Government of **Western Australia**
Department of **Housing and Works**

DEPARTMENT OF HOUSING AND WORKS

Landscape Design Brief & Guide

Effective 1 July 2025

Acknowledgement of Country

The Department of Housing and Works respectfully acknowledge Aboriginal people as the Traditional Custodians of the lands on which we deliver our services to the communities throughout Western Australia. We acknowledge their enduring connection to the lands, waterways and communities and pay our respects to Elders past and present.

Document review

Revision Date	Comments	Author
08.11.2024	Landscape Design Brief & Guide Revision	REALMstudios
01.07.2025	Updated branding to Department of Housing and Works	Urban Design

Contents

Introduction

Overview

This landscape design brief and guide has been developed by the Department of Housing and Works (DHW), to guide expectations for landscape and external works on housing projects delivered by DHW in partnership with stakeholders and building partners across Western Australia.

It is important to recognise that landscape plays a large role in people's daily lives. Carefully considered design and construction can assist with social and health benefits as well as add economic value to a development and its neighbourhood.

Vision: 'Responding to Place'

DHW is committed to achieving good high quality landscape outcomes that are responsive to regional and local context and addressing a changing climate. By maximising opportunities for physical and visual connection to landscape we will improve physical and mental health for residents.

Symbols reference

Throughout the document this icon and supporting text provides additional tips and considerations.

Throughout the document this icon refers to considerations of high importance.

Throughout the document this icon is an invitation to refer to the supporting Design & Construct Landscape Specification (by NATSPEC) 2024.

Throughout the document this icon refers to relating supporting Typical Details which can be found in Appendix 4. The number on top denotes which detail it relates to.

Design Guidance Context

The Landscape Design Brief and Guide is to be read in conjunction with DHW built form design briefs, Department of Planning Lands & Heritage, Local Government guidance and requirements as well as any requirements from Utility and Authority agencies.

Where existing estate design guidelines are in place, the landscaping design will be required to comply with those guidelines. Where guidance is inconsistent, seek DHW clarification.

DHW reserve the right to seek alternative landscape outcomes to what is prescribed in Estate guidelines at the discretion of the Project Manager (PM).

How to use this document

The body of the document is structured through the three standard **housing typologies** and captures common metropolitan (metro) region guidance.

Designers are to factor in **design principles,** and adhere strictly to both hardscape and softscape **design requirements**. Following the brief and guidance closely will support successful application.

The Appendices provide specific and supporting detail. Feedback from seven regions across WA has been collated to address local climate, soil, material supply and cultural considerations. The Appendices also include examples of landscape documentation, recommended plant species and typical technical details.

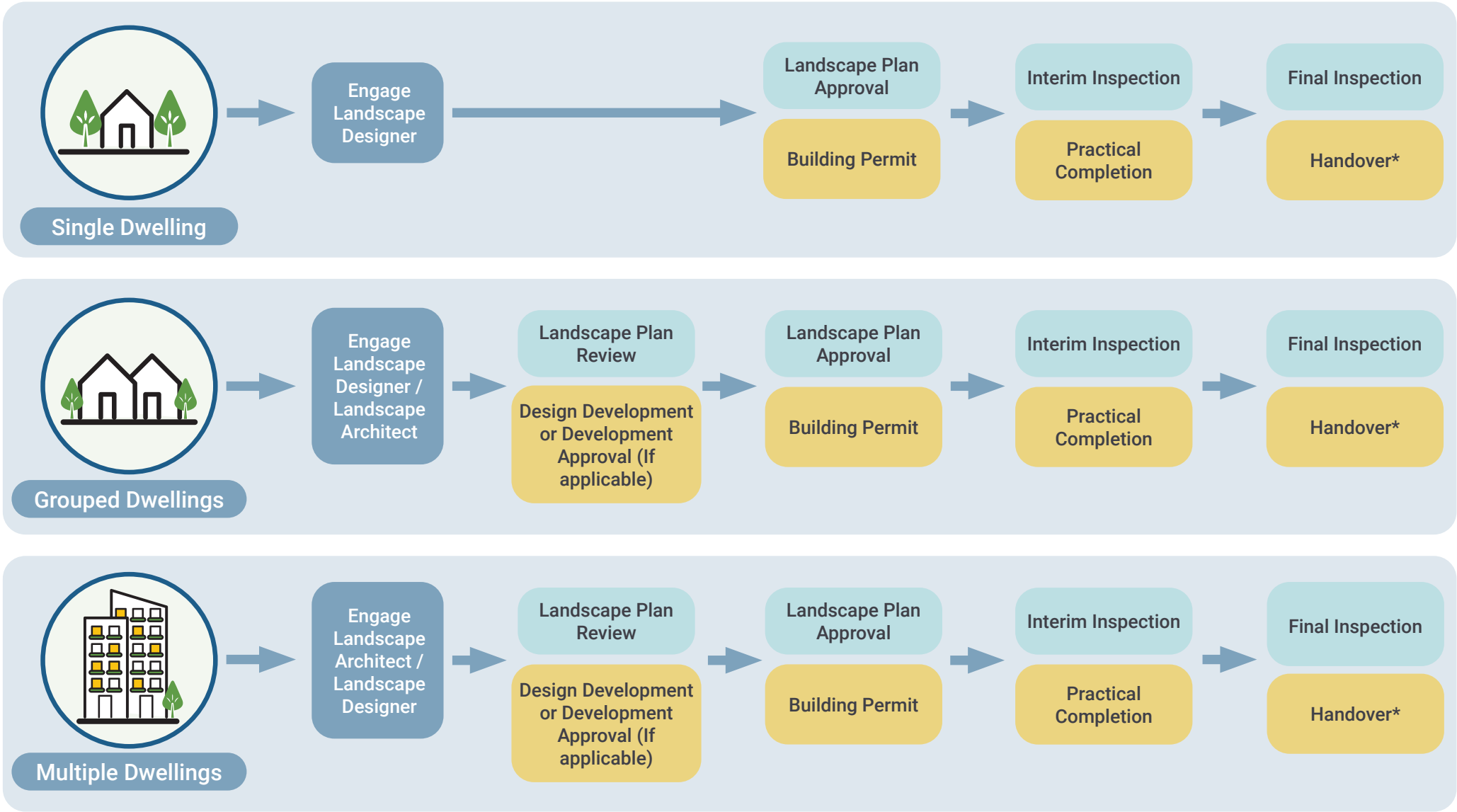


Figure 01: Landscape Milestones & Hold Points diagram

Legend

- *Landscaping Milestone*
- *Project Milestone*

Disclaimer:

Milestones are typical of a Design & Construct building contract. Milestones may be simplified in other instances.

***Submit As-Constructed plans for irrigation and connection services at project completion**

Landscape Principles

Design Principles have been carefully selected and developed to guide design issues that relate specifically to DHW projects. Whilst a robust, low maintenance, functional and cost-effective garden is a central concern, there is opportunity to address longer term challenges and topics such as Urban Heat and Biodiversity loss. Landscaping plays an important role in improving walkability, contributes to neighbourhood character, and providing residential amenity.

Accessibility & Compliance

Support equitable and dignified access for everyone

Function & Aesthetics

Meeting resident requirements and creating beauty

Biodiversity

Improve biodiversity values and sustainability by using local native plant species

Communal Open Space

Provide meaningful recreation opportunities for residents to come together on Grouped and Multiple Dwelling projects

Urban Heat & Drainage

Providing shade, planting, areas of infiltration and reflective hard surfaces can reduce urban heat

Establishment & Maintenance

Minimise maintenance of landscape through efficient and simple design, quality materials and good site preparation and construction

Landscape on Structure

Contribute to green open space provision for developments and maximising amenity in urban sites

Accessibility & Compliance

Support equitable and dignified access for everyone

Provide a clear and continuous accessible path of travel between verge footpath, parking areas, building entries and common areas. Support equitable and dignified access for all including older people, people with impairments or disabilities and families with prams.

- *Consider minimal usage of stairs and ramps unless required.*
- *Clearly delineate pedestrian pathways from driveways and provide legible entrance ways and accessways into buildings.*
- *Consider planting that is not obtrusive and does not overhang onto the path or drop seeds etc, creating trip hazards.*

Function & Aesthetics

Meeting resident requirements and creating beauty

Address basic functionality whilst ensuring an aesthetic outcome. Provide residents with an enjoyable, attractive and safe experience that facilitates ease of use.

- *Use planting to screen unsightly elements such as bins and service areas.*
- *Establish a colour palette for landscape elements that is consistent and responsive to the architectural materials palette.*
- *Consider key views at points of arrival, from windows and terminating vistas.*

Biodiversity

Improve biodiversity values and sustainability by using local native plant species

Preserving and enhancing biodiversity is crucial for the sustainability and resilience of urban landscapes. Thoughtful design that integrates native species and diverse habitats can mitigate biodiversity loss and create thriving ecosystems that support both wildlife and the community.

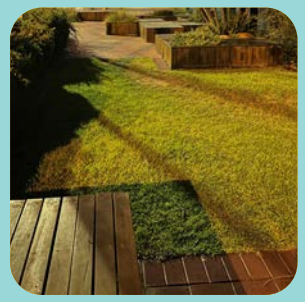
- *Retention of existing trees on site wherever possible.*
- *Encourage usage of native plants which support habitat creation and reduces reliance on fertiliser and pesticides.*
- *Include a variety of flowering plants that provide nectar and pollen resources throughout the year.*

Communal Open Space

Provide meaningful recreation opportunities for residents to come together

Communal open space should be flexible and offer various passive and recreation opportunities for residents.

- *Consider food production areas with low height low maintenance raised planted areas, with a mix of fruit bearing species and edible plant species.*
- *Consider casual seating nodes where residents can meet, talk, and share their stories surrounded by various plant varieties.*
- *Consider communal open space suitable for family gatherings and opportunities for play in a safe and open environment.*



Urban Heat & Drainage

Providing shade, planting, areas of infiltration and reflective hard surfaces can reduce urban heat

Across Western Australia climate change is bringing about challenging conditions. The integration of green infrastructure, Water Sensitive Urban Design (WSUD), and appropriate material selection plays a critical role in reducing heat stress and preventing flooding.

- *Minimise hard surfaces in favour of planting and permeable materials where possible.*
- *Direct run-off from hard pavements to garden beds.*
- *Implement shading through tree canopies and built structures to reduce surface temperatures.*

Establishment & Maintenance

Minimise maintenance of landscape through efficient and simple design

Support residents with easy maintenance and upkeep of their garden. Good preparation with quality materials, products and workmanship is essential for landscapes that both present well and are sustainable.

- *Consider whether a manual or automatic irrigation system is appropriate for the size of the garden and the climatic conditions of the region.*
- *Planting selections to be low maintenance and waterwise.*
- *Use stable, durable and tough materials which require low to no maintenance.*
- *Ensure turf and mulch is installed with adequate soil preparation for effective weed management.*

Landscape on Structure

Contribute to green open space provision for developments and maximising amenity in urban sites

Whilst landscaping at grade is favoured, landscapes on structures offer significant opportunities to improve landscape amenity and contribute to the green open space provision for developments.

- *Liaise with relevant consultants during the site planning phase to ensure set downs and appropriate soil depths, widths, volumes, and weight loadings are incorporated in suitable locations beneficial to landscape spaces.*
- *Ensure all garden beds are accessible for maintenance, in particular balustrade planters should not be wider then 800mm.*
- *Ensure waterproofing and adequate drainage is integrated.*
- *Utilise lightweight free draining soil mixes on slab.*

Landscape on Structure (*continued*)

Contribute to green open space provision for developments and maximising amenity in urban sites

Landscapes on structures offer significant opportunities to improve landscape amenity and contribute to the green open space provision for developments.

- *Specify suitable plant species for raised structures.*
- *Limit 1m high raised planters where possible to improve visual and physical aesthetics (particularly when seated) and consider more practical wall heights such as 450mm which can be used as informal seating.*

Single Dwelling Design Requirements

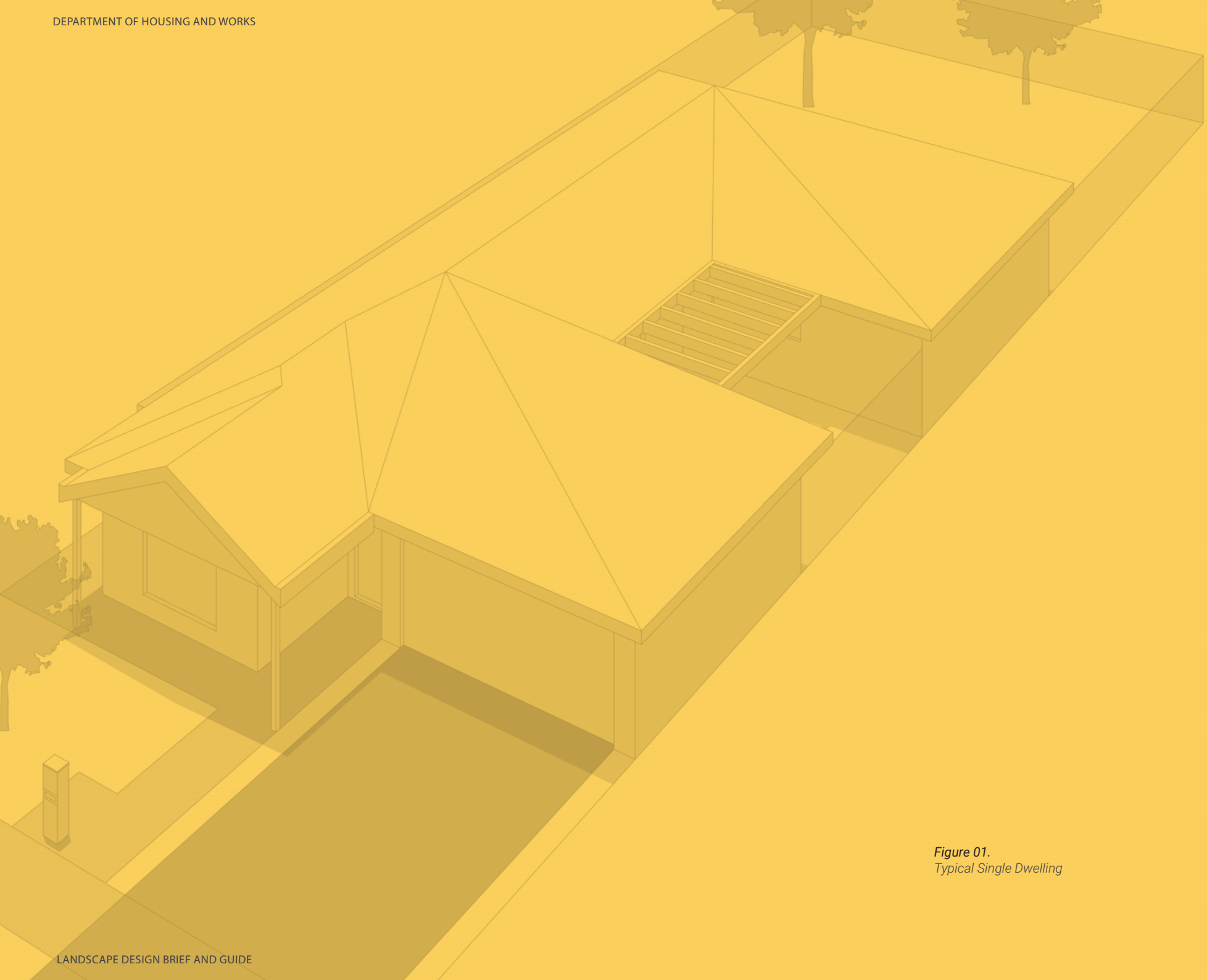


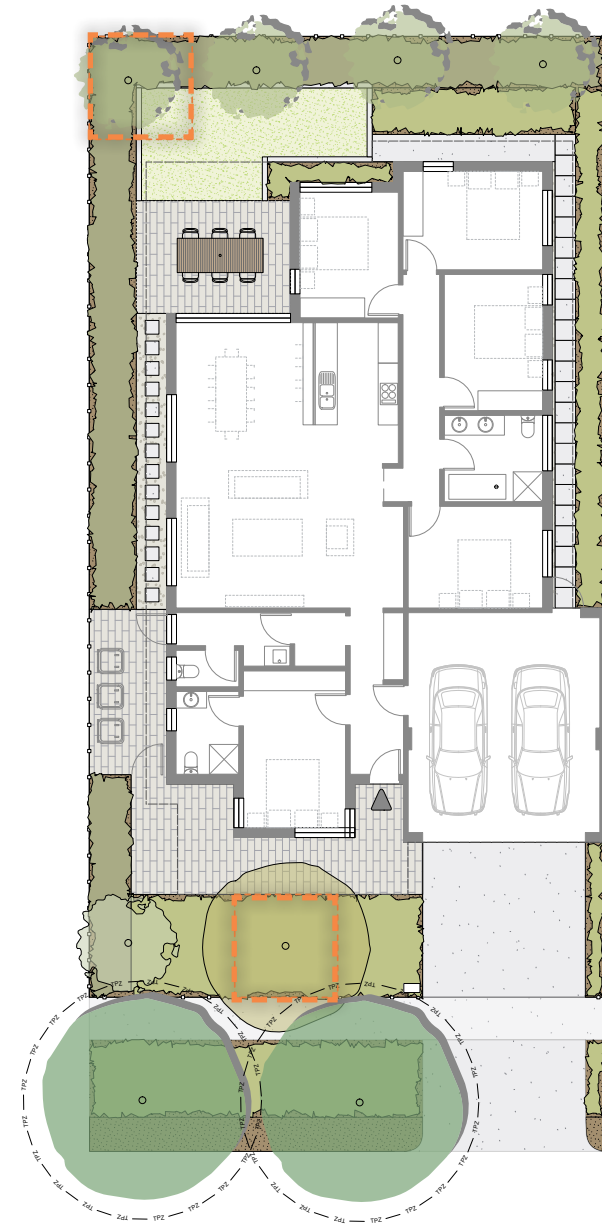
Figure 01.
Typical Single Dwelling

Single Dwelling Softscape Requirements

Objective

The development should provide suitable landscape to support tree canopy and shade, deep soil areas, site permeability, and biodiversity, whilst minimising maintenance inputs.

Shade & Canopy Cover	*Reduce ambient temperatures and increase comfort*
Deep Soil Area	*Maximise deep soil areas for optimal tree growth and benefits*
Site Permeability	*Enhance site permeability and stormwater management*
Maintenance	*Plant species that are simple to maintain and have low input requirements*
Appropriate Selection	*Right plant, in the right location, for the right reason*
Diversity	*Support a diverse range of suitable planting species to support biodiversity positive outcomes*



Deep Soil Areas

Figure 02.
Deep Soil Area diagram (Single Dwelling)

Primary Landscape Controls (Single Dwelling Only)			
Site Area (not including verge)	Minimum area of landscape** as a percentage of site	Minimum area of garden beds as a percentage of landscape**	Minimum trees required. *Refer to size definition below.
<150m^2	15%	20%	1 x small tree
150-250m^2	15%	20%	2 x small trees
251-450m^2	15%	30%	2 x small trees* and 1 x medium tree
>450m^2	20%	40%	1 x small tree and 2 x medium trees OR 1 x medium tree and 1 x large tree

**Tree size at maturity definitions:*

Small: *3-8m high x 2-6m width.*
Medium: *8-12m high x 6-9m width.*
Large: *> 12m high x > 9m width.*

***Landscape is defined as all areas on site external to the residence*

Softscape requirements	Minimum requirements
Plants per m^2 of garden bed	Two (2) plants per m^2 (minimum pot size 130mm)
Turf	No requirement for turf for lots <200m^2. Where turf is provided, minimum turf size of 20m^2 is required. Turf areas >60m^2 to be approved by DHW.
Edging	Edging to all garden beds and turf areas. Refer to Hardscape Requirements.
Garden bed width	Standard: Minimum 750mm. Driveways: Minimum 300mm width, with recommended >500mm.
Native / exotic species mix	>70% of selections to include native species.
Organic Mulch	Minimum 75mm depth. Organic mulch should be free from contaminants and foreign materials (plastics, wires and other non organic mulch material)
Soil Improver	Minimum 100mm topsoil cultivated into top 150mm soil profile for turf and garden beds.
Tree pot size	Minimum pot size 45L.

Note: Bushfire Attack Level (BAL) ratings are required to be considered when designing landscaping plan

Figure 03.
Landscape control table (Single Dwelling)

Tree Retention & Protection

Existing trees that are able to be retained are considered an asset for the development. Early engagement of an arborist and ongoing inputs through design and construction are vital to ensure existing trees are retained and protected.

General requirements:

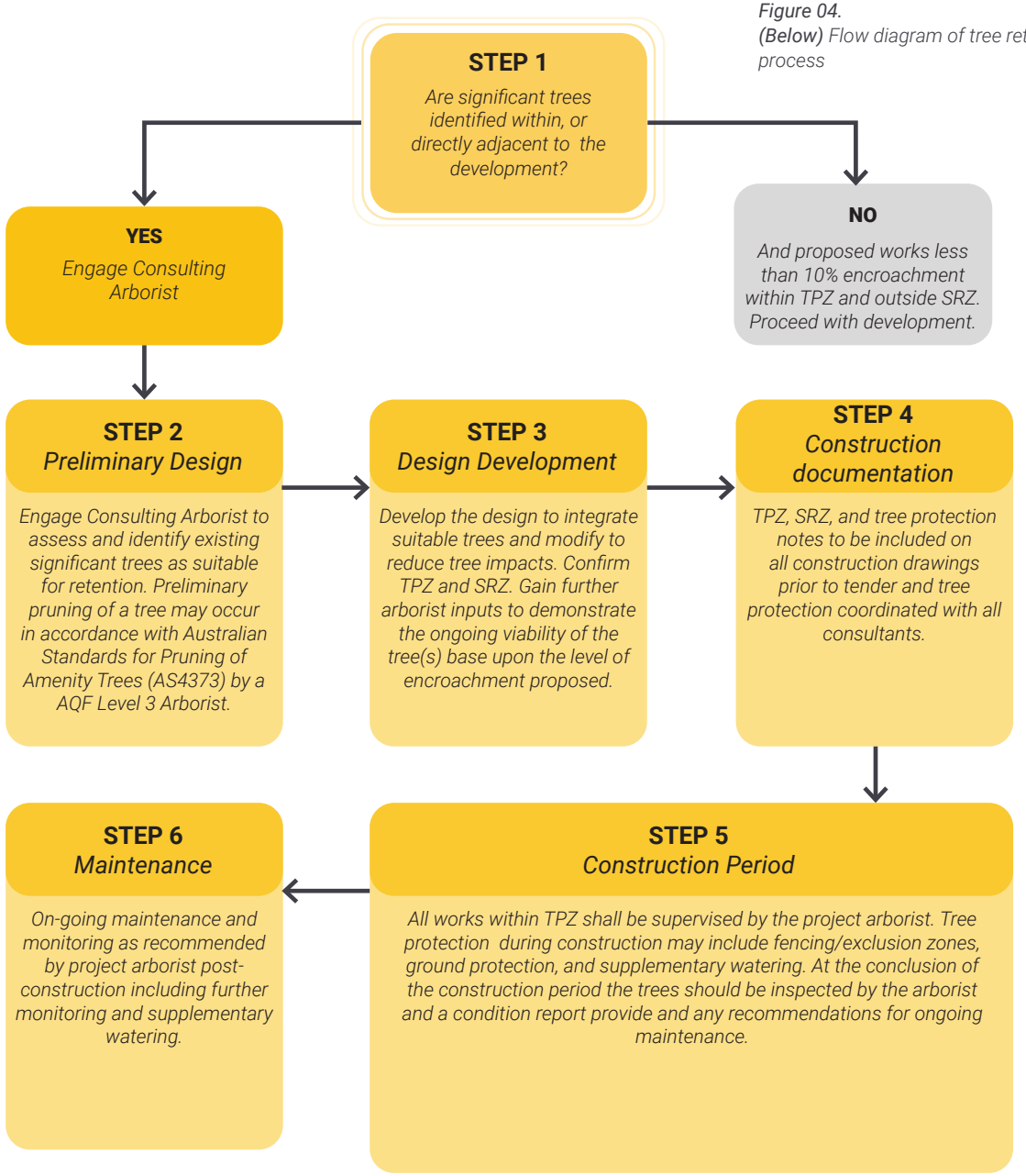
All significant trees identified as suitable for retention, including all street trees, shall be protected in accordance with ***Australian Standard AS 4970 'Protection of Trees on Development Sites (2009)'***. Trees retained on site shall count towards the tree requirements.

Ensure trees planted within turf areas include concrete edging at 750mm from trunk.

Significant Trees are defined as having a height of 5m or greater, with a trunk diameter of 200mm at DBH and/or, a canopy diameter of 5m or greater.

Early engagement of an arborist to provide a visual tree assessment, to identify the species, structure, health, size and suitability for retention.

Figure 04.
(Below) Flow diagram of tree retention process



Front Yards & Verges

Front Yards and verges are considered the 'public face' and improve the perception and overall appearance of the development. A water wise garden can assist with shade, reducing temperatures and mitigate urban heat islands, while providing an important contribution to neighbourhood character and walkability.

General requirements:

- Existing street trees to be retained and protected in keeping with local government.
- Verge treatments shall meet the requirements of the local government or authority.
- Synthetic turf is not supported generally.
- Ensure a clear and direct path from the street to the front door is provided.
- Turf should be used judiciously and located for maximum benefit with edging to separate turf from trees and garden beds.
- Provide shade to footpaths with appropriate tree species selection and spacing.
- The provision of turf to verges should be avoided
- Where there is no footpath, the verge and front of the property can be combined and treated as one area for the purpose of landscaping.

Key Front Yard requirements:

- ✓ *Additional trees and planting is encouraged at the front lot boundary in order to increase the likelihood of tree retention if the site is redeveloped in the future.*
- ✓ *Waterwise verge and tree planting with the inclusion of low maintenance, native plants, with a mix of various approved surface treatments is recommended.*
- ✓ *Plant selections shall be a maximum of 600mm in height to provide clear sightlines for pedestrians and vehicles. Taller planting is permitted along fencelines and boundaries where suitable. Ensure plantings and trees are selected and located to maintain clear sightlines from street to the house and vice-versa.*
- ✓ *Integrate and locate elements such as fences, letter boxes, and services meters and include screening as appropriate.*
- ✓ *Single neutral colour should be used for service elements such as letterboxes to minimise visual impact.*
- ✓ *Ensure the verge can accommodate access for regular bin collection. Paving and hardstand on verges to the approval of the local government.*

Good outcome example

Figure 05.
Low growing plants, mulch and street trees provide an attractive streetscape whilst retaining access and sightlines.

Poor outcome example

Figure 06.
Plants over 1m in height block sightlines between driveways and road creating potential safety issues.

Back Yards

Back yards should be designed to be a usable, flexible space that is connected to the living spaces of the dwelling.

General requirements:

- Ensure planting and tree selections are ideal for the site and maintain sufficient clearance from the dwelling.
- Provide attractive settings and amenity for the home.
- Consider the household makeup and be responsive to the needs and abilities of the different cohorts the back yard is intended to support, such as families, seniors and single person households.
- Designs should ensure ease of accessibility to rear for servicing such as location of pathways and plants do not obstruct services.
- Avoid putting turf or planting in small spaces which are hard to access for maintenance.

Key Back Yard requirements:

- ✓ *Back yards should be simple, practical, and provide appropriate facilities to support day to day functional requirements including clothes drying, furniture, storage, recreation, and play.*
- ✓ *Be flexible, providing a variety of spaces for residents to use e.g. courtyard for outdoor cooking and eating, and a small turf area for relaxing and play.*
- ✓ *Consider planting and screening to provide privacy and minimise overlooking. Use of planting for screening, especially along fence lines and boundaries.*
- ✓ *Back yards should be designed for the household size and cohorts needs e.g designing family friendly gardens for children to play or more easy to maintain gardens for seniors.*

Good outcome example

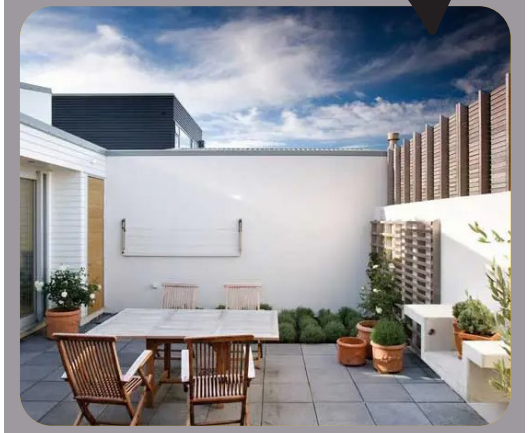


Figure 07.
A small courtyard, connected to the main living area provides a low maintenance space suitable for seniors.

Poor outcome example

Figure 08.
Whilst turf may provide space for families to play, low amounts of shade restricts use.

Planting

15 Typical Detail

Planting can be used to define and separate spaces, screen and soften building façades, increase permeable surfaces and create visual interest within landscapes.

General requirements:

- A variety of species nominated in the species selection guide (or suitable alternatives) at the required planting numbers per m^2.
- A minimum 70% native or endemic plants to be utilised. Refer to Appendix 3 - Metro Area Recommended Planting Lists for more information on species selection.
- Ensure plant species are not listed on the ***Western Australian Organism List (WAOL)*** database declared 'pest (S22)' or 'pest prohibited (s12)' under the ***Biosecurity and Agriculture Management Act 2007 (BAM Act)***.
- Plant species are not spiny, sharp or pose a reasonable risk to the residents or neighbours.

Key Planting Selection requirements:

- ✓ *Plant selection is suitable for the applicable region, climatic conditions and soil type, and are grouped accordingly.*
- ✓ *Consider consolidating smaller garden beds into fewer, larger areas where practical.*
- ✓ *Co-locate similar plant species in terms of their sun, soil, water, and fertiliser requirements to improve irrigation efficiency.*
- ✓ *Provide landscaping to improve appearance of retaining walls and fencing where they are visible in the public domain.*

Example

Figure 09.
Low maintenance, waterwise, native species provide visual interest and environmental benefits.

Example

Figure 10.
Narrow, vertical hedging varieties located between fences and driveways improves visual appearance.

Tree Selection

Tree species shall adapted to the constraints of the site and with the right characteristics to achieve the desired outcomes.

General requirements:

- Trees to be planted so that the edge of the estimated mature canopy is offset from buildings.
- Minimise estimated mature canopies overhanging joint boundaries by selecting species of a suitable scale and size.
- A minimum of 50% of tree species shall be native/endemic species. Lower than 50% to be approved by DHW.
- Trees planted within turf areas shall include edging at a minimum of 750mm from trunk.
- Fruit trees are a suitable tree option for smaller private gardens.
- Trees to be retained adjacent to dwellings may require the installation of gutter guards to minimise leaf build up.

Key Tree Selection requirements:

- ✓ *Identify all existing and proposed services and utilities and ensure trees are located at appropriate offsets.*
- ✓ *Where practical locate deciduous trees on the northern and southern side of dwellings and courtyards to maximise shade in summer and solar gain in winter. Use evergreen trees on the western and eastern side of dwellings to shade buildings from hot morning and afternoon sun.*
- ✓ *A broad range of tree species and sizes shall be used across the development. Utilise both exotic and native species of varying sizes to maximise the benefits and minimise the risk of pest and disease. In particular select species to be resistant to Polyphagous shot-hole borer (PSHB, Euwallacea fornicatus).*
- ✓ *Ensure trees are located at a suitable distance from crossovers and entrance pathways to provide clear sightlines for pedestrian and vehicle safety.*
- ✓ *Tree procurement shall conform to Australian Standard AS2303 'Tree Stock for Landscape Use' (2018).*
- ✓ *Trees should be of a suitable size and scale for the space, with larger trees located where greater space is provided and smaller trees are provided in smaller spaces e.g. courtyards. Locate trees within garden beds or mulched areas at prescribed distances from paving to avoid tree roots lifting hard surfaces.*
- ✓ *Ongoing access to water will support healthy, long-lived, and vigorous trees and maximise their benefits. Maximise soil volume and integrate trees using WSUD, permeable paving, and direct stormwater from hard surfaces to trees where practical.*
- ✓ *Minimise instances of trees at maturity overhanging buildings, fences and neighbouring buildings. Consider future access for maintenance and the long-term safety of maintenance staff by selecting trees of an appropriate scale and ease of maintenance.*
- ✓ *Consider root protection barrier zone when selecting species and planting location.*

Example

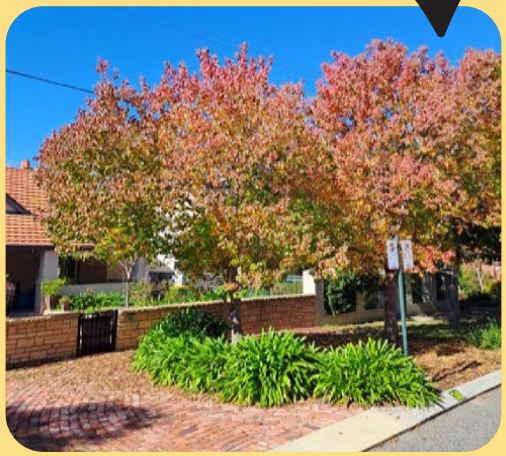


Figure 12.
Deciduous trees used on northern side of dwelling to provide summer shade and winter sun.

Example

Figure 13.
Small native tree used near overhead powerlines. Tree located to offer clear sightlines to street.

Example

Figure 14.
Existing verge tree provides shade to dwellings.

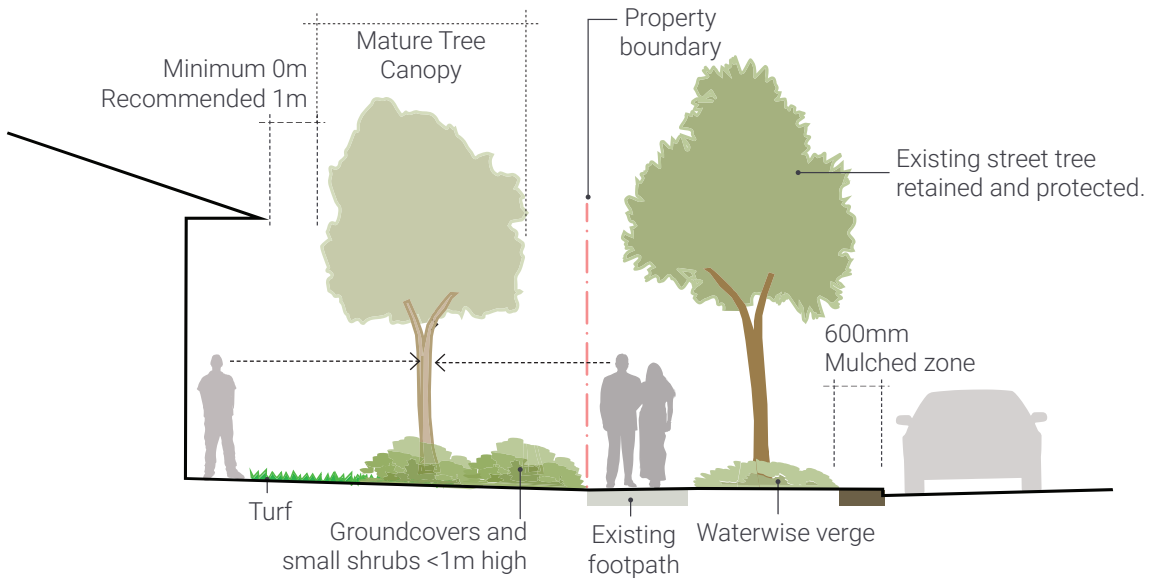


Figure 15.
***(Left)** Diagram of Existing street tree interfaces with verge planting and front yard planting.*

For more information on tree selection choices refer to Appendix 2 Metro Planting Lists and Appendix 3 Regional considerations

Turf

REFER SPEC

13 Typical Detail

Lawn can create space for activity and recreation however, the need for ongoing maintenance such as regular lawn mowing should be balanced against the size of the lawn.

General requirements:

- Weeds shall be removed and soil preparation undertaken prior to installation of turf to reduce ongoing maintenance.
- Turf is only provided in consolidated areas which can be feasibly maintained and with adequate access to direct sunlight.
- Synthetic turf is not supported generally.

Key Turf requirements:

✓ *Turf shall be located where it can receive sufficient direct sunlight per day.*

✓ *The location of turf shall consider suitable access to the area for lawn mowing to occur on a regular basis.*

✓ *Turf species should be drought tolerant such as Buffalo, Couch, Zoysia, or an approved equivalent.*

✓ *Turf must be framed by hard paving or edging to all sides. Refer to 'Edging' in 'Hardscape Requirements'.*

✓ *Turf shall not be installed directly against buildings to minimise water and moisture ingress and ongoing maintenance.*

× *Avoid small patches or strips of lawn < 2m in width.*

Good outcome example

Figure 16.
Areas of turf reduced and balanced by garden beds framed by paving and concrete edging.

Poor outcome example

Figure 17.
Lawn installed as a narrow strip against building in a high shade area.

Irrigation & Hydrozoning

Irrigation is critical to the establishment and ongoing health of gardens. Achieving a balance between minimising water use and providing appropriate levels of irrigation to sustain gardens is required.

General requirements:

- Water take-off and irrigation system shall be connected to mains power and plumbed directly to house (*Note: programmable tap timer may be acceptable for a small courtyard subject to DHW approval.*)
- One programmable automatic controller to be supplied for each dwelling to operate all irrigation zones.
- Irrigate landscape appropriately for establishment based on seasonality, eg. higher frequency and volume of irrigation during summer months.

Key Irrigation requirements:

- ✓ *Direct irrigation away from dwellings. In gardens areas near houses use bubblers or drippers to minimise over-spray and wind-drift onto the dwelling.*
- ✓ *For small gardens areas a tap timer is acceptable however, larger gardens > 20m^2 require a full irrigation system.*
- ✓ *Services metering/valves to be directly connected to dwelling power and water supply metering.*
- ✓ *Ensure solenoid boxes are located in accessible areas but away from paths of travel.*
- × *Avoid small, or isolated garden beds within the development as these are problematic to install and maintain with irrigation.*

Key Hydrozoning requirements:

Hydrozoning relates to locating plants with similar water requirements in the one location to conserve water use and reduce ongoing maintenance.

- ✓ *Minimise the plant species which require high water and ongoing inputs.*
- ✓ *Irrigate according to different hydrozones and ensure efficient use of irrigation such as drip irrigation or bubblers for general garden beds, and sprinklers for turf areas.*
- ✓ *Direct stormwater runoff from hardstand areas to landscape areas.*

For more information on selection choices for a water saving garden visit Watercorps 'Waterwise Plants' ***(https://www.watercorporation.com.au/Waterwise/Waterwise-plants)***

Soil Volumes

Providing good quality soil and ample soil volume for plants to grow is critical in the establishment and longevity of planted areas.

General requirements:

- Soil shall be decompacted, aerated, and free draining.
- Quality soil, free of contamination from building and construction waste. Replace with suitable soil prior to tree installation as required.
- Deep Soil Area shapes may be modified to work with developments and built forms however, must be contiguous and meet minimum widths specified.

Key Soil volume requirements:

- ✓ *Deep Soil Areas (DSA) for trees sizes are defined in the Residential Design Codes.*
- ✓ *Locate trees within the DSA and co-locate DSA with tree retention where relevant. Refer Tree Retention Section on Page 16 of this document. Where trees are being retained, consult an arborist.*
- ✓ *DSA is included in the Minimum Garden Bed or Turf m^2 (Refer to Primary Landscape Controls - Single Dwelling table Page 15).*
- ✓ *Shared space: Trees are ideally planted with connected soil volumes so that roots can 'share' the below ground space. A reduction in overall DSA by 25% can be achieved if trees are planted with adjacent DSA.*
- ✓ *Any paving required within a DSA area should be permeable to allow water infiltration and healthy root growth. Permeable paving should not cover more than 20% of the DSA for each tree.*

Ameliorated Soils

- ✓ *Ensure plants are going into good quality top soil. Refer to Planting Detail 14 in Appendix 4 - Landscape Typical Technical Details for more information on planting requirements.*

For more information and general advice on soils treatment and preparation contact a Structural Soil Specialist.

Strategies to Increase DSA:

A number of strategies may be employed to increase the DSA for trees within developments whilst still accommodating driveways, paths and other infrastructure.

Permeable Paving

✓ *Permeable pavers allow water to infiltrate through the surface and sub-base structure to the ground below. Whilst a slightly higher upfront cost than traditional paving, savings are generally made by reducing other traditional drainage infrastructure (e.g. soakwells, strip drains etc.). Permeable paving is particularly suitable for driveways and paths to accommodate extra tree planting.*

Example

Figure 18.
Permeable paving used in parking area provides additional deep soil for adjacent trees and planting.
Source: Author.

Cell Systems

✓ *These are engineered systems which provide high levels of load bearing capacity and large volumes of uncompacted soil for trees. Suitable for use in highly constrained areas, or heavy load and high use areas where trees are required. Cells have a dual benefit as they support the ongoing establishment and health of trees and may also be used in place of traditional drainage systems (e.g. soakwells).*

There are several proprietary Strata Cells and Permeable Paving options available on the market. Always follows the directions, details and recommendations from the manufacturer for installation and maintenance of these systems.

Example

Figure 19.
Indicates how cells function in a car park to provide deep soil for trees whilst maintaining parking spaces.
Source: CityGreen.

Single Dwelling Hardscape Requirements

Materials and finishes within the landscape can assist the functionality and longevity of a development, by careful consideration and selection of appropriate materials which can improve the aesthetics of the garden and promote a safe environment, as well as reducing ongoing maintenance.

- *Pavements (Unit Paving & In-situ Concrete)*
- *Edging*
- *Rocks & Stone Work*
- *Gravels & Compacted or Stabilised Gravels*
- *Fixtures & Furniture (Letter Boxes)*

Common and Typical Guidance

Climatic Conditions	*Consider the regional context and climatic condition when choosing hardscape materials.*
Durability & Strength	*Ensure that the material is suitable for its intended purpose and level of durability.*
Site Permeability	*Choose materials which are permeable and enable fluid movement of water throughout.*
Maintenance	*Choose materials which are easy to maintain and clean.*
Colour & Aesthetics	*Ensure material selection suits surrounding context as well as built form.*
Safety & Accessibility	*Consider the texture of materials in the landscape design. Ensure the selected materials meet relevant industry standards as excessively rough or smooth surfaces may create safety issues.*
Lifespan	*Consider and factor in the intended lifespan of the material and ensure that products with lower lifespans are not used in high traffic areas.*

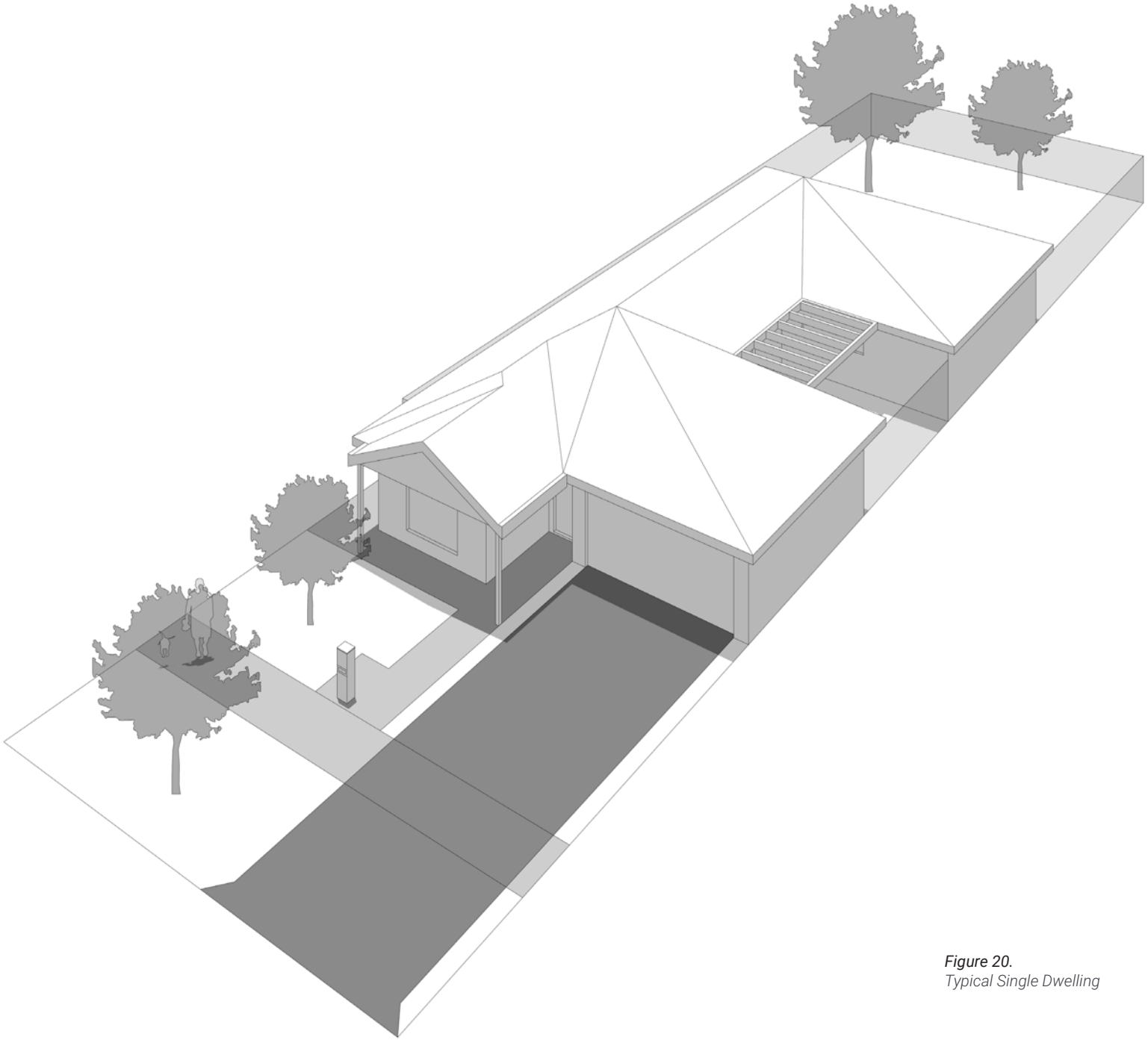


Figure 20.
Typical Single Dwelling

Pavements - Unit Paving & In-situ Concrete

REFER SPEC 1-3 Typical Detail

Pavements include driveways, access paths, maintenance paths, stepping stones and patio areas. Pavements should be minimised in favour of deep soil and planting where possible, whilst still meeting functional access and service requirements.

General requirements:

General
- Paving over DSA is to be permeable and no more than 20% of the DSA required.
- Ensure paths meet maximum grade requirements and drain correctly.
- Connect pavements to the front door of the dwelling from the driveway, verge or street pavements.

Driveways & Car Parking
- Typically, no hard pavements directly up to buildings and fences except where access is required - minimum 300mm spacing required.
- Remove pavements beyond vehicle turning movements wherever possible.
- Replace pavement with ground cover planting at end of open car bay (beyond wheel stop) to increase soft, cool and passively irrigated surfaces.

Access & Maintenance Paths
- Minimum width 700mm.

Key Paving requirements:

- ✓ *Preference for light coloured pavement materials (some regional exceptions).*
- ✓ *Provide for different materials and colours to emphasise different uses.*
- ✓ *Include permeable pavements to assist with managing storm water.*
- ✓ *Grade pavements to drain into turf of planting areas where soil permeability permits.*
- ✓ *Install irrigation sleeves prior to pavements.*
- ✓ *Provide a hard stand area for bins.*
- ✓ *Ensure 500mm wide level shoulder to all pavements.*
- ✓ *Ensure paved connection to drying areas.*
- ✓ *Stepping stones are to be set at 600mm centres and be approximately 400x400mm.*
- ✓ *Stepping stones should be used in areas where access is required occasionally. It is not suited to a daily trafficable area such as the path to a bin store or the only access to the rear yard.*

- × *Do not use incorrect pavement type for the region (Refer to Appendix 3 - Regional Considerations for more information).*
- × *Avoid access lids in pavements where possible.*
- × *Use a single pavement material across verge and lot - don't change materials at boundary.*

Good outcome example

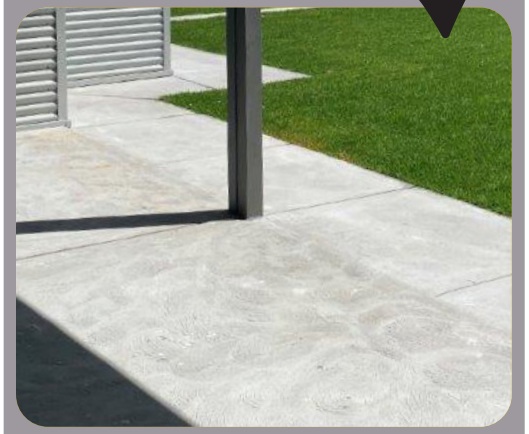


Figure 21.
Light colour finish and flush transitions between alfresco, access paths and turf and passively drained.

Poor outcome example

To ensure you are using the ideal paving type for the region, refer to Appendix 3 Regional Considerations for more information

Figure 22.
Height of gap between pavers is a trip hazard. Space needs to be filled in with material to maintain flush edge.

Edging

REFER SPEC

4-8 Typical Detail

Edging is required between adjacent but different surfaces to assist with the maintenance of those surfaces over time. Edging is to be robust, safe and fit for purpose.

General requirements:

- Thin types of edging including weathered steel and plastic edging are not to be used as they are not sufficiently robust over time.
- Suitable materials for edging include:
  - *In-situ concrete flush edging (min. 120mm wide).*
  - *Brick edging.*
  - *Treated pine sleeper edging (typ. 200x50mm).*
  - *Treated pine (H4) edging (typ. 200x25mm).*
  - *Heavy Duty Aluminium and Galvanised steel edging (min. 4mm).*
- All edging to be set flush with adjacent surfaces and be a minimum of 150mm deep.

Key Edging requirements:

- ✓ *Ensure edge is flush with adjacent finishes to assist with maintenance.*
- ✓ *Ensure minimum depth to contain turf runners.*
- ✓ *Use robust materials such as concrete, brick, hardwood or treated pine.*
- ✓ *Larger areas typically require wider edging to assist with aesthetic proportions.*
- ✓ *Edging on verges to be concrete.*
- ✓ *Curved edging are to be smooth and follow geometric arcs with tangential transitions.*
- ✓ *Edging between garden and turf areas is to be deep enough (minimum 150mm) to ensure turf is contained and runners do not get under the edging*

- × *Minimise random and meandering curves in favour of rectilinear forms, particularly in smaller spaces.*
- × *Edging is not to be used to retain adjacent materials / finishes.*
- × *Do not use thin rusty steel, untreated timbers or plastic edges.*

Good outcome example

Figure 23.
Flush and wide concrete edge provides a quality and robust edging.

Poor outcome example

Figure 24.
Thin plastic or steel edging is not robust and is not to be used.

Rocks & Stone Work

REFER SPEC

9 Typical Detail

Rocks or stones can provide interest to landscapes as well as support various functions. Use locally and sustainably sourced stone where required to add both aesthetic value to a garden as well as to support the practical function of the landscape design.

General requirements:

- Use locally sourced stone that resonates with the geological context of the site.
- Ensure stones are of a scale that cannot be moved once installed.
- Embed stones by a minimum of one third to ensure stability.

Ensure that you comply with rock sizing for the region. Generally, rocks that are smaller than 400mm will need to be checked with the regional manager or superintendent and will need to be installed into a mortar bed.

Key Rocks & Stone requirements:

- ✓ *Preference for rocks with flat surface if being used as a seating feature.*
- ✓ *Specify rocks larger than 400mm that cannot be moved or thrown.*
- ✓ *Ensure that rocks are checked for cracking, rough or sharp edges.*
- ✓ *Place rocks apart enough to ensure that maintenance of grasses and weeds can be done.*
- ✓ *Locate stone boulders to help define pedestrian movements. e.g. at corners or constrain vehicle access.*
- ✓ *If rocks are being used as a seating feature, place them within areas that are often under canopy shadow.*

- × *Avoid rocks generally smaller than 400mm as they can be a projectile risk.*
- × *Do not place rocks in areas where there is constant sun as the surface can become dangerously hot.*
- × *Placing rocks too close together makes maintenance of grasses and weeds difficult.*
- × *If stones are being used for seating then ensure adequate height (450mm), with level and smooth upper surface.*

Good outcome example

Figure 25.
Rocks are aesthetically arranged, are integrated with planting and support level change.

Poor outcome example

Figure 26.
If rocks are used for seating then selection and installation becomes critical.

Gravels & Compacted or Stabilised Gravels

REFER SPEC 10-11 Typical Detail

Gravel finishes allow for a low maintenance but trafficable and open area that is flexible for various uses whilst maintaining permeability. Use locally and sustainably sourced gravels to provide serviceable space and minimising hard pavement costs. Gravel finishes should be minimised in favour of planter beds where possible to assist in micro-climate control.

General requirements:

- Use locally sourced gravels to support a sense of place and reduce embodied energy.
- Ensure gravels are small enough to not be hazardous as projectiles.
- Ensure gravels are finished mostly level, or to a maximum fall of 1:50.
- Use stabilised and compacted gravel products (with fines/dust) for areas that will require more use or if the grade is between 1:50 and 1:20.
- Gravel finishes should not be used for surfaces steeper than 1:20 as it is unsafe and will become an ongoing maintenance issue.

Key Gravel requirements:

- ✓ *Preference for light coloured pavement materials (some regional exceptions).*
- ✓ *Use crushed rock gravel to fill in areas not suitable or too small for lawn or planting.*
- ✓ *Use weed matting such as a lightweight, non-woven geotextile filter fabric under loose gravel areas, for example under maintenance paths, to minimise weed incursion and mixing with sub-soil.*
- ✓ *Loose gravels are to be installed with a minimum depth of 80mm to ensure good coverage.*
- ✓ *Add stabilising products such as organic binding agents or cement to gravel fine mixtures to improve wearabilty and suppress dust.*

- × *Avoid gravels in highly trafficked, communal or publicly accessible areas.*
- × *Avoid gravel larger than 20mm aggregate size, as these can become projectile risks.*
- × *Cracker dust not generally appropriate (some regional exceptions).*
- × *Don't locate gravel finishes directly adjacent building entries in order to minimise dust and dirt ingress.*
- × *Avoid large expanses of gravel finishes that become dull and hot.*
- × *River pebbles are not to be used.*

Good outcome example

Figure 27.
Gravel area is flat, contained with edging, balanced spatially with planting and has no weed penetration.

Poor outcome example

Figure 28.
Chunky gravel larger than 20mm, although attractive, can become a projectile.

Retaining Walls

Level change across a site often requires the inclusion of low retaining walls to achieve access to usable and maintainable spaces. Select robust design, construction methods, products and materials to build low retaining walls, only when necessary.

General requirements:

- Minimise use of retaining walls where possible, however where required provide consistency of materiality, colour and aesthetics with the dwelling.
- Retaining walls should not be higher than 1m
- Concrete retaining wall systems should be installed strictly to manufacturer recommendations
- Preferred retaining materials / construction include:
  - Brick
  - Concrete and Core-Filled Block
  - Reconstituted Limestone Block
  - Informal Stone and Boulder terracing
- Timber is not to be used for retaining walls as it is not sufficiently robust over time.

Key Retaining Wall requirements:

- ✓ *Limit the use of retaining walls to minimise cost and visual and physical aesthetics.*
- ✓ *Where possible set practical wall heights for multiple use. For example as informal seating (approx. 450mm high and 300mm wide).*
- ✓ *Where possible, set retaining walls back approximately 500mm from boundaries to establish a raised garden (and seating edge) so screening plants can be established.*
- ✓ *Modular post and panel retaining wall systems are to be installed strictly by experienced contractors/suppliers.*
- ✓ *Use fencing colours that connect with other elements / features.*

- × *Typically, do not locate retaining walls on boundaries or immediately adjacent to fencelines.*

For all Fencing requirements and specific recommendations, please refer to:

> *A3.1 | Fencing of the Department of Housing and Works Single and Grouped Built Form Guidelines*
> *A2.1 | Fencing of the Department of Housing and Works Apartment Built Form Guidelines*

Good outcome example

Figure 35.
Limestone block with integrated boundary fencing is a preferred construction method.

Poor outcome example

Figure 36.
Where possible locate retaining walls minimum 500mm inside boundary fencing.

Fixtures and Furniture

REFER SPEC

Various features are required to activate, address safety, minimise maintenance requirements and provide fundamental and additional functionality. Select quality, products with correct installation to ensure ease of operation, maintenance and functionality of landscape areas.

Elements:

- Letterbox

Key Letterbox requirements:

- ✓ *Provide sturdy letterboxes.*
- ✓ *Locate within property boundary but close to the boundary and in an accessible location.*
- ✓ *Select style to match the building.*
- ✓ *Ensure a solid footing and compacted / stable base.*
- ✓ *Ensure matching development design requirements.*

- × *Less robust letterboxes to be avoided.*
- × *House number is not orientated to the street.*

Good outcome example

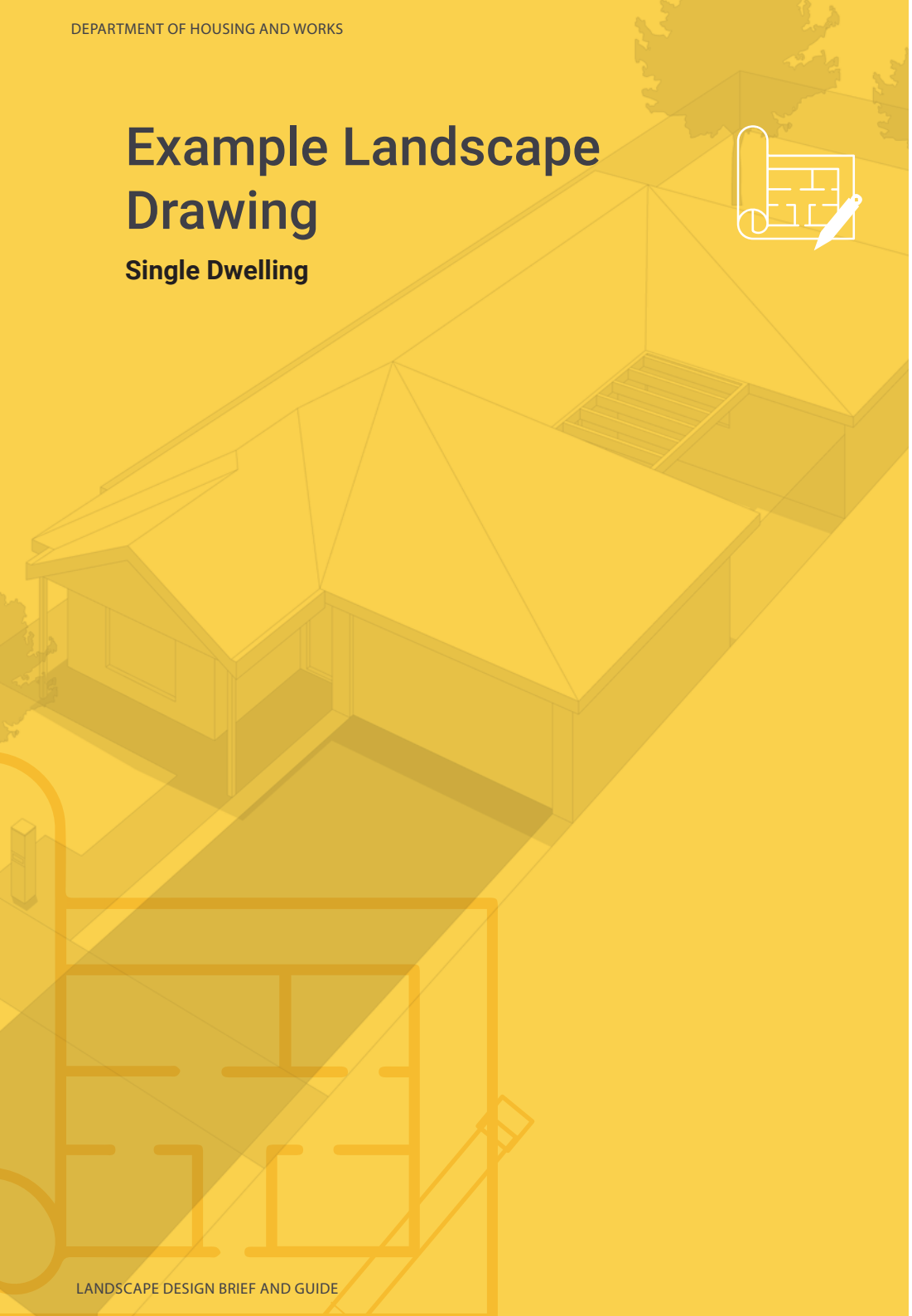
Figure 37.
Letterbox is accessible, visible, sturdy and visually appealing while in keeping with the dwelling.

Poor outcome example

Figure 38.
Letterboxes are not sturdy or well installed.

Example Landscape Drawing

Single Dwelling



Refer to Page 70 Documentation Standards within this guide for further information on drawing standards

Plan Requirements

- *Be drawn clearly and accurately to scale – typically 1:50, 1:100 or 1:200.*
- *Include title box with drawing name, property address, date of drawing, scale and north point.*
- *Include legend clearly identifying all information that has been shown on the plan.*
- *Include notes as required to clarify information shown on the plan.*
- *Show extent of irrigation, controller and service connection locations.*

Building Requirements

- *Proposed buildings (showing ground floor windows and doors).*
- *Any other proposed structures, such as shed/pergolas.*
- *Proposed surfaces and materials.*
- *All features labelled.*
- *Proposed contours and levels.*
- *Proposed retaining walls with heights, batters and materials.*
- *Proposed vegetation (drawn at mature size).*
- *Utilities such as clothes lines and bin storage.*
- *Tree protection measures.*

Planting Requirements

- *Quantity of proposed plants.*
- *Size at time of installation: pot size for understorey planting and height for tree planting.*
- *Typical size at maturity: height and width.*
- *All trees proposed to be removed, with botanical and common name.*

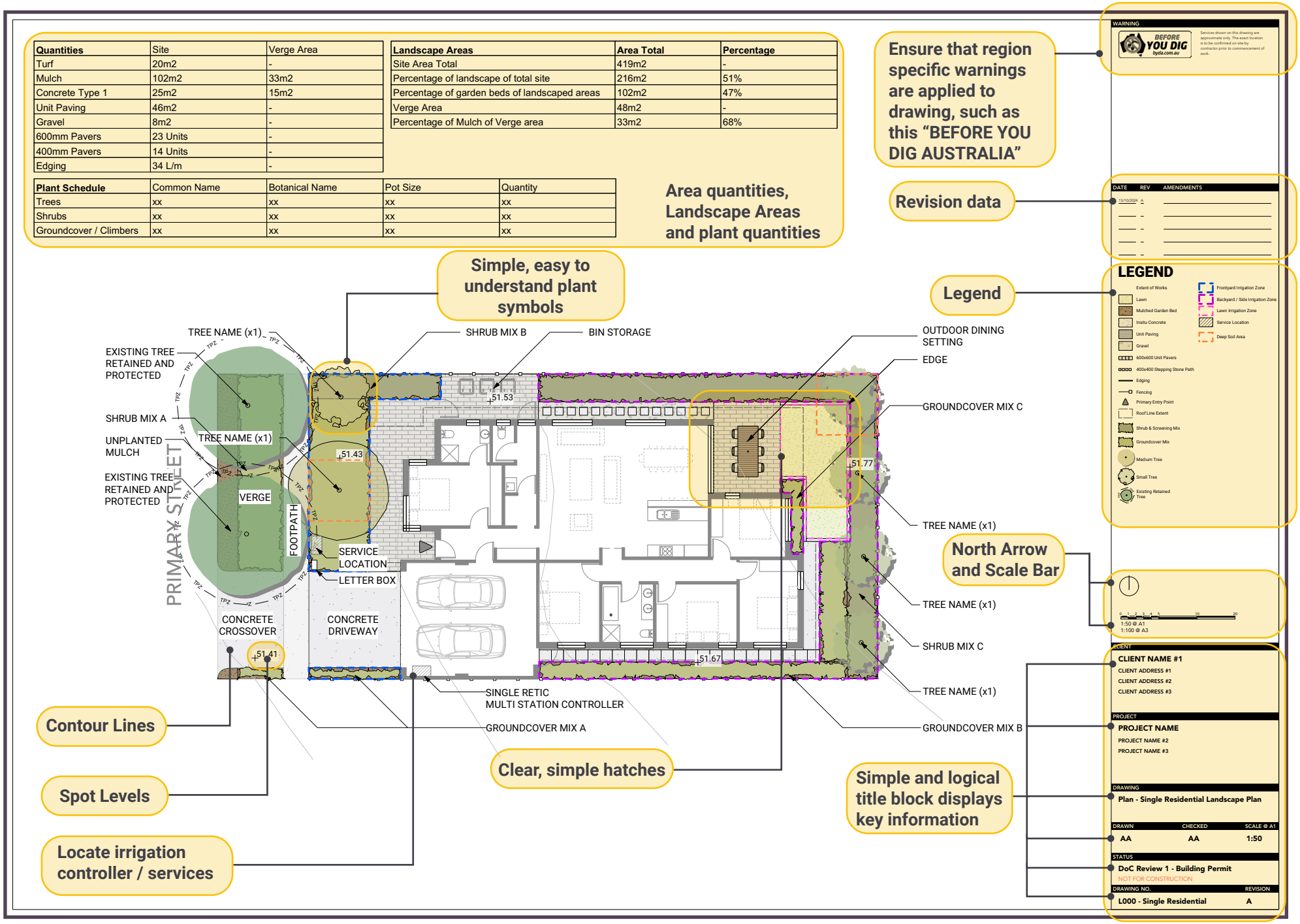


Figure 41. Single Dwelling Landscape Plan

Grouped & Multiple Dwelling Design Requirements

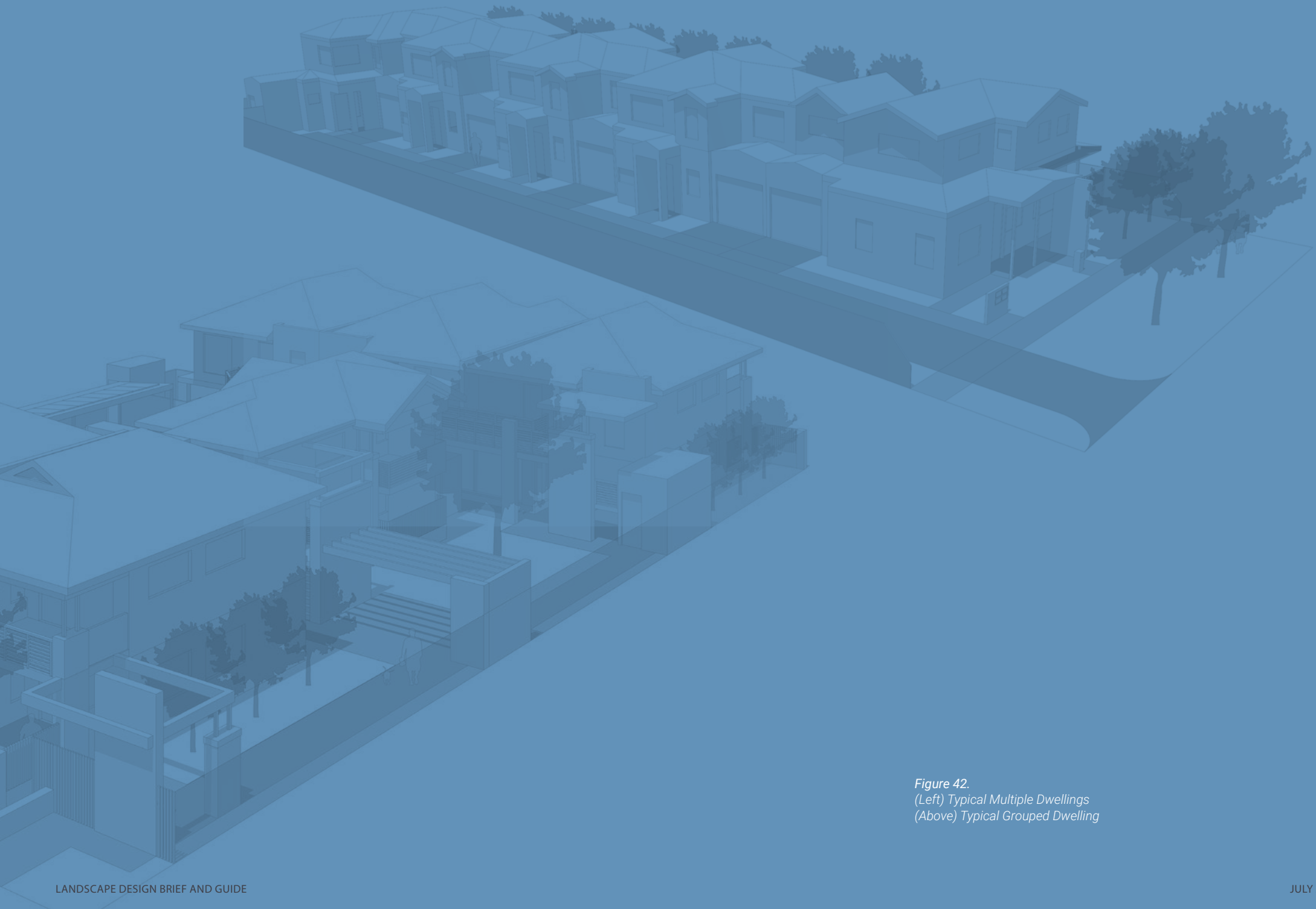


Figure 42.
(Left) Typical Multiple Dwellings
(Above) Typical Grouped Dwelling

Grouped & Multiple Dwellings Softscape Requirements

Objective

The development should provide suitable landscape to support tree canopy and shade, deep soil areas, site permeability, and biodiversity, whilst minimising maintenance inputs. Additional considerations for Grouped and Multiple Dwellings relate to planting in common property areas and strata maintenance implications.

Shade & Canopy Cover	*Reduce ambient temperatures and increase shade cover opportunities.*
Deep Soil Area	*Maximise deep soil areas for optimal tree growth and benefits.*
Site Permeability	*Enhance site permeability and stormwater management.*
Maintenance	*Plant species that are simple to maintain and have low input requirements.*
Appropriate Selection	*Right plant, in the right location, for the right reason.*
Diversity	*Support a diverse range of suitable planting species to support biodiversity positive outcomes.*

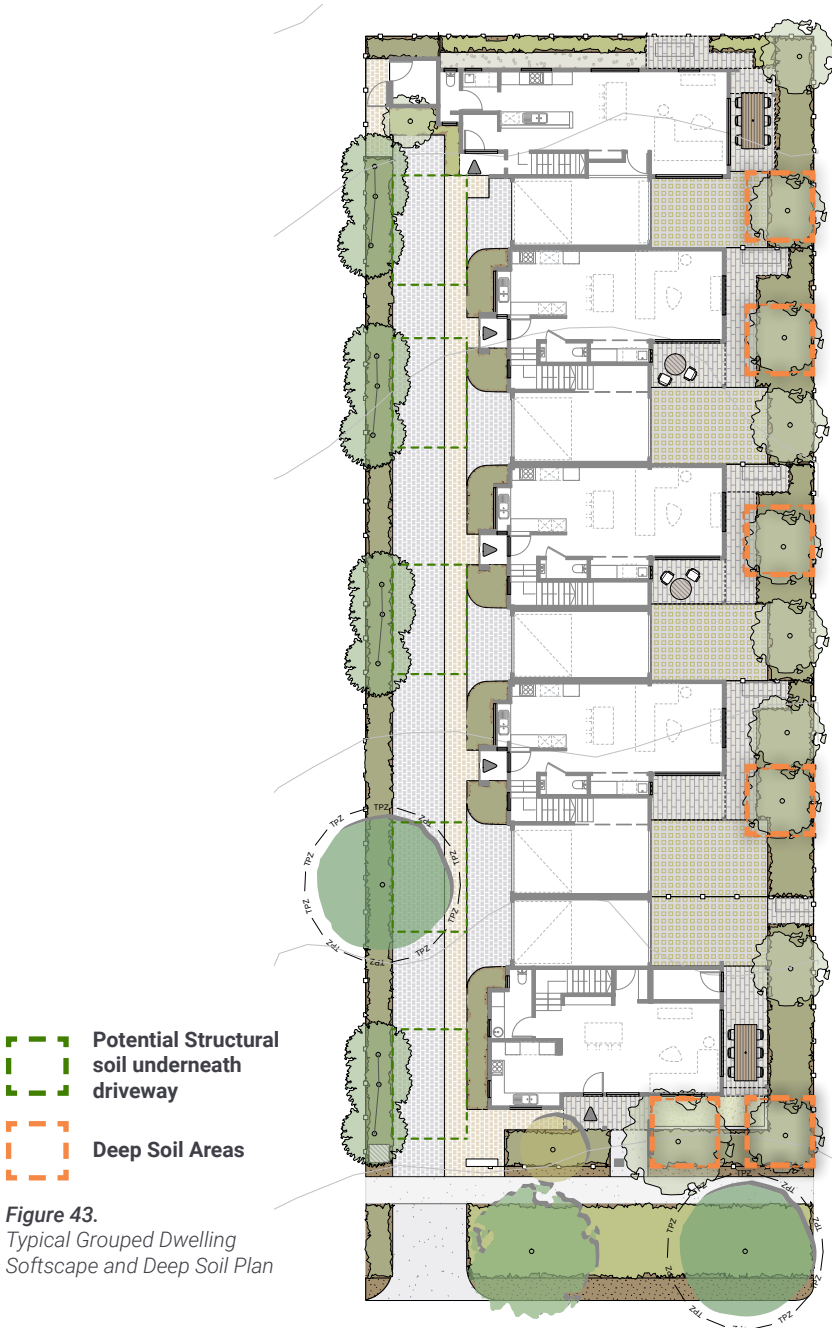


Figure 43.
Typical Grouped Dwelling Softscape and Deep Soil Plan

Primary Landscape Controls (Grouped Dwellings)		
Primary Garden Area / Outdoor Living Area [m^2]	Minimum area of garden beds as a percentage of landscape area	Minimum trees required
>40m^2	40%	2 small trees
35m^2	30%	1 small tree
30m^2	30%	1 small tree
25m^2	20%	1 small tree
20m^2	20%	1 small tree
>15m^2	15%	1 small tree where possible

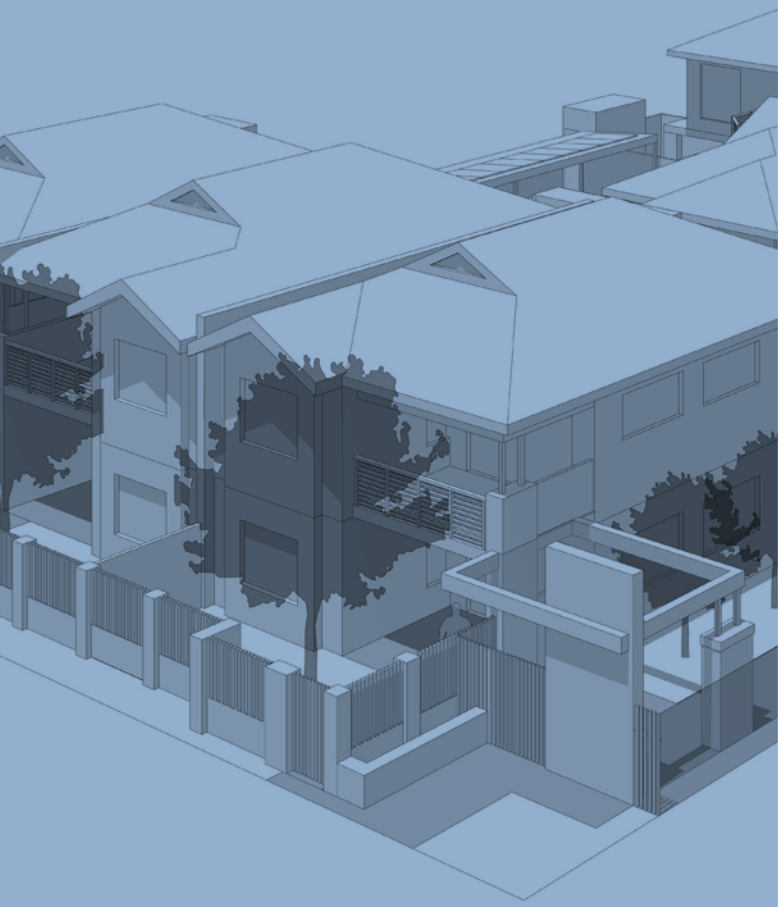
Tree Requirements				
Tree Size	Minimum deep soil area	Minimum deep soil area width	Minimum on-structure volume	Minimum on-structure soil depth
Large	64m^2	4m	76.8m^3	1200mm
Medium	36m^2	3m	36m^3	1000mm
Small	9m^2	1.5m	7.2m^3	800mm

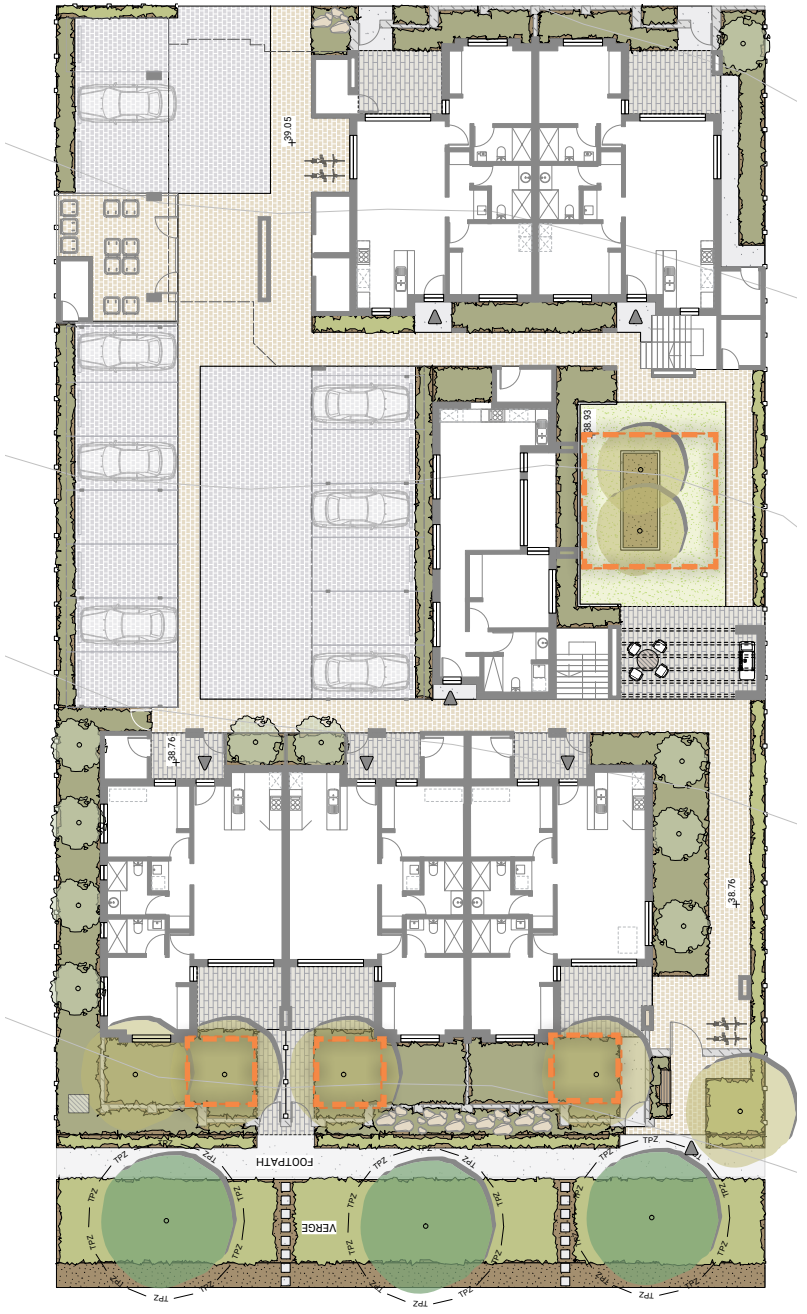
Softscape requirements	Minimum requirements
Plants per m^2 of garden bed	Three (3) plants per m^2 (minimum pot size 130ml)
Turf	A consolidated area of turf may be provided in communal or shared spaces to a maximum size of 50m^2. Larger areas of turf to the approval of DHW.
Garden bed width	Standard: 750mm. Driveways: Minimum 300mm width, with recommended >500mm.
Native / exotic species mix	>70% of selections to include native species.
Organic Mulch	Minimum 75mm depth. Organic mulch should be free from contaminants and foreign materials (plastics, wires and other non organic mulch material).
Soil Improver	Minimum 100mm topsoil cultivated into top 150mm soil profile for turf and garden beds.
Tree pot size	Minimum pot size 45L.

Note: Bushfire Attack Level (BAL) ratings are required to be considered when designing landscaping plan

Figure 44.
Landscape control table (Grouped Dwelling)

Multiple Dwellings DSA Plan & Landscape Controls table





Deep Soil Areas

Figure 45.
Typical Multiple Dwelings Softscape and Deep Soil Plan

Primary Landscape Controls (Grouped Dwellings)		
Primary Garden Area / Outdoor Living Area [m^2]	Minimum area of garden beds as a percentage of landscape area	Minimum trees required
>40m^2	40%	2 small trees
35m^2	30%	1 small tree
30m^2	30%	1 small tree
25m^2	20%	1 small tree
20m^2	20%	1 small tree
>15m^2	15%	1 small tree where possible

Tree Requirements				
Tree Size	Minimum deep soil area	Minimum deep soil area width	Minimum on-structure volume	Minimum on-structure soil depth
Large	64m^2	4m	76.8m^3	1200mm
Medium	36m^2	3m	36m^3	1000mm
Small	9m^2	1.5m	7.2m^3	800mm

Softscape requirements	Minimum requirements
Plants per m^2 of garden bed	Three (3) plants per m^2 (minimum pot size 130ml)
Turf	A consolidated area of turf may be provided in communal or shared spaces to a maximum size of 50m^2. Larger areas of turf to the approval of DHW.
Edging	Edging to all garden beds and turf areas. Refer to Hardscape Requirements.
Garden bed width	Standard: 750mm. Driveways: Minimum 300mm width, with recommended >500mm.
Native / exotic species mix	>70% of selections to include native species.
Organic Mulch	Minimum 75mm depth. Organic mulch should be free from contaminants and foreign materials (plastics, wires and other non organic mulch material).
Soil Improver	Minimum 100mm topsoil cultivated into top 150mm soil profile for turf and garden beds.
Tree pot size	Minimum pot size 45L.

Note: Bushfire Attack Level (BAL) ratings are required to be considered when designing landscaping plan

Figure 46.
Landscape control table (Multiple Dwellings)

Tree Retention & Protection

Existing trees that are able to be retained are considered an asset for the development. Early engagement of an arborist and ongoing inputs through design and construction are vital to ensure existing trees are retained and protected.

General requirements:

All significant trees identified as suitable for retention, including all street trees, shall be protected in accordance with ***Australian Standard AS 4970 'Protection of Trees on Development Sites (2009)'***. Trees retained on site shall count towards the tree requirements.

Ensure trees planted within turf areas include concrete edging at 750mm from trunk.

Significant Trees are defined as having a height of 5m or greater, with a trunk diameter of 200mm at DBH and/or, a canopy diameter of 5m or greater.

Early engagement of an arborist to provide a visual tree assessment, to identify the species, structure, health, size and suitability for retention.

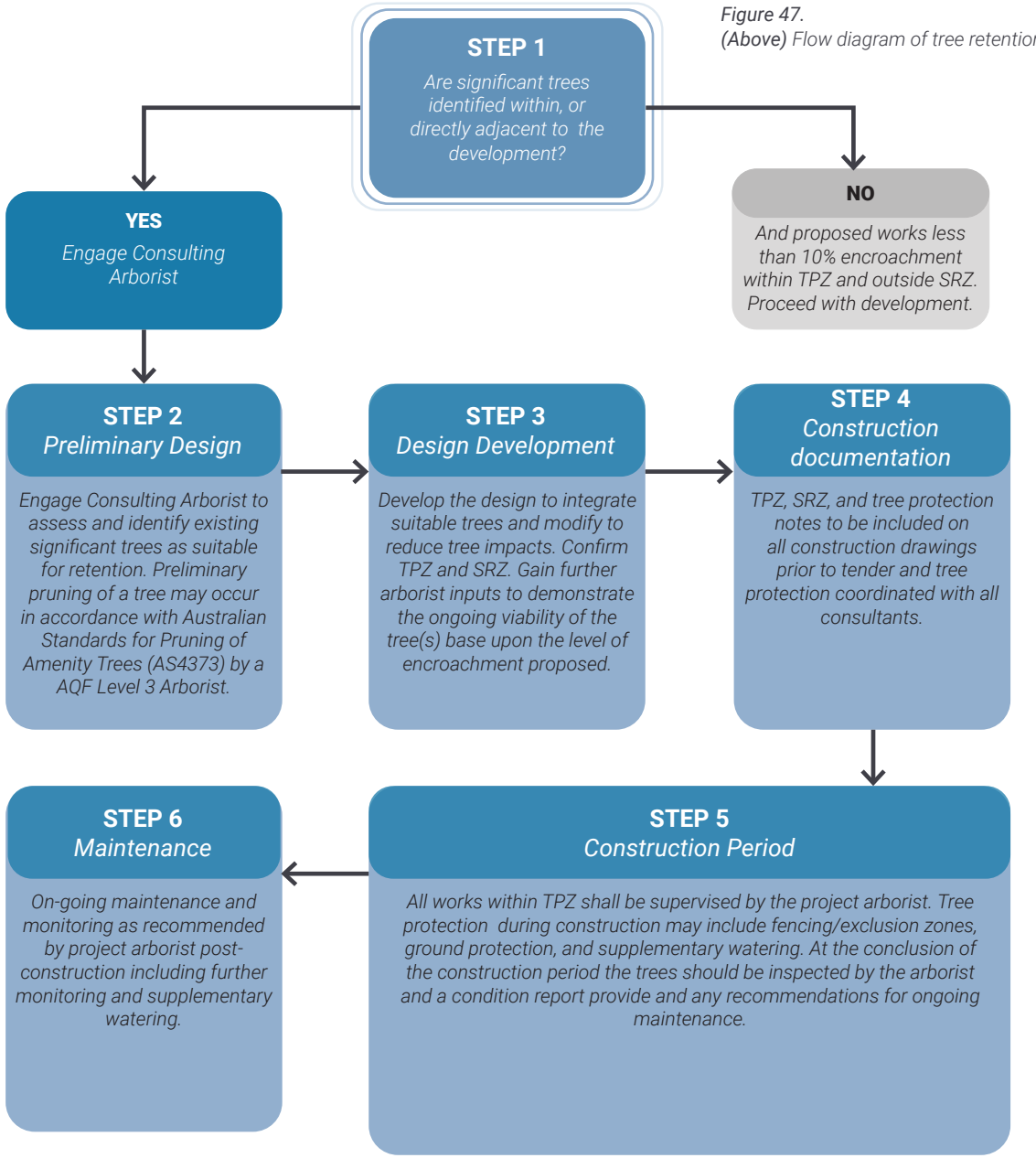


Figure 47.
(Above) *Flow diagram of tree retention process.*

Front Yards & Verges

Front yards and verges are considered the 'public face' and improve the perception and overall appearance of the development. A water wise garden can assist with shade, reducing temperatures and mitigate urban heat islands, while providing an important contribution to neighbourhood character and walkability.

General requirements:

- Existing street trees to be retained and protected in keeping with local government authority.
- Verge treatments shall meet the requirements of the local government or authority.
- Synthetic turf is not supported generally.
- Ensure a clear and direct path from the street to the front door is provided.
- Turf should be used judiciously and located for maximum benefit with edging to separate turf from trees and garden beds.
- Provide shade to footpaths with appropriate tree species selection and spacing.
- Where there is no footpath, the verge and front of the property can be combined and treated as one area for the purpose of landscaping.

Key Front Yard requirements:

- ✓ *Additional trees and planting is encouraged at the front lot boundary in order to increase the likelihood of tree retention if the site is redeveloped in the future.*
- ✓ *Waterwise verge and tree planting with the inclusion of low maintenance, native plants, with a mix of various approved surface treatments is recommended.*
- ✓ *Plant selections shall be a maximum of 600mm in height to provide clear sightlines for pedestrians and vehicles. Taller planting is permitted along fencelines and boundaries where suitable. Ensure plantings and trees are selected and located to maintain clear sightlines from street to the house and vice-versa.*
- ✓ *Integrate and locate elements such as fences, letter boxes, and services meters and include screening as appropriate.*
- ✓ *Ensure the verge can accommodate access for regular bin collection. Paving and hardstand on verges to the approval of the local government.*
- ✓ *Single neutral colour should be used for service elements such as letterboxes to minimise visual impact.*
- ✓ *Use trees and shrubs of different heights to break the roof line or 'break up' the bulk or scale of a development, softening its appearance to the street.*

Good outcome example

Figure 48.
Low growing plants, mulch and street trees provide an attractive streetscape whilst retaining access and sightlines.

Poor outcome example

Figure 49.
Plants over 1m in height block sightlines between driveways and road creating potential safety issues.

Back Yards

Back Yards should be designed to be a usable, flexible space that is connected to the living spaces of the dwelling.

General requirements:

- Ensure planting and tree selections are ideal for the site and maintain sufficient clearance from the dwelling.
- Provide attractive settings and amenity for the home.
- Check the household makeup and be responsive to the needs and abilities of the different cohorts the back yard is intended to support, such as families, seniors, single person households.
- Ensure designs for smaller landscape areas such as rear courtyards are appropriate for the space.
- Ensure access to the back yard for maintenance is facilitated by having clear pathways free from plant material to the rear for servicing.
- Avoid putting turf or planting in small spaces which are hard to access for maintenance.

Key Back Yard requirements:

- ✓ *Back yards should be simple, practical, and provide appropriate facilities to support day to day functional requirements including clothes drying, furniture, storage, recreation, and play.*
- ✓ *Be flexible, providing a variety of spaces for residents to use e.g. courtyard for outdoor cooking and eating, and a small turf area for relaxing and play.*
- ✓ *Consider planting and screening to provide privacy and minimise overlooking. Use of planting for screening, especially along fence lines and boundaries.*
- ✓ *Climbing plants or other forms of vertical greening should be used to improve the appearance of all blank walls within a development visible from the common areas of the development and public domain.*
- ✓ *Ensure landscape design in smaller spaces such as balconies or rear courtyards have manageable garden spaces. These spaces should have lower green waste production and should be maintainable without the need for heavy machinery and equipment.*
- ✓ *Back yards should be designed for the household size and cohorts needs e.g designing family friendly gardens for children to play or more easy to maintain gardens for seniors.*

Good outcome example

Figure 50.
A small courtyard, connected to the main living area provides a low maintenance space suitable for seniors.

Poor outcome example

Figure 51.
Whilst turf may provide space for families to play, low amounts of shade restricts use.

Planting

15 Typical Detail

Planting can be used to define and separate spaces, screen and soften building façades, increase permeable surfaces and create visual interest within landscapes.

General requirements:

- A variety of species nominated in the species selection guide (or suitable alternatives) at the required planting numbers per m^2.
- A minimum 70% native or endemic plants to be utilised. Refer to Appendix 3 - Metro Area Recommended Planting Lists for more information on species selection.
- Ensure plant species are not listed on the ***Western Australian Organism List (WAOL)*** database declared 'pest (S22)' or 'pest prohibited (s12)' under the ***Biosecurity and Agriculture Management Act 2007 (BAM Act)***.
- Plant species are not spiny, sharp or pose a reasonable risk to the residents or neighbours.

Key Planting Selection requirements:

- ✓ *Plant selection is suitable for the applicable region, climatic conditions and soil type and grouped accordingly.*
- ✓ *Consider consolidating smaller garden beds into fewer, larger areas where practical.*
- ✓ *Co-locate similar plant species in terms of their sun, soil, water, and fertiliser requirements to improve irrigation efficiency.*
- ✓ *Provide landscaping to improve appearance of retaining walls and fencing where they are visible in the public domain.*
- ✓ *Productive fruit, vegetable or herb gardens for common use and socialising opportunities. The proponent is to provide plants to these areas – empty planters are not to be left for future tenants to populate.*

Example

Figure 52.
Low maintenance, waterwise, native species provide visual interest and environmental benefits.

Example

Figure 53.
Narrow, vertical hedging varieties located between fences and driveways improves visual appearance.

Tree Selection

Tree species shall adapt to the constraints of the site and with the right characteristics to achieve the desired outcomes.

- Trees to be planted so that the edge of the estimated mature canopy is offset from buildings.
- Minimise estimated mature canopies overhanging joint boundaries by selecting species of a suitable scale and size.
- A minimum of 50% of tree species shall be native/endemic species. Lower than 50% to be approved by DHW.
- Trees planted within turf areas shall include concrete edging at a minimum of 750mm from trunk.
- Tree planting is encouraged along lot boundaries and especially in corners to provide a larger area for canopy spread and to locate trees where they will be easy to retain if the site is redeveloped in the future.
- Fruit trees are a suitable tree option for smaller private gardens or communal areas (*Read more on Page 53 - Communal Areas for example trees*).
- Trees to be retained adjacent to dwellings may require the installation of gutter guards to minimise leaf build up.

Key Tree Selection requirements:

- ✓ *Identify all existing and proposed services and utilities and ensure trees are located at appropriate offsets.*
- ✓ *Where practical locate deciduous trees on the northern and southern side of dwellings and courtyards to maximise shade in summer and solar gain in winter. Use Evergreen trees on the western and eastern side of dwellings to shade buildings from hot morning and afternoon sun.*
- ✓ *A broad range of tree species and sizes shall be used across the development. Utilise both exotic and native species of varying sizes to maximise the benefits and minimise the risk of pest and disease. In particular select species to be resistant to Polyphagous shot-hole borer (PSHB, Euwallacea fornicatus).*
- ✓ *Ensure trees are located at a suitable distance from crossovers and entrance pathways to provide clear sightlines for pedestrian and vehicle safety.*
- ✓ *Tree procurement shall conform to Australian Standard AS2303 'Tree Stock for Landscape Use' (2018).*
- ✓ *Ongoing access to water will support healthy, long-lived, and vigorous trees and maximise their benefits. Maximise soil volume and integrate trees using WSUD, permeable paving, and direct stormwater from hard surfaces to trees where practical.*
- ✓ *Trees should be of a suitable size and scale for the space, with larger trees located where greater space is provided and smaller trees are provided in smaller spaces e.g. courtyards. Locate trees within garden beds or mulched areas at prescribed distances from paving to avoid tree roots lifting hard surfaces.*
- ✓ *Minimise instances of trees at maturity overhanging buildings, fences and neighbouring buildings. Consider future access for maintenance and the long-term safety of maintenance staff by selecting trees of an appropriate scale and ease of maintenance.*
- ✓ *Consider root protection barrier zone when selecting species and planting location.*

Example

Figure 54.
Large existing trees provide immediate shading capacity for the streetscape and residences.

Example

Figure 55.
Spaced tree placement provides screening and shading to residences.

Example

Figure 56.
Trees planted in the front garden improve visual amenity and provide summer shading.

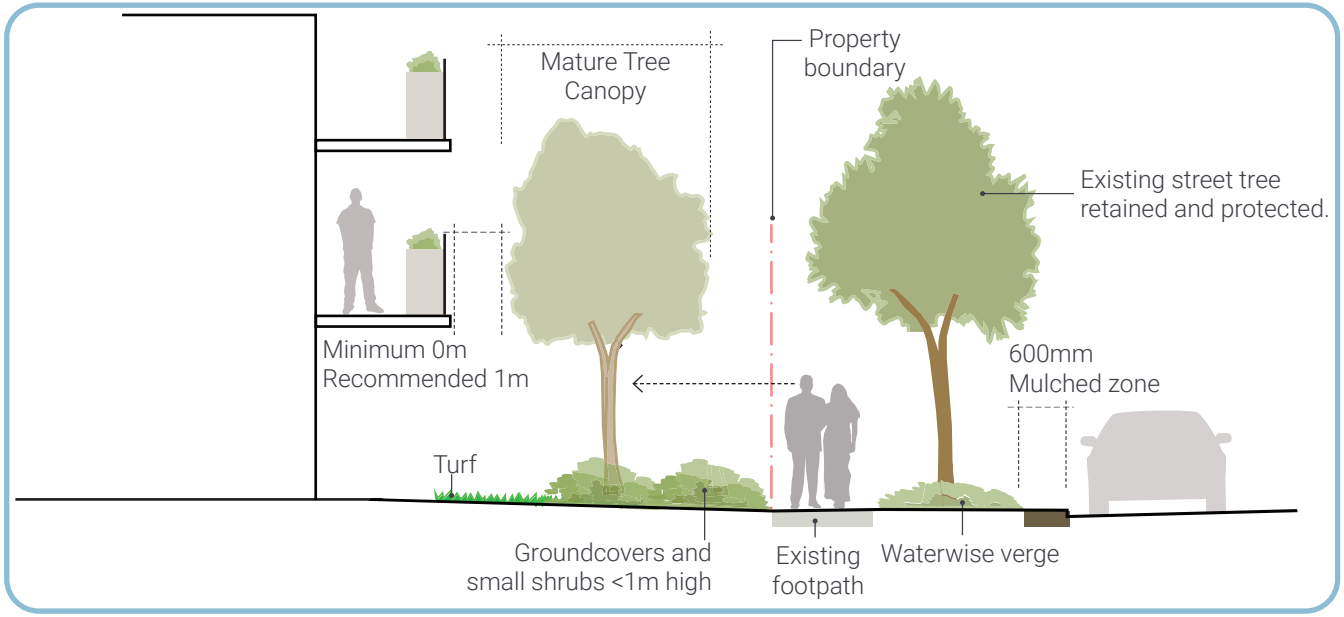


Figure 57.
***(Left)** Diagram of Existing street tree interfaces with verge planting and front yard planting.*

For more information on tree selection choices refer to Appendix 2 Metro Planting Lists and Appendix 3 Regional considerations

Turf

REFER SPEC

13 Typical Detail

Lawn can create space for activity and recreation however, the need for ongoing maintenance such as regular lawn mowing should be balanced against the size of the lawn.

General requirements:

- Weeds shall be removed and soil preparation undertaken prior to installation of turf to reduce ongoing maintenance.
- Turf is only provided in consolidated areas which can be feasibly maintained and with adequate access to direct sunlight.
- Synthetic turf is not supported generally.

Key Turf requirements:

- ✓ *Turf shall be located where it can receive sufficient direct sunlight per day.*
- ✓ *The location of turf shall consider suitable access to the area for lawn mowing to occur on a regular basis.*
- ✓ *Turf species should be drought tolerant such as Buffalo, Couch, Zoysia, or an approved equivalent.*
- ✓ *Turf must be framed by hard paving or edging to all sides. Refer to 'Edging' in 'Hardscape Requirements'.*
- ✓ *Turf shall not be installed directly against buildings to minimise water and moisture ingress and ongoing maintenance.*
- ✓ *Consider consolidating turf and use within communal areas.*
- × *Avoid small patches or strips of lawn < 2m in width*

Good outcome example

Figure 58.
Areas of turf reduced and balanced by garden beds framed by paving and concrete edging.

Poor outcome example

Figure 59.
Lawn installed as a narrow strip against building in a high shade area.

Irrigation and Hydrozoning

REFER SPEC

Irrigation is critical to the establishment and ongoing health of gardens. Achieving a balance between minimising water use and providing appropriate levels of irrigation to sustain gardens is required.

General requirements:

- Water take-off and irrigation system shall be connected to mains power and plumbed directly to house (Note: programmable tap timers may be acceptable for a small courtyard subject to DHW approval).
- One programmable automatic controller to be supplied for each dwelling to operate all irrigation zones separately.
- Irrigate landscape appropriately for establishment based on seasonality, eg. higher frequency and volume of irrigation during summer months.

For more information on selection choices for a water saving garden visit Watercorps 'Waterwise Plants' ***(https://www.watercorporation.com.au/Waterwise/Waterwise-plants)***

Key Irrigation requirements:

- ✓ *Direct irrigation away from dwellings. In gardens areas near houses use bubblers or drippers to minimise over-spray and wind-drift onto the dwelling.*
- ✓ *For small private gardens areas < 20m² can be watered with a single station irrigation controller and a tap timer may be subject to consideration by DHW. Larger gardens > 20m² or landscapes that have more than one irrigation zone will require a full irrigation system.*
- ✓ *Services metering/valves to be directly connected to dwelling power and water supply metering.*
- ✓ *Ensure solenoid boxes are located in accessible areas but away from paths of travel.*
- ✓ *Water for common property landscape areas should generally be supplied from the dedicated common property sub meter or master meter for the development.*
- ✓ *Private resident yards should be on individual irrigation zones connected to the dwellings own sub meter and water supply (subject to housing mix and Project Manager's approval).*
- ✓ *Services Metering/Valves for grouped sites of 2 dwellings or where no common property is proposed consider areas adjacent to each dwelling from the dwellings water supply (subject to Project Manager's approval).*
- ✓ *Consider weather based sensor systems that turn off irrigation when triggered by rain.*
- ✓ *Water supply to be provided from a separate cut in within 2 metres of the master water meter, with a 25mm tested gate valve fitted with an approved backflow prevention device as required.*
- × *Avoid small, or isolated garden beds within the development as these are problematic to install and maintain with irrigation.*

Key Hydrozoning requirements:

Hydrozoning relates to locating plants with similar water requirements in the one location to conserve water use and reduce ongoing maintenance.

- ✓ *Minimise the plant species which require high water and ongoing inputs.*
- ✓ *Irrigate according to different hydrozones and ensure efficient use of irrigation such as drip irrigation or bubblers for general garden beds, and sprinklers for turf areas.*
- ✓ *Direct stormwater runoff from hardstand areas to landscape areas.*

Soil Volumes

Providing good quality soil and ample soil volume for plants to grow is critical in the establishment and longevity of planted areas.

General requirements:

- Soil shall be decompacted, aerated, and free draining.
- Quality soil, free of contamination from building and construction waste. Replace with suitable soil prior to tree installation as required.
- Deep Soil Areas shapes may be modified to work with developments and built forms however, must be contiguous and meet minimum widths specified.
- DSA Refer to SPP 7.3 Apartment Guidelines.

Key Soil volume requirements:

- ✓ *Deep Soil Areas for trees sizes are defined in the Residential Design Codes.*
- ✓ *Locate trees within the DSA and co-locate DSA with tree retention where relevant. Refer Tree Retention Section on Page 42 of this document. Where trees are being retained, consult an arborist.*
- ✓ *DSA is included in the Minimum Garden Bed or Turf m^2 (Refer to Primary Landscape Controls - Grouped & Multiple Dwellings table Page 39, 41).*
- ✓ *Shared space: Trees are ideally planted with connected soil volumes so that roots can 'share' the below ground space. A reduction in overall DSA by 25% can be achieved if trees are planted with adjacent DSA.*
- ✓ *Any paving required within a DSA area should be permeable to allow water infiltration and healthy root growth. Permeable paving should not cover more than 20% of the DSA for each tree.*

Ameliorated Soils

- ✓ *Ensure plants are going into good quality top soil. Refer to Planting Detail 14 in Appendix 4 - Landscape Typical Technical Details for more information on planting requirements.*

For more information and general advice on soils treatment and preparation contact a Structural Soil Specialist.

Strategies to Increase DSA:

A number of strategies may be employed to increase the DSA for trees within developments whilst still accommodating driveways, paths and other infrastructure.

Permeable Paving

✓ *Permeable pavers allow water to infiltrate through the surface and sub-base structure to the ground below. Whilst a slightly higher upfront cost than traditional paving, savings are generally made by reducing other traditional drainage infrastructure (e.g. soakwells, strip drains etc.). Permeable paving is particularly suitable for driveways and paths to accommodate extra tree planting.*

Example

Figure 60.
Permeable paving used in parking area provides additional deep soil for adjacent trees and planting.
Source: Author.

Cell Systems

✓ *These are engineered systems which provide high levels of load bearing capacity and large volumes of uncompacted soil for trees. Suitable for use in highly constrained areas, or heavy load and high use areas where trees are required. Cells have a dual benefit as they support the ongoing establishment and health of trees and may also be used in place of traditional drainage systems (e.g. soakwells).*

There are several proprietary Strata Cells and Permeable Paving options available on the market. Always follows the directions, details and recommendations from the manufacturer for installation and maintenance of these systems.

Example

Figure 61.
Indicates how cells function in a car park to provide deep soil for trees whilst maintaining parking spaces.
Source: CityGreen.

Landscape on Structure

Although landscape at grade is preferable, landscape on structure is an acceptable approach to achieving plant area requirements.

General requirements:

In certain sites it may be difficult to support successful tree growth and provide the required deep soil areas. Planting on-structure can be utilised and may include:

- Wall supported planting (including trellis structures attached to walls);
- Green roofs (particularly roofs which are visible from the public domain or other parts of the development);
- Large scale planter boxes suited to small or medium trees; and;
- Green walls, living walls and/or vertical gardens;

When designing areas for landscape on structure, it is imperative that there is co-ordination with an Architect and an Engineering consultant. Miscalculation of the weight of planters can result in structural damage to the building and associated resident safety risks.

Key Landscape on Structure requirements:

Successful planting on structure will require technical expertise to advise on:

- ✓ *Light weight soil(s) or soil blends to support the proposed plant species.*
- ✓ *Soil volume to support establishment and healthy growth of plants.*
- ✓ *Irrigation type and frequency for proposed plant species.*
- ✓ *Plant species for the climatic conditions that are low maintenance and long-lived.*
- ✓ *Access for ongoing maintenance (pruning, mulching etc).*
- ✓ *Loading requirements including weights of the proposed tree(s) at maturity and soils at saturation.*
- ✓ *Location of planters as these may need to situated over building columns or areas supported by reinforced structures.*
- ✓ *The minimum deep soil area of 20% of the lot (excluding verge area) aligns with the minimum standards outlined in the **Residential Design Codes**.*

Example

Figure 62.
Pots are a great option to add planting to balcony spaces and requires lower maintenance.

Communal Areas

Communal Areas offer play and casual social opportunities. Gardens such as productive gardens using water efficient garden beds allow for residents to plant vegetables and herbs.

General requirements:

Communal areas should be positioned in a central area within the site to encourage residents to use the space.

Productive plants require specific micro-climate, soil, irrigation, and maintenance requirements. Ensure that the plants can grow in the proposed conditions. If site conditions are not conducive within a common area for productive plants, they may also be dispersed within the general landscape across the site and may include:

- Hedging plants using rosemary or similar species.
- Creeping thyme may be used as a groundcover.
- Small trees such as lemons, mandarins, and macadamia are both productive and ornamental.
- Grapes or passionfruit can be grown as climbers on walls and trellises.

Key Productive Garden requirements:

- ✓ *Consider storage of gardening equipment to undertake maintenance in a well located position on site.*
- ✓ *Provide easily accessible garden beds which allow for all residents to engage and participate.*
- ✓ *Install productive gardens in a central space within communal areas to make them more accessible for culinary purposes for residents.*

Key Communal Area requirements:

- ✓ *Provide seating in communal areas which promotes casual social opportunities between residents.*
- ✓ *Consolidate turf area into a single expansive lawn area which facilitates play opportunities and recreation spaces. Follow requirements outlined in the turf subsection.*
- ✓ *Consider plant species that are not spiny, sharp or pose a reasonable risk to young children or seniors using the communal areas.*
- ✓ *Consider hardscape interface and requirement for communal areas.*

Example

Figure 63.
Garden beds offer a great opportunity for residents to meet, catch up and participate on a common project together.

Example productive plants

Plants

- ✓ **Tomato**
  Solanum lycopersicum
- ✓ **Beetroot**
  Beta vulgaris subsp. vulgaris
- ✓ **Zucchini**
  Cucurbita pepo

Trees

- ✓ **Lemon**
  Citrus limon
- ✓ **Macadamia**
  Macadamia integrifolia
- ✓ **Mandarin**
  Citrus reticulata

Grouped & Multiple Dwellings Hardscape Requirements

Materials and finishes within the landscape can assist the functionality and longevity of a development, by careful consideration and selection of appropriate materials which can improve the aesthetics of the garden and promote a safe environment, as well as reducing ongoing maintenance.

- *Pavements (Unit Paving & In-situ Concrete)*
- *Edging*
- *Rocks & Stone Work*
- *Gravels & Compacted Gravels*
- *Retaining Walls*
- *Fixtures & Furniture (Letter Boxes)*

Common and Typical Guidance

Climatic Conditions	*Consider the regional context and climatic condition when choosing hardscape materials.*
Durability & Strength	*Ensure that the material is suitable for its intended purpose and level of durability.*
Site Permeability	*Choose materials which are permeable and enable fluid movement of water throughout.*
Maintenance	*Choose materials which are easy to maintain and clean.*
Colour & Aesthetics	*Ensure material selection suits surrounding context as well as built form.*
Safety & Accessibility	*Consider the texture of materials in the landscape design. Ensure the selected materials meet relevant industry standards as excessively rough or smooth surfaces may create safety issues.*
Lifespan	*Consider and factor in the intended lifespan of the material and ensure that products with lower lifespans are not used in high traffic areas.*

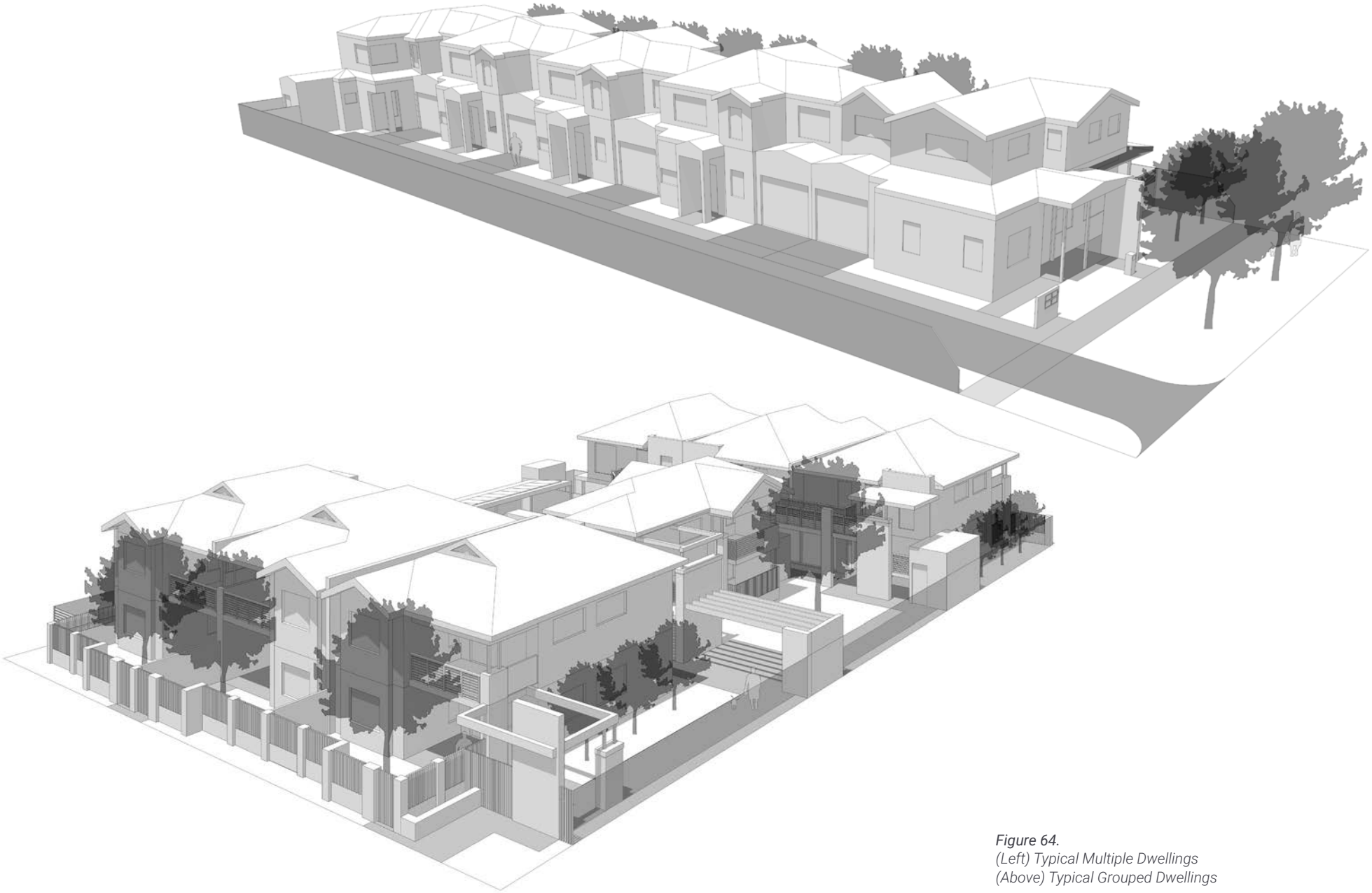


Figure 64.
(Left) Typical Multiple Dwellings
(Above) Typical Grouped Dwellings

Pavements - Unit Paving & In-situ Concrete

REFER SPEC

1-3 Typical Detail

Pavements include driveways, access paths, maintenance paths, stepping stones and patio areas. Pavements should be minimised in favour of deep soil and planting where possible, whilst still meeting functional access and service requirements.

General requirements:

General
- Paving over DSA is to be permeable and no more than 20% of the DSA required.
- Ensure paths meet maximum grade requirements and drain correctly.
- Connect pavements to the front door of the dwelling from the driveway, verge or street pavements.

Driveways & Car Parking
- Remove pavements beyond vehicle turning movements wherever possible.
- Replace pavement with ground cover planting at end of open car bay (beyond wheel stop) to increase soft, cool and passively irrigated surfaces.

Access & Maintenance Paths
- Minimum width 700mm.

Key Paving Requirements:

- ✓ *Preference for light coloured pavement materials (some regional exceptions).*
- ✓ *Provide for different materials and colours to emphasise different uses.*
- ✓ *Include permeable pavements to assist with managing storm water.*
- ✓ *Grade pavements to drain into turf of planting areas where soil permeability permits.*
- ✓ *Install irrigation sleeves prior to pavements.*
- ✓ *Provide a hard stand area for bins.*
- ✓ *Ensure 500mm wide level shoulder to all pavements.*
- ✓ *Ensure paved connection to drying areas.*
- ✓ *Stepping stones are to be set at 600mm centres and be approximately 400x400mm.*
- ✓ *Stepping stones should be used in areas where access is required occasionally. It is not suited to a daily trafficable area such as the path to a bin store or the only access to the rear yard.*
- ✓ *Use correct pavement type for the region (Refer to Appendix 3 - Regional Considerations for more information).*
- ✓ *Use a single pavement material across verge and lot*

- × *Refrain from material change at boundary*
- × *Avoid access lids in pavements where possible.*

Good outcome example

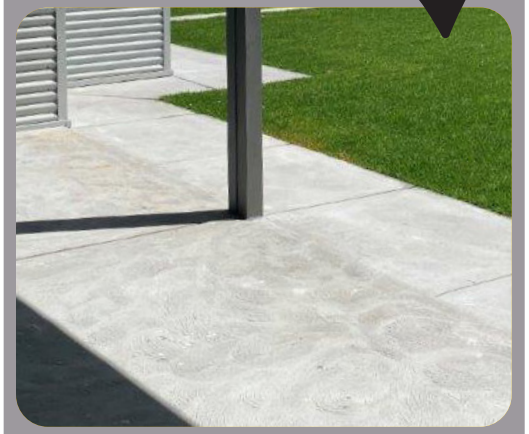


Figure 65.
Light colour finish and lush transitions between alfresco, access paths and turf and passively drained.

Poor outcome example

To ensure you are using the ideal paving type for the region, refer to Appendix 3 Regional Considerations for more information

Figure 66.
Height of gap between pavers is a trip hazard. Space needs to be filled in with material to maintain flush edge.

Edging

REFER SPEC 4-8 Typical Detail

Edging is required between adjacent but different surfaces to assist with the maintenance of those surfaces over time. Edging is to be robust, safe and fit for purpose.

General requirements:

- Thin types of edging including weathered steel and plastic edging are not to be used as they are not sufficiently robust over time.
- Suitable materials for edging include:
  - *In-situ concrete flush edging (min. 120mm wide).*
  - *Brick edging.*
  - *Hardwood or Treated pine sleeper edging (min. 150x50mm).*
  - *Treated pine (H4) edging (min. 200x25mm).*
  - *Heavy Duty Aluminium and Galvanised steel edging (min. 4mm thick).*
- All edging to be set flush with adjacent surfaces and be a minimum of 150mm deep.

Key Edging requirements:

- ✓ *Ensure edge is flush with adjacent finishes to assist with maintenance.*
- ✓ *Ensure minimum depth to contain turf runners*
- ✓ *Use robust materials such as concrete, brick, hardwood or treated pine.*
- ✓ *Larger areas typically require wider edging to assist with aesthetic proportions.*
- ✓ *Edging on verges to be concrete.*
- ✓ *Curved edging are to be smooth and follow geometric arcs with tangential transitions.*
- ✓ *Edging between garden and turf areas is to be deep enough (minimum 150mm) to ensure turf is contained and runners do not get under the edging.*

- × *Minimise random and meandering curves in favour of rectilinear forms, particularly in smaller spaces.*
- × *Edging is not to be used to retain adjacent materials / finishes.*
- × *Do not use thin rusty steel, untreated timbers or plastic edges.*

Good outcome example

Figure 67.
Flush and wide concrete edge provides a quality and robust edging

Poor outcome example

Figure 68.
Thin plastic or steel edging is not robust and is not to be used.

Rocks & Stone Work

REFER SPEC

9 Typical Detail

Rocks or stones can provide interest to landscapes as well as support various functions. Use locally and sustainably sourced stone where required to add both aesthetic value to a garden as well as to support the practical function of the landscape design.

General requirements:

- Use locally sourced stone that resonates with the geological context of the site.
- Ensure stones are of a scale that cannot be moved once installed.
- Embed stones by a minimum of one third to ensure stability.

Ensure that you comply with rock sizing for the region. Generally, rocks that are smaller than 400mm will need to be checked with the regional manager or superintendent and will need to be installed into a mortar bed

Key Rocks & Stone Requirements:

- ✓ *Preference for rocks with level and smooth upper surface if being used as a seating feature.*
- ✓ *Ensure adequate height (450mm) if stones are used for seating*
- ✓ *Specify rocks larger than 400mm that cannot be moved or thrown.*
- ✓ *Ensure that rocks are checked for cracking, rough or sharp edges.*
- ✓ *Place rocks enough apart to ensure that maintenance of grasses and weeds can be done.*
- ✓ *Locate stone boulders to help define pedestrian movements, e.g. at corners or in dedicated communal areas.*
- ✓ *If rocks are being used as a seating feature, place them within areas that are often under canopy shadow.*
- × *Avoid rocks generally smaller than 400mm as they can be a projectile risk.*
- × *Do not place rocks in areas where there is constant sun as the surface can become dangerously hot.*
- × *Do not place rocks too close together which makes maintenance of grasses and weeds hard.*

Good outcome example

Figure 69.
Rocks are aesthetically arranged, are integrated with planting and support level change.

Poor outcome example

Figure 70.
If rocks are used for seating then selection and installation becomes critical.

Gravels & Compacted or Stabilised Gravels

REFER SPEC 10-11 Typical Detail

Gravel finishes allow for a low maintenance but trafficable and open area that is flexible for various uses whilst maintaining permeability. Use locally and sustainably sourced gravels to provide serviceable space and minimising hard pavement costs. Gravel finishes should be minimised in favour of planter beds where possible to assist in micro-climate control.

General requirements:

- Use locally sourced gravels to support a sense of place and reduce embodied energy.
- Ensure gravels are small enough to not be hazardous as projectiles.
- Ensure gravels are finished mostly level, or to a maximum fall of 1:50.
- Use stabilised and compacted gravel products (with fines/dust) for areas that will require more use or if the grade is between 1:50 and 1:20.
- Gravel finishes should not be used for surfaces steeper than 1:20 as it is unsafe and will become an ongoing maintenance issue.

Key Gravel Requirements:

- ✓ *Preference for light coloured pavement materials (some regional exceptions).*
- ✓ *Use crushed rock gravel to fill in areas not suitable or too small for lawn or planting.*
- ✓ *Use weed matting such as a lightweight, non-woven geotextile filter fabric under loose gravel areas, for example under maintenance paths, to minimise weed incursion and mixing with sub-soil.*
- ✓ *Loose gravels are to be installed with a minimum depth of 80mm to ensure good coverage.*
- ✓ *Add stabilising products such as organic binding agents or cement to gravel fine mixtures to improve wearabilty and suppress dust.*
- ✓ *Use for pathways through productive gardens in communal areas.*
- × *Avoid gravels in highly trafficked, communal or publicly accessible areas.*
- × *Avoid gravel larger than 20mm aggregate size, as these can become projectile risks.*
- × *Cracker dust not generally appropriate (some regional exceptions).*
- × *Don't locate gravel finishes directly adjacent building entries in order to minimise dust and dirt ingress.*
- × *Avoid large expanses of gravel finishes that become dull and hot.*
- × *River pebbles are not to be used.*

Good outcome example

Figure 71.
Gravel area is flat, contained with edging, balanced spatially with planting and has no weed penetration.

Poor outcome example

Figure 72.
Chunky gravel larger than 20mm, although attractive, can become a projectile.

Retaining Walls

Level change across a site often requires the inclusion of low retaining walls to achieve access to usable and maintainable spaces. Select robust design, construction methods, products and materials to build low retaining walls, only when necessary.

General requirements:

- Minimise use of retaining walls where possible, however where required, provide consistency of materiality, colour and aesthetics with the dwelling.
- Retaining walls should not be higher than 1m.
- Concrete retaining wall systems should be installed strictly to manufacturer recommendations.
- Preferred retaining materials / construction include:
  - *Brick*
  - *Concrete and Core-Filled Block*
  - *Reconstituted Limestone Block*
  - *Informal Stone and Boulder Terracing*
- Timber is not to be used for retaining walls as it is not sufficiently robust over time.

Key Retaining Wall requirements:

- ✓ *Limit the use of retaining walls to minimise cost, visual, and physical aesthetics.*
- ✓ *Where possible set practical wall heights for multiple use. For example as informal seating (approx. 450mm high and 300mm wide).*
- ✓ *Where possible, set retaining walls back approximately 500mm from boundaries to establish a raised garden (and seating edge) so screening plants can be established.*
- ✓ *Modular post and panel retaining wall systems are to be installed strictly by experienced contractors/suppliers.*
- ✓ *Terrace and break-up level changes over 1m into smaller stepped retaining walls to integrate planting and minimise visual impact.*
- ✓ *Use fencing colours that connect with other elements / features.*
- × *Typically, do not locate retaining walls on boundaries or immediately adjacent to fencelines.*

For all Fencing requirements and specific recommendations, please refer to:

> *A3.1 | Fencing of the Department of Housing and Works Single and Grouped Built Form Guidelines*
> *A2.1 | Fencing of the Department of Housing and Works Apartment Built Form Guidelines*

Good outcome example

Figure 73.
Limestone block with integrated boundary fencing is a preferred construction method.

Poor outcome example

Figure 74.
Where possible locate retaining walls minimum 500mm inside boundary fencing.

Fixtures & Furniture

REFER SPEC

12 Typical Detail

Various features are required to activate, address safety, minimise maintenance requirements and provide fundamental and additional functionality. Select quality products with correct installation to ensure ease of operation, maintenance and functionality of landscape areas.

Elements (over following pages):

- Letterbox
- Bollard
- Lighting Bollard
- Bike Hoop
- Communal Seating
- BBQ
- Ramps, Handrails and Kickrails
- Tactile Ground Surface Indicators (TGSI's)

Letterbox requirements:

- ✓ *Provide sturdy letterboxes.*
- ✓ *Locate within property boundary but close to the boundary and in an accessible location.*
- ✓ *Select style to match the building.*
- ✓ *Ensure a solid footing and compacted / stable base.*

- × *Less robust letterboxes to be avoided.*
- × *House number not orientated to the street.*

Good outcome example

Figure 75.
Letterbox is accessible, visible, study and visually appealing and in keeping with the dwelling.

Poor outcome example

Figure 76.
Letterboxes are not sturdy or well installed.

Fixtures & Furniture (cont.)

Bollard requirements:

- ✓ *Minimise use of bollards for vehicle deterrence.*
- ✓ *Conform to Australian Standards for DDA compliant accessibility bays (which include bollards).*
- ✓ *When required provide sub-surface fixed bollards.*

Good outcome example

Figure 77.
Large visitor and resident car park and gate with no use of bollards.

- × *Bollards are to be avoided where possible. Use raised planters, landscaped areas or kerbs to define vehicle movement.*
- × *Do not use surface fixed bollards.*

Poor outcome example

Figure 78.
Vehicular bollards are to be avoided in favour of better site planning and design.

Lighting requirements:

12 Typical Detail

- ✓ *Integrate lighting fixtures into built form where possible to provide a robust solution.*

Good outcome example

Figure 79.
Communal space lighting is integrated into built form.

- × *Bollard lighting should not be used due to ease of vandalism. Utilise lighting off buildings or via pole top where required.*
- × *Do not locate bollard lighting in car parking areas.*

Poor outcome example

Figure 80.
Communal space lighting can be damaged and vandalised.

Fixtures & Furniture (cont.)

Bike Parking requirements:

- ✓ *Locate visitor bike parking in accessible and visually legible locations.*
- ✓ *Ensure bike parking units are fixed down to a concrete footing (if into paving) and ensure it cannot be moved.*
- × *Avoid concealing bike parking for visitors, including behind excessive fencing.*

Good outcome example

Figure 81.
Accessible and legible bike parking stand.

Poor outcome example

Figure 82.
Bike parking concealed and not integrated or visually legible.

Communal Seating requirements:

- ✓ *Seating in communal space is to be located in appropriate locations to support social interaction on projects of sufficient scale.*
- ✓ *Nodes such as entries should also support seating.*
- ✓ *Locate communal space to minimise social issues with residents.*
- × *Central communal space on project dominated by circulation with no provision of respite for seating or social interaction.*

Good outcome example

Figure 83.
Integrated seating and raised planter at entry creates a welcoming space.

Poor outcome example

Figure 84.
Communal open space is not integrated into project with over 10 units.

Fixtures & Furniture (cont.)

Communal Outdoor Area requirements:

- ✓ *Provide space for BBQ as part of a communal gathering area.*
- ✓ *Provide space for picnic tables, bench seating and other low maintenance furniture for communal areas.*

Good outcome example

Figure 85.
Communal space with niche for BBQ

- × *BBQ areas in communal space that is not accessible by all users.*
- × *Communal spaces without provision for outdoor dining and cooking facilities.*

Poor outcome example

Figure 86.
BBQ space has been allocated however design not conducive to social interaction or dining.

Ramps, Handrails & Kickrails requirements:

- ✓ *Where access to front doors require ramping grades over 1:20 then handrails and kickrails are required.*
- ✓ *Provide sturdy design and construction with minimum galvanising finish to metals.*

Good outcome example

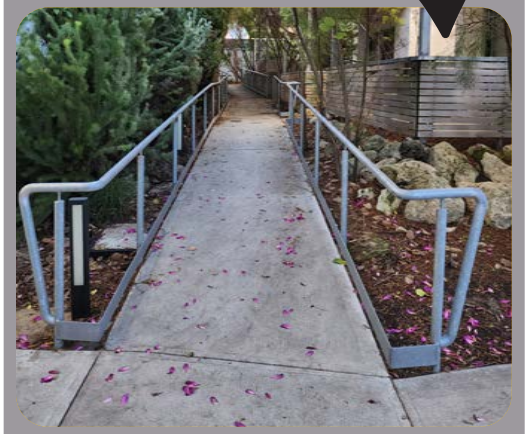


Figure 87.
Good quality galvanised steel handrails ensure stable and accessible entries

- × *Equitable access for residents and guests to dwelling entries is not considered due to lack of site planning and level management*

Poor outcome example

Figure 88.
Primary entries to dwellings are steep with non-conforming ramps, no handrails, kickguards or TGSI's

Fixtures & Furniture (cont.)

Tactile Ground Surface Indicators requirements:

- ✓ *Use TGSI pavers where required to meet accessibility standards.*

Good outcome example

Figure 89.
TGSI pavers provide a more robust finish

- × *Stick on TGSIs are not supported.*
- × *Grades less than 1:20 do not require TGSI's.*

Poor outcome example

Figure 90.
Stick on TGSI's are not sufficiently robust. TGSIs only required where ramps or stairs are needed.

Bin Housing requirements:

- ✓ *Bin enclosures are to be provided that conceal the visual clutter of waste receptacles.*
- ✓ *Provide area on verge for waste collection.*
- ✓ *Ensure hard paved connection between on-lot bin enclosure and verge collection location.*

- × *No concealed bin locations results in visual clutter and unsightliness.*

Good outcome example

Figure 91.
Bin enclosures are to be provided for screening.

Poor outcome example

Figure 92.
Bins are exposed and create poor visual appeal

Example Landscape Drawing

Grouped Dwellings

Refer to Page 70 Documentation Standards within this guide for further information on drawing standards

Plan Requirements

- *Be drawn clearly and accurately to scale – typically 1:50, 1:100 or 1:200.*
- *Include title box with drawing name, property address, date of drawing, scale and north point.*
- *Include legend clearly identifying all information that has been shown on the plan.*
- *Include notes as required to clarify information shown on the plan.*
- *Show extent of irrigation, controller and service connection locations.*

Building Requirements

- *Proposed buildings (showing ground floor windows and doors).*
- *Any other proposed structures, such as shed/pergolas.*
- *Proposed surfaces and materials.*
- *All features labelled.*
- *Proposed contours and levels.*
- *Proposed retaining walls with heights, batters and materials.*
- *Proposed vegetation (drawn at mature size).*
- *Utilities such as clothes lines and bin storage.*
- *Tree protection measures.*

Planting Requirements

- *Quantity of proposed plants.*
- *Size at time of installation: pot size for understorey planting and height for tree planting.*
- *Typical size at maturity: height and width.*
- *All trees proposed to be removed, with botanical and common name.*

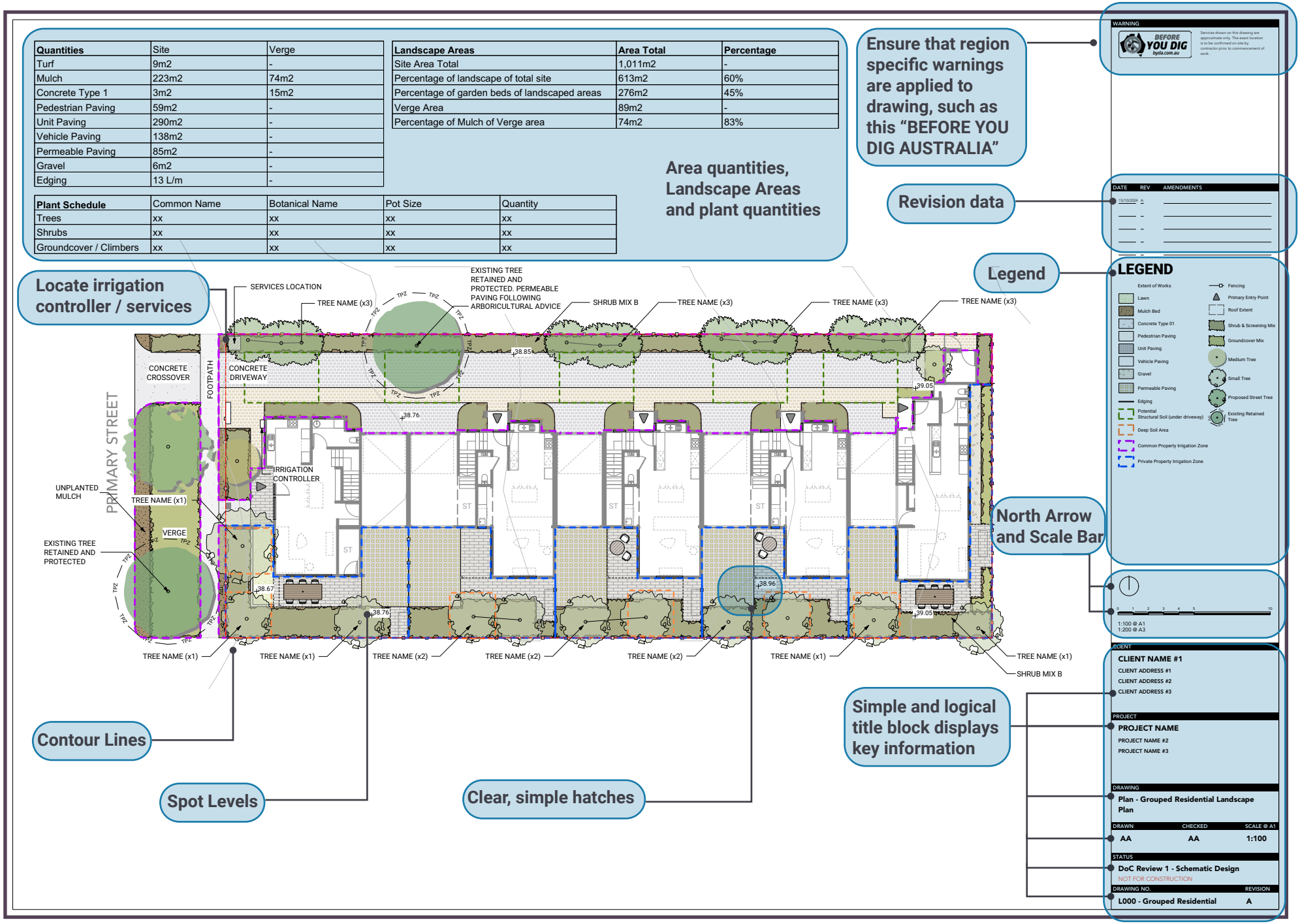
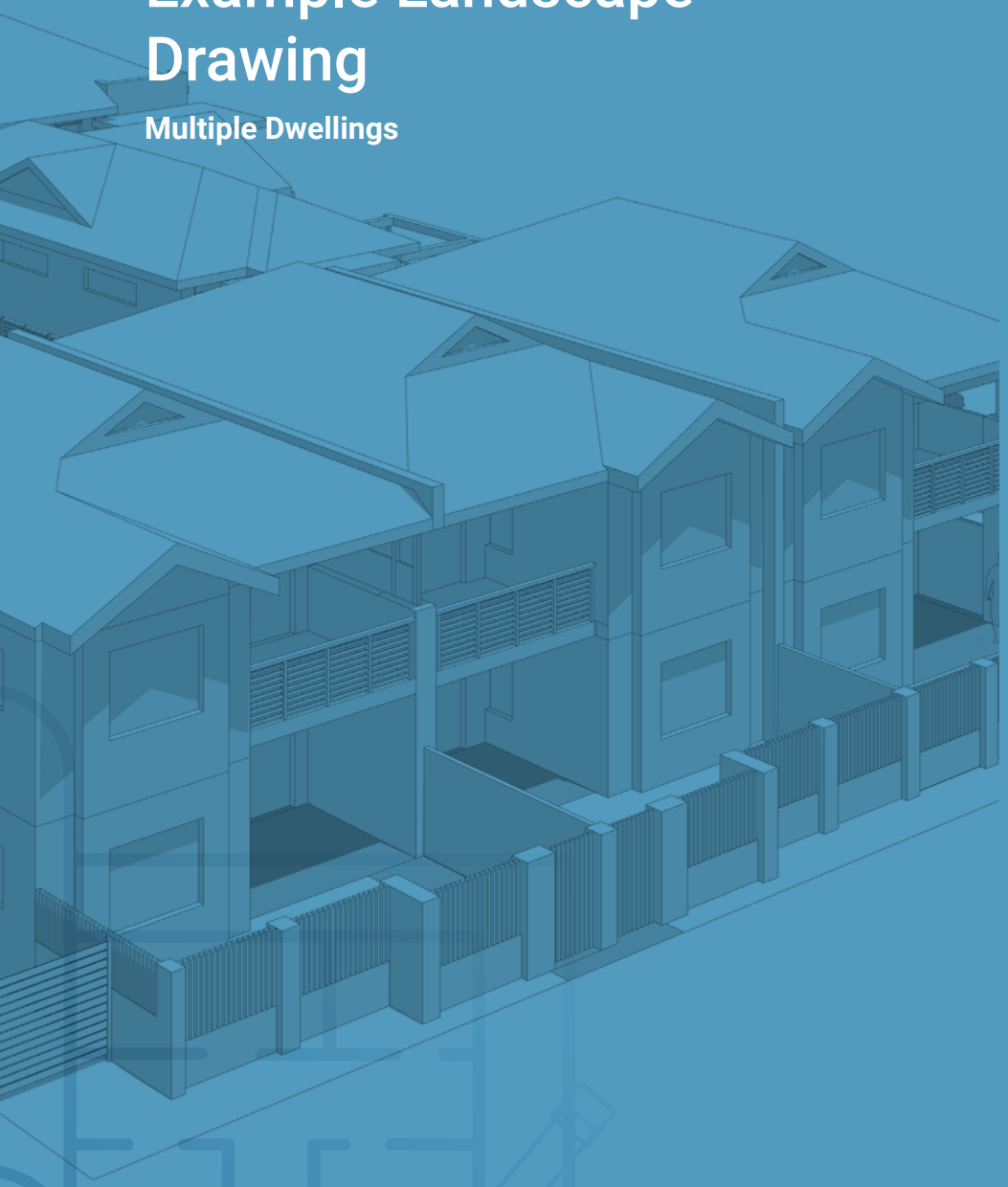


Figure 93. Grouped Dwelling Landscape Plan

Example Landscape Drawing

Multiple Dwellings



Refer to Page 70 Documentation Standards within this guide for further information on drawing standards

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- *Proposed surfaces and materials.*
- *All features labelled.*
- *Proposed contours and levels.*
- *Proposed retaining walls with heights, batters and materials.*
- *Proposed vegetation (drawn at mature size).*
- *Utilities such as clothes lines and bin storage.*
- *Tree protection measures.*

Planting Requirements

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- *Typical size at maturity: height and width.*
- *All trees proposed to be removed, with botanical and common name.*

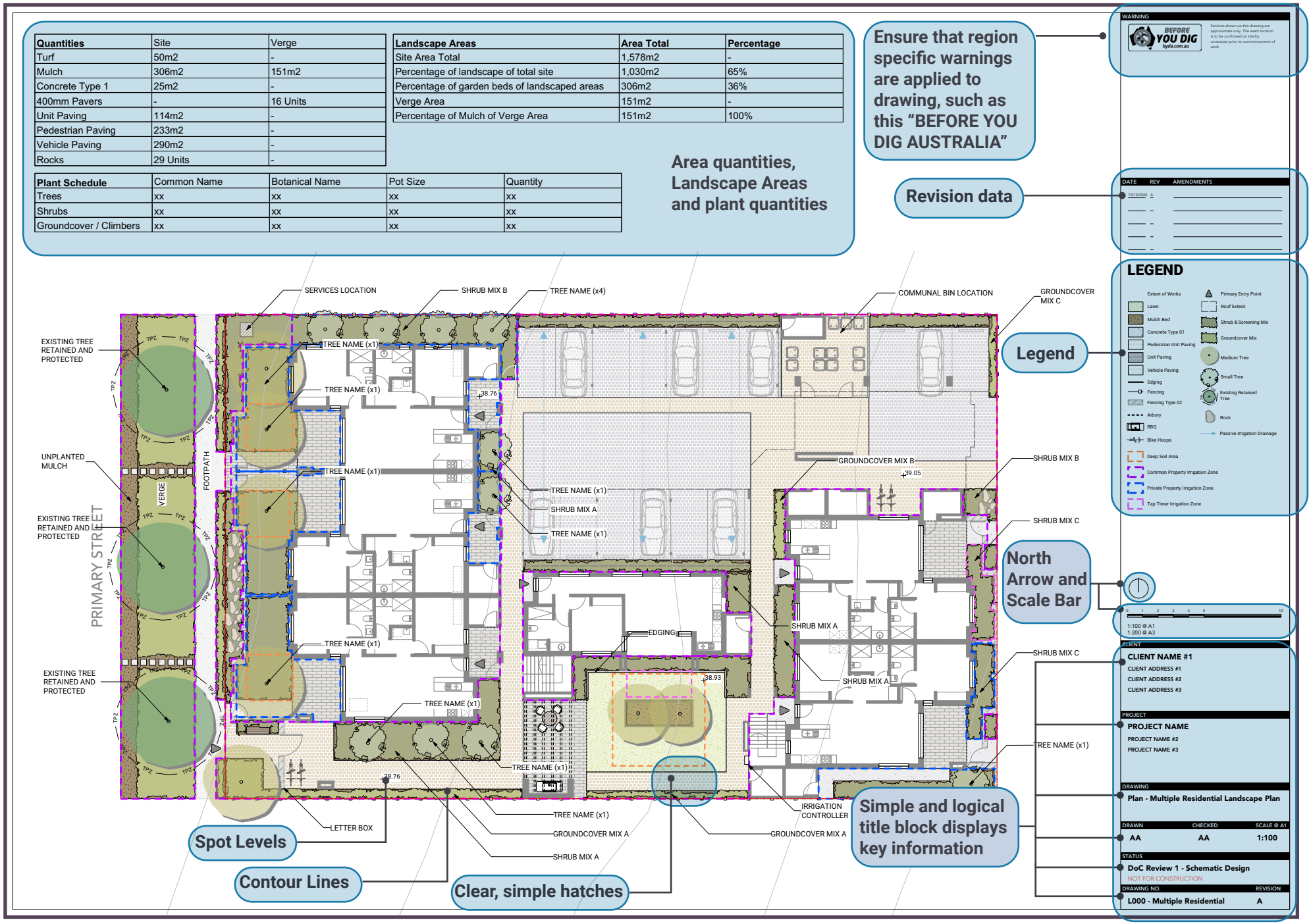

Figure 94. Grouped Dwelling Landscape Plan

Documentation Requirements

Minimum Drawing Documentation Requirements

At nominated milestones a Landscape Plan is required to be prepared and submitted for review and approval. This includes a package of drawings (plans, cross-sections, typical details etc) to be drawn and provided detailing the hard and soft landscaping within a proposed residential development.

Requirements

This provides specific design guidance for the development and creation of acceptable landscape drawing sets.

Drawing standards

This list includes standard drawing conventions to ensure that reviewers and builders have a clear and comprehensible understanding of what is proposed design.

Include standard drawing conventions:

- Simple and clear North arrow
- Scale bar along with sheet scale in metric units
- Dimensions of relevant information
- Legend with legible symbols
- Title block with contact information, drawing name and revision number
- Author and typical notes

For additional information on Technical Drawing standards please refer to Australian Standard AS 1100.301-2008

Drawing legibility

This list includes standard drawing conventions to ensure that reviewers and builders have a clear and comprehensible understanding of what is proposed design.

Include standard drawing conventions:

- Author and typical notes
- Site Survey information with street and kerbing, spot levels, service pit locations and surrounding connections
- The proposed built form clearly shown
- Simple and clear hatching / colours to delineate areas
- Use of clear line weights for drawing hierarchy
- Use of annotation tags
- Area calculations / rates for: turf, pavements, groundcovers, mulch, gravel and trees

Planting & Irrigation plan conventions

This list includes standard drawing conventions to ensure that reviewers and builders have a clear and comprehensible understanding of what is proposed design.

For planting plans, include standard drawing conventions:

- Common plant name annotations
- Clear and legible tree and plant symbols
- Planting height and width annotations
- Planting quantities
- Groups of plants connected with appropriate annotation

For Irrigation plans, include standard drawing conventions:

- Irrigation controller location
- Solenoid locations
- General Irrigation system zone outline

Note: Approved Landscape plan and irrigation plans are to be provided for all projects.

Appendix 1 - Glossary of Terms

Government

DHW	*Department of Housing and Works*
LGA	*Local Government Authority*
Metro	*Metropolitan*

Softscape & Planting

RPZ	*Root Protection Zone*
DSA	*Deep Soil Area*
RSZ	*Rootable Soil Zone*
TCC	*Tree Canopy Coverage*
TPZ	*Tree Protection Zone*
UTCC	*Urban Tree Canopy Coverage*
DBH	*Diameter Breast Height*

Planning & Construction

DA	*Development Application*
D&C	*Design and Construct*
PC	*Practical Completion*
SD	*Schematic Design*
PM	*Project Manager*

Other

TGSI	*Tactile Ground Safety Indicators*

Figure 95.
***Image:** .Perry Lakes Development*
Photo By Author


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Appendix 2 - Metro Area Recommended Planting Lists

Outcomes

Good plant selection is a critical component of designing gardens and landscapes. Plant species selected shall meet the selection criteria and should be considered a "proven performer" in a similar context to which it is being planted.

Objective

The primary objective is to demonstrate the development has considered and incorporated appropriate plant selection suitable for the specific site conditions and scale of the development.

The following list of plants outlines a range of suitable selections however, it is not intended to be exhaustive. At times, planting selections may need to be made on the basis of availability, local conditions, or other criteria.

The guideline shall be read in conjunction with the landscape specification by NATSPEC.

Key

Eg = Evergreen
D = Deciduous
SD = Semi-deciduous
N = Native
Ex = Exotic

Considerations

Urbanisation and development has dramatically altered the conditions to which plants are subject to. Regardless if a plant is native or endemic to a site does not necessarily mean that the current site conditions are optimum for its growth. Many exotic species have the advantage of decades of selective cultivating which ensures the species are highly adapted to urban landscapes, including drought and heat.

Plant and tree selections have been organised to reflect several broad styles however, these may be used in different ways and may be appropriate to use multiple types on one development block.
Recent years of record high temperatures and low rainfall, and predicted changes of climate will continue to be a challenge to establishing and maintaining gardens. The use of trees and gardens will become increasingly important to ameliorate the impacts of future heatwaves.

Figure 96.
Low growing, low maintenance native planting. Source: Acre Landscape

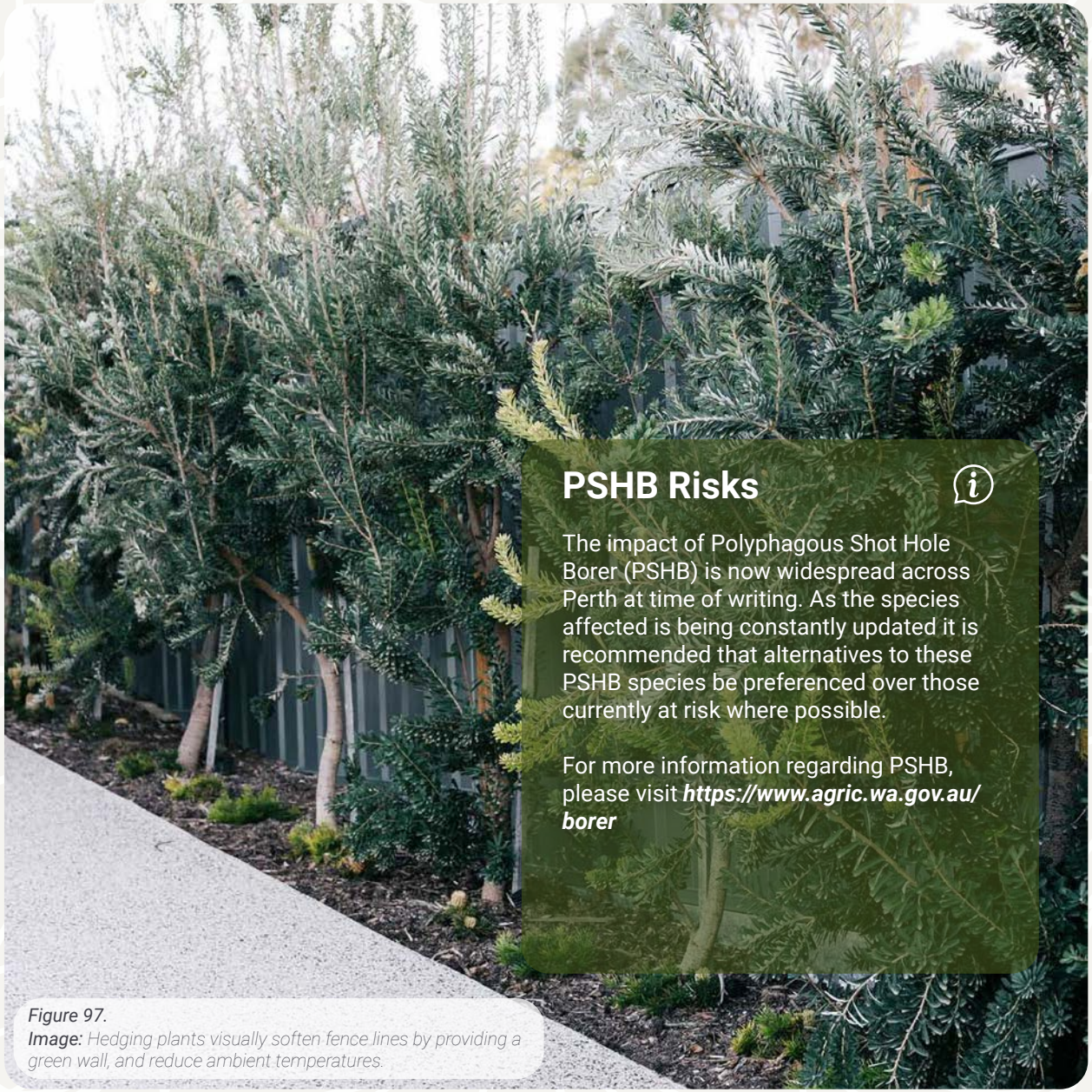
Planting and tree principles

An integrated approach to designing the dwelling and landscape to provide optimal solar access and shade can contribute to greatly improving energy efficiency and thermal comfort for residents.

Plant species selected shall meet the selection criteria and should be considered a “proven performer” in a similar context to which it is being planted. The plant selection criteria outlines the key criteria for selecting suitable plants.

Species shall be:

- *Low maintenance and with minimal water requirements.*
- *Long lived to minimise replacements.*
- *Readily available from nurseries.*
- *Suitable size and scale for the space.*
- *Suitable for the amount of sun and shade in its intended location.*
- *Not a ‘Declared Weed’, or ‘Weed of National significance’.*
- *Resistant to Shot Hole Borer (PSHB).*



PSHB Risks

The impact of Polyphagous Shot Hole Borer (PSHB) is now widespread across Perth at time of writing. As the species affected is being constantly updated it is recommended that alternatives to these PSHB species be preferenced over those currently at risk where possible.

For more information regarding PSHB, please visit ***https://www.agric.wa.gov.au/borer***

Figure 97.
Image: *Hedging plants visually soften fence lines by providing a green wall, and reduce ambient temperatures.*

Coastal and Native Gardens

Gardens shall be designed to consider coastal conditions, climate, and soil type in mind. Coastal gardens are characterised by hardy plants, arranged in an informal 'naturalistic' manner. Selection of plants include those that are able to withstand coastal (or near coastal) environmental conditions with low maintenance inputs.

Requirements:

- *Locating of trees to maximise shade and shelter from winds.*
- *Large swathes of single species, planted together in groups of 3's and 5's particularly in verges and front gardens.*
- *Low maintenance species and consideration of suitable species that are fit for purpose.*
- *Consider views from within the dwelling looking onto garden areas and plantings.*
- *Include a diversity of species to provide habitat and food sources for wildlife and support biodiversity.*
- *Plant climbers and hedges against fences and boundaries to create 'green edges' and reduce reflective heat form these surfaces.*

Figure 98.
Low maintenance, waterwise, native species provide visual interest and environmental benefits.

Figure 99.
Mass planting species will quickly spread out reducing space for weeds and reducing maintenance.

Large trees

Eucalyptus gomphocephala
Tuart (Eg, N)
Mature size: 15m x 10m
Suitable substitutes:
Angophora costata 'Sydney Apple Gum' (Eg, N)
Eucalyptus leucoxylon 'Yellow Gum' (Eg, N)

Medium trees

Melaleuca lanceolata
'Rottnest Island tea-tree' (Eg, N)
Mature size: 8m x 6m
Suitable substitutes:
Cupaniopsis anacardioides 'Tuckeroo' (Eg, N)
Casuarina equistifolia 'Horsetail Sheoak' (Eg, N)

Small trees

Eucalyptus torquata
Coral Gum (Eg, N)
Mature size: 5m x 4m

Suitable substitutes:
Eucalyptus erythrocorys 'Red Cap Gum' (Eg, N)
Melaleuca viridiflora 'Red flowering paperbark' (Eg, N)

Banksia integrifolia
'Candlestick Banksia' (Eg, N)
Mature size: 5m x 3m

Suitable substitutes
Olea europaea 'Tolleys Upright' (low-fruiting) (Eg, EX)
Metrosideros excelsa NZ Christmas Tree (Eg, EX)

The species and suitable substitutions nominated have been selected as:

- *Similar size and function.*
- *Suitability in coastal conditions.*
- *Long-lived, low water use, and low maintenance inputs.*
- *Readily available.*
- *Suitable for use in full-sun to part-shade areas.*

Other species that meet the above criteria may be used with approval.

Groundcovers

Acacia lasiocarpa
'Dune Moses' (N)
Mature size: 0.5m x 1m

Suitable substitutes:
Grevillea obtusifolia 'Gingin gem' (N)
Callothamnus quadrifidus prostrate 'One sided Bottledbrush' (N)

Grevillea crithmifolia
'Grevillea' (N)
Mature size: 0.5m x 1.2m

Suitable substitutes:
Grevillea thelemaniana 'Grevillea' (N)
Juniperus conferta 'Shore juniper' (EX)

Scavola crassifolia
'Cushion Fan Flower' (N)
Mature size: 0.5m x 1.5m

Suitable substitutes:
Eremophila glabra (prostrate) 'Emu bush' (N)
Westringia var. 'Coastal Creeper' (N)

Grasses

Lomandra sp. *'Seascape'*
Lomandra (N)
Mature size: 0.5m x 1m

Suitable substitutes:
Ficinia nodosa 'Knobby club rush' (N)
Conostylus candicans 'Cottonheads' (N)

Climbers

Hibbertia scandens
'Snake Vine' (N)
Mature size: 0.5m x 1m

Suitable substitutes:
Hardenbergia comptonia 'Native Wisteria' (N)
Kennedia nigracans 'Black Pea' (N)

Shrubs

Banksia ashbyii
Ashby's Banksia (N)
Mature size: 0.5m x 1m

Suitable substitutes:
Banksia nivea 'Honeypot banksia' (N)
Leucophyta 'Silver Nugget' (N)

Melaleuca incana *'nana'*
'Dwarf honey myrtle' (N)
Mature size: 0.8m x 0.8m

Suitable substitutes:
Olearia axillaris 'Little smokie' (N)
Thryptomene 'Paynes Hybrid' (N)

Small Hedges

Carissa *'Desert Star'*
Natal Plum (EX)
Mature size: 0.5m x 1m

Suitable substitutes:
Salvia rosmarinus 'Rosemary' (EX)
Coleonema 'Brilliant Pink' Dwarf Pink Diosma (EX)

Narrow Hedges

Adenanthos cunninghamii
Lighthouse 'Woolly bush' (N)
Mature size: 1.2m x 1m

Suitable substitutes:
Rhaphiolepsis 'Springtime' (EX)
Murraya paniculata 'Min-A-Min' 'Orange Jessamine' (EX)

Banksia intergrifolia
'Sentinel' (N)
Mature size: 1.5m x 1.0m

Suitable substitutes:
Callistemon 'LC01' MacArthur 'Bottlebrush' (N)
Dodonea viscosa 'purpurea' (N)

Formal Gardens

Gardens shall be designed to consider coastal conditions, climate, and soil type in mind. Selection of plants that are suitable for context and are generally designed and installed in a formal, linear, and symmetrical arrangement.

Requirements:

- *Locating of trees to maximise shade and shelter using both deciduous and evergreen trees.*
- *Use of low edges and border planting to define paths and driveways.*
- *Use symmetry and symmetrical layouts where appropriate e.g. framing buildings, entries, pedestrian pathways and driveways.*
- *Use of single species of tree in an 'avenue' effect along driveways or boundaries.*
- *Locate planting at the end of views or vistas e.g. garden beds located at the end of a long driveway.*
- *Low maintenance species and consideration of suitable species that are fit for purpose.*

Figure 100.
Example of a formal garden utilising native plants.

Figure 101.
Use of compact, single species used as a border to edge paths, or garden beds.

Large trees

Quercus palustris
Pin Oak (D, EX)
Mature size: 12-15m x 8m

Suitable substitutes:
- ***Jacaranda mimosifolia***
Jacaranda (SD, Ex)
- ***Tipuana tipu*** Pride of Bolivia (SD, Ex)

Medium trees

Agonis flexuosa
WA peppermint (Eg, N)
Mature size: 8m x 8m

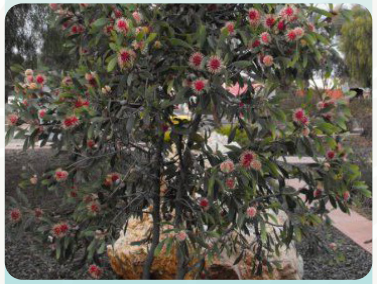
Suitable substitutes:
Gleditsia tricanthis
Honey locust (D, Ex)
Ulmus parvifolia Chinese Elm (D, Ex)

Small narrow trees

Pyrus calleryana *'Javelin'*
Ornamental Pear (D, EX)
Mature size: 6m x 2-3m

Suitable substitutes:
- ***Prunus nigra 'Crimson Spire'*** (D, EX)
- ***Callitris pressii*** Rottnest Island Pine (Eg, N)

Small trees



Hakea laurina
Pin cushion hakea (Eg, N)
Mature size: 4-5m x 3m

Suitable substitutes
- ***Eucalyptus caesia*** 'Silver Princess' (Eg, N)
- ***Corymbia ficifolia*** Red flowering gum (Eg, N)

The species and suitable substitutions nominated have been selected as:

- *Similar size and function.*
- *Compact form.*
- *Long-lived, low water use, and low maintenance inputs.*
- *Readily available.*
- *Suitable for use in full-sun to part-shade areas.*

Other species that meet the above criteria may be used with approval.

Groundcovers

Hemiandra pungens
'Dune Moses' (N)
Mature size: 0.2m x 1m

Suitable substitutes:
- ***Adenanthos cuneatus***
'Coral Carpet' (N)
- ***Cerastium tomentosum*** 'Snow in Summer' (EX)

Grevillea obtusifolia
'Gingin Gem' (N)
Mature size: 0.2m x 1.2m

Suitable substitutes:
- ***Grevillea thelemaniana*** 'Grevillea' (N)
- ***Juniperus conferta*** 'Shore juniper' (EX)

Grasses

Lomandra *'Little Lime'*
Lomandra (N)
Mature size: 0.3m x 0.5m

Suitable substitutes:
- ***Lomandra longifolia*** 'Tanika' (N)
- ***Poa poaformis*** 'Eskdale Blue' (N)

Flax Leafed

Dianella revoluta
Dianella (N)
Mature size: 0.5m x 1m

Suitable substitutes:
- ***Lomandra*** 'Nyalla' 'Mat Rush' (N)
- ***Conostylus candicans*** 'Cottonheads' (N)

Climbers

Ficus pumila
'Creeping Fig' (EX)
Mature size: 0.5m x 1m

Suitable substitutes:
- ***Trachelospermum jasminoides*** 'Star Jasmine' (EX)

Pyrostegia venusta 'Orange trumpet vine' (EX)

Shrubs

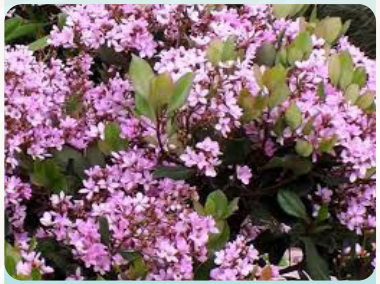
Chamlaucium uncinatum
PBR Local Hero 'Geraldton Wax' (N)
Mature size: 0.5m x 1m

Suitable substitutes:
- ***Banksia nivea*** 'Honeypot banksia' (N)
- ***Westringia sp.*** 'Blue Gem' (N)

Pittosporum tobira *'Miss muffet'*
Pittosporum (EX)
Mature size: 0.5- 0.8m x 0.8m

Suitable substitutes:
- ***Acacia cognata*** 'Limelight' (N)
- ***Acmena smithii*** 'Allyn Magic' (N)

Small Hedges



Rhaphiolepis indica *'Cosmic Pink'*
Indian Hawthorn (EX)
Mature size: 0.8m x 0.8m

Suitable substitutes:
- ***Salvia rosmarinus*** 'Rosemary' (EX)
- ***Caprosma*** 'Sahara TM Ruby' 'Mirror Bush' (EX)

Narrow Hedges

Westringia *'Grey Box'*
'Native rosemary' (N)
Mature size: 1.0m x 1.0m

Suitable substitutes:
- ***Rhaphiolepsis*** 'Springtime' (EX)
- ***Murraya paniculata*** 'Min-A-Min' 'Orange Jessamine' (EX)

Viburnum odoratissimum
'Sweet viburnum' (EX)
Mature size: 2.0m x 2.0m

Suitable substitutes:
Callistemon 'LC01' MacArthur 'Bottlebrush' (N)
Dodonea viscosa 'purpurea' (N)

Perth-Mediterranean Gardens

A variety of plants that reflect a mixed planting of both native and Mediterranean climate-adapted species. Selection of plants that are able to withstand long periods of low rainfall and high temperatures with low maintenance inputs.

Requirements:

- *Locating of trees to maximise shade and shelter from winds.*
- *Large swathes of single species, planted together in groups of 3's and 5's particularly in verges and front gardens.*
- *Low maintenance species and consideration of suitable species that are fit for purpose.*
- *Ensure views from within the dwelling looking onto garden areas and plantings.*
- *Include a diversity of species to provide habitat and food sources for wildlife and support biodiversity.*
- *Plant climbers and hedges against fences and boundaries to create 'green edges' and reduce reflective heat from these surfaces.*

Figure 102.
A low maintenance, waterwise, selection of grasses, succulents and native plantings.

Figure 103.
Select plants that offer contrasting foliage and form to provide diversity and visual interest.

Large trees

Eucalyptus sideroxylon
'Ironbark' (Eg, N)
Mature size: 10-12m x 10m
Suitable substitutes:
Corymbia exemia 'Bloodwood'(Eg, N)
Eucalyptus leucoxylon 'Yellow Gum' (Eg, N)

Medium trees

Casuarina equistifolia
'Horsetail Sheaok' (Eg, N)
Mature size: 8m x 8m
Suitable substitutes:
- ***Gleditsia tricanthis*** Honey locust (D, Ex)
- ***Ulmus parvifolia*** Chinese Elm (D, Ex)

Small trees

Callistemon viminalis
Bottlebrush (E, N)
Mature size: 5m x 5m
Suitable substitutes:
Eucalyptus caesia 'Silver Princess' (Eg, N)
Corymbia ficifolia Red flowering gum (Eg, N)

Small fruit trees

Olea europaea
Olive (EX, Eg)
Mature size: 4-5m x 3m

Suitable substitutes
Prunus dulcis 'Almond' (D, EX)
Citrus limon 'Meyer Lemon' (Eg, EX)

The species and suitable substitutions nominated have been selected as:

- *Similar size and function.*
- *Suitability in coastal conditions. Long-lived, low water use, and low maintenance inputs.*
- *Readily available.*
- *Suitable for use in full-sun to part-shade areas.*

Other species that meet the above criteria may be used with approval.

Groundcovers

Banksia petiolaris
'Banksia' (N)
Mature size: 0.5m x 1m

Suitable substitutes:
- ***Rhagodia spinescens*** 'Aussie Flat Bush' (N)
- ***Eremophila glabra*** 'Kalbarri Carpet' ***(N)***

Heliochrysum petiolare
'Licorice plant' (EX)
Mature size: 0.2m x 1.2m

Suitable substitutes:
- ***Westringia var.*** 'Silver lining' (N)
- ***Juniperus conferta*** 'Shore juniper' (EX)

Grasses

Cotelydon orbiculata
'Silver waves' (EX)
Mature size: 0.3m x 0.8m

Suitable substitutes:
- ***Carpobrotus virescens*** 'Pigface' (N)
- ***Sensecio*** 'Chalksticks' (EX)

Flax Leafed

Lomandra sp. *'Seascape'*
Lomandra (N)
Mature size: 0.6m x 0.6m

Suitable substitutes:
- ***Ficinia nodosa*** 'Knobby club rush' (N)
- ***Conostylus candicans*** 'Cottonheads' (N)

Climbers

Vitus vinifera
'Ornamental Grape' (EX)
Mature size: 3.0m x 3.0mm

Suitable substitutes:
- ***Hibbertia scandens*** 'Snake vine' (N)
- ***Pyrostegia venusta*** 'Orange trumpet vine' (EX)

Shrubs

Beaufortia aestiva
'Summer Flame' (N)
Mature size: 0.5m x 0.5m

Suitable substitutes:
- ***Eremaea paucifolia*** Eremaea (N)
- ***Verticorida chysantha*** Yellow feather flower (N)

Salvia leucantha
Mexican Sage (EX)
Mature size: 0.5-1.0m x 1.0m

Suitable substitutes:
- ***Salvia rosmarinus*** 'Rosemary' (EX)
- ***Verticodia plumosa*** Feather flower (N)

Small Hedges

Rhaphiolepis indica 'Cosmic Pink'
Indian Hawthorn (EX)
Mature size: 0.8m x 0.8m

Suitable substitutes:
- ***Salvia rosmarinus*** 'Rosemary' (EX)
- ***Melaleuca incana 'nana'*** 'Dwarf honey myrtle'

Narrow Hedges

Adenanthos cunninghamii
Lighthouse 'Woolly bush' (N)
Mature size: 1m x 1.0m

Suitable substitutes:
- ***Rhaphiolepsis*** 'Springtime' (EX)
- ***Murraya paniculata*** 'Min-A-Min' 'Orange Jessamine' (EX)

Tall Hedges

Acmema *'Goodbye Neighbours'*
'Lilly Pilly' (N)
Mature size: 4-6.0m x 2.0m

Suitable substitutes:
- ***Callistemon*** 'LC01' MacArthur 'Bottlebrush' (N)
- ***Syzgium*** 'Straight and Narrow' (N)

Shade Gardens

Gardens shall be designed to consider shade and low light conditions. Selection of plants that are suitable in shade, part-shade or low light conditions with low maintenance inputs.

Requirements:

Shade and low light conditions limit many native plants from being utilised in these conditions as many suitable plant species originate from rainforest and similar environments and are well adapted to these conditions.

- *Locating of trees to maximise shade and shelter from winds.*
- *Large swathes of single species, planted together in groups of 3's and 5's.*
- *Low maintenance species and consideration of suitable species that are fit for purpose.*
- *Consider views from within the dwelling looking onto garden areas and plantings.*
- *Include a diversity of species to provide habitat and food sources for wildlife and support biodiversity.*

Figure 104.
Low maintenance, waterwise, native species provide visual interest and environmental benefits.

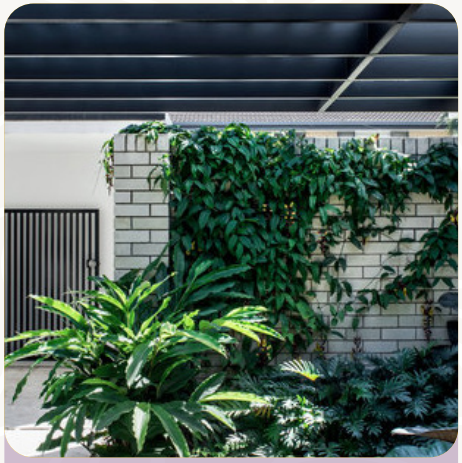
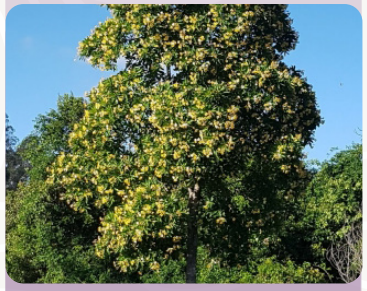


Figure 105.
Mass planting shade tolerant species provides useful green spaces adjacent dwellings.
Source: Dan Young Landscape Architect

Medium trees



Hymenosporum flavum
'Native Frangipani' (Eg, N)
Mature size: 5-8m x 2-4m

Suitable substitutes:
Cupaniopsis anacardioides 'Tuckeroo' (Eg, N)
Backhousia citriodora 'Lemon Scented Myrtle' (Eg, N)

Medium trees

Bauhinia x blakeana
'Hong Kong Orchid tree' (D, EX)
Mature size: 5-6m x 4m

Suitable substitutes:
Gleditsia tricanthos 'Sunburst' (D, EX)
Fraxinus griffithii ' Evergreen Ash' (Eg, EX)

Small trees

Pyrus calleryana *'Javelin'*
Ornamental Pear (D, EX)
Mature size: 6m x 2-3m

Suitable substitutes:
- Prunus nigra 'Crimson Spire'
Flowering Plum (D, EX)

Magnolia *'Little Gem'* (Eg, EX)
Mature size: 4-5m x 2-5m

Suitable substitutes:
Magnolia 'Teddy Bear' (Eg, EX)

The species and suitable substitutions nominated have been selected as:

- *Similar size and function.*
- *Compact form.*
- *Long-lived, low water use, and low maintenance inputs.*
- *Readily available.*
- *Suitable for use in part-shade to full-shade areas.*

Other species that meet the above criteria may be used with approval.

Groundcovers

Trachelospermum jasminoides
'Star Jasmine' (EX)
Mature size: 0.5m x 2m

Suitable substitutes:
Hibbertia scandens 'Snake vine' (N)
Dichondra repens 'Kidney Weed' (D)

Flax Leafed

Dianella revoluta
'Dianella' (N)
Mature size: 0.5m x 0.5m

Suitable substitutes:
Patersonia occidentalis 'Native Iris' (N)
Ophiopogon japonicus 'Mondo Grass' (N)

Apinia mutica
False Cardamon' (EX)
Mature size: 0.3m x 0.8m

Suitable substitutes:
Clivia miniata 'Clivia' (EX)
Sanserveria sp. 'Mother in Laws Tongue' (EX)

Lomandra hystrix
'Mat Rush' (N)
Mature size: 0.3m x 0.8m

Suitable substitutes:
Liriope 'Evergreen Giant' (EX)
Sanserveria sp. 'Mother in Laws Tongue' (EX)

Climbers

Hibbertia scandens
'Snake vine' (N)
Mature size: 3.0m x 3.0mm

Suitable substitutes:
Trachelospermum jasminoides 'Star Jasmine' (EX)
Ficus pumila 'Creeping Fig' (EX)

Shrubs

Nandina domestica
'Sacred Bamboo' (EX) (N)
Mature size: 0.5m x 1m

Suitable substitutes:
Chorizema cordatum 'Flame Pea'
Coleonema album 'White Diosma'
(EX)

Coprosma repens
'Mirror Bush' (EX)
Mature size: 0.5-1.0m x 1.0m

Suitable substitutes:
Fatsia japonica 'Japanese Aralia' (EX)
Philodendron 'Rojo Congo' (EX)

Broad Leafed

Philodendron 'Xanadu'
'Xanadu' (EX)
Mature size: 0.8m x 0.8m

Suitable substitutes:
Plectranthus parviflorus 'Blue Spires' (N)
Spathiphyllum 'Sweet Mario' (EX)

Tall Broad Leafed

Strelitzia reginae
'Bird of Paradise' (EX)
Mature size: 4-6.0m x 2.0m

Suitable substitutes:
Alpinia caerulea 'Native Ginger' (N)
Cordyline 'Caruba Black' (EX)

Rhapis excelsa
'Lady Palm (EX)
Mature size:3.0m x 2.0m

Suitable substitutes:
Schefflera Queensland Umbrella Tree' (N)

Appendix 3 - Regional Considerations

Outcomes

Good landscape design can result in enhanced outcomes for residents and for the Department of Housing and Works. Providing waterwise, easily managed landscapes reduces ongoing costs and maintenance for residents.

The ratio of garden beds, turf, paved and other surfaces shall be balanced to ensure suitability for the housing typology and functional use, and ease of maintenance by the residents.

Objective

Demonstrate the development has considered and incorporated relevant landscape design principles for the specific region.

Landscape designs shall be simple, robust, and low-maintenance to ensure efficient and ease of maintenance for residents. Shade from planting and trees shall be prioritised within designs.

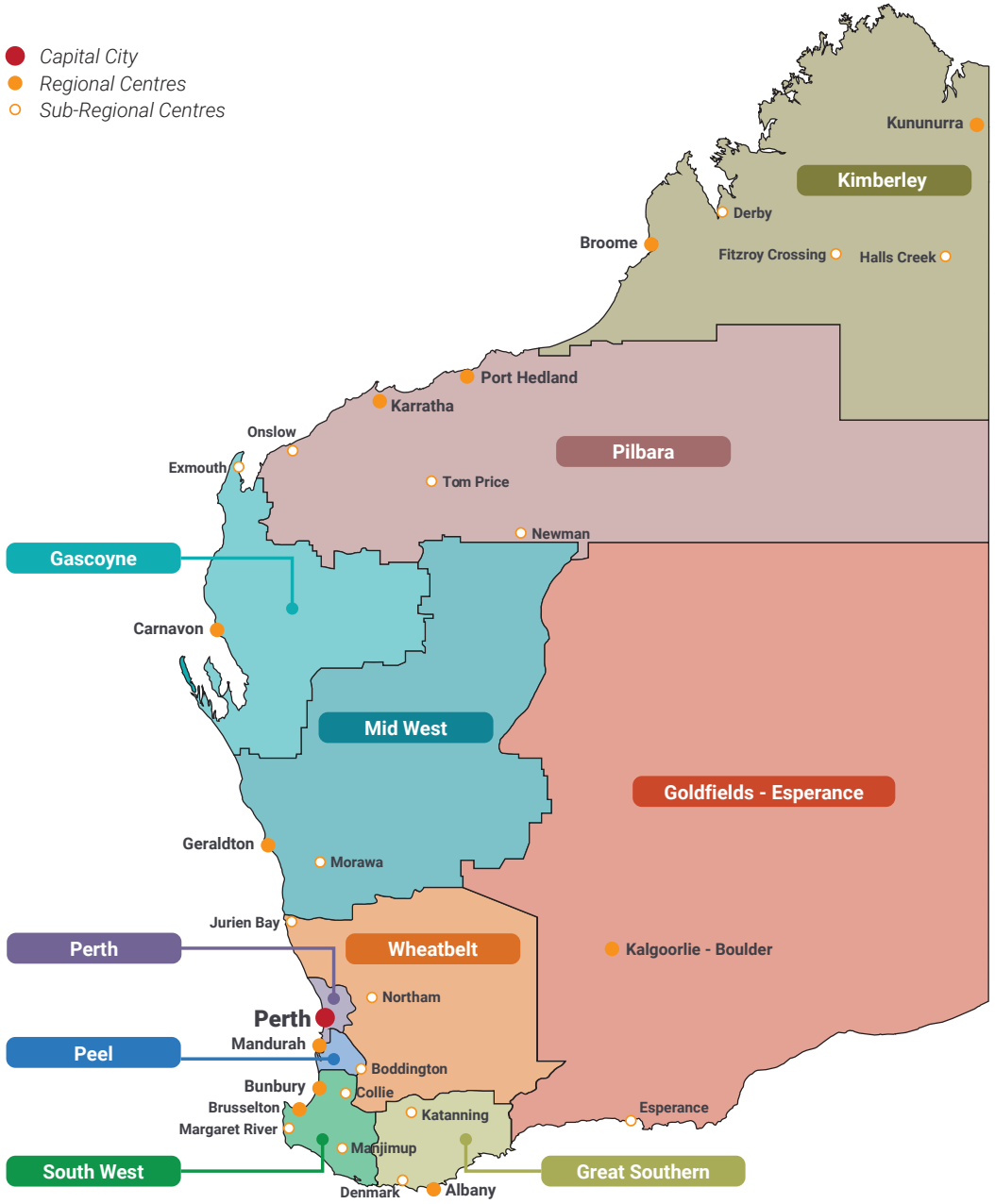


Figure 106.
Image: Regions of Western Australia

Regional considerations

The following information outlines considerations and requirements beyond those outlined within the Perth Metropolitan area.

An integrated approach to designing the dwelling and landscape will result in optimal solar access and shade which can contribute to greatly improving energy efficiency and thermal comfort for residents.

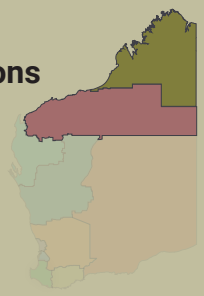
Plant species selected shall be regionally appropriate.

Planting Selection

For more information and in depth planting lists for a specific region or area, refer to the local council, city or shire recommended useful planting resources. On the following pages there are links to planting guides and resources.

Figure 107.
Image: *Acacia flower*

Pilbara and Kimberley Regions
Overview



Key Regional Centres:
Broome, Port Hedland

Local Government Areas:
8

Geographical Size (total):
932,413 km^2

The Pilbara region is 1,200 kilometres north of Perth and extends from the Indian Ocean coast to the Northern Territory border. The Kimberley region is the northernmost of the nine regions of Western Australia. It is south of Great Sandy and Tanami Deserts of the Pilbara and east by the Northern Territory.

The region is a sub-tropical climate with high temperatures, a cyclone season and long periods of dryness. The coastal towns are humid with a typical wet season from December to February, and the inland towns can experience extreme high temperatures and long periods of dryness.

Generally, the 'pindan' soils are red, clayey sands which when dry, sets extremely hard, limiting permeability. When pindan becomes fully saturated, it becomes soft and is susceptible to erosion.

Trees

Prioritise small to medium tree species, planted at appropriate locations from dwelling and boundaries to minimise risks from cyclones and termite activity. Strategically locate trees to ensure shade in summer to outdoor spaces and to increase shading to dwellings, particularly to the northern, western and eastern façades. Existing trees suitable for retention shall be integrated into the development where practical.

Irrigation

Irrigation shall be installed to garden beds and turf areas. Controllers may be mains connected or battery. Take-off points and/or taps shall be connected to the dwelling.
Automatic (electronic) systems are high maintenance and complex to operate.
Minimal if any retic (only to sustain new construction period and establish planting)
Manual timer operation with battery could be installed with resident choice to continue with this water option or turn off.

Turf

Turf areas are considered a high maintenance element and shall be used judiciously. Designs should seek to minimise or omit turf. If turf is utilised it should be sized appropriately to the dwelling typology e.g. larger family homes to have a single area of turf.

Planting

Plant species selected to minimise ongoing irrigation requirements. Ensure the mature planting size is considered when locating plants to ensure paths of travel or sightlines are not impeded. Selections of trees and plant species shall also consider local availability from nurseries.

Drainage

Ensure that stormwater falling from roofs has a concrete apron or area of gravel beneath. Drainage shall be directed away from the dwelling and other properties, towards the street.

Resources & Examples

The following are examples of recommended useful planting resources.

Shire of East Pilbara:
https://www.eastpilbara.wa.gov.au/documents/370/newman-town-centre-style-guide-and-design-guidelines

Town of Port Hedland:
https://www.porthedland.wa.gov.au/Profiles/porthedland/Assets/ClientData/Appendix_4__Preferred_Planting_Guide.pdf

Shire of Broome
https://roebuckbay.org.au/pdfs/coastal-gardens-web-version.pdf

Surface Treatments

The following surface treatments are noted as acceptable for use:

- Concrete is a recommended surface material for all driveways, paths and other areas of hardstand. A concrete apron is to be installed around the roof line perimeter, incorporating access to air conditioners and hot water systems, with falls away from the dwelling to garden beds.
- Provide and maintain a minimum depth of up to 75mm layer of organic, coarse mulch across all garden areas, finishing levels shall be 25mm below adjacent hard stand.
- Generally, pine bark mulch for all planted areas, however other mulch materials such as white quartz cracker dust compacted fines, and rock mulches such as river shingles may be acceptable as per the LGA's landscape guidelines documents.
- Edging: Heavy Duty Aluminium and Galvanised steel edging *(min. 4mm thick)* or concrete edging is acceptable.
- Crushed gravel: <10mm size suitable for service areas or as mulch.
- Seating or feature rocks are not accepted.
- Due to termites, if timber is used (subject to approval) it must be treated as per NATSPEC specification.

Poor outcome example

Figure 108.
An excessive use of gravel treatment and turf located directly against the dwelling.

Good outcome example

Figure 110.
A balance of hard surfaces, turf and garden beds provided. Landscape does not impeded sightlines to dwelling from street.

Poor outcome example

Figure 109.
Irrigation not efficiently used or consolidated to service small garden bed. Gravel mulch or similar to be used for service/maintenance access areas.

Good outcome example

Figure 111.
Informal, low water use native planting with decorative gravel mulch.

Gascoyne and Mid-West Region
Overview

Key Regional Centres:
Carnarvon, Geraldton

Local Government Areas:
26

Geographical Size (total):
420,570 km^2

The Gascoyne region encompasses four major areas including the shires of Carnarvon, Exmouth, Shark Bay, including the town of Denham and the shire of Upper Gascoyne, and has more than 600 kilometres of Indian Ocean coastline and stretches more than 500 kilometres inland through to the remote outback.

The Gascoyne has a moderate arid tropical climate. It is generally warm all year round, with temperatures ranging from 22°C in July to 35°C in January, with the region receiving around 320 days of sunshine per year.

The Mid-West region is a sparsely populated region extending from the west coast of Western Australia, about 200km north and south from its administration centre of Geraldton and inland to 450km east of Wiluna in the Gibson Desert.

Trees

Prioritise small to medium tree species, planted at appropriate locations from dwelling and boundaries to minimise risks from cyclones and termite activity. Strategically locate trees to ensure shade in summer to outdoor spaces and to increase shading to dwellings, particularly to the northern, western and eastern façades. Existing trees suitable for retention shall be integrated into the development where practical.

Planting

Plant species selected to minimise ongoing irrigation requirements. Ensure the mature planting size is considered when locating plants to ensure paths of travel or sightlines are not impeded. Selections of trees and plant species shall also consider local availability from nurseries.

Turf

Turf areas are considered a high maintenance element and shall be used judiciously. If a large back yard area with turf is provided, no turf shall be installed to front yard. Turf shall be sized appropriately to the dwelling typology e.g. larger family homes to have a single area of turf. Synthetic turf may be used in shaded areas with approval.

Irrigation

Drip irrigation shall be installed to garden beds and pop-up sprinklers to turf areas. Controllers may be mains connected or battery. Take-off points and/or taps shall be connected to the dwelling.

Drainage

Ensure that stormwater falling from roofs has a concrete apron or area of gravel beneath. Drainage shall be directed away from the dwelling and other properties, towards the street. Water Sensitive Urban Design (WSUD) to maximise reduction of water use.

Resources & Examples

The following are examples of recommended useful planting resources.

Shire of Carnavon:
https://www.carnarvon.wa.gov.au/services/roads-maintenance/verge-maintenance-faq.aspx

City of Greater Geraldton:
https://www.cgg.wa.gov.au/profiles/cgg/assets/clientdata/you_and_your_verge_booklet__2015_.pdf

https://www.cgg.wa.gov.au/profiles/cgg/assets/clientdata/d-14-44648_million_trees_-_top_ten_trees_booklet_-_2014_final_0.pdf

Surface Treatments

The following surface treatments are noted as acceptable for use:

- Concrete is a recommended surface material for all driveways, paths and other areas of hardstand. A concrete apron is to be installed around the roof line perimeter, incorporating access to air conditioners and hot water systems, with falls away from the dwelling to garden beds. No paving over leach drains.
- Provide and maintain a minimum depth of up to 75mm layer of organic, coarse mulch across all garden areas, finishing levels shall be 25mm below adjacent hard stand.
- Edging: Heavy Duty Aluminium and Galvanised steel edging *(min. 4mm thick)*, treated pine or concrete edging is acceptable.
- Organic mulch is acceptable or local stone mulch (<10mm size) is acceptable as an alternative.
- Crushed gravel mix is acceptable for both informal access paths and mulch surfaces.
- Seating or feature rocks are not accepted without approval.
- Due to termites, if timber is used (subject to approval) it must be treated as per NATSPEC specification.
- Composite decking and bollard lighting is acceptable in accordance with NATSPEC specification.

Poor outcome example

Figure 112.
An excessive use of turf installed creates a maintenance burden on resident.

Good outcome example

Figure 114.
A balance of hard surfaces, turf and garden beds provided. Landscape and fencing does not impeded sightlines to dwelling from street.

Poor outcome example

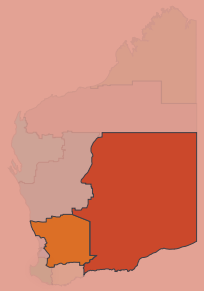
Figure 113.
Cracker dust and rocks become too hot to sit on or use. Insufficient deep soil area for tree.

Good outcome example

Figure 115.
Informal, low water use native planting with decorative organic mulch installed 25mm below driveway.

Goldfields - Esperance & Wheatbelt Region

Overview



Key Regional Centres:
Kalgoorlie-Boulder

Local Government Areas:
50

Geographical Size:
925,350 km^2

The Goldfields-Esperance region is the largest region in WA. It is bounded geographically by the Little Sandy Desert and Gibson Desert to the north, the Wheatbelt region to the west, the Great Australian Bight to the south, and the South Australian and Northern Territory borders to the east. The Goldfields-Esperance region comprises ten local governments.

The Wheatbelt is primarily an agricultural region, dominated by the grains and livestock industries, and consists of 42 local government areas.

The climate in the Wheatbelt is relatively dry with low levels of underground water, with much of the drier inland regions reliant on rainfall compared to the coastal regions.

Trees

Prioritise small to medium tree species, and avoid large or root intrusive species. Ensure trees planted at appropriate locations from dwelling and boundaries to minimise risks from weather events and problems from leaf litter. Strategically locate trees to ensure shade in summer to outdoor spaces and to increase shading to dwellings, particularly to the northern, western and eastern façades. Existing trees suitable for retention shall be integrated into the development where practical.

Turf

Turf areas are considered a high maintenance element and shall be used judiciously. If a large back yard area with turf is provided, no turf shall be installed to front yard. Turf shall be sized appropriately to the dwelling typology e.g. larger family homes to have a single area of turf.

Drainage

Ensure that stormwater falling directly from roofs has a concrete apron or area of gravel beneath. Drainage shall be directed away from the dwelling and other properties, towards the street. Water Sensitive Urban Design (WSUD) to maximise reduction of water use.

Planting

Waterwise, drought tolerant, and suitable native plant species to be specified to minimise ongoing irrigation requirements. Ensure the mature planting size is considered when locating plants to ensure paths of travel or sight lines are not impeded. Selections of trees and plant species shall also consider local availability from nurseries.

Irrigation

Drip irrigation shall be installed to garden beds and pop-up sprinklers to turf areas. Controllers may be mains connected or battery. Take-off points and/or taps shall be connected to the dwelling.

Resources & Examples

The following are examples of recommended useful planting resources.

City of Kalgoorlie:
https://www.ckb.wa.gov.au/documents/150/residential-verge-landscaping-fact-sheet

https://www.yumpu.com/en/document/view/11696006/native-plant-guide-the-kalgoorlie-boulder-urban-landcare-group

Surface Treatments

The following surface treatments are noted as acceptable for use:

- Concrete is a recommended surface material for all driveways, paths and other areas of hardstand. A concrete apron is to be installed around the roof line perimeter, incorporating access to air conditioners and hot water systems, with falls away from the dwelling to garden beds. No paving over leach drains.
- Provide and maintain a minimum depth of up to 75mm layer of organic, coarse mulch across all garden areas, finishing levels shall be 25mm below adjacent hard stand.
- Edging: Heavy Duty Aluminium and Galvanised steel edging *(min. 4mm thick),* treated pine or concrete edging is acceptable.
- Organic mulch is acceptable or local stone mulch (<10mm size) is acceptable as an alternative.
- Crushed gravel mix is acceptable for both informal access paths and mulch surfaces
- Seating or feature rocks are not accepted without approval.
- Due to termites, if timber is used (subject to approval) it must be treated as per NATSPEC specification.
- Composite decking and bollard lighting is acceptable in accordance with NATSPEC specification.

Poor outcome example

Figure 116.
An excessive use of turf. No concrete apron installed to property.

Good outcome example

Figure 118.
A balance of hard surfaces, turf and garden beds provided. Concrete edges separate turf and garden beds.

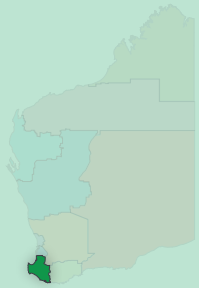
Good outcome example

Figure 117.
Concrete apron installed. Small shrubs installed to minimise conflict with fence or dwelling.

Good outcome example

Figure 119.
Informal, low water use native planting with located at suitable distance form dwelling.

South West Region
Overview



Key Regional Centres:
Bunbury, Busselton

Local Government Areas:
12

Geographical Size:
23,970 km^2

The regional landform comprises the Swan Coastal Plain to the south, Darling Range in the east, and Whicher Range linking the Darling Range to the Leeuwin-Naturaliste Ridge in the Capes area. The climate of the South West has a Mediterranean climate, with dry summers and wet winters, with most of the rainfall between May and September.

Generally, the poor nature of the surface soils are associated with some environmental challenges including sub-soil acidity, water repellence, wind erosion, compaction, waterlogging, secondary salinity and phosphate leaching.

Trees

Prioritise tree planting at appropriate locations from dwelling and boundaries to enhance shade and amenity for residents. Strategically locate trees to ensure shade in summer to outdoor spaces and to increase shading to dwellings, particularly to the northern and western façades. Existing trees suitable for retention shall be integrated into the development.

Irrigation

Irrigation shall be installed to garden beds and turf areas. Controllers may be mains connected or battery. Take-off points or taps shall be connected to the dwelling.

Common Areas

These are maintained by the department and shall be considered for higher quality and amenity finishes.

Turf

A single, functional area of turf is preferred. Small areas of turf are to be avoided to reduce ongoing maintenance.

Planting

Larger garden beds shall have smaller species to minimise growth into driveways and/or paths of travel.

Plant species should be selected to minimise ongoing irrigation requirements. Ensure the mature planting size is considered when locating plants to ensure paths of travel or sight-lines are not impeded.

Selections of trees and plant species shall also consider:

- Local availability from nurseries;
- Suitability for irrigation provision;
- Local government planting lists;
- Selections are not local weeds.

Mulch

75mm thick organic mulch for garden beds.

Resources & Examples

The following are examples of recommended useful planting resources.

Shire of Augusta - Yallingup / Margaret River:
https://www.amrshire.wa.gov.au/getmedia/4131cb7f-1c6c-47cc-af81-4e149f23eb4b/Coastal-Gardens-Planting-Guideline.pdf

City of Bunbury:
https://cdn.bunbury.wa.gov.au/wp-content/uploads/2022/07/Landscaping-%E2%80%93-Policy-No.-48.pd

Surface Treatments

The following surface treatments are noted as acceptable for use:

- Where practical, direct storm water runoff from hard surfaces towards turf and garden beds.
- Concrete: standard grey concrete for use with pathways, driveways and other hardstands. Concrete should be graded away from dwellings and directed towards garden beds and lawn where practical.
- Permeable paving is a suitable option where possible.
- A 1m wide concrete apron is to be installed around the perimeter with falls away from the dwelling to keep footings dry and ensure building weep holes remain exposed to minimise the risk of moisture build up and mould.
- Edging: Heavy Duty Aluminium and Galvanised steel edging *(min. 4mm thick)* or concrete edging is acceptable.
- Crushed gravel: <10mm size suitable for service areas or as mulch.
- Rock: large landscape rocks may be used as features within garden areas and installed with one third below ground.
- Composite decking is acceptable in accordance with NATSPEC specification.
- Bollard lighting shall be in accordance with NATSPEC specification.

Poor outcome example

Figure 120.
An excessive use of gravel treatment and turf located directly against the dwelling.

Good outcome example

Figure 123.
A balance of hard surfaces, turf and garden beds provided. Landscape does not impeded sightlines to dwelling from street.

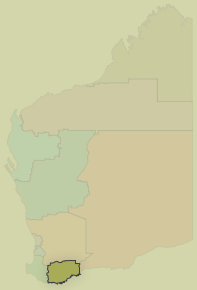
Poor outcome example

Figure 121.
Irrigation not efficiently used or consolidated to service small garden bed. Gravel mulch or similar to be used for service/maintenance access areas.

Good outcome example

Figure 122.
Informal, low water use native planting with decorative gravel mulch.

Great Southern Region
Overview



Key Regional Centre:
Albany

Local Government Areas:
11

Geographical Size:
39,007 km^2

The coastal area of the Great Southern region has a Mediterranean climate with typically warm summers and cool, wet winters. Rainfall decreases and temperature increases moving from the coast to inland areas. The north and east of the region is considered semi-arid with hot and dry conditions. It is bordered by the Southern Ocean stretching for approximately 250 kilometres.

Trees

Prioritise tree planting at appropriate locations from dwelling and boundaries to enhance shade and amenity for residents. Strategically locate trees to ensure shade in summer to outdoor spaces and to increase shading to dwellings, particularly to the northern and western façades. Existing trees suitable for retention shall be integrated into the development.

Irrigation

Areas on or near the coast (Albany and Denmark) do not require irrigation. Areas within or near Katanning shall have irrigation installed. Controllers may be mains connected or battery. Take-off points or taps shall be connected to the dwelling.

Common Areas

These are maintained by the department and shall be considered for higher quality and amenity finishes.

Mulch

75mm thick organic mulch for garden beds.

Planting

Plant species selected to minimise ongoing irrigation requirements. Ensure the mature planting size is considered when locating plants to ensure paths of travel or sightlines are not impeded.

Selections of trees and plant species shall also consider:

- Local availability from nurseries;
- Suitability for irrigation provision;
- Local government planting lists;
- Selections are not local weeds.

Turf

A single, functional area of turf is preferred. Small areas of turf are to be avoided to reduce ongoing maintenance.

Resources & Examples

The following are examples of recommended useful planting resources.

Shire of Denmark:
https://www.denmark.wa.gov.au/documents/10944/invasive-weeds-and-native-flora-information-sheet-2011

City of Albany:
https://www.albany.wa.gov.au/Profiles/albany/Assets/ClientData/Waterwise_Garden_Bed_2023.pdf

Surface Treatments

The following surface treatments are noted as acceptable for use:

- Where practical, direct storm water runoff from hard surfaces towards turf and garden beds.
- Concrete: standard grey concrete for use with pathways, driveways and other hardstands. Concrete should be graded away from dwellings and directed towards garden beds and lawn where practical.
- Permeable paving is a suitable option where possible.
- A 1m wide concrete apron is to be installed around the perimeter with falls away from the dwelling to keep footings dry and ensure building weep holes remain exposed to minimise the risk of moisture build up and mould.
- Edging: Concrete edging or treated pine sleepers (200mm x 50mm) are acceptable.
- Crushed gravel: <10mm size suitable for service areas.
- Rock: large landscape rocks may be used as features within garden areas and installed with 1/3 below ground.

Poor outcome example

Figure 124.
Grass is too large to be maintained effectively.

Good outcome example

Figure 127.
Overall turf area is reduced, with low maintenance shrubs installed to fencelines. Trees provide shade to dwelling and outdoor area.

Good outcome example

Figure 125.
1m concrete apron installed to perimeter of dwelling and graded toward garden beds. Low maintenance species planted at required 2 plants/m2.

Good outcome example

Figure 126.
Informal native planting with small feature rocks.

Appendix 4 - Landscape Typical Technical Details

Typical Detail List

Notes:

- *Details are indicative and to be used as a guide only. All landscape details are subject to architectural and structural engineer drawings and specifications.*
- *Details are to be reviewed against site requirements.*
- *Details are not rated for vehicular loads. A structural engineer is required to advise.*
- *For installation of proprietary products follow manufacturers recommendations.*

Council Standards

Always check and follow standard details and documentation requirements with the local region, council or shire. Details and requirements may vary in each region.

Additionally, ensure that any landscape areas that are within or abut to roadways or council property meet appropriate detail and finish levels. For more information on this, refer to your local council or shire detail sets.

HARDWORKS

Paving/Concrete:

- *Unit Paving - Pedestrian*
- *In-situ Concrete Pavement - Pedestrian*
- *Permeable Paving*

Edging:

- *Mower Kerb Edging*
- *Concrete Edging*
- *Timber Sleeper Edging*
- *Aluminium or Galvanised Steel Edging*
- *Reconstituted Limestone Block Edging*

Rocks and Stone Work:

- *Boulder*

Gravel/Stone:

- *Compacted & Stabilised Gravel*
- *Loose Gravel Path*

Lighting:

- *Bollard Lighting*

SOFTWORKS

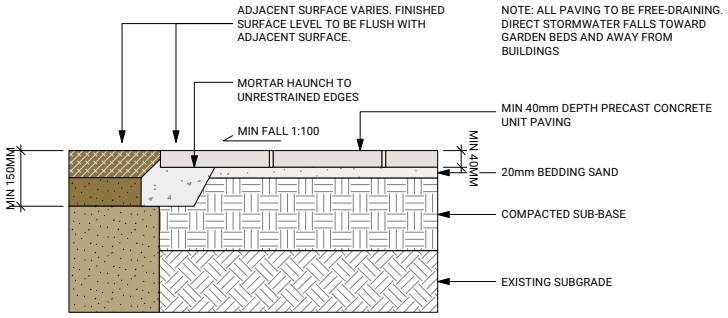
Softscape

- *Roll-On Turf*

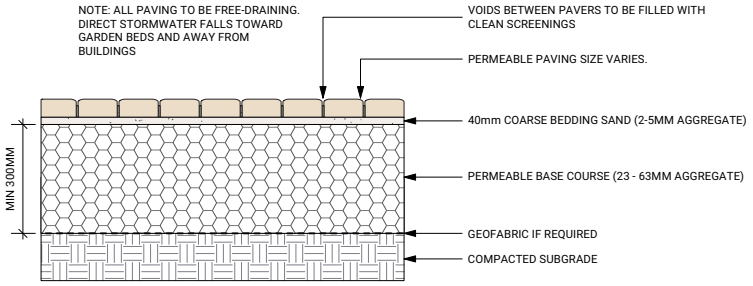
Planting:

- *Planting On Structure*
- *Shrub & Groundcover Planting*
- *Typical Tree Planting*

Paving/Concrete

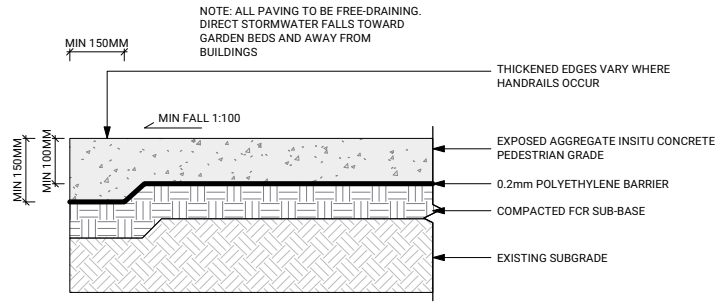


1 UNIT PAVING - PEDESTRIAN
Scale: 1:10



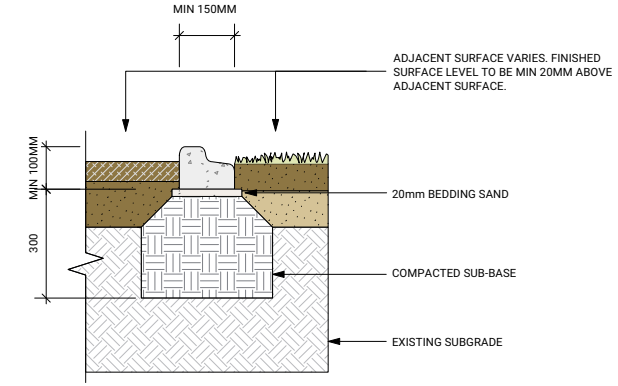
3 PERMEABLE PAVING
Scale: 1:10

Refer to relevant specification documents for paving requirements, as well as following general regional requirements

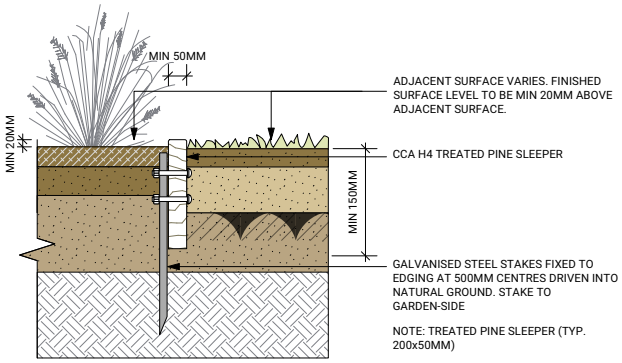


2 INSITU CONCRETE PAVEMENT - PEDESTRIAN
Scale: 1:10

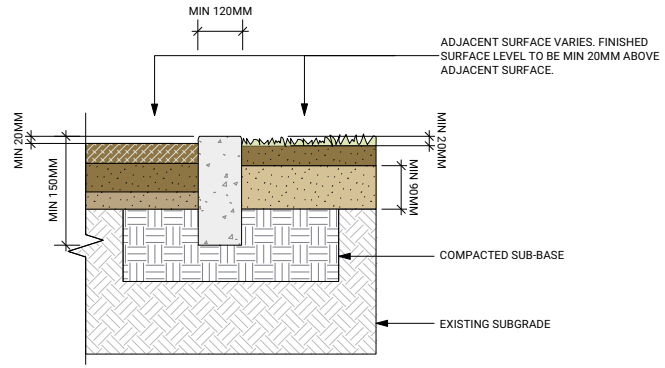
Edging



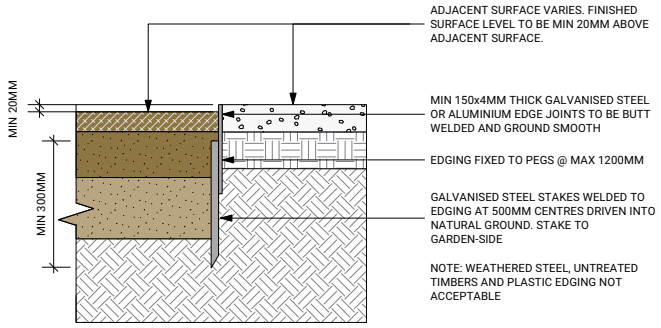
4 MOWER KERB EDGING
Scale: 1:10



6 TIMBER SLEEPER EDGING
Scale: 1:10



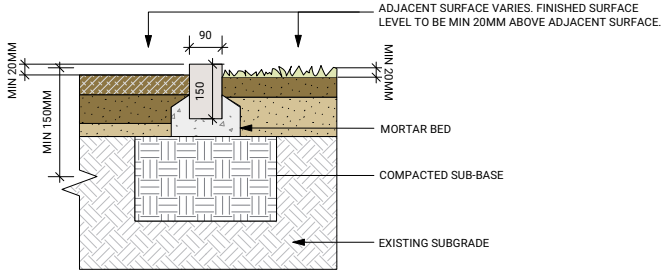
5 CONCRETE EDGING
Scale: 1:10



7 ALUMINIUM OR GALVANISED STEEL EDGING
Scale: 1:10

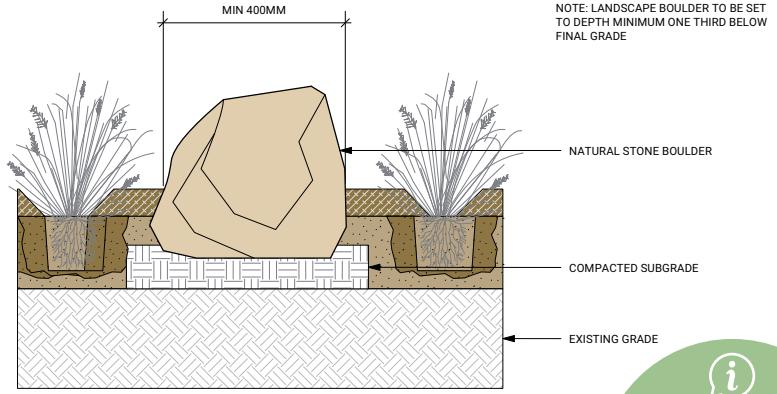
Check with the Local Council, Region and Shire for requirements for installation of edging in specific climates

Edging (continued)



8 RECONSTITUTED LIMESTONE BLOCK EDGING
Scale: 1:10

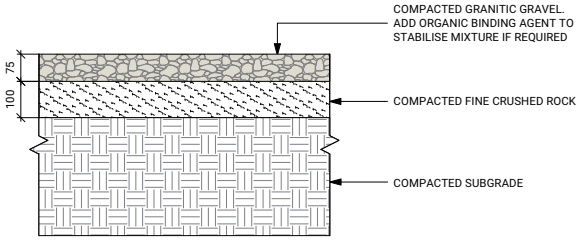
Rocks & Stone Work



9 BOULDER
Scale: 1:10

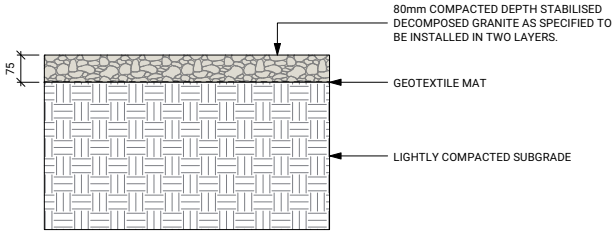
Check with the Local Council, Region and Shire for regulations and requirements for installation of boulders and stones

Gravel



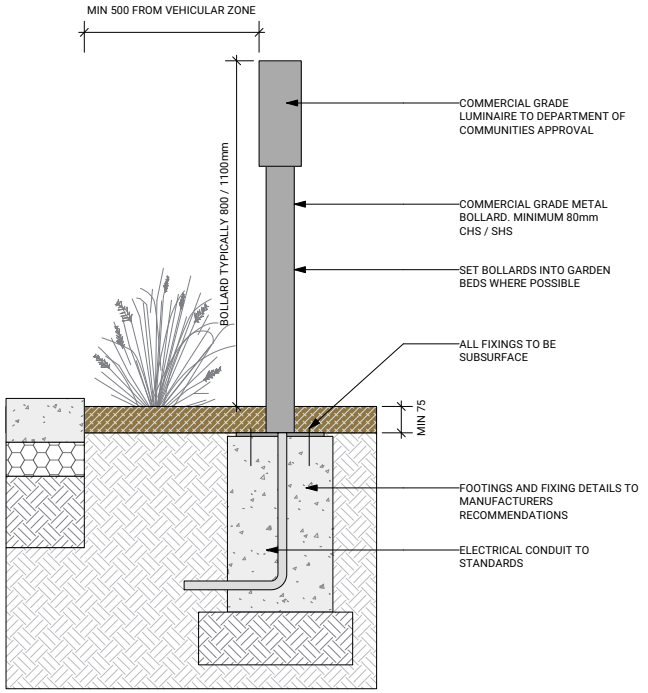
10 COMPACTED & STABILISED GRAVEL
Scale: 1:10

Check with the Local Council, Region and Shire for requirements for minimum gravel size. Refer to Appendix 3 - Regional considerations for more information



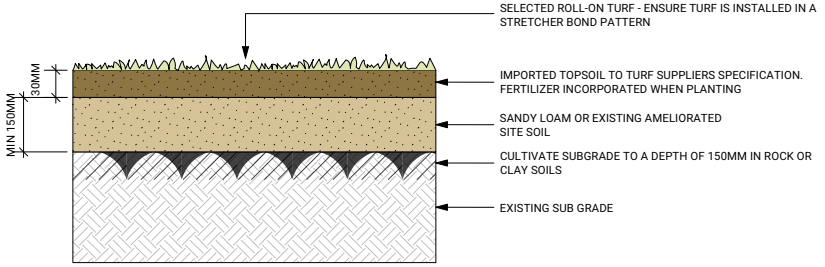
11 LOOSE GRAVEL PATH
Scale: 1:10

Lighting



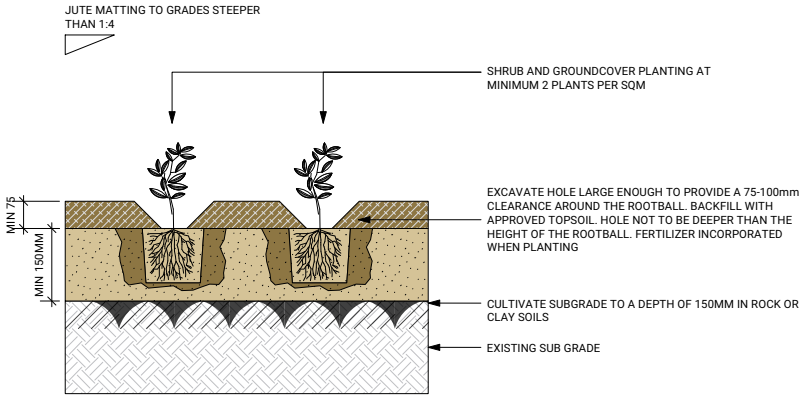
12 LIGHTING BOLLARD
Scale: 1:10

Softscape



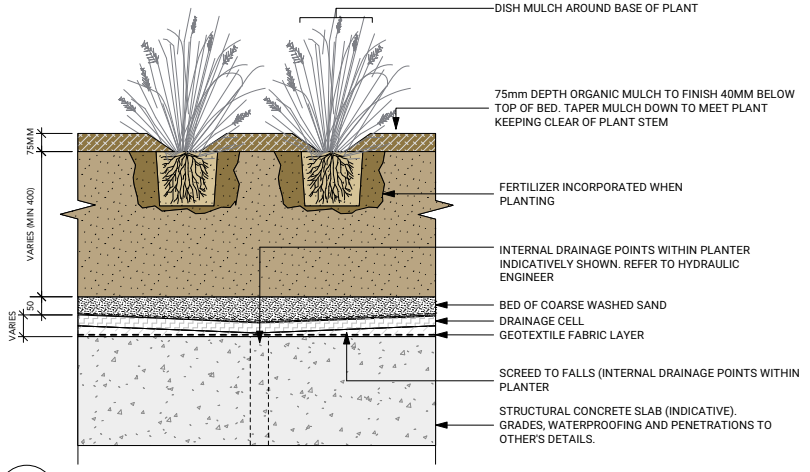
13 ROLL- ON TURF
Scale: 1:10

Planting



14 SHRUB & GROUNDCOVER PLANTING
Scale: 1:10

Planting (continued)



15 PLANTING ON STRUCTURE
Scale: 1:10

When designing for on structure gardens, always ensure Engineering and Architectural drawings take precedence.

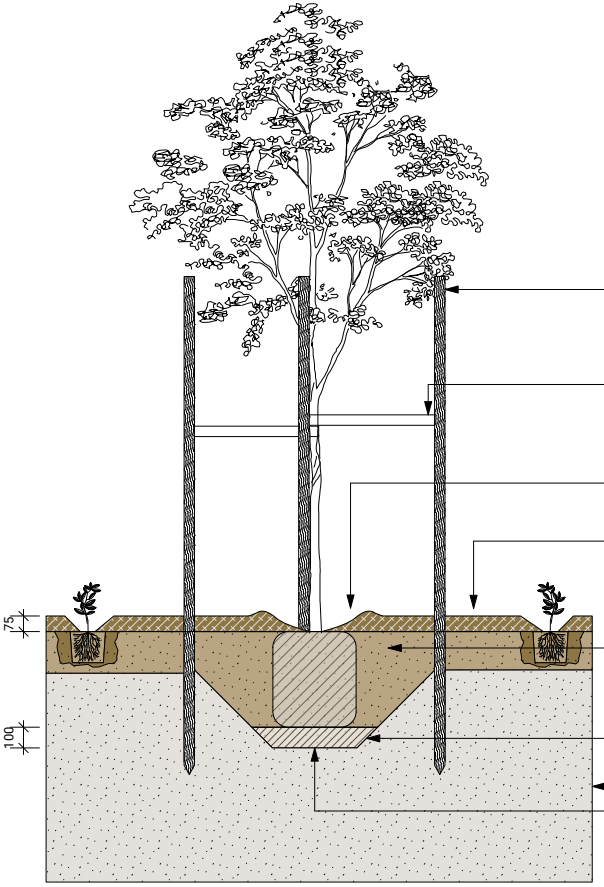
Planting (continued)

TO PROMOTE LATERAL ROOT GROWTH THE PLANTING HOLE SHALL BE NO LESS THAN TWO (2) TIMES THE DIAMETER OF THE ROOT BALL. IF SPACE RESTRICTIONS EXIST STAKE SPACING SHALL BE REDUCED TO NO LESS THAN TWO (2) TIMES THE DIAMETER OF THE ROOT BALL. SLOPE ALL SIDES AT 45 DEGREES.

TREE PLANTING NOTE:
- TREES SHALL HAVE A WELL DEVELOPED TAPER AND BE SELF SUPPORTING
- TREES SHALL BE OF GOOD HEALTH AND VIGOUR
- ENSURE ALL LABELS, WIRES, TWINE AND OTHER BINDING MATERIALS ARE REMOVED FROM PLANTING MATERIAL, INCLUDING ROOTBALLS PRIOR TO BACKFILLING
- WATER IMMEDIATELY FOLLOWING PLANTING

TREE STAKES TABLE:

TREE SIZE	No. STAKES	STAKE SIZE (MIN)
45L	3	50 X 50 X 1800MM



16 TYPICAL TREE PLANTER
Scale: 1:20

Check with the Local Council, Region and Shire for installation of trees and refer to their typical detail sets. Details may vary from region to region

Government of **Western Australia**
Department of **Housing and Works**

DEPARTMENT OF HOUSING AND WORKS

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