwelling + 45m ² Communal Open Space 47% soft landscape between building line and street Min. 1m wide soft landscaping between driveway and boundary and driveway and dwellings	<ul style="list-style-type: none"> Reduced hard surface paving areas 	<ul style="list-style-type: none"> Enhanced appearance from dwellings and street Enhanced cooling and minimised heat absorption and reflection Improved stormwater infiltration Improved contribution to biodiversity



46

large tree with 60m² soil area shades communal garden

consolidated bin storage clothes line, rainwater tank and tap with access path

backyard trees located to shade living space from afternoon sun

medium tree with 30m² soil area located to shade dwelling from western afternoon sun

3m setback

small trees along driveway - see p. 24-25 for further detail

provides space for cars to enter and exit car ports conveniently

Legend

- Driveway / car parking
- Soft landscaping
- Paving
- Permeable surface material
- Building / balcony overhead
- Fence
- Water tank
- Bin storage
- Service cabinet
- Letter box
- Tree
- Soil Area
- m² soft landscaping
- Tap
- Clothes line
- Service pits

6m vehicle access setback to verge

2 x on-street car parks

