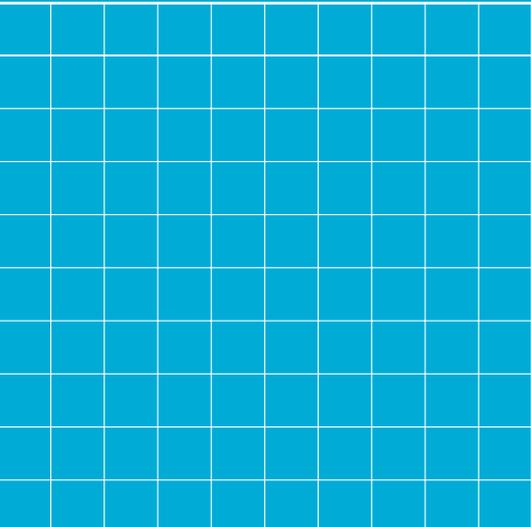




# TOITŪ TE WHENUA TOITŪ TE KĀINGA



KĀINGA ORA  
LANDSCAPE DESIGN GUIDE  
FOR PUBLIC HOUSING

VERSION 1.3  
MARCH 2023





## KUPU WHAKATAKI PREFACE

**“Toitū te marae a Tāne, toitū te marae a Tangaroa; toitū te whenua, toitū te kāinga”** – This whakatauki responds to the sustaining of the land, for the overall health and wellbeing of people. The reference to the domains of Tāne and Tangaroa reflect our duty to care for our environments (ki uta ki tai), and in doing so, the environment will care for us. Whenua and kāinga are important concepts reflecting the shared relationships with tangata – whānau and hāpori. They provide opportunities to establish one’s own sense of belonging – tūrangawaewae, and ensures we are connected and grounded to the places we inhabit.

**Toitū Te Whenua, Toitū Te Kāinga;** Landscape Design Guide for Public Housing has been developed to provide guidance in achieving landscape design reflective of our unique identity in Aotearoa New Zealand. The guide also provides a best-practice approach towards design providing solutions and opportunities for collaboration and innovation. The guide responds to the Kāinga Ora vision to build better, brighter homes, communities, and lives. Landscape is important within the development of new homes, providing spaces that support overall prosperity and wellbeing of people, and a place for communities to thrive.

This guide expresses our obligations to protect and enrich our environments and to foster healthy and sustainable living. It also proposes opportunities for partnering and engagement with our diverse communities to contribute to great outcomes for all, promoting inter-generational and multi-generational adaptability and inclusivity. The guide builds on the existing values of Kāinga Ora – manaakitanga, mahi tahi and whanake – to make positive changes in people’s lives through the design of the landscape. Therefore, **Toitū Te Whenua, Toitū Te Kāinga** is simply interpreted as sustaining the land, sustaining the home – the family unit.

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# TIROHANGA WHĀNUI OVERVIEW

## INTRODUCTION

This Landscape Design Guide outlines Kāinga Ora expectations for well-designed landscapes. It highlights design principles we consider fundamental to building successful places and communities.

The guide has been created to ensure all our new homes enjoy the benefits of liveable, functional and sustainable environments that include high-quality plants, products and materials that are, robust, sustainable, readily available and easy to maintain.

It is one of several tools in a wider framework of guidance we have established to help us and the people we work with understand our expectations of:

- improving the overall quality and longevity of landscapes within our developments
- optimising quality and reducing ongoing maintenance costs
- enhancing and reinforcing the character and community identity of our developments
- creating a positive landscape legacy across our portfolio.

These guidelines respond to best practice, are refined by lessons learned and seek to improve our landscape outcomes to ensure:

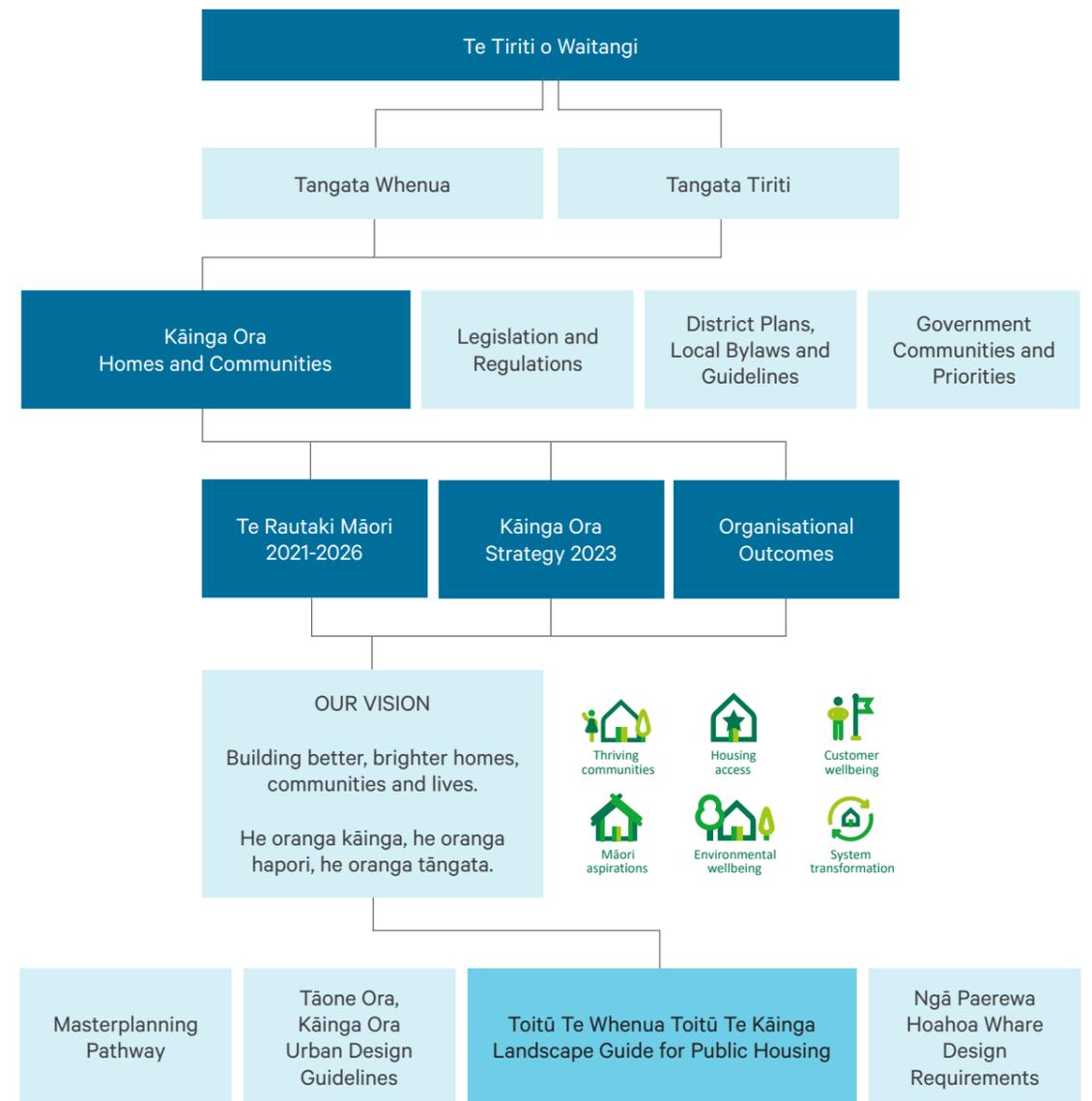
- landscape designs are attractive, fit for purpose, and easy to implement and maintain
- landscape designs are well planned, making efficient use of available space and providing a landscape framework that residents can adapt to their needs and personalise over time
- appropriate plant selection that reflects and enhances neighbourhood character and contributes towards biodiversity.

## PURPOSE OF THIS GUIDE

This guide provides support and direction in delivering high-quality, functional, and fit-for-purpose living environments for our communities. It connects with complementary resources such as Design Quality, Maintenance, Urban Design, Ngahere Framework and Sustainability.

This guide aims to enable consistently high-quality outcomes through the application of our design principles. The resource serves a number of functions, acting as:

- a guidance document for our own organisation, design consultants, and development partners, that communicates our expectations around how our sites should be designed across all delivery programs
- a guidance document that sets out the expected level of detail and quality of design throughout the entire process.



## READING THE GUIDE

This guide should be read in conjunction with the current planning framework, Design Requirements (M134), and other Kāinga Ora policies, standards and guides.

Through the document, a series of navigation tools have been employed:

- This guide contains seven sections that are colour coded and arranged in alphabetical order, as seen in the diagram below.
- The document content, including content of each section, can also be found on the left-hand side of the page.
- Where another piece of information is required to be read in conjunction with this guide, this graphic can be found to the left-hand side of the page.



Refer to [Name of document/ Section](#).

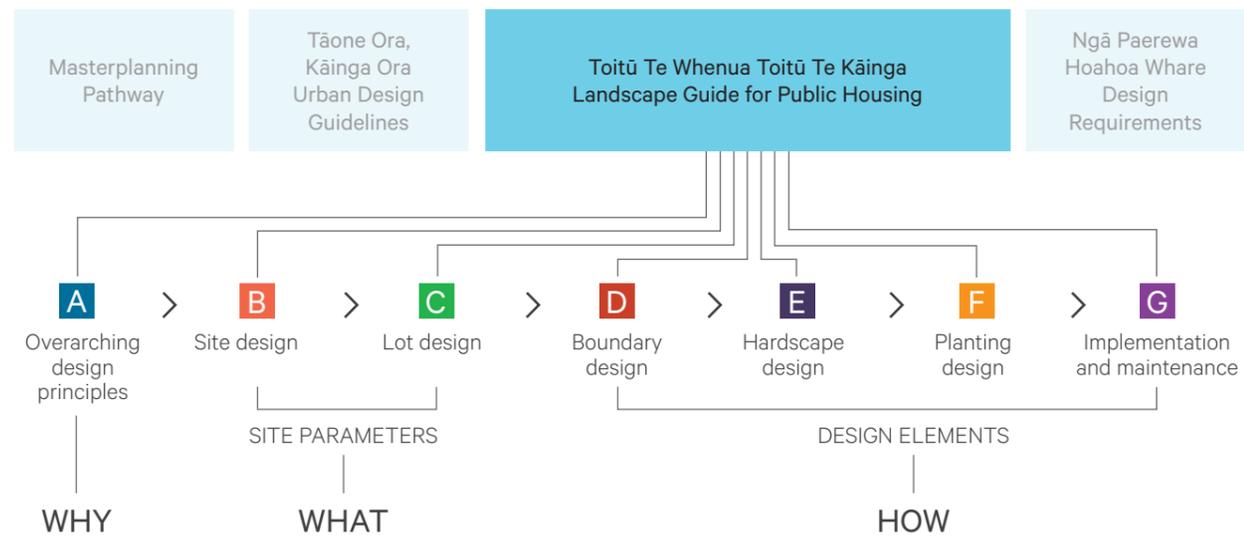


Fig 1 Document structure and the relationship with other Kāinga Ora publications.





## MAHI WHAKATAU ROLES AND SCOPE

### WHO SHOULD USE THIS GUIDE

The people this document is written for includes Kāinga Ora staff, consultant teams, project managers, contractors, and asset management organisations.

### ROLE OF LANDSCAPE ARCHITECT CONSULTANT

Landscape design outcomes should be considered from the early planning stages of a project.

Landscape consultants intersect with all other disciplines, so are a critical component of a well-coordinated and successful scheme.

Landscape architects will be expected to work as a key part of a multi-disciplinary project team, providing specialist landscape input and guidance to ensure all projects align with the landscape and urban design objectives outlined in this guide.

An important role of the landscape architect is to work alongside mana whenua and local iwi leaders to ensure te ao Māori and community aspirations/values are captured and acknowledged early in the development briefing and concept stage.

### ROLE OF KĀINGA ORA DESIGN SUPPORT

Our design support team provide advice and guidance to our design managers, development managers, consultants, and contractors in project planning, design, and delivery. They assist development and project managers to navigate the design review process and optimise outcomes for all projects.

Their involvement includes evaluating design and layout options as well as promoting and sharing best practices, and a consistency of approach to all design-related issues.

These include:

- advising on site suitability for development and assessing appropriate yields and typologies a site can comfortably accommodate
- contributing to the urban design section of the project brief for each project
- assisting in the development and review of a project's design deliverables
- contributing to multi-disciplinary design workshops
- supporting Design Review Panels (DRP) for all projects.



**Fig.1** Typical team structure for Kāinga Ora projects

**Note:** Each project is different and might have a different team .



## ROLE OF THE DESIGN TEAM

### Development Manager

Our development managers assemble the multi-disciplinary design teams for each project and are predominantly responsible for the design phase of a project. It is their role to ensure the various disciplines work together, to achieve quality design outcomes. Development managers play a key role in ensuring an adequate proportion of a project's budget is allocated to landscape design.

Upon completion of the design phase, they then hand the project over to Project Managers for the construction phase.

### Architect

Architects work closely with landscape architects and urban designers from the start of a project with regard to exploration of site layout options, all the way through to developed design, ensuring a coordinated design response for delivery.

## SCOPE OF LANDSCAPE ARCHITECTURE SERVICES

### Introduction

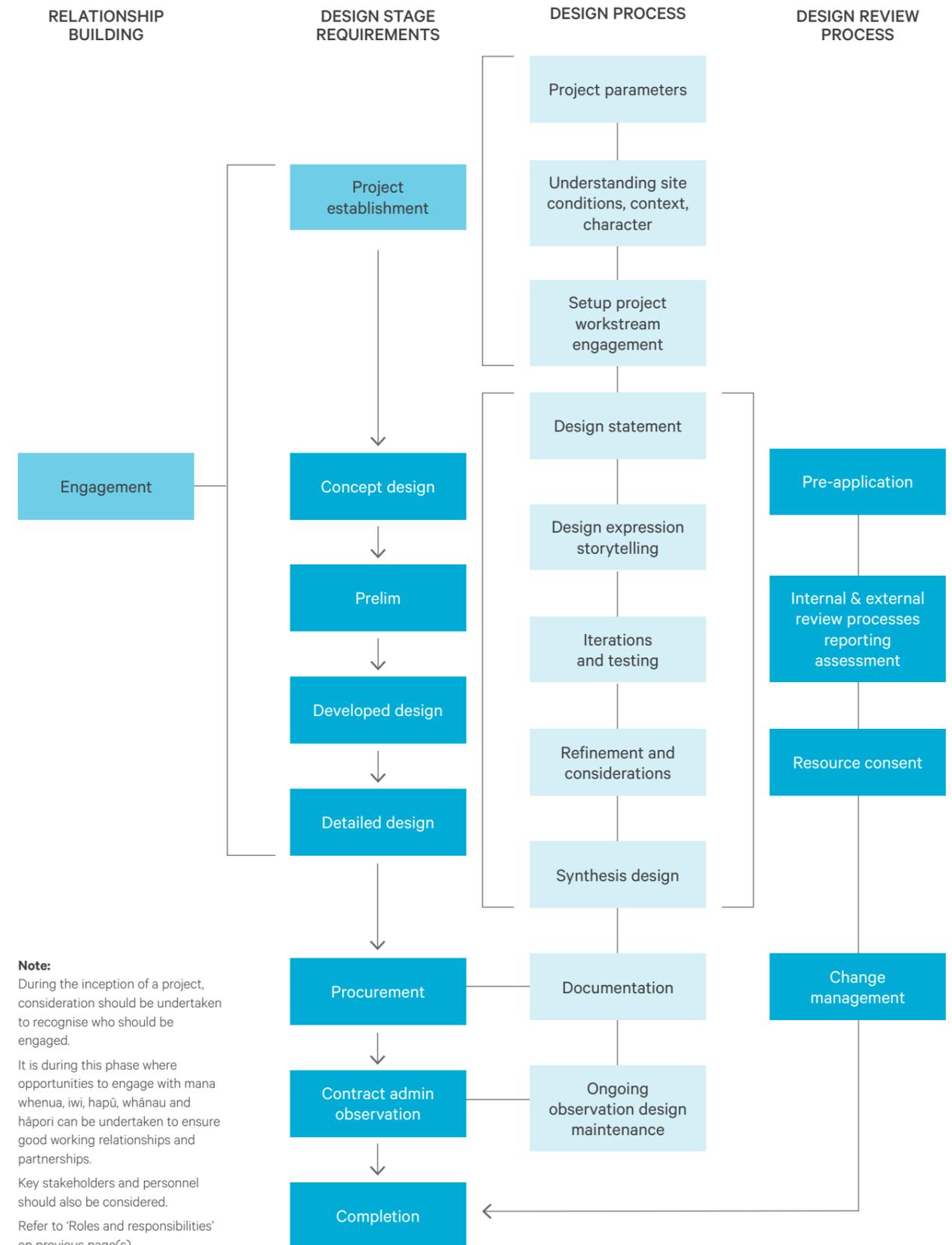
The Kāinga Ora Consultant Scope of Services document has been developed to assist consultants in providing clear and comprehensive design services and documentation to Kāinga Ora.

It is structured on using the New Zealand Construction Industry Council Guidelines 2016 (CIC Guidelines) as a baseline and industry standard provision of coordinated consultants' scopes, augmented by specific expectations set by Kāinga Ora to ensure its projects are developed to its standards and expectations.

Consultants shall provide services in accordance with the CIC Guidelines, including the identification of the party/parties responsible as well as for the provision of input where required.

Design and construction stages included in the provision of services is as per the CIC Guidelines and the Kāinga Ora supplementary Schedule of Design Stage Requirements, including:

- project establishment
- concept design
- preliminary design
- developed design
- detailed design
- procurement
- construction administration and observation (where applicable)
- post completion (where applicable).



# A

## NGĀ MĀTĀPONO OVERARCHING DESIGN PRINCIPLES

### A Nga matapono Overarching design principles

- 1 **Mauri:**  
Creating healthy  
environments
- 2 **Whiriwhiri:**  
Building  
lives and  
communities
- 3 **Tūhononga:**  
The resident's  
experience
- 4 **Āhurutanga:**  
Safe living  
environments
- 5 **Toitū Te Whenua:**  
Sustaining the  
landscapes

- B Āhua Wāhi  
Site design
- C Āhua Kāinga  
Lot design
- D Āhua Paenga  
Boundary design
- E Āhua Paenga  
Hardscape design
- F Āhua Taiao  
Planting design
- G Whakatinana  
Implementation  
and maintenance



### OVERVIEW

This section outlines the five key design principles that guide and inform the multiple components of the landscape design process within Kāinga Ora public housing developments.

These are closely interrelated and should be pursued in parallel.

The most successful outcomes have come from careful and thoughtful consideration of these principles, resulting in developments with a high level of design quality that are embraced by the communities that live in them.

The integrated application of these principles will result in the quality landscape outcomes Kāinga Ora is seeking to achieve for our residents and communities.

**A Nga matapono  
Overarching  
design principles**

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**MAURI**

**CREATING HEALTHY ENVIRONMENTS**

Mauri is the fundamental principle of life, ensuring vitality within the spaces we inhabit. This is an important part of our holistic environment where we are all interconnected, and our actions should be responsive to the needs of the landscape.

The health and wellbeing of people is intrinsically linked to the health of the natural environment. Good-quality and functioning natural environments, provision for human and non-human communities, and the availability of open spaces provides opportunities for people and nature to connect.

The Kāinga Ora objective is to ensure whānau and communities live in healthy, well-designed and well-functioning urban environments. The interrelationship between landscape and people is important in future-proofing and evolving our communities.

**WHIRIWHIRI**

**BUILDING LIVES AND COMMUNITIES**

Landscape design helps build lives and communities by delivering design solutions that foster community wellbeing and enhance streets and public spaces, and respects the natural qualities of place, local community character and the associated amenity values.

Whiriwhiri is the principle of negotiation and consideration, which is vital to how we create spaces to support our thriving communities. This is an important part in how we plan and decide for future Kāinga Ora developments, ensuring there is a collective approach in decision making and the building of communities.

**TŪHONONGA**

**THE RESIDENT'S EXPERIENCE**

The quality of the residents' experience is an essential measure of success in enhancing communities. The residents' perception of a place and its community can be heavily influenced by the quality of living, character of the landscape setting and the level of external amenity offered.

Providing attractive and functional landscapes can enable whānau to take pride in their home and environment while also having access to well-functioning infrastructure and services.

Tūhononga is the principle of connections, ensuring residents feel akin to their surroundings and are given the opportunities to experience quality living.

**ĀHURUTANGA**

**SAFE LIVING ENVIRONMENTS**

The design of the built environment can have a significant impact on personal safety, security, and social behaviour within a neighbourhood. Landscape design plays a critical role in enabling safer and more attractive environments, by applying Crime Prevention through Environmental Design (CPTED) principles.

Āhurutanga is the principle of feeling comfortable within the spaces we inhabit. This principle is about ensuring proper layout and planning mechanisms, safe access and connections, clear sightlines, and quality care towards good public areas.

**TOITŪ TE WHENUA**

**SUSTAINING THE LANDSCAPES**

The Kāinga Ora Environment Strategy (2022) sets out four key environmental outcomes. It is expected that the landscape will deliver on these principles.

Toitū te whenua reflects the principle of working together in collaboration with our environments to ensure sustainable and healthy living. To achieve this, constant consideration is required through reciprocity between people and nature, understanding the needs to co-exist in unity and establish a sustainable future.



Refer to [Kāinga Ora Environment Strategy \(2022\)](#)

# 1 MAURI HOLISTIC ENVIRONMENTS

## A Nga matapono Overarching design principles

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## EXPECTATION

Our developments should support healthy, thriving environments for the whenua, people, and flora and fauna. The landscape provides an opportunity for direct connection to the natural environment. Consider the design of landscapes as an integrated approach that brings together the principles of Whiriwhiri, Tūhononga, Āhurutanga, and Mahi Tahi to contribute to the Mauri.

## EXPLANATION

Enhancing mauri in a way that invites people to connect with the natural environment through provision of quality private and communal outdoor spaces can include provision of places for the community to gather and interact, food growing opportunities and nature play spaces that provide cultural, social, and spiritual identity for a diverse range of residents.



## DESIGN GUIDANCE

- A1.1** Healthy environments can be achieved by incorporating diverse planting within each development, supporting local strategies, frameworks, and plans for natural system restoration and protection. The landscape offers substantial benefits for improving water and soil quality, supporting biodiversity and connecting green corridors at a wider scale.
- A1.2** Larger street-frontage planting can be helpful in making connections for neighbourhood-scale biodiversity corridors.
- A1.3** Explore food growing opportunities both within lots and communal spaces – for example, edible gardens or informal orchards. Structured vegetable gardens aren't always used, so provide space for these in the future if they are desired.
- A1.4** Provide natural play spaces, and informal play elements.
- A1.5** Minimise impervious surfaces where possible. Where this can't be avoided, provide permeable surfaces for stormwater to percolate back into the soil.
- A1.6** Consider the holistic view of natural systems, and aim for filtering and cleaning water on site where possible.
- A1.7** Locate larger trees where they will provide the greatest relief to the built form from public vantage points. As space is often at a premium along street frontages, street trees can sometimes be proposed to perform screening functions, enabling larger species without being too close to a building's edge.

## 2 WHIRIWHIRI BUILDING LIVES AND COMMUNITIES

### A Nga matapono Overarching design principles

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Refer to [New Zealand Building Code Clause D1 Access Routes](#)

Refer to [Design Requirements A Site](#)

Refer to [Sustainable Transport Outcomes](#)

### EXPECTATION

Communal landscape spaces are developed through meaningful engagement with mana whenua, community and residents, and provide opportunities for residents to interact, relax and play. They are safe, easy to access, and open to all. The spaces contribute to local character and ecology. There is sufficient flexibility for residents and communities to adapt spaces to their needs, and support stewardship and wellbeing.

### EXPLANATION

Streets and public spaces within our developments should ensure a positive first impression of the neighbourhood through good design of the street-tree framework, lighting, street furniture, and boundary treatments. Public spaces should be welcoming and accessible and cater to haukāinga, manuhiri and wider hāpori.

Quality spaces can contribute to a sense of wellbeing by encouraging social interaction, and community stewardship.

Landscape proposals should enhance the local sense of place, including respect for local character, culture, and neighbourhood identity.

Spaces should allow opportunities for the community to develop them to suit their needs, including food sovereignty, recreation, and wellbeing.



### DESIGN GUIDANCE

- A2.1** Configure streets and communal spaces to promote neighbourliness and include elements that allow people to sit, interact, observe, play, and enjoy.
- A2.2** Design sites to enhance local identity, community ownership, and civic pride in the composition of streetscapes, communal areas, and private lots.
- A2.3** For apartment developments, provide communal outdoor spaces in prominent, sunny locations that feel welcoming for all, facilitate surveillance, and encourage opportunities for community interaction, gathering, and play.
- A2.4** Include opportunities for community interaction such as seating areas, play spaces, māra kai (fruit forests and vegetable gardens), and pedestrian and cycle-friendly linkages.
- A2.5** Encourage non-vehicular circulation through people-focused, interconnected networks both within the site, and around the wider neighbourhood.
- A2.6** Provide natural surveillance over all spaces and pedestrian connections, supported by the appropriate selection of landscape elements such as paving surfaces, furniture, and planting.
- A2.7** Design landscapes to be accessible and inclusive, and to contribute to the wellbeing of all members of the community, no matter their age or ability.
- A2.8** Create and enhance nearby maunga, visual landmarks and natural features, and protect and frame significant views or vistas.
- A2.9** Retain and enhance existing features on site, both natural and built, that recognise the local history and identity of the site or neighbourhood.

### 3 TŪHONONGA THE RESIDENT'S EXPERIENCE

#### A Nga matapono Overarching design principles

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#### EXPECTATION

The residents' experience is enhanced and optimised through the quality and character of the landscape setting of their homes.

#### EXPLANATION

Enhancing the residents' experience of where they live helps to foster pride of place, reinforcing wellbeing and stewardship. Providing landscapes that cater to the needs of residents helps to support healthy living. Providing opportunities to enable residents to take ownership can help establish one's sense of belonging, or tūrangawaewae. Explore how landscapes can provide for a diverse range of cultural practices and interactions.



Communal food production.

#### DESIGN GUIDANCE

- A3.1** Enhance the quality of residents' experience by designing landscapes that:
- are well-integrated with the wider urban fabric
  - are appropriate to the local context and character
  - are uncluttered and cohesive
  - allow flexibility for the community to take ownership of their spaces
  - are well implemented and maintained.
- A3.2** Create interactive play spaces that accommodate residents of all ages.
- A3.3** Use specimen trees to create distinctive landscape markers or features – for example, by:
- providing focal points in gardens or communal areas
  - creating or enhancing tree-lined avenues, streets, and lanes
  - greening and shading shared parking and driveways
  - forming clusters of trees in open landscapes
  - greening and shading outdoor spaces and seating.
- A3.4** Enhance the character of the development, along with the quality of residents' experience, by:
- providing adequate visibility to allow safe movement around the development
  - considering the size, scale, and form of planting within shared communal spaces
  - providing shade trees or structures where appropriate
- providing opportunities for communal food production.
- Lot consideration**
- A3.5** Consider practical and functional circulation to and within the private lot.
- A3.6** Consider reasonable practical use of the outdoor area when locating the utility areas and circulation.
- A3.7** Support residents' health and wellbeing by:
- providing a range of fruiting species across a development to supply fruit throughout the annual cycle, promoting sharing among neighbours
  - if appropriate, providing space for a garden within the private lot.
- A3.8** Liaise with the Kāinga Ora Place Based Team regarding the provision and arrangement of amenities within communal spaces. In many cases, deferring the implementation of communal space amenities until the development is occupied can enable resident participation, resulting in a much higher feeling of ownership and guardianship over the space.

## 4 ĀHURUTANGA SAFE LIVING ENVIRONMENTS

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### EXPECTATION

Our tenants and their whānau feel safe and secure in their homes, and immediate neighbourhood environments.

### EXPLANATION

Crime Prevention through Environmental Design (CPTED) is a crime prevention discipline that promotes effective design of the built environment to deter anti-social behaviour and foster local custodianship within a community.

CPTED helps reduce crime and fear of crime by reducing criminal opportunity and fostering positive social interaction among legitimate users of the space.

A good understanding of local circumstances, together with the site-specific application of CPTED principles at the design stage can lead to successful community safety and crime prevention initiatives that benefit the development and the wider community.



### DESIGN GUIDANCE

The Ministry of Justice's Guidelines for Crime Prevention through Environmental Design sets out guidance for well-designed, safer places through landscape design.

This guidance is summarised below under two overarching headings: natural surveillance (the quality that affords places clear visibility – see and be seen) and access control (the implementation of clear physical boundaries to attract or restrict people's presence).

#### Natural Surveillance

**A4.1 Surveillance and sightlines:** Ensure clear sightlines are provided between homes, communal spaces and the public realm as well as down shared driveways and/or pedestrian lanes from streets, public reserves, and other areas of high activity. Specify appropriate plant species, heights, and densities to retain sightlines for natural surveillance.

**A4.2 Activity mix:** Design to encourage passive recreation in public and communal spaces to maintain surveillance. Provide informal surveillance between streetscapes or other public or communal spaces and the homes that front onto them. This includes the ability to see and be seen when approaching and/or entering private property.

#### Access Control

**A4.3** Movement networks should be designed with open, clear access to encourage through traffic and offer alternative routes for pedestrians. Consider sightlines and pedestrian choices within the networks to deter criminal activity.

**A4.4** Configure site layouts to afford maximum exposure of homes to the public realm, including streets, reserves, and common accessways. Avoid the creation of isolated enclaves of back-lot housing, clustered beyond public view. Wayfinding and orientation within a development should be clear and logical, and work within the legible patterns of the wider neighbourhood.

**A4.5** Ensure the delineation of public, communal and private property is unambiguous to support a sense of ownership, with clearly defined boundaries that demarcate each home's defensible space and communal area.

**A4.6** Maximise the visual quality and amenity of spaces to foster residents' sense of pride and custodianship. Ensure environments are well designed, managed, and maintained.

**A4.7** The landscape should encourage active use of appropriate areas, and limit access to sensitive environments or private areas. Avoid areas of entrapment or concealment, including blind alleys, high fences around entrance doors, and areas hidden from view by planting or walls. Provide appropriate lighting in all areas, including entrance doors, laneways, and communal areas.

## 5 TOITŪ TE WHENUA SUSTAINING THE LANDSCAPES

### A Nga matapono Overarching design principles

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Safe living environments

### 5 Toitū Te Whenua: Sustaining the landscapes

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Site design
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Implementation and maintenance



Refer to [Homestar®](#)

### EXPECTATION

Our homes are designed, built and maintained in a way that minimises cost, maintenance, and replacement. Design and construction consider existing topography, natural features, and natural systems, working with or around them. Residents are able to live in a more environmentally sustainable way, which includes growing their own kai, composting food waste, mulching, and using rainwater within the landscape.

### EXPLANATION

Our developments are designed to significantly reduce the impact of our operations, build programmes, and assets on the natural environment. This is achieved by adopting and incorporating sustainable landscape design practices including Low-Impact Design (LID) principles and features.

For all material and plant selections in Public Housing, we aim to balance cost and durability, and ensure the best possible long-term value is achieved. Where possible, all landscape design shall incorporate low-impact and low-maintenance principles, as well as ensuring that what is designed and built now, will not lead to unnecessary maintenance or replacement later.

Delivering the goals of the Kāinga Ora Environment Strategy will mean:

- our operations are more environmentally sustainable
- we own and deliver more sustainable, resilient assets
- our residents are empowered to live in a more environmentally sustainable way
- we promote and enhance local biodiversity by utilising native plant species where possible and appropriate
- wherever possible, we work with and retain existing natural features, processes, and assets within our site
- wherever possible, our developments adopt and incorporate LID principles and features for stormwater attenuation.

To this end, we have committed to all new developments achieving a 6-Homestar® rating. Low maintenance and whole-of-life value for money in the management of landscape assets is a fundamental component of good landscape design. Landscape proposals that integrate operation and maintenance thinking are generally more cost-effective, successful and enduringly attractive in the long term.

### DESIGN GUIDANCE

- A5.1** All development proposals should adopt an integrated approach to design across architecture, landscape, and engineering disciplines that will impact on landscape and external works to optimise environmental outcomes. Early engagement of landscape architects and development engineers will help facilitate integrating environmentally sensitive design features at the design layout stage.
- A5.2** Design site layouts and landscapes to take best advantage of natural landforms and the natural character of the area. Retain wherever possible, existing trees and vegetation, and reinforce the existing local character through additional trees on site and, where appropriate, in streets and public spaces.
- A5.3** Contribute to regional biodiversity through retention of existing tree species as well as including generous deep-soil areas within developments that can enable the scale of planting to respond to the scale of development and contribute to the ngahere within the wider urban context.
- A5.4** In the demolition phase, and in void periods between tenancies, retain existing landscape features, including all mature, healthy trees wherever possible.
- A5.5** Ensure a tree protection methodology for the retained trees has been coordinated with the on-site project manager prior to any siteworks.
- A5.6** When evaluating material and plant options, prioritise whole-of-life-cycle costs over simple capital costs.
- A5.7** Wherever possible, use the site's natural characteristics, vegetation, and open space areas to help facilitate groundwater recharge, including maximising permeable areas, retaining overland flowpaths, and creating natural surface ponding areas.
- A5.8** Reinforce this with LID features to treat rainwater as close as possible to the source using techniques such as rainwater retention gardens and swales to filter contaminants, thereby protecting downstream water quality.
- A5.9** Whenever practical, mimic natural systems and processes in stormwater management to contribute to local sense of place and identity.
- A5.10** Prioritise durable, long-lifespan inert materials that require low maintenance in the design and specification of landscape features to avoid the slow release of toxic preservatives to the surrounding soils and waterways.
- A5.11** Optimise development configurations to promote walking, cycling, and use of public transport.
- A5.12** Base landscape proposals on a simple robust landscape framework that residents can take ownership of and add to over time.
- A5.13** Ensure landscape elements, materials, and utility items are sufficiently durable to not require unplanned maintenance. Materials and elements should be easily replaced if required.

B

# ĀHUA WĀHI SITE DESIGN

A Nga matapono  
Overarching  
design principles

**B Āhua Wāhi  
Site design**

- 1 Site design strategy
- 2 Accessible landscape
- 3 Sloping site design
- 4 Streetscape
- 5 Pedestrian circulation
- 6 Vehicular circulation
- 7 Communal parking and service areas
- 8 Communal outdoor recreation space

C Āhua Kāinga  
Lot design

D Āhua Paenga  
Boundary design

E Āhua Paenga  
Hardscape design

F Āhua Taiao  
Planting design

G Whakatinana  
Implementation  
and maintenance



## OVERVIEW

Successful landscape design responses are achieved through careful consideration of site-specific conditions and features, such as climate, topography, ecology, stormwater, and existing vegetation.

A clear understanding of natural, cultural, and social layers of the area will ensure an outcome that sits well within its context.

This section sets out guidelines to ensure all new developments promote and contribute to achieving safe, well-connected, integrated communities.

Decisions made early in the design process have a positive impact on built outcomes, in both the immediate and long term. Thinking through how the residents use and move around the site will lead to a practical, functional outcome. Proposing low-impact, robust materials and taking care with plant selection can significantly reduce maintenance and remediation costs across the whole of a development's life.

# 1 SITE DESIGN STRATEGY

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design
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circulation
  - 6 Vehicular  
circulation
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Implementation  
and maintenance

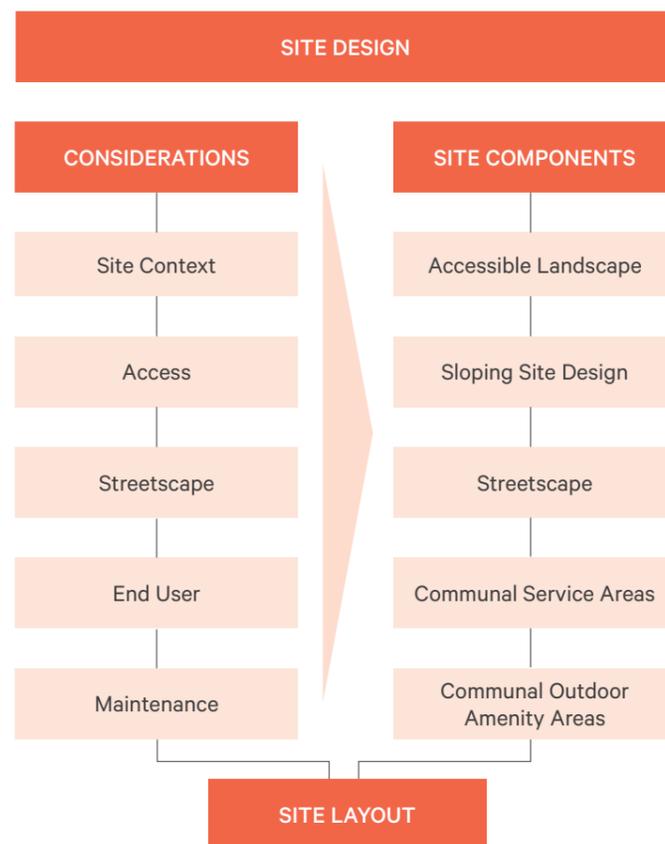
➔ Refer to [Design Requirements A Site](#)

## EXPECTATION

Our developments are unique and distinctive, and fit well within their surroundings. They complement the existing character of the neighbourhood and enhance the natural environment. Sites are laid out in a practical arrangement that ensures safe, efficient movement around the site. Consideration is given to existing features, minimising civil works, and removal of existing vegetation. Efficient layouts reduce the amount of impervious surfaces across the site.

## EXPLANATION

Before the design process begins, a thorough investigation of the wider context should be undertaken. Natural, cultural and urban features should be identified as opportunities and constraints. Successful site design includes safe streets that foster high levels of pedestrian activity, contributing vitality, community stewardship, and wellbeing to a neighbourhood.



## DESIGN GUIDANCE

- B1.1** Respond to environmental factors such as solar orientation, flood risk, and prevailing winds, as well as existing physical factors such as landform patterns, topography, and infrastructure. Early consideration of these factors saves costly changes later in the design process. For example, early assessment of slope might influence the building typology or orientation, saving significant cost on retaining.
- B1.2** Consider viewshafts and pathways towards significant natural features – notably awa and maunga. Visual connection to tūpuna maunga in cities is of considerable cultural importance.
- B1.3** Consider existing trees and vegetation on the site and apply The Management Of Trees & Vegetation Policy. The preference is that trees and vegetation of value are retained or relocated.
- B1.4** If retention is not possible, and trees need to be removed as a last resort, replacement planting in an appropriate location and scale should be provided. The installation of larger-grade specimens should be explored for immediate impact. Consider existing street and public transport networks, local amenities, and public parks and how residents can connect to and utilise these.
- B1.5** Prioritise pedestrian movement, safety and convenience. The network of paths into and around the site should be legible and safe for all users.

- B1.6** The proposed layout should make it clear where motor vehicles are expected to move and park. Minimise lane widths to reduce traffic speeds. Car parking spaces should be clear and unambiguous. Ensure that there are no opportunities for informal parking. Use bollards as required.
- B1.7** Work with existing contours wherever possible, and where earthworks and retaining can't be avoided, break up large level changes through the use of terracing. Use vegetation to soften the view of large retaining structures.
- B1.8** Consider stormwater run-off in the wider context and minimise the amount of hardstand, exploring the use of permeable hard surfaces and on-site treatment solutions wherever possible.
- B1.9** Where practical, incorporate natural water filtration systems such as swales, rain gardens, tree pits and natural detention to improve the quality of the run-off.
- B1.10** Communal open spaces should respond to the needs of the community and should make use of existing natural features such as mature trees and existing vegetation. When designing community outdoor spaces, allow opportunity for the community to develop and take ownership of the space. Also consider the whole-life value and maintenance of these spaces.
- B1.11** Consider how elevated living spaces such as decks or balconies interface with neighbouring properties, avoiding overlooking issues.



Bader McKenzie - site design

## 2 ACCESSIBLE LANDSCAPE

A Nga matapono  
Overarching  
design principles

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G Whakatinana  
Implementation  
and maintenance



Refer to [Design Requirements A3.3 Carparking](#)

Refer to [Building Code Clause D1 Access Routes](#)

### EXPECTATION

Residents of all ages and abilities can enjoy access into and around their homes. Access requirements should feel integrated into the development seamlessly rather than as an afterthought.

### EXPLANATION

The Kāinga Ora Accessibility Policy (2019–2022) sets an initial target that at least 15% of our new builds meet performance requirements for universal design. The remainder will meet as many of the requirements as possible.

Universal design is defined as being “about making sure everything is accessible to, understood by, and used to the greatest extent possible by everyone without adaptation, or requiring little adaptation.

Planning and design for access should begin at the site layout stage, arranging accessible or fully universal homes in parts of the site that are best suited to residents with mobility challenges.

Consider day-to-day movements into and around a home, such as to and from a car, hanging out washing, or taking rubbish to the bin. These are often unconsidered, resulting in expensive modifications for things that should have been addressed at the beginning.



Arrange the site to minimise excessively long ramps on accessible routes.

### DESIGN GUIDANCE

**B2.1** Accessible and fully universal dwellings should be located on flatter parts of the site, and close to the carpark or public road for reasons of visibility, security and ease of non-vehicular access to neighbourhood amenity.

**B2.2** Treat any slope greater than 1:20 as a ramp. This will need to comply with the requirements of NZS 4121:2001 Design for access and mobility: Buildings and associated facilities.

**B2.3** Choose plant species in close proximity to accessible ramps and paths carefully, ensuring foliage doesn't obstruct the route, or create a trip hazard, and there is adequate separation from any leaf drop that may create a slip hazard.

**B2.4** Ensure landscape features such as clothes lines and letterboxes are at a height and position that is easily accessed from a wheelchair and by residents with impaired or restricted mobility.

**B2.5** Arrange the site to minimise excessively long ramps on accessible routes.

**B2.6** Maximise Full Universal Design and accessible homes on flatter sites, to offset sloping sites where accessibility is difficult to achieve.

### 3 SLOPING SITE DESIGN

A Nga matapono  
Overarching  
design principles

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Site design**

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Implementation  
and maintenance



Refer to [Design Requirements A1.3 Safety, security and privacy](#)

Refer to [Urban Design Guide 2.0 Site planning](#)

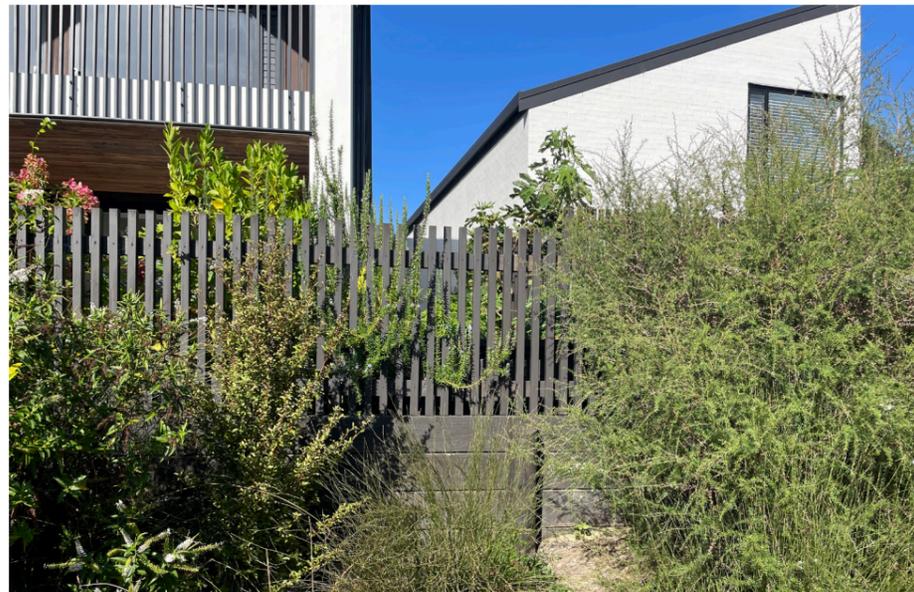
#### EXPECTATION

Developments on sloping terrain work with the natural features and contours where possible, and earthworks and retaining are kept to a minimum. Where large level changes are unavoidable, these are broken up with planting where possible to create a visually appealing outcome. Safe and reasonable access is provided, without compromising privacy.

Fencing and boundary conditions are carefully considered, avoiding overbearing vertical elements, and shaded living spaces. Key levels and sections are shown to a sufficient level of detail to demonstrate that the proposal is practically feasible, and financially viable.

#### EXPLANATION

Some of the most challenging conditions result from sites with sloping terrain, and early consideration of levels both inside and outside the site boundary is critical in achieving a successful outcome. Steep pedestrian and vehicular access routes, retaining, fencing, and overlooking are all factors that need to be carefully resolved as early as possible to avoid issues during or after construction. The landscape architect should work closely with the other disciplines to propose design solutions that result in the best possible outcome. As an intermediary between all other disciplines, the landscape architect is well placed to guide the design at the site layout level.



Landscape proposals should include mitigation of visual and environmental impacts imposed by retaining structures.

#### DESIGN GUIDANCE

- B3.1** Where slopes exceed 1:20, ensure landscape plans include key existing and proposed levels and cross-sections, in order to indicate proposed falls, gradients, retaining, and associated fencing. The level of detail should be sufficient to illustrate how the design will achieve suitable levels of access, safety, natural surveillance, and private amenity.
- B3.2** Where retaining is proposed, provide information on the height and construction of the wall, direction of retaining (top and bottom of wall) and how any fencing and planting will be arranged on or near the wall.
- B3.3** Consider the combined height of retaining walls and fences, especially how this might impact the lower side. This can create an especially poor condition where fences and retaining run between split-level houses.
- B3.4** For retaining walls that exceed 1.0m in height, consider splitting or terracing the wall, and separating with a planting bed of adequate width.
- B3.5** If safety-from-falling barriers are required above the retaining, consider setting these back to reduce the perceived height. Allow for planting to improve overall visual amenity, while considering access for maintenance.
- B3.6** Where possible, use cost-effective solutions to minimise landscape retaining. Consider gently sloping lawn for areas that are less than 1:10 and battered, planted slopes for steep ground that does not require regular access. Maintenance access should still be considered for these areas.
- B3.7** In all cases, landscape proposals should include mitigation of visual and environmental impacts imposed by retaining structures, and/or extensive siteworks.
- B3.8** Where retaining structures are in full view of streets or other frequently used public spaces, use measures to mitigate the visual impact of the retaining structures, such as proposing climbing or screening plants, using materials that fit into the local context, and/or staining bare timber.
- B3.9** Avoid retaining on the edge of a site where possible, especially when stepping down to the boundary, as this can create difficulties for access and maintenance. It can also create difficulties when there is a maximum boundary fence height, which considers the combined height of the retaining wall and fence.
- B3.10** If retaining on or near a boundary, care should be taken to avoid excavation within the root zones of existing trees either within the site, or on the boundary of neighbouring properties.

## 4 STREETScape

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Refer to [Urban Design Guide 2.3 Movement, circulation & Parking](#)

### EXPECTATION

The design of the streetscape is visually appealing, ensures safe and direct connections to the neighbourhood, and includes features that reduce vehicle speeds, and promote walking, cycling, and public transport.

Developments take design and materiality cues from the existing neighbourhood context, and fit in with the local character.

Planting along the street supports and reinforces the existing street-tree network, and mitigates the scale of the development.

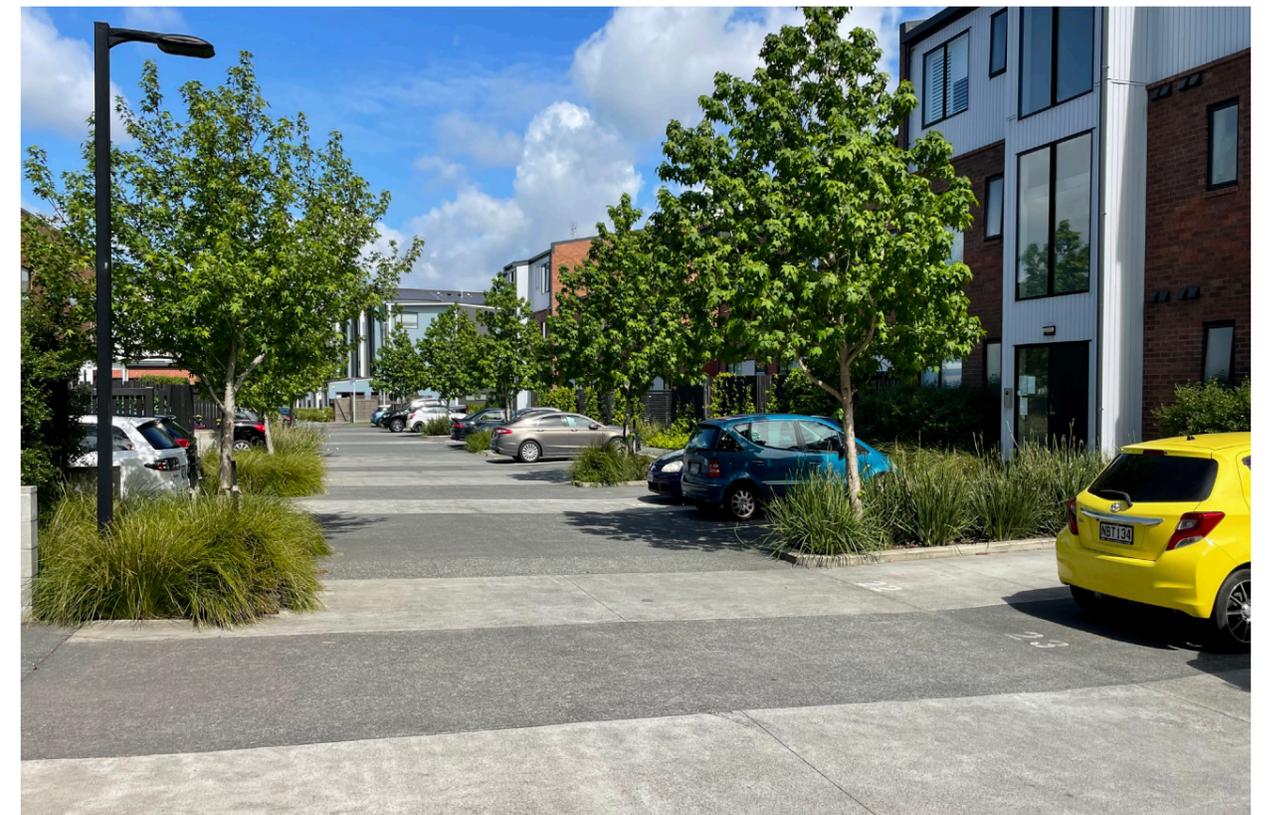
### EXPLANATION

The way our developments present to the street has a significant impact on how they are perceived, by both the residents and the public. Factors such as pedestrian-friendly access, appropriately scaled fencing and planting, and welcoming frontages all contribute strongly to our developments. These can work together to reinforce social connectivity, and foster pride in the neighbourhood.

This also applies to internal accessways. The internal street environment has even more impact on the community, as residents will spend more time in and around these spaces. The circulation networks, materiality, and planting can all contribute to a safe and well-used space.

### DESIGN GUIDANCE

- B4.1** Design streetscapes and communal spaces to promote community interaction, and include spaces specifically set-aside for people to sit, interact, socialise, and enjoy.
- B4.2** Design spaces that prioritise walking, cycling and use of public transport. Use materials, tight geometry and traffic calming to keep traffic speeds low.
- B4.3** Select plants to complement the local environment and community and mitigate the scale of development where required. Consider wider connections to green spaces and ecological networks.
- B4.4** Material selection should consider local context and neighbourhood character.
- B4.5** Prioritise pedestrian connectivity by enhancing connections within the development. Create visual cues to pedestrian priority, such as continuing pedestrian surface treatment over trafficable routes.
- B4.6** Take cues from existing street boundary conditions in the neighbourhood and ensure that our developments fit into the street as a whole.



When designing streets, use materials, tight geometry and traffic calming to keep traffic speeds low.

## 5 PEDESTRIAN CIRCULATION

A Nga matapono  
Overarching  
design principles

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Site design**

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Refer to [Design Requirements A3.1 Pedestrian Circulation](#)

Refer to [Urban Design Guide 2.3 Movement, Circulation & Parking](#)

### EXPECTATION

Our developments provide opportunity for all pedestrians and cyclists to access and move around the site safely and easily. Through physical and visual cues, vehicle users are made aware that pedestrians and cyclists have priority.

### EXPLANATION

Successful neighbourhoods and places are characterised by high levels of pedestrian activity that, in turn, support community interaction and tiakitanga/stewardship.

Pedestrian safety is a critical consideration, and takes precedence over vehicular circulation.



Prioritise pedestrians by clearly delineating pedestrian routes through change of material, colour, or texture.

### DESIGN GUIDANCE

**B5.1** Prioritise pedestrian access and safety over vehicle movement, through clearly defined footpaths from the street to front doors.

**B5.2** For stand-alone, duplex and terraced housing, ensure ungated access to front doors. This is not always practical, so ungated access may be provided to a rear door as an alternative. If neither is possible, engage with the Place-Based Team for direction.

**B5.3** Design any shared or common access-ways to give priority to pedestrians, by clearly delineating pedestrian routes through change of material, colour, or texture.

**B5.4** Where dwellings are required to be accessible, provide footpaths that align with Kāinga Ora performance requirements, and meet the requirements the New Zealand Building Code Clause D1: Access routes.

**B5.5** Pedestrian paths to the main entry must be at least 1200mm wide and provide the most direct pathway for pedestrians and those with a mobility impairment from the street front.

**B5.6** For entrance paths to multi-unit developments, use planting to separate paths from vehicle routes where space allows. Avoid completely isolating the two as their combined activity increases natural surveillance within the internal streetscape.

**B5.7** Wherever possible and appropriate, provide pedestrian links to adjacent, publicly accessible land such as schools, reserves, and esplanades.

**B5.8** Ensure pedestrian paths are located to allow maximum visibility for pedestrians and vehicles, avoiding paths running directly behind carparks wherever possible. Equally, there should be sufficient refuge for residents exiting doors and gates into areas where vehicles are manoeuvring.

## 6 VEHICULAR CIRCULATION

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Overarching  
design principles
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Refer to [Design Requirements A3 Site movement and circulation](#)

Refer to [Urban Design Guide 2.3 Movement, circulation & parking](#)

### EXPECTATION

Vehicles are incorporated into developments with a focus on safety and are secondary to other modes of transport and movement. Vehicular routes are clearly defined, and are no larger than they need to be, to minimise impervious surfaces. Traffic-calming features, such as planted build-outs, narrow carriageways, and material changes, are incorporated to reduce vehicle speeds.

### EXPLANATION

In our developments, common accessways should be approached just like any street environment. The priority should always be on pedestrians and non-motorised forms of transport. Although cars are a necessity for most people, they should not dominate communal spaces.

Accessways should allow sufficient space for vehicles to manoeuvre, especially large vehicles such as refuse trucks, fire appliances, and delivery vehicles where appropriate. Not allowing for these movements creates a compromised space for years to come.

Materiality can be used to clearly define pedestrian and cycle routes into and around the site. Visibility between all users should be maximised, ensuring that everyone using the space is safe.



Ensure good connectivity by providing more than one connection to the public street network.

### DESIGN GUIDANCE

- B6.1** Create an internal streetscape environment that prioritises pedestrian amenity, legibility and safety, and is activated and overlooked by dwellings.
- B6.2** Configure common access ways to allow direct sight lines from homes and communal or public areas, such as public streets or parks. Avoid blind-spots and paths branching off main routes with poor surveillance.
- B6.3** Where possible, ensure good connectivity by providing more than one connection to the public street network.
- B6.4** Configure common access-ways to minimise impervious surfaces, affording sufficient space for vehicle manoeuvring and safe pedestrian access to dwellings.
- B6.5** Ensure large areas of paved surfaces are broken up by material change and planting. For example, break up long runs of parking with adequately sized tree pits, and use planted build-outs as traffic calming.
- B6.6** To support pedestrian safety, it is preferred to provide a grade separation between vehicle access-ways and pedestrian paths through the use of mountable kerbs.
- B6.7** Where space does not allow grade-separated paths, pedestrian access can be incorporated into the driveway. Flush or at-grade pedestrian routes must be clearly defined by a change in material, colour or texture to signal a pedestrian priority route.
- B6.8** Shared surfaces can work well for many people but can be unsafe for certain parts of the community. These should be avoided.
- B6.9** Ensure fencing and planting along accessways allows clear sightlines for vehicles and pedestrians, and at junctions with driveways and the public street network.
- B6.10** Vary surface treatment to break down the visual impact of large areas of paving. Ensure changes in material are practical to construct.
- B6.11** Provide lighting for safe night-time access which should be coordinated with a lighting engineer. Give careful consideration to placement to avoid glare and light spill into adjacent or nearby dwellings, and other sensitive areas.
- B6.12** Ensure the layout of common accessways can be easily navigated by visitors and residents alike, minimising the need for way-finding signage. Where additional signage is required (such as for dedicated parking), ensure it is simple, effective, and discreet, and does not identify the development as public housing.

## 7 COMMUNAL PARKING AND SERVICE AREAS

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Implementation and maintenance



Refer to [Design Requirements A2.3 Outdoor service area](#)

### EXPECTATION

Shared parking, and shared service areas are conveniently located, well screened, and in view of the dwellings.

### EXPLANATION

The location, design, and treatment of communal parking and service areas can have significant impact on how a development is viewed, both by residents and the public.

Parking should not dominate the public frontage of a development, and large areas of parking should be broken up with planting and trees.

Communal facilities should be located conveniently for residents, but consideration should also be given to visibility from communal spaces and the street. If necessary, screening and planting can reduce the visual dominance.

Consider day-to-day practicalities, such as getting to and from parking areas safely and easily, accessing communal bin stores, and providing taps to wash down bin areas.



Consider changes in surface material that differentiate parking bays from manoeuvring aisles, to break down the visual impact of expansive areas of hardstand.

### DESIGN GUIDANCE

- B7.1** Locate shared parking for bicycles and mobility scooters in close proximity to the dwellings they serve. Ensure they are visible from homes, and are well screened to the street.
- B7.2** Ensure all parking spaces are well defined with signage identifying the units they serve. Include measures such as boulders, kerbs, bollards, or wheel-stops to eliminate 'opportunity' parking in amenity areas not intended for parking.
- B7.3** For larger areas of shared parking, reduce the impact of open hardstand with suitably scaled trees. Ensure all tree foliage enables clear sightlines.
- B7.4** Consider changes in surface material texture or colours that differentiate parking bays from manoeuvring aisles, to break down the visual impact of expansive areas of hardstand. Exposed aggregate concrete offers the advantage of concealing oil spills and tyre marks.
- B7.5** Use suitable screening such as walls, fences, or planting to avoid light spill from cars into dwellings.
- B7.6** Ensure parking proposals incorporate provisions that promote alternative modes of transport, including access to public transport and secure cycle parking.
- B7.7** Bicycle parking can be free-standing or built into the architecture. This needs to provide cover for bikes and the ability for each bicycle to be securely locked.
- B7.8** Configure vehicle access to parking areas to avoid the need to reverse onto roads.
- B7.9** Locate shared refuse collection areas in screened locations where they can be accessed by rubbish collection vehicles and away from the street frontage where possible.
- B7.10** Ensure refuse collection areas can be readily accessed from all dwellings. Liaise with rubbish collection providers to correctly size the storage area required for each development and to obtain tracking dimensions of collection vehicles.
- B7.11** For communal bin storage areas, ensure that they are located in a central, practical and easily accessed location, are sized in accordance with local authority requirements, and are located and sufficiently screened.
- B7.12** Include a lockable external hose tap in each refuse collection area.
- B7.13** A fire-rated block wall may be appropriate as a buffer for parking or rubbish bins where located directly adjacent to a boundary.
- B7.14** Provide 1.2m wide pedestrian accessways between rubbish collection areas, cycle and mobility scooter parking and main building entry points. Wherever possible, ensure accessways meet universal design criteria.
- B7.15** Ensure all proposed parking, street, and driveway layouts have been reviewed and approved by the project traffic engineer.
- B7.16** In centralised car parking areas, stacked vehicle parking is to be avoided in carparks as it can cause problems with vehicle manoeuvring and access to parked vehicles.
- B7.17** Within communal carpark areas, ensure there is adequate space for on-site manoeuvring, avoiding excessive lengths of reversing.
- B7.18** When arranging carparks, avoid situations where cars are required to reverse past or towards front doors. If this is unavoidable, ensure there is adequate separation.
- B7.19** Provide visual relief and traffic calming to longer lengths of accessway through variation in texture and colour of the surface, and planting.

## 8 COMMUNAL OUTDOOR RECREATION SPACE

### EXPECTATION

Residents in multi-unit developments have access to a central, flexible, and welcoming communal outdoor space. It is located to be well overlooked and sunny. The space is sized in proportion to the scale of the development and is suited to the make-up of the intended cohort, allowing flexibility for residents to make the space their own over time.

### EXPLANATION

The trend towards higher density living with limited outdoor space afforded to individual dwellings requires an approach that is supplemented by communal outdoor spaces.

These communal spaces should foster and enable community interaction, while encouraging play opportunities for all. These spaces should enable residents to experience, share, and build collective social capital.

The design of communal spaces should respond to the scale of the development and the proximity to surrounding open space and amenities as well as the anticipated demographic mix of residents. Design communal outdoor recreation spaces as outdoor rooms that require the same amount of careful design and furnishing as any other room in a development.

Outdoor recreation spaces benefit hugely from the residents taking ownership of them over time. Allowing flexibility for spaces to be developed to suit the needs of the community.

A Nga matapono  
Overarching  
design principles

### B Āhua Wāhi Site design

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Refer to [Design Requirements A2.2 Communal outdoor recreation space](#)

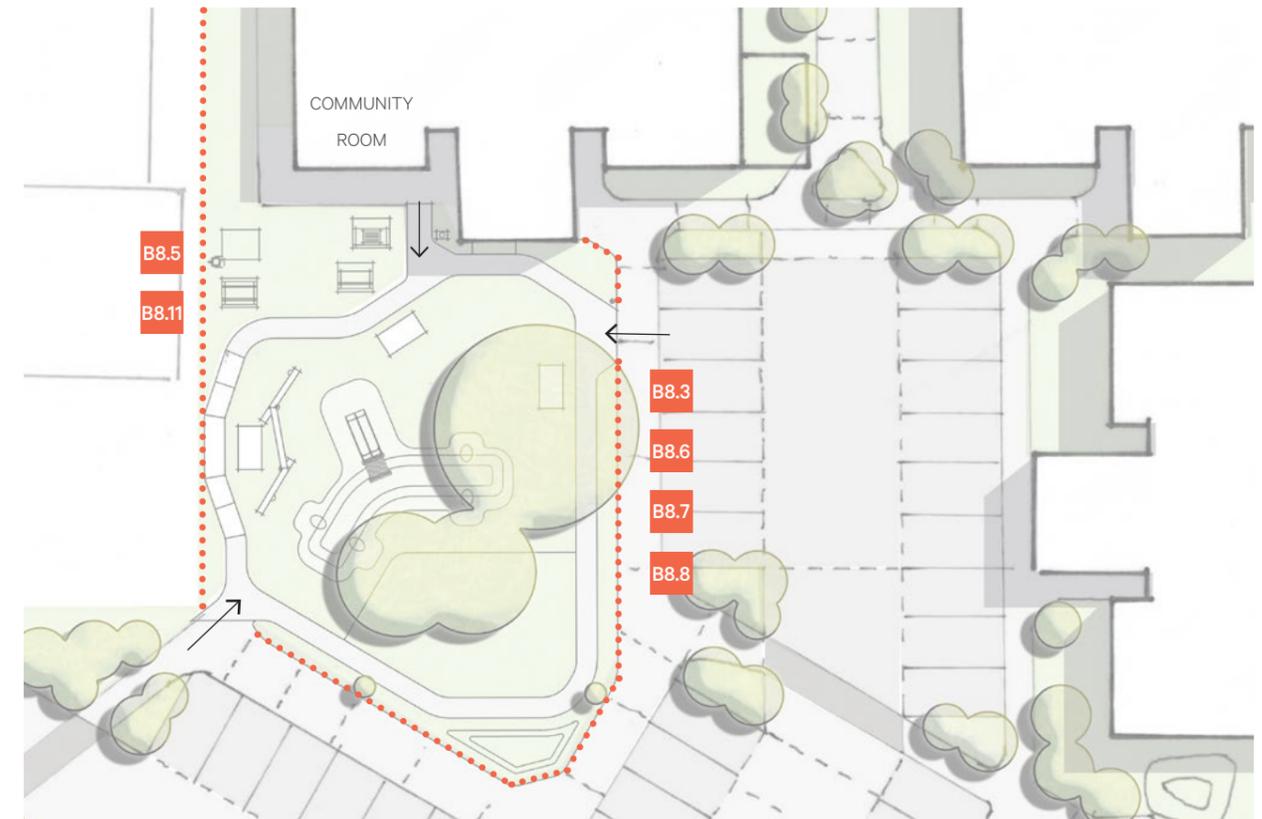


## DESIGN GUIDANCE

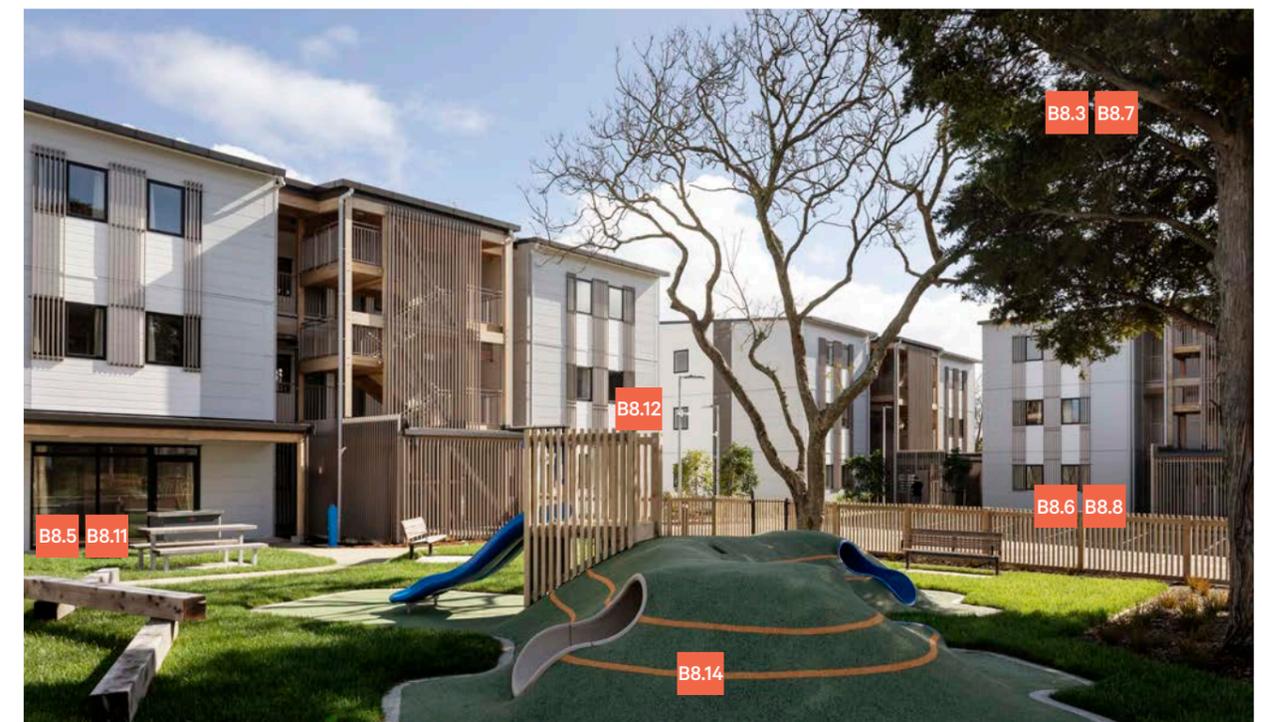
- B8.1** Locate the primary communal outdoor recreation spaces in sunny, sheltered, and central locations, with gradients predominantly less than 1:20 and with direct sightlines from dwellings, the street, and/or other well-used public spaces.
- B8.2** Avoid locating spaces in isolated or inaccessible areas, narrow side yards or adjacent to private outdoor spaces or communal service areas.
- B8.3** The retention of significant existing trees on a development site should be prioritised. Large trees can provide focal points for the design of communal spaces, providing shade, character, ecological outcomes, sense of place, and cultural perspective.
- B8.4** The design of communal outdoor recreation spaces should reflect both the scale of the development, and the anticipated cohort.
- B8.5** Consider amenities to assist in activating the communal space and existing vegetation that can be retained, include seating and picnic areas, productive gardens and fruiting trees and structural elements that encourage play.
- B8.6** Where children's play is proposed, ensure these areas are separate from vehicle circulation routes and prioritise children's safety. Consider the placement of play activities in relation to neighbours and residents.
- B8.7** Consider the environmental aspects of the space, maximise direct sunlight and provide shade and protection from prevailing winds. Consider providing covered areas for rainy-day activities and to encourage the space to be used year-round.
- B8.8** Communal outdoor recreation spaces should be easy to maintain and have well-defined boundaries with no ambiguity or leftover areas. Design communal spaces so there

is a clear distinction between any areas designated for servicing (rubbish collection, outdoor washing-drying spaces) and communal amenity spaces.

- B8.9** Ensure CPTED principles and strategies are applied with regards to natural surveillance, access control, and avoidance of potential entrapment zones. Where required, provide artificial lighting, taking care to avoid light spill into adjacent dwellings.
- B8.10** Consider the space's role in terms of the ecological context of the surrounding landscape. Use native planting to reinforce ecological corridors and explore the opportunity to create areas that support habitat for birds and microfauna.
- B8.11** Design the space to promote and enable year-round use in a range of weather conditions. Include features such as seating, slip-resistant paving, picnic areas, wind screening, pergolas and shading devices.
- B8.12** Include adequate lighting that facilitates use of the space but is not a nuisance to neighbours.
- B8.13** Consider including a communal garden as part of, or in addition to the communal outdoor recreation spaces. This provides opportunities for exercise and sharing and learning while giving customers a sense of ownership, building community spirit, and providing a source of fresh, healthy food.
- B8.14** Use landscaping, surface treatment, or a change of grade within the common open space to separate play areas. This will minimise differences and potential conflicts between the interests of different age groups. Provide well-placed seating to encourage parent supervision of children.



Bader McKenzie - Communal Outdoor Recreation Space



Bader McKenzie - Playground

A Nga matapono  
Overarching  
design principles

**B Āhua Wāhi  
Site design**

- 1 Site design strategy
  - 2 Accessible landscape
  - 3 Sloping site design
  - 4 Streetscape
  - 5 Pedestrian circulation
  - 6 Vehicular circulation
  - 7 Communal parking and service areas
  - 8 Communal outdoor recreation space**
- C Āhua Kāinga  
Lot design
- D Āhua Paenga  
Boundary design
- E Āhua Paenga  
Hardscape design
- F Āhua Taiao  
Planting design
- G Whakatinana  
Implementation  
and maintenance

**Active play space**

**B8.15** Play areas have social value for parents and carers of young children, as a meeting place for informal interaction, that can help reduce the pressures of childcare responsibilities.

**B8.16** Providing an active play area for children encourages people to be more active. More frequent activity has a positive impact on children's health and wellbeing.

**B8.17** When providing play spaces consider the following:

- a range of ages from preschool to teenagers
- full range of abilities
- seating for parents and carers
- areas are separated from on-site hazards
- areas are located to provide natural surveillance from roads, windows, and balconies.

**B8.18** Following these recommendations can help to promote safety and reduce the risk of injury along with providing secure fencing and opportunities for parental supervision.

**B8.19** Provide a variety of natural play elements to encourage a range of physical movement such as jumping, rolling, running, and crawling.

**B8.20** Provide a suitable level surface for informal games and similar activities that can be used by a range of ages.

**B8.21** Natural play elements, such as timber balance beams, varying-height timber stepper logs, accessible garden beds and topography/landforms encourage children of all abilities to engage with nature while playing.



Natural play elements, such as timber balance beams, varying-height timber stepper logs, encourage children to engage with nature while playing.



Play areas have social value for parents and carers of young children, as a meeting place for informal interaction, that can help reduce the pressures of childcare responsibilities.



Provide a variety of play equipment to encourage a range of physical movement.



# ĀHUA KĀINGA LOT DESIGN

- A Nga matapono  
Overarching  
design principles
- B Āhua Wāhi  
Site design
- C Āhua Kāinga  
Lot design**
  - 1 Lot design  
strategy
  - 2 Pedestrian  
circulation
  - 3 Driveways and  
parking areas
  - 4 Outdoor service  
areas
  - 5 Private outdoor  
space
  - 6 Side yards
- D Āhua Paenga  
Boundary design
- E Āhua Paenga  
Hardscape design
- F Āhua Taiao  
Planting design
- G Whakatinana  
Implementation  
and maintenance



## OVERVIEW

Well-designed outdoor spaces provide a place in which our residents play, relax, socialise, grow food, and enjoy their privacy. As the need for density increases, it is important that these are highly functional spaces.

This section sets out guidelines to ensure all lot designs promote and contribute to achieving safe, well-connected, integrated communities, as well as catering to the needs of the residents who live within them.

Landscape design responses should take into consideration how the private spaces will be used day to day, ensuring they are practical, functional, and enjoyable.

For all material and plant selections in public housing developments, the landscape design should embody low-impact, low-maintenance principles. Sustainable materials should be balanced with longevity, and how they will perform across the whole life of the development.

## 1 LOT DESIGN STRATEGY

A Nga matapono  
Overarching  
design principles

B Āhua Wāhi  
Site design

### C Āhua Kāinga Lot design

#### 1 Lot design strategy

2 Pedestrian  
circulation

3 Driveways and  
parking areas

4 Outdoor service  
areas

5 Private outdoor  
space

6 Side yards

D Āhua Paenga  
Boundary design

E Āhua Paenga  
Hardscape design

F Āhua Taiao  
Planting design

G Whakatinana  
Implementation  
and maintenance



Refer to [Design Requirements A1.2 Site response: Building form and orientation](#)

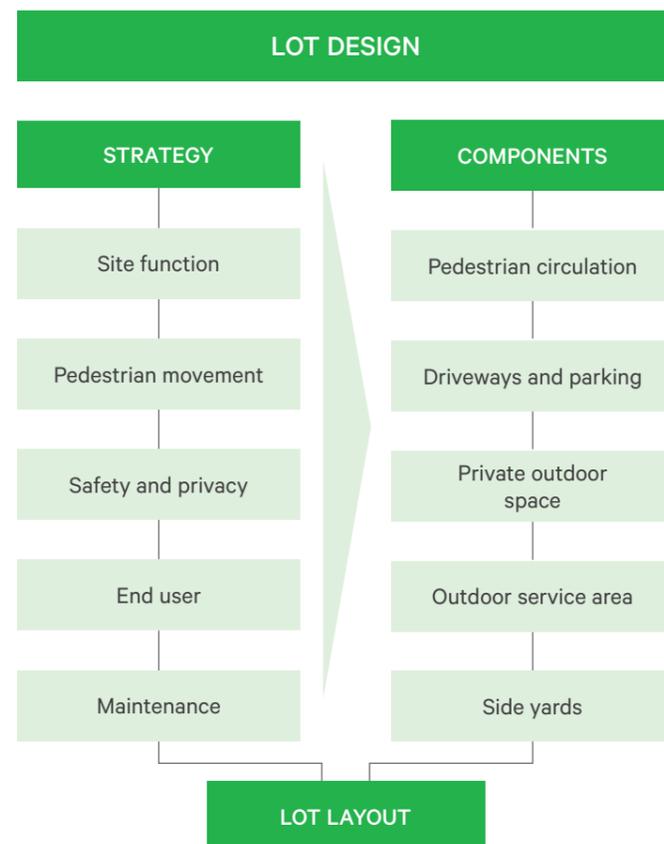
### EXPECTATION

Lot design is a comprehensive consideration of how the space is used and lived in on a day-to-day basis, throughout the seasons, and over the longer term as our climate changes. The design should be a simple, robust landscape scheme that residents can take ownership of and add to over time.

### EXPLANATION

Through good design, an efficient lot layout can be achieved, optimising functionality and circulation, and minimising impervious surfaces. It is critical for a designer to understand how the spaces will function.

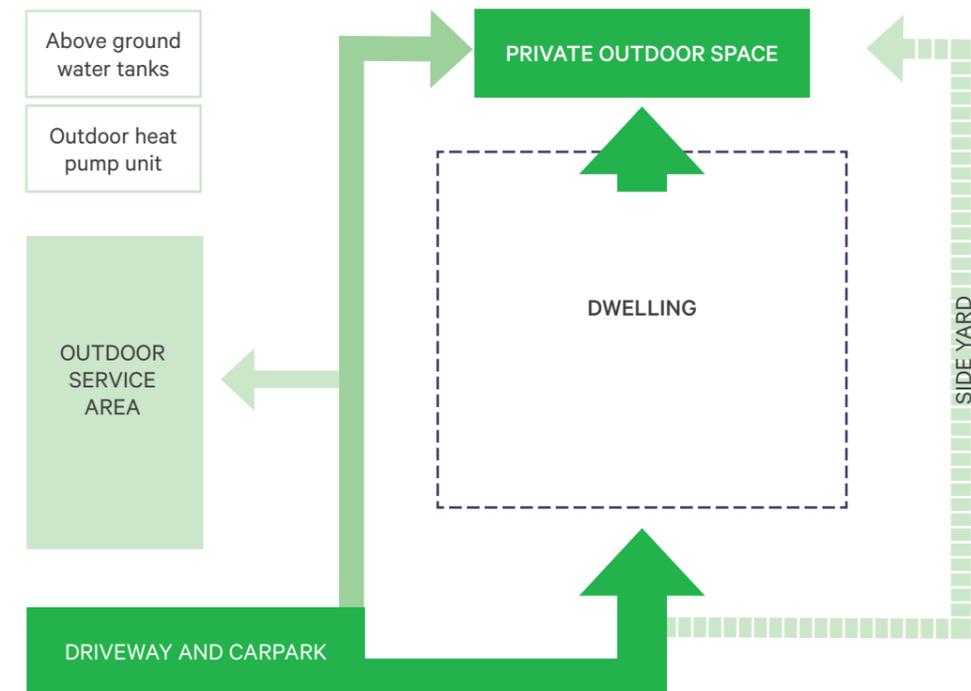
While planning the lot components, consideration needs to be given to implementation, maintenance, and whole-life performance.



## DESIGN GUIDANCE

- C1.1** For all stand-alone, duplex, and terraced housing, clearly delineate all lot boundaries to enable residents to identify the extent of their property so there is no ambiguity with regard to defensible space, and responsibility for maintenance.
- C1.2** Ensure that fencing, planting, or other landscape elements do not obstruct sight lines to public and communal areas, to ensure adequate natural surveillance from homes.
- C1.3** Interaction with the streetscape should be carefully considered, with clear entries and a sense of arrival, avoiding high fences or planting to the street or common accessway, and minimising placement of elements such as bins and storage sheds.
- C1.4** Patios or decks are to be directly accessible from living areas, of a practical size and arrangement, and with suitable access to and from the rest of the private outdoor spaces. Careful consideration should be given where level changes impact the access to the home.
- C1.5** Orient private outdoor spaces for adequate solar access, while maintaining privacy, and minimising visual impact, especially where living areas face onto public or communal spaces.
- C1.6** Avoid overlooking through careful positioning of outdoor spaces, and the use of landscape elements such as planting, screens, fences, and elevation.
- C1.7** Each lot shall provide space for utilities such as rubbish and recycling bins, clothes lines, and outdoor storage if not provided in common space. If required, heat pump units, and above-ground water tanks should be incorporated. Ensure practical and unobstructed access.
- C1.8** If stormwater detention tanks are not able to be incorporated in the communal area, ensure above-ground water tanks are located either within the utility area, or, if that is not possible, in a discreet location, away from windows and living areas, and not obstructing pathways or sightlines.
- C1.9** Where possible, avoid dead-end side yards, as these become difficult spaces to maintain. If grass is unlikely to grow due to shading, consider a hardy groundcover that could withstand being walked on every now and then. Stepping stones or loose surfaces such as bark chip or aggregate are not acceptable solutions.
- C1.10** Utility areas should be easily accessed from the dwelling, the driveway (where appropriate), and the private outdoor space. Ensure there is no clash between gates, doors, or windows, and that paths are not obstructed by clothes lines.
- C1.11** Rubbish bins should be practically located to be away from living spaces and windows, and within easy access to the street or collection point. If bins are at the street front, they should be screened from view while still ensuring ease of access.

- C1.12** Provide planting that is suited to local geographic and climatic conditions, and will not become a maintenance issue as it matures.
- C1.13** Within private lots, minimise length and width (typically 800mm wide) of the extent of paths required to access service areas and other essential functions. Locate outdoor service functions close to dwelling entries while balancing other requirements such as solar access for clothes lines.



**Fig. 1** Individual lot - typical layout and circulation

## 2 PEDESTRIAN CIRCULATION

- A Nga matapono  
Overarching design principles
- B Āhua Wāhi  
Site design
- C Āhua Kāinga  
Lot design**
  - 1 Lot design strategy
  - 2 Pedestrian circulation**
  - 3 Driveways and parking areas
  - 4 Outdoor service areas
  - 5 Private outdoor space
  - 6 Side yards
- D Āhua Paenga  
Boundary design
- E Āhua Paenga  
Hardscape design
- F Āhua Taiao  
Planting design
- G Whakatinana  
Implementation and maintenance

### EXPECTATION

Residents have clear and easy access into and around their homes, and are able to carry out day-to-day activities with ease. Pedestrian paths provide a durable, and slip-free surface at a width and gradient that is suitable for all users.

### EXPLANATION

Pedestrian circulation routes need to be as direct and functional as possible. The design and treatment of paths and walkways should prioritise pedestrian safety and amenity. Paths should be suited to the intended use, and be of an appropriate width and gradient for the residents that will be using them. Paths should be balanced with the site permeability requirements, and all-weather paths should be focused to key routes, and efficiently oriented.

### DESIGN GUIDANCE

- C2.1** Provide all dwellings with a minimum 1200mm wide path from the street and carpark to the front door of the property.
- C2.2** For non-accessible homes, primary paths to the front door or connecting the rear yard to the street should be 1200mm wide. Secondary paths such as side yard or maintenance access can be 600–1000mm wide.
- C2.3** Where possible, footpath gradients should not exceed a slope of 1:20. Where paths are at a steeper gradient, ensure there are no steep drop-offs on either side of the path.
- C2.4** For Full Universal Design units with paths over 1:20 slope, consider how handrails will impact the design if the home is converted to accessible in future.
- C2.5** Surface treatments should comprise non-slip finish that is visibly different in colour or texture from any vehicular areas, and laid with adequate falls to prevent ponding. Consider surface texture for better grip where slopes exceed 1:12.
- C2.6** While the preference is generally to minimise impervious surfaces, all-weather paths should be provided anywhere there is likely to be frequent access within the lot. Primarily, this means connections between doors, patios or decks, driveway access, and service areas.
- C2.7** Permeable paving surfaces are encouraged within developments, but it is preferred that unit pavers are focused to areas of lower pedestrian activity. Stepping stones are not an accepted solution due to increased maintenance requirements.



Refer to [Design Requirements A3.1 Pedestrian circulation](#)

### 3 DRIVEWAY AND PARKING AREAS

A Nga matapono  
Overarching  
design principles

B Āhua Wāhi  
Site design

**C Āhua Kāinga  
Lot design**

1 Lot design  
strategy

2 Pedestrian  
circulation

**3 Driveways and  
parking areas**

4 Outdoor service  
areas

5 Private outdoor  
space

6 Side yards

D Āhua Paenga  
Boundary design

E Āhua Paenga  
Hardscape design

F Āhua Taiao  
Planting design

G Whakatinana  
Implementation  
and maintenance

#### EXPECTATION

Residents have safe and easy vehicular access to their homes. Driveways and parking areas are separated from living areas, have good visibility, and give priority to pedestrians and cyclists.

#### EXPLANATION

Driveway safety is one of the most critical concerns for Kāinga Ora. It is important that both pedestrians and vehicle users can use the same spaces safely, and have clear visibility and sightlines. Ensuring the safety of all residents – in particular, children – is paramount.



Driveways and parking areas are separated from living areas, have good visibility, and give priority to pedestrians and cyclists.

#### DESIGN GUIDANCE

**C3.1** Minimise the surface area of driveways, while affording sufficient space for vehicle manoeuvring and parking. Maximise the extent of permeable surface and planting.

**C3.2** Provide pedestrian access to the front door that is separate from the driveway.

**C3.3** Avoid an additional path from a car park to a front door if an existing public or communal path can be used. If the distance is impractical, then a direct path may be provided. This can be screened with planting and/or fencing from the public footpath.

**C3.4** If planting is to be used between parking and pathways, ensure the planting is of an adequate size, and safe from damage by vehicles.

**C3.5** Ensure driveways, associated fencing and planting areas are configured to provide unimpeded sightlines between pedestrians, cyclists, and vehicles.

**C3.6** If communal parking is required, provide safe and clear access between the carpark and the front door.

**C3.7** Securely fence all private yards and private outdoor spaces from driveways with non-climbable fences that are at least 1200mm high, with child-proof latches on gates.

**C3.8** Avoid continuous lengths of high fencing along driveways, as this reduces sightlines and surveillance. Ensure any fencing or planting adjacent to driveways has the required visibility splays and is approved by the project traffic engineer.

**C3.9** If permeable paving is required in order to meet permeability requirements, aim to limit this to carpark bays.

**C3.10** Avoid street-front car parks that are parallel to the street, as this is generally viewed negatively by local authorities. If it is unavoidable, ensure adequate separation from the street, with appropriate fencing and planting to assist in screening.

**C3.11** Where possible, avoid vehicle crossings that result in dropdowns to the public footpath. To reinforce pedestrian priority, public footpaths should stay at the same level and continue the same material and texture.

**C3.12** Ensure planting does not provide an obstruction when getting out of the car, or walking to the house, and that trees are either columnar in form or have a raised canopy to enable clear visibility above ground.

**C3.13** Ensure all proposed parking, street, and driveway layouts have been reviewed and approved by the project traffic engineer.



Where driveways are located on the boundary, consider using a material change as boundary demarcation.



Refer to [Design Requirements A3.2 Driveway safety](#)  
[A3.3 Carparking](#)

- A Nga matapono  
Overarching design principles
- B Āhua Wāhi  
Site design
- C Āhua Kāinga  
Lot design**
  - 1 Lot design strategy
  - 2 Pedestrian circulation
  - 3 Driveways and parking areas
  - 4 Outdoor service areas**
  - 5 Private outdoor space**
  - 6 Side yards
- D Āhua Paenga  
Boundary design
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- F Āhua Taiao  
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Implementation and maintenance



Refer to [Design Requirements A2.3 Outdoor service areas](#)  
[A2.1 Private outdoor spaces](#)

Refer to [Landscape Design Guide D Boundary Design](#)

## 4 OUTDOOR SERVICE AREAS

### EXPECTATION

All ground-floor dwellings are provided with a practically arranged, and appropriately sized outdoor service area that is functional, accessible, and discreetly located.

### EXPLANATION

Functional aspects of outdoor service areas, including sunlight to clothes lines and convenience of access, need to be balanced with discreet positioning and adequate screening.

### DESIGN GUIDANCE

- |  |  |
|--|--|
| <p><b>C4.1</b> Provide all stand-alone houses, duplexes, and end-of-terrace units with functional outdoor service areas for rubbish bins, outdoor storage, clothes lines and any other elements such as heat pump units and stormwater detention tanks.</p>  | <p><b>C4.4</b> For terraced units where there is no external access to rear yards, consider providing screened enclosures at the front of the unit to locate rubbish and recycling bins. If space allows, secure bicycle enclosures may be provided.</p> |
| <p><b>C4.2</b> These areas should be efficiently planned to minimise the amount of space and impervious surfaces, but should be arranged to allow adequate access, and not obstruct circulation routes.</p>  | <p><b>C4.5</b> Locate utility elements such as bins, clothes lines and outdoor storage away from private outdoor spaces and, wherever possible, avoid locating them in full view of the indoor living and dining areas.</p>                              |
| <p><b>C4.3</b> Paved access should be provided from anticipated access routes to service areas – for example, connecting side yard access, sheds, bins, clothes lines, and patios. The surface under clothes lines should be paved. Provide an area of hardstand in front of sheds to allow suitable access.</p> | <p><b>C4.6</b> Outdoor storage sheds may not be required in smaller lots – for example, where there is no lawn. A smaller storage box may be adequate as an alternative. Confirm this with the Place-Based Team before proceeding.</p>                   |

## 5 PRIVATE OUTDOOR SPACE

### EXPECTATION

Residents have a private external space that is appropriately sized to the dwelling, and provides opportunity to comfortably relax, socialise, and play outdoors.

### EXPLANATION

Private outdoor spaces include external living areas in the form of decks, paved patio areas, or balconies for apartments. These should be designed to create secure outdoor areas where children can play safely without direct supervision.

Privacy is a key consideration for public housing, and can be a defining factor in whether a space is used or not. Other considerations are ensuring a practically sized area, access to and around the space and good solar orientation in balance with shelter and shade, and surfaces that allow a variety of uses.

### DESIGN GUIDANCE

- |  |  |
|--|--|
| <p><b>C5.1</b> Ensure all outdoor areas are of a practical size in relation to the size of the home, and comply with the standards and requirements of both Kāinga Ora and the relevant local authority.</p>   | <p><b>C5.5</b> Artificial turf is to be avoided wherever possible.</p>   |
| <p><b>C5.2</b> Prioritise residents' privacy within these spaces in order to avoid exposure to the street or neighbours. This can be achieved through the use of fences, vegetation, and changes in level. Avoid relying on planting alone, as this takes time to establish, and leaves living areas exposed in the meantime.</p>                    | <p><b>C5.6</b> Where private outdoor spaces are adjacent to a street, shared/public accessway, or communal space, ensure fences are high enough to afford residents sufficient privacy, while providing a degree of visual permeability in the upper section for passive surveillance.</p> |
| <p><b>C5.3</b> Land-locked private outdoor spaces where there is no external access to the rear yards, should be designed to minimise the need for garden waste to be removed via internal access. For example, the patio or deck could be increased in size and balanced with larger garden beds where plant material may be composted on site.</p> | <p><b>C5.7</b> Private outdoor spaces are to be directly adjacent to and visible from living areas. Careful consideration should be given where level changes impact the access between private outdoor spaces, and into the home.</p>   |
| <p><b>C5.4</b> In land-locked private outdoor spaces, low storage garden box may be provided for garden tools.</p>   | <p><b>C5.8</b> Screen private outdoor spaces to achieve suitable privacy from one another and from public vantage points while ensuring unobstructed access is provided to all other common external areas.</p>  |
|  | <p><b>C5.9</b> For one-bedroom dwellings, all ground-level areas (other than the paved private outdoor space) will be maintained by Kāinga Ora.</p>  |

## 6 SIDE YARDS

A Nga matapono  
Overarching  
design principles

B Āhua Wāhi  
Site design

**C Āhua Kāinga  
Lot design**

- 1 Lot design strategy
- 2 Pedestrian circulation
- 3 Driveways and parking areas
- 4 Outdoor service areas
- 5 Private outdoor space

**6 Side yards**

D Āhua Paenga  
Boundary design

E Āhua Paenga  
Hardscape design

F Āhua Taiao  
Planting design

G Whakatinana  
Implementation  
and maintenance

### EXPECTATION

Side yards allowing access to the rear of a property are functional, and provide adequate privacy, visibility, and accessibility where appropriate. Any service elements are adequately screened, and do not obstruct access and circulation.

### EXPLANATION

As well as providing access, primary side yards are often an ideal location for services such as rubbish bins, clothes lines, and outdoor storage if space allows. Ideally these are located out of view of living area windows, and are screened from public and communal areas.

Secondary side yards are often narrow, shady, and difficult to access, making maintenance of any planting a challenge. This can be avoided by providing suitable external access. The surface treatment options should ensure practical, safe access, and minimal upkeep. If access is likely to be infrequent, a hardy groundcover may be suitable.

Any planting in side yards should be appropriate to the space and conditions. Planting should be selected to ensure it does not cause maintenance and access issues as it matures.



Avoid narrow, dead-end side yards whenever possible.

### DESIGN GUIDANCE

**C6.1** For side yards providing primary access to the rear yard, provide a 1200mm wide, unobstructed concrete path that connects to the main private outdoor space, and service area if relevant.

**C6.2** For side yards providing secondary access, provide a 600–1000mm-wide concrete path, with a cross-fall away from the building. Planting should be appropriate to the space available – for example, a shade-tolerant ground cover, climber, compact shrub that won't grow to obstruct the path.

**C6.3** Avoid narrow, dead-end side yards whenever possible.

**C6.4** Lawn should only be used in side yards that receive a minimum of 4 hours' direct sunlight per day. This will allow the area to be maintained by mowing, while providing a usable area for residents.

**C6.5** Avoid pebbles or other loose aggregate surface treatment (including bark mulch), which require regular maintenance and topping up, placing a significant cost and maintenance burden on the Asset Teams.

**C6.6** If there are no elements in the side yard that require screening or privacy, a 1200–1500mm high fence is acceptable. For side yards with elements such as sheds or clothes lines that require screening, fences can be 1800mm high, with a visually permeable section at the top.

**C6.7** Where houses are directly adjacent, consider the use of planting within the side yard to provide some screening between windows if space allows.



Refer to [Design Requirements A2.3 Outdoor service areas](#)  
[A2.1 Private outdoor spaces](#)

Refer to [Landscape Design Guide D Boundary design](#)



# ĀHUA PAENGA BOUNDARY DESIGN

A Nga matapono  
Overarching  
design principles

B Āhua Wāhi  
Site design

C Āhua Kāinga  
Lot design

**D Āhua Paenga  
Boundary design**

1 CPTED & Privacy

2 Fencing strategy

3 Low-height  
fences

4 Mid-height  
fences

5 Full-height  
fences

6 Visually  
permeable  
fences

7 Gates

E Āhua Paenga  
Hardscape design

F Āhua Taiao  
Planting design

G Whakatinana  
Implementation  
and maintenance



## OVERVIEW

The design guidance in this section sets out to ensure all boundary treatments in our developments enable our residents to feel safe residing in their homes, with well-designed, functional outdoor spaces. Boundary treatments need to be visually appealing, provide clear delineation of public and private spaces, and allow a balance between privacy and natural surveillance.

While fencing is only one of a number of boundary treatments, it is one of the most immediately visible elements of our developments, and can impact people's immediate reaction – whether they live there, or are passing by. It is important for our residents to feel safe, and to feel that they have privacy when they need it. The boundary treatment has a direct impact on both of these needs.

Ensuring visibility from homes out to the streets, accessways, walkways, or communal spaces is a vital component of CPTED. People coming into a site are less likely to undertake anti-social behaviour if they feel they can be seen. Boundary treatments have a direct impact on surveillance and visibility, making a critical contribution to safer living environments.

# 1 CPTED AND PRIVACY

## EXPECTATION

Our boundary treatments foster safer neighbourhood environments by enabling natural surveillance between private homes and public spaces, while affording our residents suitable levels of privacy, sun, and outlook.

## EXPLANATION

Safety and security are best achieved where the layout and outlook of houses are designed to create and support safe and secure neighbourhood communities, in accordance with CPTED principles. The ability to see and be seen is a key factor in creating safe environments. Boundary treatments play a vital role by ensuring mutual natural surveillance is enabled between the public and private spaces.

## DESIGN GUIDANCE

**D1.1** Design boundary treatments to enable good natural surveillance of streets, parking, public accessways, walkways, and common areas.

**D1.2** Design fencing to maintain sightlines to front entrances, and remove opportunities for concealment and entrapment.

**D1.3** Avoid high fencing that screens the house from the street and common accessways, except when providing privacy for private outdoor spaces. This can create a negative visual impact, compromise natural surveillance and undermine the overall sense of community tiakitanga/stewardship.

**D1.4** It is encouraged to place vegetation between the path and the boundary fence. This additional separation and screening can help to reduce overlooking into the private area.

**D1.5** Where the ground steps down from the street level, privacy can be achieved through a combination of planting, retaining and fencing. It is important to ensure that when combined, these do not create an imposing vertical element, or limit light into the living area.

**D1.6** Where ground-level outdoor living is located between the street/accessway and the dwelling, use a sufficiently high fence to provide privacy, with a degree of visual permeability towards the top. This provides natural surveillance out to the street, while ensuring the resident has sufficient privacy.

**D1.7** Where the ground steps up from the street level, the fence height may be able to be reduced, so that the combined height of the retaining and the fence provides privacy from the street, and still allows natural surveillance out.

A Nga matapono  
Overarching  
design principles

B Āhua Wāhi  
Site design

C Āhua Kāinga  
Lot design

**D Āhua Paenga  
Boundary design**

**1 CPTED & Privacy**

- 2 Fencing strategy
- 3 Low-height fences
- 4 Mid-height fences
- 5 Full-height fences
- 6 Visually permeable fences
- 7 Gates

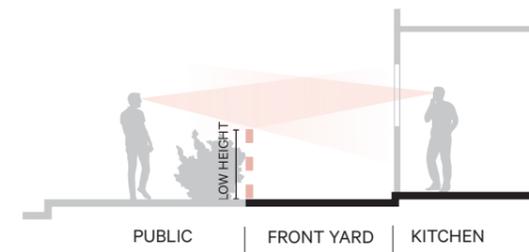
E Āhua Paenga  
Hardscape design

F Āhua Taiao  
Planting design

G Whakatinana  
Implementation  
and maintenance

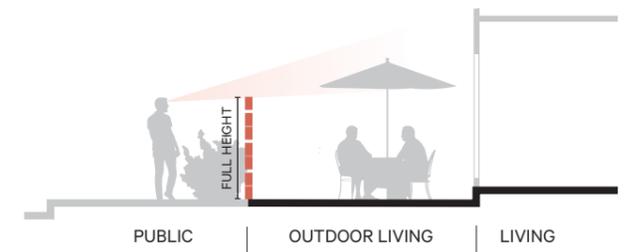


Refer to [Design Requirements A1.3 Site response: Safety, security and privacy](#)



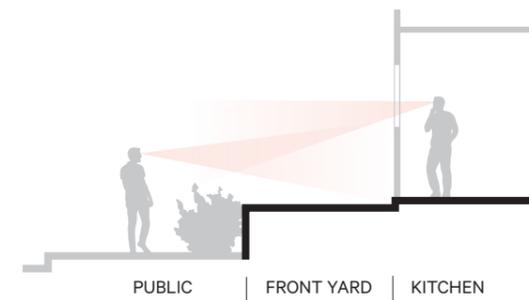
**D1.1 D1.2 D1.3 D1.4**

**Fig. 1** Kitchens and stairways are less sensitive to personal privacy considerations and offer good opportunities for visual surveillance. Keep front-yard fencing low or make it partially permeable to facilitate visual connectivity from dwellings to the surrounding community.



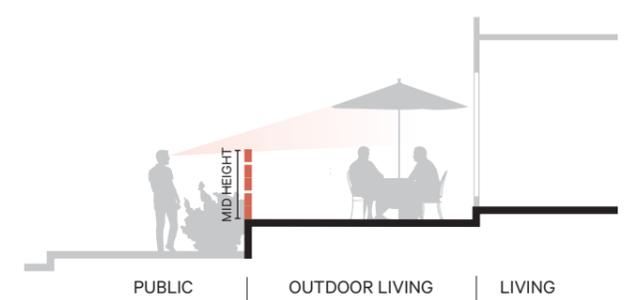
**D1.3 D1.4 D1.5**

**Fig. 2** When outdoor living at the front of a dwelling is level with the footpath, use a full-height screening fence for the length of the patio to achieve privacy for the resident. Screening planting is important here to soften the fence.



**D1.1 D1.2 D1.3 D1.6**

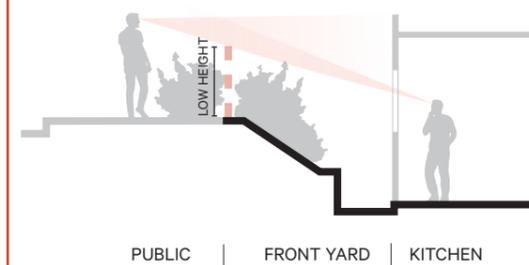
**Fig. 3** Retaining walls on front boundaries enable privacy to front yards, while providing unobstructed sight-lines for passive surveillance into the street and common accessways from kitchen windows.



**D1.1 D1.4 D1.5 D1.6**

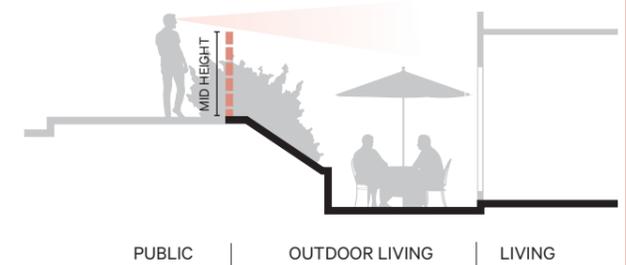
**Fig. 4** When private outdoor living is elevated from the footpath, achieve privacy via a low screening fence that obstructs direct sight-lines while maintaining natural surveillance.

**Note:** These scenarios should be avoided where possible, as they have a negative impact on flood mitigation and create a poor quality living environment.



**D1.1 D1.3 D1.4 D1.7**

**Fig. 5** Natural surveillance and solar access can be maintained where the front yard is lower than the street level by sloping the ground and keeping the fence height to a minimum.



**D1.1 D1.4 D1.5 D1.7**

**Fig. 6** When outdoor living steps down from the street level, privacy can be achieved through a combination of planting, mid-height fence and retaining.

## 2 FENCING STRATEGY

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Lot design

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**2 Fencing strategy**

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fences

4 Mid-height fences

5 Full-height fences

6 Visually  
permeable fences

7 Gates

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### EXPECTATION

Fences are visually appealing, and appropriate to both their location and the role they are fulfilling. There is an adequate balance of privacy and surveillance achieved. Fences and screening complement the materiality of the architecture, are both durable and robust, and promote neighbourhood safety.

### EXPLANATION

Fencing design plays a key role in enabling our residents to feel safe and secure. It can foster a sense of community by allowing natural surveillance, encourage interaction between neighbours along frontages, and provide private outdoor spaces with suitable privacy. Consideration should be given to the parts of a home such as bedrooms, internal living areas and private outdoor spaces, that require visual privacy from the public and neighbours.

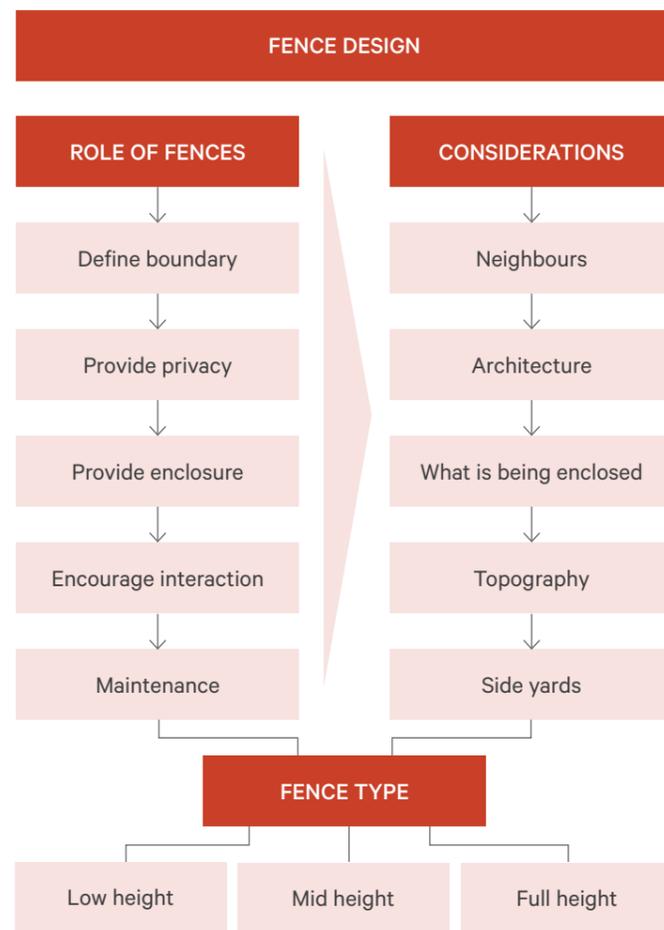


Fig. 1 Bader McKenzie - fence design

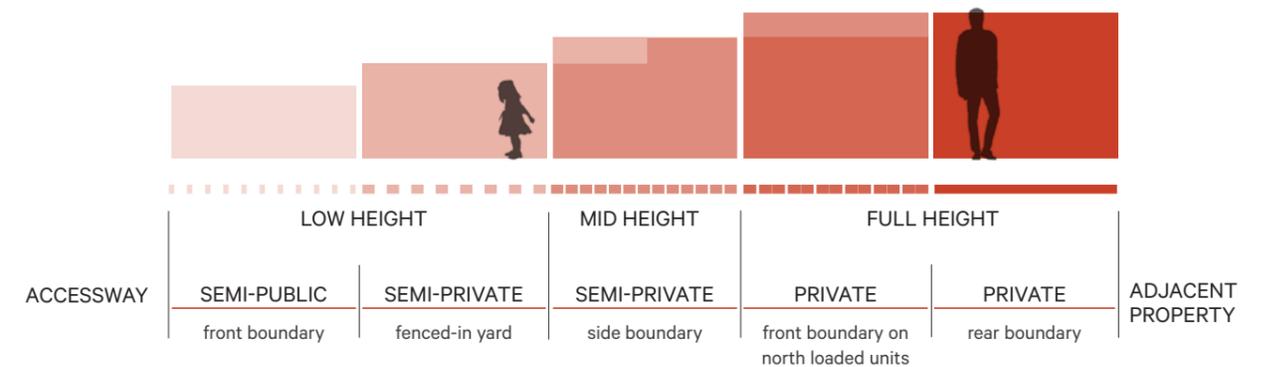


Fig. 2 Privacy zones & fence height

## DESIGN GUIDANCE

- D2.1** Design front boundary treatments to clearly define the boundary between public and private spaces to discourage casual intrusion, and delineate the area the residents are expected to maintain.
- D2.2** Design front fencing to be sufficiently low and/or visually permeable to facilitate visual connections between the street and the site, and create a feeling of openness to the street and other public spaces, while denying opportunities for concealment and antisocial behaviour.
- D2.3** Ensure visitors and delivery people have direct, ungated pedestrian access to front doors, where possible.
- D2.4** Design side boundary treatments and fencing next to driveways to ensure drivers entering and exiting a property (including reversing onto the street) can see and be seen by pedestrians.
- D2.5** Fencing to private outdoor spaces that may be visible from the street and other public spaces needs to balance natural surveillance with suitable levels of privacy.
- D2.6** Where fencing returns to the facade, the height should be appropriate to the amount of screening required. If there is no immediate private outdoor area or service area that requires screening, fence heights can be lower.

- D2.7** Where private outdoor spaces are raised above ground, consider using a more solid balustrade or screening to provide privacy.
- D2.8** For all family homes, design fencing and planting to prevent young children from running directly out of the yard onto roads or driveways. Include a child-proof gate on self-closing hinges with a latch at least 1500mm above ground level.
- D2.9** Wherever possible, restrict the combined height of fencing and retaining wall to 2000mm high. When over 2000mm, consider using visually permeable fencing to lessen the visual impact.
- D2.10** Fencing for rear yards and side yards should generally comprise 1800mm high solid fences.
- D2.11** Fire-rated concrete block boundary walls can enable groupings of storage sheds, bicycle shelters, or refuse storage to be located along boundaries to neighbours.
- D2.12** Stain timber fencing that is prominent from streets and public places to compliment the architecture.
- D2.13** Where neighbouring driveways are side by side, ensure there's sufficient clearance to fences to provide easy access and avoid damage to cars.

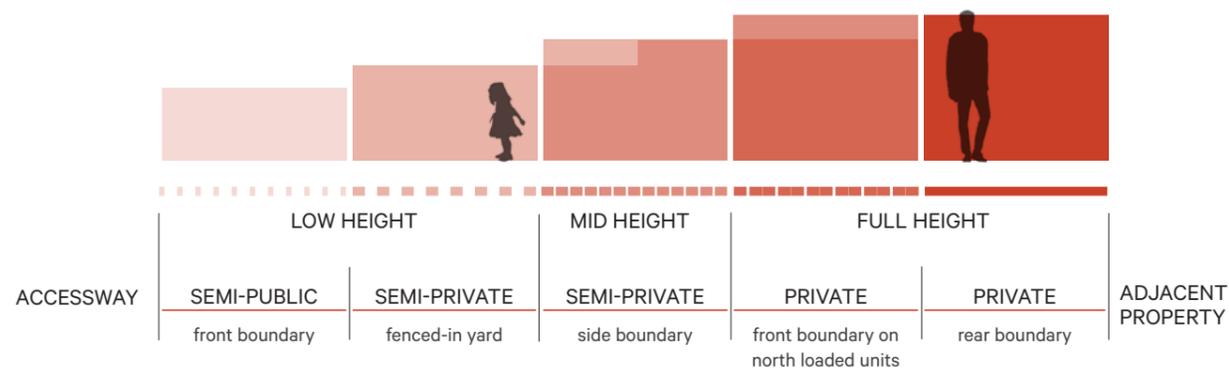


Fig. 1 Privacy zones & fence height

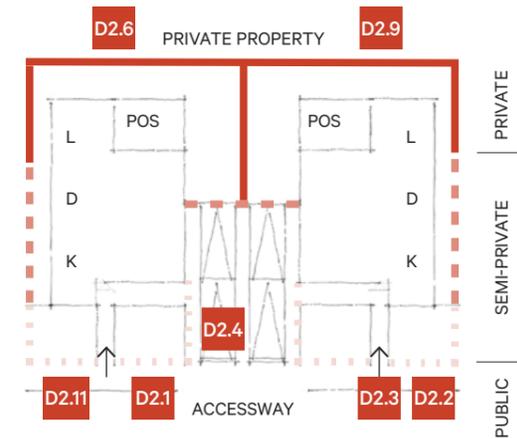


Fig. 1 South loaded units

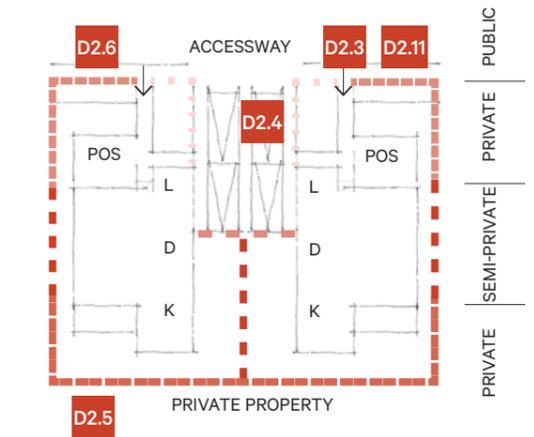


Fig. 2 North loaded units

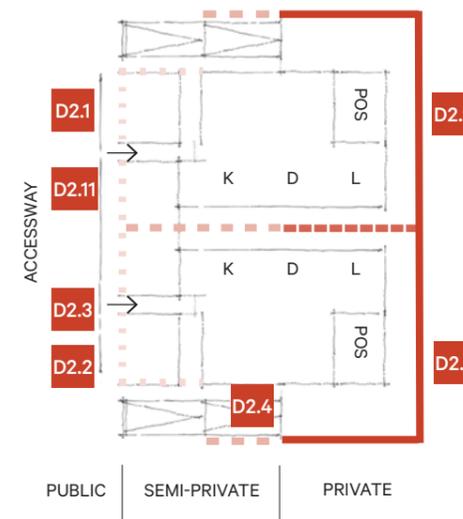


Fig. 3 East loaded units

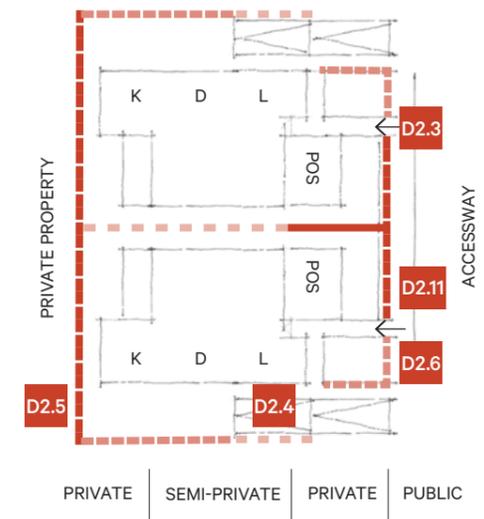


Fig. 4 West loaded units

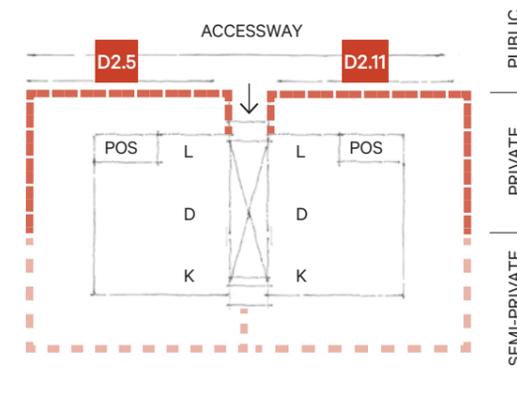


Fig. 5 South loaded walk-ups

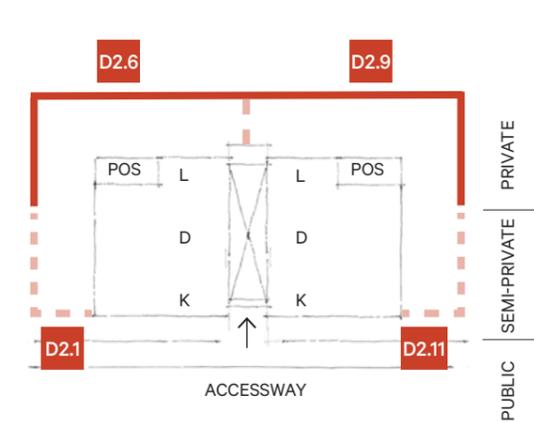


Fig. 6 North loaded walk-ups

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### 3 LOW-HEIGHT FENCES

#### DESIGN GUIDANCE

- D3.1** Low-height fencing is generally used for defining property boundaries that are adjacent to streets, shared accessways, and public areas.
- D3.2** Where appropriate, low fences can reflect architectural treatments.



Stain fences that are located in prominent locations.

### 4 MID-HEIGHT FENCES

#### DESIGN GUIDANCE

- D4.1** Mid-height fencing is generally to be used for screening service areas and to provide privacy for outdoor living courtyards, in combination with low retaining and level changes to achieve privacy for outdoor living courts.
- D4.2** Ensure mid-height boundary fencing is not climbable. Horizontal board fence types are to be close boarded up to 1200mm above ground level.



1200mm timber batten fence along a common accessway.

### 5 FULL-HEIGHT FENCES

#### DESIGN GUIDANCE

- D5.1** Use full-height screening fences for fencing boundaries between private properties, and screening private outdoor spaces.
- D5.2** Where water run-off can be impeded with standard fencing, design fences in coordination with the civil engineer to determine minimum clearance above ground level to allow overland flow.
- D5.3** Ensure full-height boundary fencing is not climbable. Ensure horizontal board fence types are close-boarded up to 1500mm above ground level.



Full-height screening fence.

### 6 VISUALLY PERMEABLE FENCES

#### DESIGN GUIDANCE

- D6.1** Use full-height, visually permeable fencing for private outdoor spaces and outdoor play areas that are adjacent to streets, shared accessways, and public areas that require high levels of surveillance, as well as natural surveillance.
- D6.2** Open aluminium type fencing enables low planting or hedging on the private side of a front boundary to contribute amenity to the streetscape. Consider the species, size and growth rate of plants that are intended to provide screening as the intended outcome will not be achieved until the plants have matured.



Horizontal slatted timber fence with a 300mm permeable top.

## 7 GATES

### DESIGN GUIDANCE

**D7.1** Where required, use robust, durable gates to facilitate external access to fenced areas, and ensure properties are safe and secure.

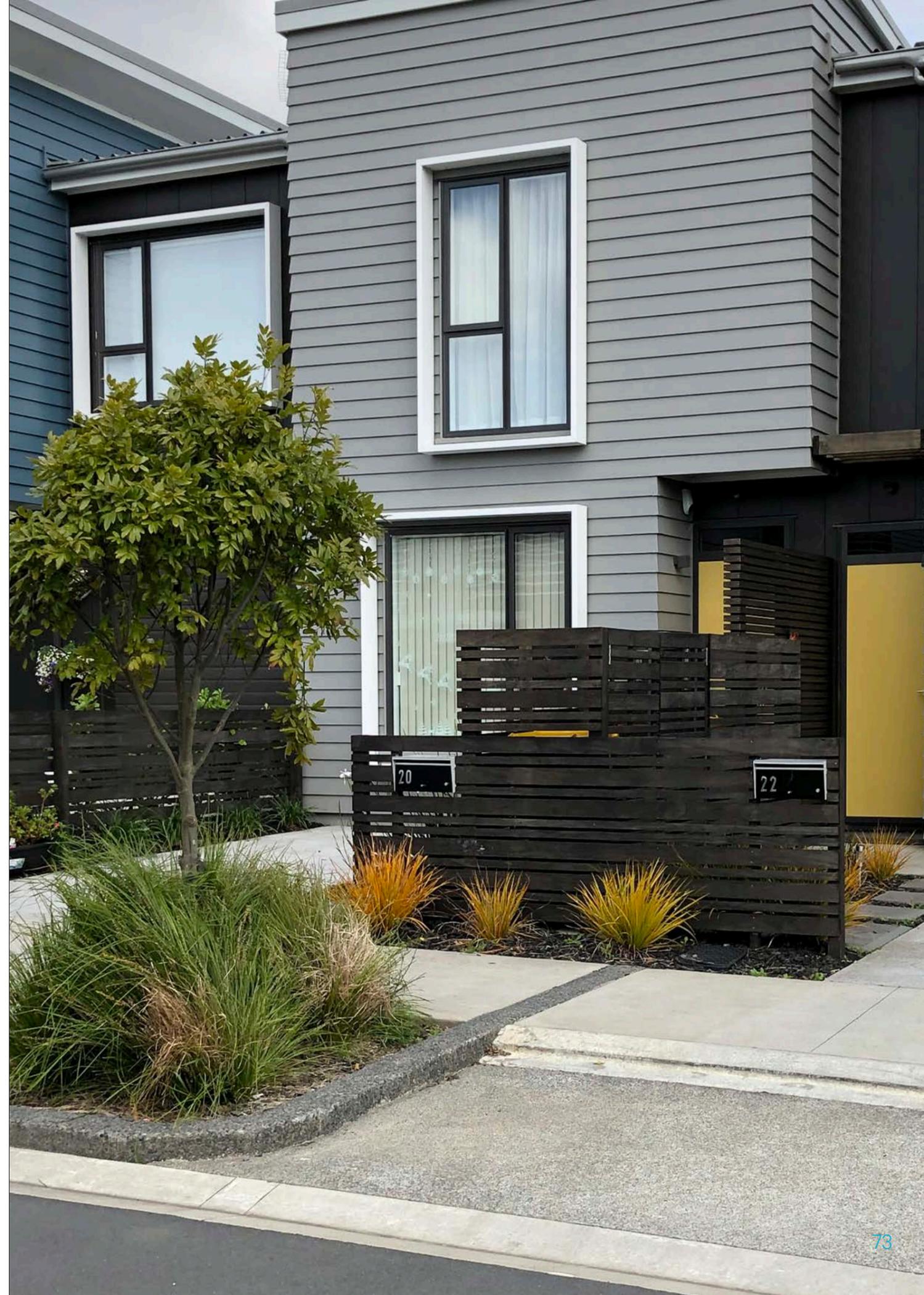
**D7.2** Gates should be located towards the front of the dwelling to allow good surveillance, and minimise concealment opportunities.

**D7.3** Ensure all gates enclosing yards from driveways and streets, or enclosing shared play-areas are child-proof with a magnetic latch set at least 1500mm above ground level, and mounted on self-closing hinges.

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All gates must have a lockable child proof latch.



# E

## ĀHUA PAENGA HARDSCAPE DESIGN

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**2 Surface  
treatments**

**3 Landscape  
edging**

**4 Retaining**

**5 Signage, lighting,  
and landscape  
furniture**

**6 Storage sheds**

**7 Letterboxes**

**8 Clothes lines**

**9 Above ground  
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### OVERVIEW

This section sets out guidance for surface treatments, edging, retaining, and any other constructed features contained within the landscape.

The objective of the design guidance in this section is to ensure that hardscape materials and fixtures are robust, durable, and practically arranged to ensure residents have safe and easy access into and around their homes, and can enjoy functional outdoor spaces.

All-weather surfaces are important in providing safe and functional access to and around residents' homes, but this should be balanced with the benefit of permeable paving surfaces and planted areas that help to reduce stormwater run-off. Impervious surface coverage should be minimised wherever possible.

Hardscape often represents a large proportion of the cost related to landscape works, so consideration should be given to minimising elements such as retaining and earthworks wherever possible.

## 1 HARDSCAPE STRATEGY

### EXPECTATION

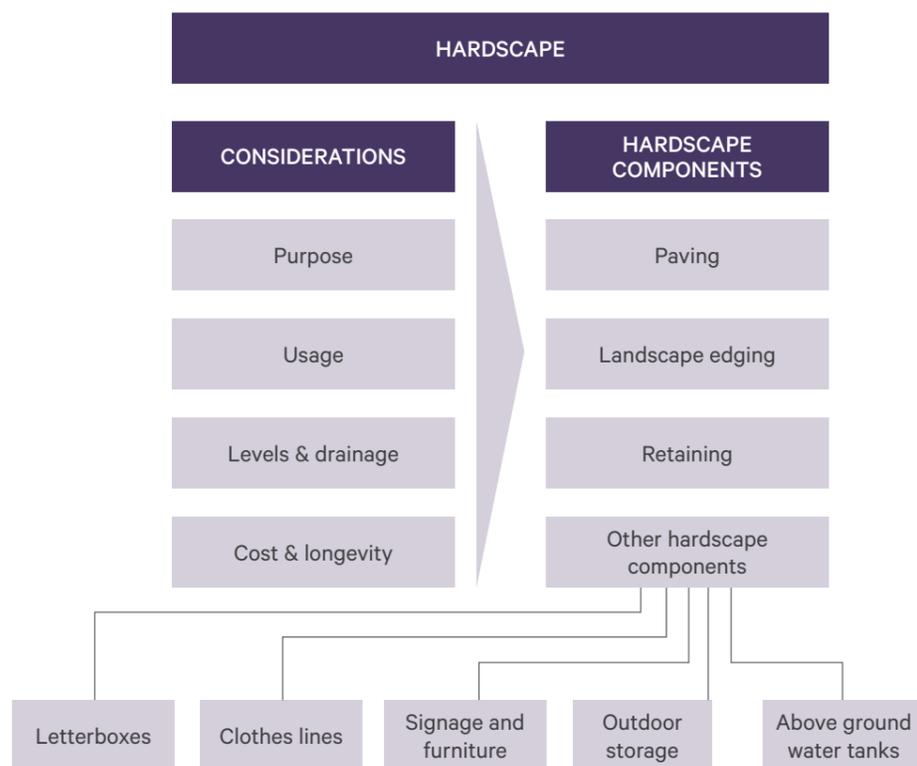
Hardscape materials and elements are robust and low maintenance, and will remain functional throughout the intended life of the home. Designs will consider ease of construction and ensure that details do not result in unnecessary costs. High-impact elements such as retaining are minimised.

### EXPLANATION

Hardscape is essential to a quality outcome, and functionality and appearance are important considerations in achieving this. The hardscape elements are expected to be in place long term, so appropriate material selection is important.

Surfaces need to provide obstacle-free, direct access that is safe and comfortable for all users, while adding to the visual appeal of a home or development.

Retaining has a high impact in terms of cost and disruption of natural landforms, so should be minimised or designed out wherever possible. If retaining is required, ensure it is softened with planting, and the material selection is appropriate to the surrounding.



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## 2 SURFACE TREATMENTS

### EXPECTATION

Residents can arrive home by any mode of transport, and access their home safely and easily on durable, all-weather surfaces. They are able to go about their daily lives, whether it be socialising outdoors, working in the garden or taking out the bins.

### EXPLANATION

Surface treatments should be selected to reflect the frequency of use, and visibility from public areas. Vehicle access and main paths will be a robust material as they are most likely to be high-use areas, and may be broken up with changes in texture and colour, while a secondary access path to a side yard may be a more simple finish.

Materials and finishes should be appropriate to their location and use.

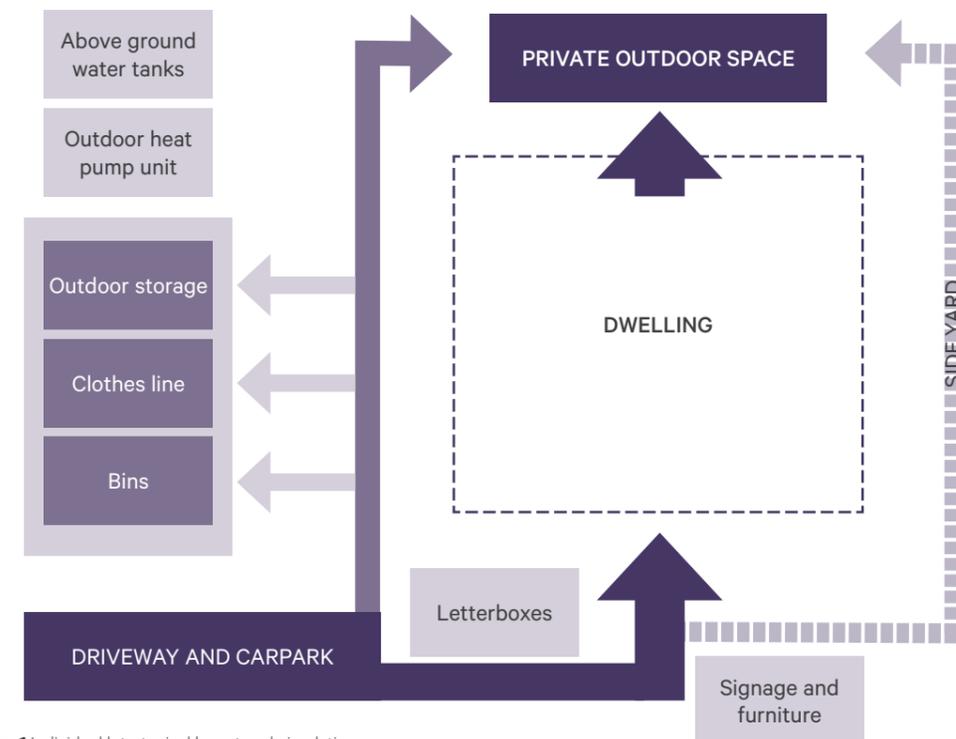


Fig. 1 Individual lot - typical layout and circulation

DESIGN GUIDANCE

- E2.1** Configure site layouts to minimise the total paved area taken up by vehicle access, parking, and pedestrian paths, while allowing sufficient width for safe and practical access.
- E2.2** Minimise impervious surfaces where possible by ensuring efficient layout of vehicular areas and pedestrian paths. Ensure the design meets the local authority permeability requirements where appropriate. Incorporate permeable surfaces in areas where there will be reduced manoeuvring such as parking bays.
- E2.3** Pedestrian surface treatments should be clearly defined from vehicular areas with a contrasting finish, texture, or colour, and comprise a non-slip finish. Consider exposed aggregate or other means of applying surface texture for better grip where slopes exceed 1:12.
- E2.4** Textural contrast is generally more durable than colour variations, which tend to fade over time. Exposed aggregate on vehicular surfaces is also less affected by oil spills and tyre marks. Avoid painted or applied treatments that have a limited lifespan.

- E2.5** In outdoor spaces, concrete with smoother finishes are preferable to textured finishes such as exposed aggregate, as they are more comfortable to walk, sit and play on.
- E2.6** Avoid large expanses of a single material, especially in carparks and accessways. Use material or texture changes to break up the scale of larger areas of concrete. Expansion joints and saw-cuts can also assist breaking up the scale of paving, as well as manage cracking. If different materials are being used, such as oxide tints in concrete, ensure they are practical to form up and pour during construction, as this can add considerable cost to a project.
- E2.7** Where treated timber decking is used for decks above ground level, ensure it will get sufficient sun, and avoid grip tread surfaces. If a deck is shaded, the grooves accumulate fungal growth, making them slippery when wet.
- E2.8** Grass-block pavers are to be avoided where possible. If they are to be used, limit them to low-traffic areas, where there is sufficient solar access for grass to grow.
- E2.9** Loose pebbles, aggregate, compacted chip and wood chip are to be avoided, as these represent a significant maintenance burden to our maintenance teams requiring regular top-up and replacement.



Fig. 1 Bader McKenzie - hardscape design



Bader McKenzie - hardscape design

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### 3 LANDSCAPE EDGING

#### EXPECTATION

Maintenance is made easier for residents by providing edging to lawn and garden areas.

#### EXPLANATION

Landscape edging helps garden and lawn areas to stay tidy, attractive, and easy to maintain. It helps to contain loose materials such as garden mulch and soil, and defines edges to lawns for mowing and trimming.

#### DESIGN GUIDANCE

- |   |  |
|---|--|
| <p><b>E3.1</b> Configure landscape edging to garden beds in straight segments, avoiding curved edging where possible.</p> | <p><b>E3.3</b> Metal or poured concrete edging should be avoided due to cost.</p>  |
| <p><b>E3.2</b> Ground-treated timber is considered a suitable material for landscape edging.</p>                          | <p><b>E3.4</b> Wherever lawn or garden edge meets a building perimeter, install 150mm wide concrete mowing strips. Access paths around the building can be utilised to form an edge to garden areas and lawns.</p> |



Ground-treated timber edge

### 4 RETAINING

#### EXPECTATION

If retaining is required, it is designed to maximise usable space, while minimising visual impact, shading and overlooking. Consideration is given to any fencing or barriers that may be required on top of retaining. Spaces that are difficult to access for maintenance are avoided.

#### EXPLANATION

On sites with steeper gradients, landscape retaining assists in establishing level building platforms and sufficiently level areas for private outdoor space and service areas. Retaining is a costly element, and has a significant impact on the land and project feasibility, so every effort should be made to avoid or minimise retaining through the use of slopes and batters. While providing more practical and usable spaces, retaining often also creates some poor outcomes, such as imposing vertical faces, a requirement for fall-from-height barriers, shading, and overlooking. Careful consideration should be given to the outcomes of providing retaining.

#### DESIGN GUIDANCE

- |   |   |
|---|---|
| <p><b>E4.1</b> Design landscape retaining to be functionally effective and efficient, while avoiding or mitigating adverse impacts on the quality and visual amenity of the site and/or the neighbourhood.</p>  | <p><b>E4.4</b> Additionally, consider how the combined height of boundary fences may be limited by maximum fence heights set by local authorities.</p>  |
| <p><b>E4.2</b> Use terraced or stepped retaining to break up large level changes. Combine this with low or visually permeable fences and planting to reduce visual dominance and any adverse shading effects.</p>   | <p><b>E4.5</b> Where safety-from-falling barriers and/or vehicle protection barriers are required, refer to Design requirements A1.3 Site response: safety, security and privacy and the Building Code Clause D1 Access Routes.</p>   |
| <p><b>E4.3</b> In all retained areas, consider access for maintenance, including lawn mowers. For retaining against site boundaries, consider how the space between the retaining and the site boundary – either higher or lower – will be accessed and maintained.</p> | <p><b>E4.6</b> Consider measures to mitigate the visual impact of retaining features when they are in full view of the street, or other frequently used public spaces. Options include stain to timber exposed to public view, using finishes or materials that are in keeping with local context, and/or screening or climbing plants.</p> |



Refer to [New Zealand Building Code Clause D1 Access Routes](#)

Refer to [Design Requirements A1.3 Site response: safety, security and privacy](#)

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Refer to [Design Requirements C2.3 Lighting](#)  
[A2.3 Outdoor service areas](#)

## 5 SIGNAGE, LIGHTING, AND FURNITURE

### EXPECTATION

Residents and visitors are able to easily and safely navigate into and around the development. Appropriate signage, lighting, and landscape furniture is considerate of local character and amenity values, provided discreetly, and designed in a way to avoid clutter.

### EXPLANATION

Legible wayfinding and access routes within a development are important for both residents and visitors. This creates a safe environment for residents, and ensures that visitors can easily navigate a development.

The lighting strategy should ensure that safe access is provided into and around shared areas after dark, and that any lighting provided avoids glare and light spill to homes both within the development, and into neighbouring properties. Landscape furniture should be robust, fit for purpose, and easily maintained or replaced if required.

### DESIGN GUIDANCE

- E5.1** When selecting landscape furniture and signage, ensure it is durable, easy to maintain, and fit for purpose.
- E5.2** Signage, street furniture, and lighting installations should be appropriate to location and context, particularly in regard to size, location, specification, and design quality.
- E5.3** Ensure the site signage such as residents' parking and directional signs, do not obviously identify the development as public housing.
- E5.4** Coordinate all landscape plans with lighting consultants and architectural design.

**E5.5** Lighting strategy should minimise light pollution in and around the site. For example, avoid the use of in-ground uplights, and consider light spill into and out of the site.



Light fixtures should prioritise safe access and avoid adverse effects on views and light spill.

## 6 STORAGE SHEDS

### EXPECTATION

All stand-alone, duplex, or terraced dwellings include a shed or lockable storage unit, unless the home has a garage. It is placed in a practical location with all-weather access.

### EXPLANATION

With limited space for storage in homes, sheds or storage units enable storage of bikes, outdoor equipment, garden tools, lawn mowers and fuel.

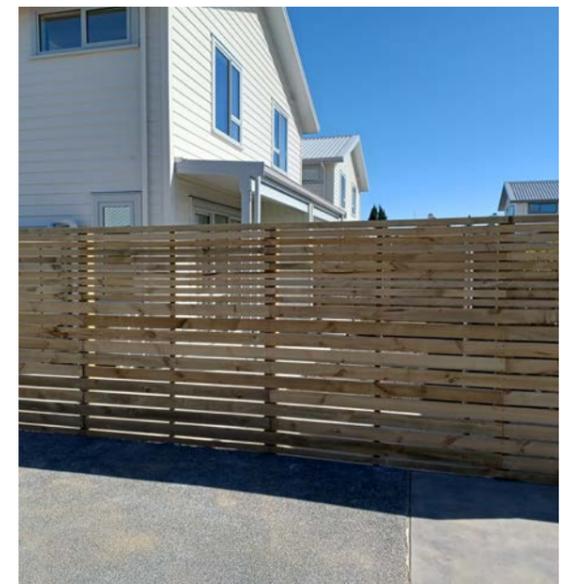
For communal spaces, sheds can provide storage for supplies and equipment for communal gardens, such as tools, compost, fertiliser, and hoses.

Sheds can be difficult to place within dense developments, so early thought should be given during the site layout to ensure poor outcomes are not encountered later on.

### DESIGN GUIDANCE

- E6.1** Include lockable storage sheds for all stand-alone and/or duplex homes and end-of-terrace units, where rear yards can be externally accessed.
- E6.2** For central, land-locked terraced homes where external access to rear yards is not available, provide secure external storage in the form of low, screened, lockable enclosures.
- E6.3** Locate storage sheds discreetly in rear or side yards where they are concealed from public view, out of view of living and dining areas.
- E6.4** Place them on flat areas with a concrete base and an all-weather access path.
- E6.5** Ensure fencing is high enough to screen sheds along the boundary or in view from public areas.
- E6.6** Storage shed colours should be visually recessive and complement the development's architecture and fencing.
- E6.7** Ensure the size of outdoor storage complies with Kāinga Ora design requirements.

**E6.8** Ensure outdoor storage is located a minimum 1m away from external boundaries, in accordance with fire regulations. If this is not achievable, the adjacent fence must be fire rated, as set out in Design Requirements. Additionally, ensure that sheds are offset sufficiently from façades to allow maintenance access.



Locate storage sheds discreetly in rear or side yards where they are concealed from public view

## 7 LETTERBOXES

### EXPECTATION

All homes have a robust, durable letterbox located along the primary pedestrian access route to the front door.

### EXPLANATION

Letterboxes are an important part of wayfinding and identifying a resident's street address.

### DESIGN GUIDANCE

- E7.1** For stand-alone, duplex, and terraced housing, locate letterboxes at the junction of the public street boundary and the access to the front door.
- E7.2** Letterboxes for homes along common accessways are to be located where the shared footpath or accessway meets the public street. This should be located at the most practical point for residents and NZ Post staff to access.
- E7.3** For apartment buildings, locate letterboxes adjacent to the main pedestrian entrance to the building's lobby.
- E7.4** Where a large number of letterboxes are clustered, integrate them into the fencing, or mount them on a bespoke support structure. Clustering of letterboxes on individual posts for each box is not acceptable.
- E7.5** For universally designed and/or accessible dwellings, ensure access to letterboxes is suitable for residents with limited mobility.
- E7.6** Provide a sufficiently sized, level hardstand area for a wheelchair next to the letterbox.



Where letterboxes are clustered, integrate them into the fencing or mount them on a bespoke support structure.

## 8 CLOTHES LINES

### EXPECTATION

All homes have clothes lines mounted in practical, easy-to-access locations, with sufficient sun and air movement.

Apartment balconies have fold-up clothes lines that do not obstruct access, and are screened from the street or public areas.

### EXPLANATION

Clothes lines are a part of everyday life for our residents, and their access and location should reflect that. In order to function effectively, solar access and air movement are essential. Clothes lines should be located where they are exposed to adequate sun, ideally with a northern orientation. Adequate screening from public or communal view is critical.

### DESIGN GUIDANCE

- E8.1** Locate clothes lines in sunny positions where they are easily accessed, and screened from public view.
- E8.2** Ideally, locate clothes lines discreetly in rear yards, well clear of private outdoor spaces, and close to an external door. For apartments, fold-up clothes lines on decks should be screened from the street or public areas.
- E8.3** Install clothes lines at a height of 1.8m. For all fully universal and/or accessible dwellings, provide a clothesline that is suitable for wheelchair users.
- E8.4** Ensure footings for free-standing clothes lines are sufficiently robust to withstand high winds when fully loaded.
- E8.5** Clothes lines should not be directly fixed to a building. If fence-mounted, fixings should be to posts, rather than just palings. If this is not possible, free-standing posts should be provided.
- E8.6** Restrict rotary clothes lines to locations where sufficient space is available without them impinging on private outdoor spaces.
- E8.7** For apartment blocks, coordinate clothesline locations and screening with the architectural consultant.
- E8.8** Ensure there is a hardstand beneath the clothesline that extends 600–800mm in front of the line. Provide an all-weather access path to the nearest external door to the dwelling.
- E8.9** Ensure the clothes line's total line length aligns with Kāinga Ora design requirements.
- E8.10** Do not use a retractable clothesline for accessible units.



Washing lines are best installed on a north-facing position.

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Refer to [Design Requirements A2.3 Outdoor service areas](#)

## 9 ABOVE GROUND WATER TANKS

### EXPECTATION

Above-ground stormwater detention tanks are ideally avoided through the use of permeable surfaces and communal/centralised systems. Where they are required, above-ground water tanks are discreetly integrated into the landscape, away from living areas and public spaces.

### EXPLANATION

Above-ground stormwater detention tanks may be required as a means of gathering of water during a heavy rainfall, slowing the flow of water into the system. Their configuration and location need careful consideration at the design stage to avoid their bulky forms disrupting the limited amount of space available for outdoor amenity.

### DESIGN GUIDANCE

- E9.1** Where possible, locate stormwater detention tanks underground, such as beneath carpark pads, to maximise capacity, reduce the impact on individual lots, and minimise visual impact within the development.
- E9.2** Where above-ground water tanks are required, choose slim styles that can integrate with, or form part of fence lines, utilising their acoustic properties to buffer noise.
- E9.3** Do not locate above-ground water tanks within private or shared outdoor spaces, or outdoor play areas.
- E9.4** Choose colours that complement the architecture of the project, with a preference for darker, more recessive colours.
- E9.5** When locating above-ground water tanks, ensure they do not obstruct access routes.
- E9.6** Where stormwater detention tanks are located along boundaries, ensure fencing is high enough to screen them from public or communal areas.
- E9.7** Note that plastic tanks are required to meet fire regulations with regard to being offset from fences and boundaries.

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Refer to [Design Requirements C1.1 Stormwater](#)



F

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OVERVIEW

Planting design recognises that the wellbeing of people is grounded in the relationship between people, nature and place. This is a long-established value for mana whenua, and one that should be more widely acknowledged as a basis for the design of our built environments.

Well-designed planting will achieve the following outcomes:

- Strengthen natural and cultural connections to local landscapes.
- Encourage residents to become kaitiaki of their home environments, through active use, enjoyment, and care of the spaces, in addition to a sense of pride.
- Improve soil, water, and air quality through functional planting that supports and increases habitat and biodiversity.
- Exhibit longevity and resilience by increasing the contribution that planting makes towards the surrounding environment over time, such as providing shade or fruit.
- Provide amenity and optimal functionality for residents, through provision of shelter, privacy, visual connection with the wider landscape, and seasonal change.
- Ensure that Kāinga Ora Ngāhere, CPTED and Environmental Strategy aims are met.
- Reduce the ongoing maintenance required for our tenants and Kāinga Ora maintenance providers after the plants are well established.

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Refer to [Kāinga Ora Environment Strategy \(2022\)](#)

# 1 PLANTING DESIGN STRATEGY

## EXPECTATION

Planting is appropriate to the geographical and climatic context, contributes to neighbourhood quality, and supports and enhances local ecology, and biodiversity, mana whenua values, and amenity.

The planting strategy supports opportunities for food security and sustaining landscapes.

## EXPLANATION

When designed well, planting contributes to wider ecosystems throughout our cities, as well as forming distinct environments within Kāinga Ora developments.

Increasing the presence of native flora and fauna, and edible plants/trees aligns with the Kāinga Ora Environmental Strategy 2022.

As one of the largest landholders in the country, the cumulative effect of Kāinga Ora developments can contribute positively towards our overall kaitiakitanga role, as well as enhancing and expanding the natural environments within our cities.

## DESIGN GUIDANCE

- F1.1** Refer to available local planting guides for information on regional biodiversity and suitable species for particular environments.
- F1.2** A regional biodiversity strategy should be established at the beginning of the design process, to ensure the availability of nursery stock at implementation, and that the strategy is not compromised.
- F1.3** Specifying local stock sourced from within reasonable proximity of natural dispersal is desirable for recognising local variation within species/genera.
- F1.4** Site visits undertaken at the beginning of design processes should consider the local ecology and character of neighbourhoods, including the kinds of plants that local communities value.
- F1.5** If exotic species are required for a specific reason within the planting strategy, the reason for this choice should be communicated.
- F1.6** If there is an existing mature tree on site that would not normally be a desirable species, consider how this could be retained for the short- to medium- term as part of a succession strategy that allows new planting to establish before removing the existing tree.

## Procurement strategy

- F1.6** The planting strategy should be developed early, through engagement with specialists such as ecologists, mana whenua, and nurseries. This ensures ecologically and culturally appropriate species selection.
- F1.7** The planting strategy should set out a procurement plan in order to reduce risk around the supply of the proposed species, and ensure that locally sourced stock will be available for implementation. This approach also allows adequate time to identify any substitutions, should they be required.
- F1.8** In addition to the points above, the planting strategy should demonstrate:
  - cultural and ecological significance of selected species
  - connection to the wider ecological network and natural systems, such as rivers, streams, or coastal margins
  - identification of local suppliers with current or upcoming stocks of each species.
  - if relevant, comment on risks for procurement, and acceptable substitutions that conform to Kāinga Ora expectations.

## Substitutions

- F1.9** Early conversations with suppliers can reduce the risk around procurement. Any necessary substitutions should be identified and approved well before the procurement phase.
- F1.10** Exotic species or cultivars should not be used as substitutes for specified native plant species, unless approved by the landscape architect.

## 2 WATER AND SOIL ENVIRONMENTS

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### EXPECTATION

The principles of water-sensitive urban design are applied to detain and treat stormwater on site. Natural stormwater management devices are used where possible to support soil moisture retention and improve nutrient levels.

Soil disturbance is kept to a minimum, and any topsoil removed is retained on site where possible. If topsoil is removed and returned, sub-soils are adequately prepared and conditioned to avoid pans forming.

### EXPLANATION

Urban development should work with the natural hydrological processes of the water catchment it sits within. Water-sensitive urban design means moving beyond mitigation planting, and identifying opportunities for watercourses and stormwater management devices throughout sites. Deeper soil profiles with good soil structure encourage the development of substantial root systems. This allows trees and shrubs to anchor themselves in place as any staking is gradually removed.

Soil preparation should improve the nature of existing subsoil and topsoil. It is important that soil importation does not lead to the creation of distinct pans/ layers in the soil column. Conditioning between these layers activates existing soil environments, and facilitates the flow of moisture and nutrients, in addition to enhancing drainage. While appropriate preservation and development of site soil is the most effective means of ensuring healthy soil environments, contouring is a useful device for lifting soil profiles where water tables are comparatively high.

### DESIGN GUIDANCE

- F1.1** Avoid general removal of topsoil wherever possible, limiting this to only areas required for development.
- F1.2** If removal is due to contamination, additional sampling should be done to confirm whether contamination goes beyond obvious sources, such as existing houses, sheds and so on.
- F1.3** If cut and fill is required, topsoil should be retained, and reinstated on completion of civil works.
- F1.4** If imported soil is required, it should be clean, and free of contaminants, weeds, and debris. Ideally, imported soil can be coordinated with soil removal from nearby construction sites.



### 3 REGIONAL AND LOCAL SITE SUITABILITY

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#### EXPECTATION

Plant species are appropriate to local climates and geology/landform. Species are scaled appropriately to their proposed location and function, and do not cause maintenance issues as they mature.

Species are suited to the site conditions, such as soil type and microclimates.

#### EXPLANATION

The success of planting in challenging site conditions and often out-of-season planting phases, requires careful species selection, as well as adequate soil preparation, and maintenance and care regimes. Site suitability is therefore based on how species perform during the most challenging periods of the year.

The specification of locally appropriate plant species that are well adapted to their habitats, together with good horticultural practice, helps to achieve longevity and aesthetic appeal.

Utilise the expertise and experience of local nurseries to ensure the selection of regionally appropriate species, including local variations.



New Zealand Biomes

## 4 PLANTING DESIGN - NEIGHBOURHOOD

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### EXPECTATION

Planting design and species selection support, enhance, and expand the wider ecological network within and beyond the neighbourhood. Existing trees within the neighbourhood are retained.

### EXPLANATION

Kāinga Ora has an opportunity to contribute to enriching ngahere of the wider neighbourhood, and to support and enrich urban character and biodiversity.

Planting strategies at the neighbourhood scale should look to provide street amenity through larger-scale planting on the street boundary. Street character can be supported by proposing tree species that fit in with existing or signature species.

Neighbourhood-scale planting strategies should help mitigate climate effects through the retention of existing trees and expansion of vegetated areas, and contribute to ecological corridors that exist beyond the site.

### DESIGN GUIDANCE

- F4.1** With respect to density of large trees, the '3:30:300' metric is a useful guide –residents should be able to see three large trees from their home, live in neighbourhoods that have 30% tree canopy and live not more than 300m from their nearest green space.
- F4.2** Investigate wider-scale ecological networks to establish how the project planting strategy can support and enrich them.
- F4.3** Where developments are adjacent to watercourses, establish whether there are opportunities for revegetation or restoration.
- F4.4** Planting strategies should be guided by historical ecologies and biomes, and plant material is ideally eco-sourced within the area.
- F4.5** Locate larger trees where they will provide the greatest relief to the built form from public vantage points.
- F4.6** As space is often at a premium along street frontages, street trees can sometimes be proposed to perform screening functions, enabling larger species without being too close to a building's edge.



## 5 PLANTING DESIGN - SITE

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### EXPECTATION

Existing trees and vegetation are retained in line with the Kāinga Ora Management Of Trees & Vegetation Policy, and incorporated into the design. Where appropriate, trees that can not be retained are relocated.

Species selection supports local character, cultural identity, and ecology. Vegetation softens vertical elements, provides screening, and contributes to visually appealing spaces.

Tree locations reflect the root structure, growth form and mature size of the selected species, and allow adequate solar access to living areas. Shrubs and groundcovers are selected and located to suit the space and climatic conditions, and do not create maintenance issues.

### EXPLANATION

With increasing density, it is important to create environments that connect people to nature. Planting can soften the visual impact of fencing and hard paved areas, mitigate the vertical scale of buildings, and provide shade and food.

The Kāinga Ora Management Of Trees & vegetation policy aims to retain existing trees wherever possible, as there is simply no better solution to have instant scale, shade, and ecological value. Retention of less-desirable or valuable specimens can be useful as part of a medium-term succession plan.

While solar access is important, it is equally important to provide sufficient shade to reduce heat-island effects on large expanses of paved surfaces.

Practical selection and location of trees and vegetation is a very important consideration. Poor placement or species selection can cause costly maintenance issues as vegetation matures. Placing trees a sufficient distance from façades or services, and avoiding grasses or strappy foliage next to paths are basic considerations due to the impact they have on maintenance and accessibility.

Effective shrub and ground coverage provides benefits with respect to groundwater dispersal and storage, reduction of evaporation and moisture loss, and moderation of soil temperature and health.

### DESIGN GUIDANCE

#### Trees

- F5.1** Position trees with appropriate clearance from buildings and services to prevent structural damage and maintenance issues.
- F5.2** Tree placement should be arranged to carefully balance solar access to private outdoor spaces with privacy to internal spaces.
- F5.3** Consider tree species with a columnar form for narrow planting zones. This allows significant tree canopies without compromising building maintenance.
- F5.4** Select species that will grow to an adequate size and form to mitigate the bulk of buildings, especially along street frontages.
- F5.5** Where natural surveillance is critical, select tree species to ensure tree canopies do not restrict visibility.
- F5.6** Ensure leaf drop from trees, notably from species with fibrous leaves, does

not contribute to restricting stormwater flow, or create a slip hazard on pathways. This should be a particular consideration with Full Universal Design (FUD) housing.

#### Fruit trees

- F5.7** Locate fruit trees in sunny, sheltered positions suited to the requirements of the species, with sufficient canopy clearance to reach maturity.
- F5.8** Ensure species are selected to achieve cross-pollination where required.
- F5.9** Across developments, select a variety of fruit species to enable varied supply, and interaction through cross-boundary exchange of produce.
- F5.10** Avoid placing fruit trees or other edible plants in areas that may collect contaminants, such as planting beds adjacent to vehicular surfaces.



Position trees with appropriate clearance from buildings and services to prevent structural damage and maintenance issues.

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## DESIGN GUIDANCE

### Shrubland and Groundcover

- F5.11** Where possible, specify eco-sourced species, or native species that are specific to the area. Encourage the selection of rare, endemic species that may be in decline.
- F5.12** Limit selection of exotic species to where they are required for a specific role that can't be achieved by natives.
- F5.13** Give consideration to planting design and composition, to create depth, texture, and layering. Biodiversity can be amplified by increasing the number of species that grow in close association. Avoid monoculture, or rows of singular species.
- F5.14** Consider potential mature height and spread of the selected species, to avoid foliage extending over paths, driveways, or facades and roofs.
- F5.15** When specifying planting for privacy screening, ensure plants are an adequate size at implementation, and privacy is supported by appropriate fencing while plants mature to the required height.

- F5.16** Avoid climbing plants near cladding, downpipes and guttering.
- F5.17** Planting selection should be balanced against CPTED aims, to ensure adequate safety and surveillance as the planting matures.
- F5.18** For steeper slopes where access is limited, use embankment planting, with low-maintenance species that are suited to bank stabilisation. Diversity within the ground plane enhances resilience. Within diverse associations, where one species decreases in vigour, other species take on a more important role – for example, in the shift from shaded to sunny positions.
- F5.19** Consider desire lines of pedestrians and select hardy species that will withstand some pedestrian traffic where shortcuts may be taken.
- F5.20** Plant along edges of footpaths to create a clear, maintainable edge. Species selection for path edges should avoid grasses or strappy leaves to minimise trip hazards.



Plant along edges of footpaths to create a clear, maintainable edge.



Planting selection should be balanced against CPTED aims, to ensure adequate safety and surveillance as the planting matures.

## 6 LAWNS

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### EXPECTATION

Lawns are of a practical size and location, providing a flexible and functional space for residents to use. Lawns are easily accessible and directly connected to living spaces or communal areas.

They are suited to the intended use and conditions, and are not in shaded, wet, or steeply sloped locations. Lawns are easily accessed for mowing and maintenance.

### EXPLANATION

Lawns provide a natural, flexible surface for people of all ages. As well as being a usable recreation space, they contribute to reducing heat retention, site permeability and stormwater management, allowing stormwater to return to the soil.

Lawn is a highly versatile surface for both private gardens and communal spaces. Care should be taken to avoid proposing lawn in wet or shady areas, or on key circulation routes that are likely to have high foot traffic.

While lawn is a relatively low-cost treatment, it requires regular maintenance with regard to mowing, weed control, and edge maintenance. Lawn areas should be designed with this in mind.

### DESIGN GUIDANCE

- F6.1** Lawn areas should be a practical size and location that is easy to access, and not narrow, fragmented spaces.
- F6.2** Lawn areas should receive adequate light to be able to maintain healthy growth. If access to light is an issue, explore alternatives such as groundcover planting.
- F6.3** Avoid using lawn on obvious circulation routes that will receive regular foot traffic. These areas inevitably become compacted and/or muddy, and impractical for use.
- F6.4** Generally, slopes up to 1:5 can be mown and are therefore suitable for lawn. Embankment planting is recommended for steeper slopes.
- F6.5** Ensure seeded lawns are planted as early as practically possible to allow adequate establishment prior to handover or occupation.
- F6.6** For areas where lawn is not practical, alternatives should be explored, such as increasing patio or deck sizes. An example of this is landlocked terraced gardens, where a larger patio/deck could be provided, in balance with increased planting beds.
- F6.7** Avoid establishing lawns in spaces that do not allow practical access for a lawn mower.
- F6.8** Where lawn is proposed, consider storage of equipment such as lawnmowers, fuel, and garden tools.



Lawn areas should be a practical size and location that is easy to access, and not narrow, fragmented spaces.

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# WHAKATINANA IMPLEMENTATION AND MAINTENANCE

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## OVERVIEW

It is critical all planting implemented in Kāinga Ora developments is correctly installed and then properly maintained for a full annual cycle to allow plants to establish adequately and have the best possible chance at survival.

The basic planting implementation and maintenance guidance that follows will ensure good plant survival rates and provide a generic starting point for landscape architects to produce detailed and site-specific implementation and maintenance specifications that local councils may require.

# 1 PLANTING IMPLEMENTATION

## EXPECTATION

Our landscape implementation follows best practice to ensure all new planting is of suitable quality and has the best possible establishment, and chance of survival.

## EXPLANATION

To get the best value from the money invested in landscaping, attention, and care to plant selection and implementation is essential to ensure plant losses are minimised and to ensure landscaping can achieve the intended functions and amenity contribution.

## TECHNICAL GUIDANCE

### 1 Site Preparation

- G1.1** Remove all rubbish, debris, excavated material, contaminants, and materials surplus to requirements from the area to be planted.
- G1.2** Before planting, the contractor should ensure all planting areas are weed free and must undertake all necessary spraying at least 1 week before starting planting. A minimum of two spray applications are required if reusing topsoil or if weed-free topsoil is used.
- G1.3** All garden beds (shrub planting) shall consist of high-quality topsoil that is at least 300mm deep. Use hand-held tools to undertake any cultivation around existing trees.
- G1.4** Plant all plants PB40 and larger into pits with a diameter at least 500mm larger than that of the root system when fully spread and a depth of 200mm more than the depth of the root system.
- G1.5** Pierce the bottom of each pit to a depth of 200mm with the tines of a fork or similar implement to ensure root penetration and free drainage.

- G1.6** Use rotary augers to roughen the sides of pits to remove the glazing of the surface.
- G1.7** Include proprietary compost that is at least 200mm deep in the base of tree pits, and backfill the sides with topsoil. If the tree pit is located in a low area or the site is water-prone, place 200mm of free-draining material (scoria) at the bottom of each hole.

### 2 Plant Supply

- G1.8** Ensure plant materials are first-class specimens, and true to name and type with well-developed and well-shaped trunk or stem and head. Ensure they are well hardened off and free from pests, disease, disfiguring knots, bark abrasions, and wind or freezing injuries.
- G1.9** The roots shall have a high percentage of fibre that is just touching the edge of their containers.
- G1.10** Where several specimens of the same species are selected, ensure there is evenness of shape and size within the specified size range.
- G1.11** Ensure all plants are to the bag size, height, and combination specified on the plans.

### 3 Installation of Trees and Shrubs

- G1.12** Stake all specimen trees with three straight-pointed, untreated *Pinus radiata* staked 50 x 50 x 1500mm long. Use 50mm wide hessian webbing ties attached to stakes with approved galvanised fastenings. Ensure ties and fixings are sufficiently durable to provide required support to the plants for at least 3 years.
- G1.13** Regularly monitor any planting done in the summer months. Watering will be required to keep plants in good health.

### 4 Mulching of Planted Areas

- G1.14** Spray any weeds in newly planted areas with non-residual herbicide and remove any rubbish or foreign matter.
- G1.15** The contractor must make sure surface levels of growing media are as consistent as possible to allow easy and even application of 75mm of cambium pine bark mulch.
- G1.16** Ensure the finished surface of the mulch in all new landscaped areas is flush with or no more than 25mm below the surrounding ground surface, garden edging, kerb, path, or other formed surface.

### 5 Landscape and Plant maintenance handover

- G1.17** The landscape contractor is responsible for establishing and maintaining all new planting from the time installation is completed up until the handover of the project to Kāinga Ora.
- G1.18** In any period between installation and handover, the landscape contractor is responsible for ensuring optimum conditions for plants to thrive are provided, including but not limited to barricading, watering, weed control, cultivation, pest and disease control, removal of litter, checking of stakes and ties, pruning and mowing.
- G1.19** In any period between installation and handover, the landscape contractor will advise the main contractor and the project manager of any plants removed or stolen as well as any damage to the planting, lawn, hard surfaces, or structures caused by others in the course of their work.
- G1.20** Any such damage is the responsibility of the main contractor and should be repaired prior to handover.
- G1.21** At handover, the landscape contractor must demonstrate to the project manager that landscaping has been carried out in accordance with the project's landscape plans.
- G1.22** At handover, the landscape contractor must provide a landscape maintenance plan to Kāinga Ora. This plan sets out a 12-month, project-specific plant maintenance regime that aligns with the guidance notes set out in the following section.

## 2 PLANTING MAINTENANCE

### EXPECTATION

A 12-month planting maintenance regime is carried out across all developments, increasing the likelihood of landscapes thriving in their locality and context.

### EXPLANATION

All planting in our projects is selected on the basis of being as hardy and as maintenance-free as possible. Monitoring and maintenance over an annual cycle enables the planting to establish in its new environment and serves to protect our landscape investment.

### TECHNICAL GUIDANCE

#### 1 Plant establishment period

**G2.1** All planting, other than in areas set out below, must be maintained for a period of 12 months from the time installation is completed in accordance with the landscape maintenance plan.

**G2.2** Provide optimal conditions for plant establishment and survival during the 12-month maintenance period. This includes but is not limited to barricading, watering, weed control, cultivation, pest and disease control, rubbish removal, checking of stakes and ties, pruning and mowing.

#### 2 Areas excluded from the plant establishment period

**G2.3** Unless otherwise directed by the asset or maintenance manager, all fenced-in areas surrounding stand-alone houses, duplexes, terraces, and ground-level apartments intended for the exclusive use of the dwelling's residents are excluded from the 12-month maintenance requirement.

**G2.4** It is expected such areas will instead be maintained by residents.

**G2.5** Prior to resident occupation and during any void periods between tenancies within the 12-month establishment period, the maintenance contractor must maintain these areas.

#### 3 Inspection and reporting

**G2.6** A suitably qualified landscaper must inspect all planted and grassed areas on a monthly basis to establish what maintenance is required and set out an action programme with the procedures and frequencies set out below used as a benchmark.

**G2.7** Every 3 months, send a record for the development of monthly inspections and resultant maintenance to the Kāinga Ora asset manager.

#### 4 Plant and lawn vandalism, losses, and replacement

**G2.8** Promptly report any vandalised or stolen plants to Kāinga Ora and include the likely cause of the damage. Where instructed by Kāinga Ora, remove, and replace any vandalised and/or stolen plants.

#### 5 Lawn damage

**G2.9** During the 12-month establishment period, maintenance partners are responsible for any damage to lawns caused by maintenance.

#### 6 Replacement planting

**G2.10** Monitor plant health at each monthly inspection and replace any dead or dying plants.

#### 7 Herbicide applications

**G2.11** Apply herbicide every 2 months to control any perennial weeds.

**G2.12** Glyphosate will be sprayed by certified operatives from a hand-operated knapsack or towable spray unit.

#### 8 Hand-weeding

**G2.13** At least every 3 months, hand weed to remove any dead weeds or annual weed growth. Dig out all weeds by hand and remove them from the site.

#### 9 Adjustment to tree ties

**G2.14** Adjust tree ties as and when required to ensure trees are not leaning or rubbing on the ties. These should generally be removed by the end of the 12-month maintenance period.

#### 10 Pruning

**G2.15** Prune twice a year to promote healthy new growth. Immediately remove dead or broken branches if reported or as per instructions from Kāinga Ora.

#### 11 Fertiliser application

**G2.16** Apply fertiliser once a year in the spring to all planted areas, excluding grass.

#### 12 Pest and disease control

**G2.17** Monitor for pests and diseases on a monthly basis and take appropriate action as and when necessary.

#### 13 Watering

**G2.18** Monitor all planting on a regular basis during dry weather to establish ground moisture levels.

**G2.19** Water when required using mobile watering systems.

#### 14 Mowing

**G2.20** Mow lawns on a fortnightly cycle using an upfront mower with a side throw-deck. Take care to ensure roads and footpaths are left in a clean and tidy condition. Weedeat or spray edges and fixtures to avoid damage from mowers.

#### 15 Final inspection

**G2.21** At the completion of the maintenance period arrange a final inspection meeting with the Kāinga Ora asset manager.

**G2.22** Demonstrate the landscape planting set out in the project's landscape plan is well established.

**G2.23** Demonstrate how the grounds have been maintained in accordance with the Maintenance Plan as well as any subsequent modifications to that plan made by maintenance partners.



# GLOSSARY



**Āhurutanga** - Safe living environment

**Amenity space** - A common or private, on-site indoor or outdoor space designed for active or passive recreational use.

**Biodiversity** - The variety of different forms of life found on Earth. This includes plants, animals, fungi, micro-organisms and the ecosystems they form. Collectively, the diversity and interdependence of species and the associated ecosystems makes Earth habitable for people.

**Circulation** - The movement patterns of natural systems, pedestrians and vehicular traffic through a space.

**Common space** - A space or area of a building or site accessible by tenants, owners and visitors, including parking and service areas, access routes, lifts etc.

**Communal space** - A space or area of a building or site designed for the exclusive shared use by people in a development.

**Connectivity** - The ability to link to and communicate with other systems.

#### **Crime Prevention Through Environmental Design**

- An approach that uses design to create naturally safer environments with less reliance on law enforcement. CPTED aims to reduce opportunities for crime and anti-social behaviour while increasing opportunities for social interaction. In this approach, built environments are designed to make committing crimes less easy, reducing opportunities for crime to occur.

**Green corridors** - Ecological corridors or eco-friendly paths and lanes used for movement of people and/or natural habitats (this term can also be used to refer to a green belt).

**Hāpori** - Community

**Hardscape** - The constructed elements of a property, including paving, fencing, walls and landscape furniture.

**Homestar®** - A rating tool developed and administered by the New Zealand Green Building Council. It measures the health, warmth, and efficiency of New Zealand homes across seven key areas. A 6-Homestar® rating or higher provides assurance a home will be warmer, drier, healthier and more energy efficient than a typical new house designed to meet the Building Code. From mid-2019, all new homes designed and built by Kāinga Ora will meet the requirements needed to achieve a 6-Homestar® rating.

**Iwi** - Tribe

**JOAL** - Jointly owned access lot

**Kāinga** - Home or dwelling

**Kaitiakitanga** - Guardianship or protection

**Landmarks** - Buildings, structures or natural features that act as clear and distinct orientation points and provide a sense of location or identity for residents and visitors.

**Landscape** - Covers the planning, design, construction, and planting of all outdoor spaces, including utility and garden areas. An integral part of any successful development, good landscaping creates a pleasant environment for occupants and improves their quality of life. Landscape can be further divided into hardscape and softscape.

**Mahi tahi** - Better together

**Manaakitanga** - People at the heart

**Mana whenua** - Māori who have retained authority over their land or territory for long periods of time.

**Manuhiri** - Visitors

**Māori** - The indigenous people of Aotearoa New Zealand

**Māra kai** - Production garden or cultivation

**Maunga** - Mountain, mount or peak

**Mauri** - Life-force or principle and vitality

**Open space** - Land that is undeveloped (has no buildings or other built structures) and is accessible to the public, including parks, reserves and natural landscapes.

**Passive surveillance** - When people are seen or believe they can be seen by others (such as through windows), they are less likely to carry out criminal or anti-social behaviour.

**Permeability** - The degree to which an area is permeable in respect of surface treatments that are able to soak up stormwater.

**Private space** - Spaces or areas of a building or site only accessible to the tenants and/or owners.

**Public realm** - The public and semi-public spaces that form most people's 'first impression' of a city or neighbourhood. Primarily, the public realm comprises the street space between the faces of buildings (including the façade, front yard, sidewalk and streets) and open spaces like parks and squares (including the façade, front yard, sidewalk and streets) and open spaces like parks and squares.

**Public space** - Spaces or areas of a site or neighbourhood available for use by all members of the public.

**Softscape** - The living landscape – the plant components.

**Streetscape** - A term covering everything that makes up the scene on a street, including footpaths, road, street trees, street lights, street furniture and the building frontages that line the street. Collectively, these elements create an outdoor environment for people to be in, whether travelling from one place to another or lingering where there is an inviting ambience.

**Tangata whenua** - People of the land

**Tiakitanga** - Guardianship or stewardship

**Topography** - The precise description of the physical form of an area, including natural and man-made land forms and relief features.

**Tuitui** - Engage with people

**Tūhononga** - The residents experience

**Tūrangawaewae** - A place where one has rights of residence and belonging through kinship and whakapapa.

**Universal Design** - Universal design is about making sure everything is accessible to and understood by and used to the greatest extent possible by everyone without adaptation or requiring little adaptation.

**Urban forest** - The collection of all the trees within a city, town, or suburb, including those in both public and privately owned properties. Urban forests play a vital role in the urban ecology, including supporting biodiversity, mitigating heat build-up, absorbing stormwater, supporting property values and beautification.

**Visual Amenity** - A generic and agreeable character or feature that could make a place more appealing and an attractive place to be, work and live.

**Whakatinana** - Implement

**Whanake** - Develop

**Whānau** - The family unit and kinship

**Whanaungatanga** - Wider family kinships and relationships

**Whare** - House or dwelling

**Whenua** - Reflective of landscape and the associated connection to people

**Whiriwhiri** - Building lives and communities



# APPENDICES





## APPENDIX 1

## PLANTING DESIGN - NEIGHBOURHOOD

Biome	Species	Role Within Ngahere (Including Biodiversity)
Northern	Vitex lucens	Food for birds (nectar and berries) for most of the year
	Metrosideros excelsa	Useful for exposed conditions & creating shelter. Nectar for birds and lizards
	Sophora chathamica	Nectar in spring. Young foliage is a source of protein for kereru in late winter.
	Knightia excelsa	Attractive to tui and other honey eaters in early summer
	Podocarpus totara	Significant component of forest canopy (providing shade and shelter); fruits for birds.
	Dacrycarpus dacrydioides	Significant species of damp forests and gullies (such as in Waikato); fruit for birds.
Central Plateau	Sophora godleyi	Impressive species of kōwhai from the Central North Island, with strong flowering performance (and associated nectar supply).
	Fuscospora fusca (syn. Nothofagus fusca)	The most statuesque of our native beech; habitat for many birds and insects.
East Coast	Metrosideros robusta	Major tree species of mature forests; nectar resource for birds and lizards.
	Kunzea robusta	The flowering of kanuka is a significant food resource for native invertebrates. Pioneer species.
	Cordyline australis	Flowers attractive to bees and other invertebrates; fruits are a favourite of kereru.
SW North Island	Hoheria sexstylosa	Pioneer species with rapid growth; flowers are a valuable source of nectar for butterflies.
	Dacrydium cupressinum	Fruit for birds; significant component of ancient forests
	Rhopalostylus sapida	Kereru are particularly fond of nikau's fruits; flowers valuable for insects.
	Didymocheton spectabilis (syn. Dysoxylum spectabile)	The flowers that develop on the stems are visited by honeyeater bird species.

Conditions & Tolerances	Form	Mature Size H(m)xW(m)
Best planted in fertile, sheltered conditions.	Spreading growth form with a dense canopy of vibrant green foliage.	8 x 8
Extremely drought-tolerant when established, and very tolerant of salt winds.	Mostly spreading, but some selections are more upright (including 'Maori Princess' and 'Vibrance').	8 x 8
Best in fertile soils, and well suited to cultivating in groves.	Useful for its asymmetrical, weeping form, which can lean away from buildings.	6 x 4
Best emerging from other trees and shrubs during establishment. Wind-tolerant.	Narrow, columnar form during its first two decades, similar to a poplar.	7 x 3
Drought-tolerant when established; resistant to wind and pollution.	Rounded canopy (allowing filtered light) on a stout trunk.	8 x 8
High light species; for average to damp soil (consider micro-contouring)	Narrow, pyramidal form; fine texture to the foliage	8 x 5
High light; woodland edge species or well suited to cultivating in groves.	Broad crown with semi-weeping branches; good light infiltration.	6 x 6
Best with some shelter at the beginning, but resilient in windy conditions once established.	Large, rounded crown and strong trunking form; dappled light.	9 x 3
Associated with well-drained sites in high light; slow-growing and should therefore be planted in large grades.	Upright form a much more compact canopy than pohutukawa. For this reason, hybrids involving this species have become popular as street trees.	8 x 5
High light and well-drained conditions.	Upright tree with a single stem; good for rapid establishment.	4 x 3
Tolerant of a wide range of ground conditions and wind, high-light species.	Distinctive trunking form and heads of sword-shaped foliage.	6 x 4
High light; able to withstand exposed conditions.	Upright form; weeping branches; graceful specimen.	5 x 3
Full sun to semi-shade; requires average moisture to establish.	Weeping stems of vibrant green foliage on a comparatively narrow tree.	8 x 4
Best planted to emerge from other trees and shrubs. Mainland forms perform best in semi-shade.	Single stem; narrow form typical of palm trees, and therefore useful adjacent to buildings.	8 x 2
Best planted in a slightly sheltered position to achieve optimal establishment	Spreading canopy with large, compound leaves that register well when viewed from above.	8 x 5

## APPENDIX 2

## PLANTING DESIGN - NEIGHBOURHOOD (CONTINUED)

Biome	Species	Role Within Ngahere (Including Biodiversity)
Nelson	<i>Elaeocarpus hookerianus</i>	Flowers are visited by invertebrates, and fruits consumed by birds.
	<i>Nestegis montana</i>	Elegant forest tree that provides fruits for kereru, and habitat for nesting.
	<i>Prumnopitys taxifolia</i>	Fodder for birds; long-lived forest species that endures within open conditions.
West Coast	<i>Pectinopitys ferruginea</i> (syn. <i>Prumnopitys ferruginea</i> )	Fruits are a favoured food for kereru
	<i>Laurelia novae-zelandiae</i>	Important species of damp forests
Rainshadow	<i>Plagianthus regius</i> subsp. <i>regius</i>	Pioneer species; associated with riverine forest and swamps, as well as very dry habitats in inland SI.
	<i>Fuscospora solandri</i> (syn. <i>Nothofagus solandri</i> )	Significant component of SI forests, offering habitat for birds and insects.
	<i>Sophora microphylla</i>	This species of kōwhai is the main representative of the genus in southern areas. Nectar for birds.
Otago/Southland	<i>Fuscospora</i> (syn. <i>Nothofagus</i> ) <i>cliffortioides</i>	The most cold-tolerant of our native beeches, ascending all the way to the treeline.
	<i>Hoheria angustifolia</i>	Similar to <i>H. sexstylosa</i> , the flowering of hungere is a good source of pollen for bees.
	<i>Griselinia littoralis</i>	Kapuka is commonly planted throughout the country, but is more appropriate in southern climes.

Conditions & Tolerances	Form	Mature Size H(m)xW(m)
Best with some shade in warmer areas; able to grow in full sun in cooler climes.	Columnar growth form in its juvenile phase, making this very useful in confined spaces like parking strips.	8 x 6
Tolerant of a wide range of conditions. Best in high light to semi-shade, and fertile soils.	Small tree with fine, bamboo-like leaves and a graceful, rounded growth form.	4 x 2
Best established within semi-shade; drought-tolerant as mature specimens.	Fine foliage; upright form and slow growth make this a suitable tree for developments.	6 x 5
Best within sheltered locations, although able to withstand wind when emerging from shrubland.	Vibrant green, narrow leaves; tiered growth form with a graceful structure when the trunk is lifted.	6 x 5
High light and moist soil; best emerging from shrubland	An especially vibrant foliage tone and narrow growth form on an under-utilised species.	8 x 3
Open sites and woodland edge zones.	Slender, upright form in its early years. Best planted with some space from buildings to allow for eventual, symmetrical form	5 x 3
Well suited to lowland areas; wind-tolerant once established.	Dappled light through a tiered branching structure.	8 x 8
High-light areas in fertile soils. Staking should be gradually removed, so that trees develop long roots.	Very attractive weeping form; able to develop asymmetrical growth.	6 x 6
High-light and average soil conditions. More resilient than silver beech in a wider range of conditions.	More compact growth form than other beech species; dappled light.	6 x 6
Full sun; moist and dry soils; wind-tolerant	Excellent narrow tree with a graceful form and summer flowers.	6 x 2
Open conditions and woodland edges. Well drained soil.	Vibrant foliage colour and an attractive trunking habit. Able to be trained to an asymmetrical form.	4 x 5

## APPENDIX 3

## PLANTING DESIGN - SITE

## Trees &amp; Fruit trees

Biome	Species	Role Within Plantings
Northern	Magnolia denudata	Winter-flowering and deciduous form for increased light infiltration in winter.
	Sophora fulvida	Bright yellow flowers in spring provide seasonal interest; comparatively light growth habit.
	Carpodetus serratus	Rapid growth rate contributes to establishment of projects, and providing shade for other species.
	Plum varieties (including 'Sultan' and 'Hawera')	Provision of fruit for residents (and social connection associated with fruit harvesting).
Central Plateau	Pittosporum turneri	Narrow growth form is exceptionally useful within confined spaces. Adapted to damp conditions.
	Melicytus novae-zelandiae	Bright green, narrow foliage on a low, spreading tree. Attractive tree species that should be planted more in the Central North Island.
East Coast	Orange trees	Provision of fruit for residents; the scent of the flowers justifies planting their inclusion.
	Lophomyrtus obcordata	Understorey species with an elegant, tiered branching structure and fine foliage. Attractive trunks.
SW North Island	Pennantia corymbosa	Narrow small tree with a divaricating growth form in its juvenile phase (during which it offers a fine texture).
	Melicope ternata	An understorey species of coastal forest, which can perform a similar role in Kāinga Ora sites.

Conditions & Tolerances	Form	Mature Size H(m)xW(m)
High-light areas; well-drained conditions.		5 x 4
Tolerant of exposure to wind and drought (once established)	Uncommon species of the west coast of the upper North Island; especially around Waitakere.	3 x 4
Full sun or semi-shade in soil that is not dry.	Provides habitat for invertebrates and birds.	5 x 4
Full sun, semi-dry, sheltered, tolerant of frost	Seasonal blossoms attract insects.	4 x 3
High light conditions in average to damp soil.	Nationally threatened species with scented red flowers.	3 x 1
High light; average to moist soil.	Scented flowers are attractive to insects; purple fruits for birds.	4 x 4
Oranges require a warm position in New Zealand, and perform particularly well in Gisborne and Hawke Bay	Fruit provision for residents.	3 x 3
Tolerant of dry conditions, but best within semi-shade. Allow 3m space for canopy	Pollen for insects.	3 x 3
Full sun or semi-shade; moist soil encourages maximum growth rates	Fruits for birds, in addition to nectar and pollen from flowers.	5 x 3
Best suited to very light shade, which its pale green foliage helps to illuminate, especially as viewed from above	Flowers contribute to habitat for insects.	4 x 3



## APPENDIX 4

## PLANTING DESIGN - SITE

## Trees &amp; Fruit trees (Continued)

Biome	Species	Role Within Plantings
Nelson	<i>Sophora longicarinata</i>	A particularly slender species of kōwhai associated with marble and limestone habitats of Nelson and Marlborough
	Pear tree varieties	Provision of fruit for residents; pear trees are also particularly attractive specimen trees. Durable.
	<i>Ginkgo biloba</i> 'Fastigiata'	Deciduous, columnar tree for autumn colour and increased winter light. Attractive leaf form
West Coast	<i>Myrsine salicina</i>	Toro is an attractive, narrow tree of forest understorey habitats. Under-utilised and adaptable.
Rainshadow	Apricot varieties	Self-fertile and disease resistant fruit tree for orchard spaces in drier, colder climates.
	<i>Fagus sylvatica</i> 'Dawyck Purple'	Tall, columnar tree for narrow spaces. The foliage colour helps to provide character to individual sites.
	Apple 'Liberty' & associated varieties	Self-fertile and disease-resistant variety of apple. Other heritage varieties such as 'Hetlina' are worth considering.
	<i>Magnolia</i> 'Yellow Bird'	Upright habit and yellow flowers for seasonal change and colour.
Otago/Southland	<i>Styrax japonicus</i>	A deciduous, white-flowered exotic tree with a spreading, tiered growth form
	<i>Carpinus betulus</i> 'Fastigiata'	Columnar deciduous tree for narrow spaces and establishing rhythm within plantings.

Conditions & Tolerances	Form	Mature Size H(m)xW(m)
Full sun; drought tolerant when established.	An uncommon species that demonstrates regional variation within this genus.	3 x 4
High light; fertile soils	The flowers are attractive to insects, and this is one of several fruit trees for orchards.	5 x 4
Sheltered positions in open aspects		7 x 3
Able to be grown in open conditions and shaded habitats. Average soil	Bird-attractant species when in fruit.	
Full sun, well-drained	Fruit provision for residents and flowers for pollinators.	4 x 3
High light; semi-sheltered locations		8 x 3
Able to be espaliered or grown in manners that are less demanding for space.	Good species for pollinators.	3 x 2
Open aspects; able to be trained to an asymmetrical form.		5 x 4
Semi-shade; moist soil; good species for seasonal change.		4 x 3
Suited to a variety of aspects, including exposed conditions. Well-drained soil.		5 x 1.5



## APPENDIX 5

## PLANTING DESIGN - SITE

## Shrubland &amp; Understorey

Biome	Species	Role Within Site (including Form & Texture)
Northern	Veronica diosmifolia (syn. Hebe diosmifolia)	Upright, tidy and compact. Good track record with commercial plantings.
	Coprosma lucida	Can be utilised for mixed boundary plantings
	Corokia cotoneaster	Natural diversity of tones and leaf size has potential in planting design. Yellow flowers in Spring add seasonal variation
	Cordyline fruticosa	Cultural value within Northern New Zealand; Bright foliage colour.
	Pseudopanax discolor	Valuable for introducing a shift in foliage size, colour (bronze) and shape.
	Strelitzia reginae var. parvifolia	Seasonal change and colour, especially in winter
Central Plateau	Olearia virgata	Fine texture and scented flowers in summer. Useful in mixed boundary planting
	Phormium cookianum subsp. hookeri	Often associated with shrubland in natural conditions. Should be utilised within diverse plantings
East Coast	Veronica tairawhiti (syn. Hebe tairawhiti)	Rapid establishment; Eventual size should be considered in its placement
	Clianthus maximus	This species should be planted in combination with other species through which it can emerge. Well-known red flowers in winter and spring.
SW North Island	Veronica parviflora (syn. Hebe parviflora)	Bright green foliage and rounded form are valuable attributes for structural planting
	Coprosma crassifolia	Useful as part of 'compressed shrublands' (ref. Figure #) for boundary condition
	Osmanthus delavayi	Useful near pathways due to its scented flowers
	Coprosma pedicellata	Useful within very poorly-drained locations, and for the fine texture of its foliage

Conditions & Tolerances	Biodiversity Values	Mature Size H(m)xW(m)
Requires good drainage, tolerates exposure and drought	Nectar attracts butterflies	2 x 1
Tolerates shade and drought when established	Fruit attracts birds	3 x 2
Tolerant of a wide range of conditions. For well-drained soil.	Fruit for lizards and small birds	2 x 1.5
Best colour achieved with bright indirect light		2 x 1
Tolerant of wind and dry conditions	Fruit for wildlife	2 x 1.5
Tolerant of full sun, dry soils and the demands of high-use environments.		1.2 x 1
Naturally inhabits open shrubland; tolerant of exposure to wind and sun	Scented, white flowers (visited by insects).	3 x 2
Coastal; resilient in exposed conditions	Nectar for birds	1.5 x 2
Naturally occurring in coastal and riverine habitats	Nectar for butterflies. Rare species in the wild, and endemic to Tairāwhiti	3 x 2
Cliff-dweller; prefers well-draining soils	Critically endangered in the wild.	3 x 3
Native to exposed sites on the Wellington coast. Requires high light.	Provision of nectar for butterflies	7 x 4
Tolerant of dry and exposed conditions	Fruit attracts lizards and small birds	3 x 2
Requires good drainage and best in partial shade		1.2 x 1
Naturally occurring in water-logged soils and seasonally inundated habitats	A rare species, threatened by wetland drainage.	3 x 2

## APPENDIX 6

## PLANTING DESIGN - SITE

## Shrubland &amp; Understorey (Continued)

Biome	Species	Role Within Site (including Form & Texture)
Nelson	<i>Olearia polita</i>	Interlacing, strongly divaricating branch structure
	<i>Melicytus obovatus</i>	Naturally rounded form to 1.5m. Associated with well-drained areas in high light.
	<i>Calycanthus floridus</i>	Fragrant red flowers with a dense and rounded habit
West Coast	<i>Metrosideros umbellata</i>	Useful for increasing seasonal change with red flowers in summer. Vibrant foliage.
	<i>Pseudowintera axillaris</i>	Bright green leaf tone and whitish undersides visually lightens shaded areas.
Rainshadow	<i>Muehlenbeckia astonii</i>	Reddish stems offer colour, and the fine texture of the foliage increases the sense of depth in plantings. Well adapted for high-use areas
	<i>Olearia adenocarpa</i>	Low structure within plantings
	<i>Myrsine divaricata</i>	Striking form with weeping foliage
	<i>Melicytus 'Waipapa'</i>	Resilient within high-use areas. Fine, mineral tone to its foliage, and a distinctive branching habit.
Otago/Southland	<i>Olearia fragrantissima</i>	Orange-tinged, zig-zagging stems. Pale green leaves emerging in spring.
	<i>Pseudowintera colorata</i>	Leaf colour provides interest throughout the year. Useful within mixed plantings. Significant cultural value for mana whenua.
	<i>Pittosporum obcordatum</i>	Tall, columnar form is suitable for narrow spaces

Conditions & Tolerances	Biodiversity Values	Mature Size H(m)xW(m)
Performs well in shade and dry conditions.	Scented flowers for insects. Nationally threatened and endemic to Nelson/Buller.	3 x 2
Compact form; drought-tolerant	Rare species adapted to strong coastal influences and dry marble/limestone habitats. Fruit for lizards	1.5 x 2
Best with partial shade, useful emerging from other shrubs		2 x 2
Associated with warmer sites, such as coastal forest and lakeside margins.	Nectar for birds and insects	5 x 2
Thrives in shade and sheltered conditions	Berries are attractive for birds	6 x 2
Tolerant of a wide range of conditions (including drought), although it requires well-drained conditions.	Nationally endangered. Host species for native copper butterflies	1.5 x 1
Canterbury Plains endemic; associated with dry, gravel habitats	Critically endangered	1.2 x 1.5
Occurs in a wide range of habitats, accommodating drought, cold and periodic flooding.	Fruits provide value for native lizards and small birds	2.5 x 1
Tolerant of drought, shade and exposed conditions	Undescribed species with variation between local forms	0.5 x 1
Tolerant of cold, wind and exposure	Increasingly rare species. Small, fragrant flowers.	5 x 2
Occurs in a wide array of habitats, including windshore mountain shrubland	The leaves can be used for flavouring food.	3 x 2
Adaptable to a variety of environmental conditions; often associated with swampy areas.	Threatened species; night-scented flowers.	7 x 2

## APPENDIX 7

## PLANTING DESIGN - SITE

## Groundcover

Biome	Species	Habitat Types	Factors for Resilience
Northern	<i>Astelia grandis</i>	Swampland and gullies	Grows naturally in boggy conditions, although adaptable to average soils. Robust growth form.
	<i>Freesia refracta</i>	South African native for sunny aspects.	Bulbs increase with time and endure amongst competition
	<i>Asplenium oblongifolium</i>	Diverse; coastal to montane	Robust and drought tolerant when grown in shade
	<i>Fuchsia procumbens</i>	Coastal cliffs, dunes and grassland	Drought tolerant (sometimes summer-deciduous within very dry conditions)
Central Plateau	<i>Pimelea prostrata</i> subsp. <i>vulcanica</i>	Volcanic slopes and plains throughout Central North Island	Adapted to dry, exposed conditions
	<i>Parablechnum procerum</i> (syn. <i>Blechnum procerum</i> )	Tussock and scrubland	Adaptable to light and shaded conditions
East Coast	<i>Libertia cranwelliae</i>	Naturally associated with well-drained habitats near East Cape.	Stoloniferous growth habit. Clumps naturally increase
	<i>Pimelea mimosa</i>	Limestone cliffs	Naturally inhabits dry, south-facing, exposed conditions
SW North Island	<i>Coprosma acerosa</i> 'Hawera'	Sandy, coastal habitats	Tolerant of exposure, skeletal soils and drought
	<i>Geranium x cantabrigiense</i>	Hybrid between European species	Drought tolerant due to thick rhizomes.
	<i>Carex solandri</i>	Dry forest	Self-seeds once established; more drought-tolerant (in shade) than commonly-planted carices.
	<i>Dianella nigra</i>	Open woodland; forest edge	Tolerant of dry, shade

Growth Form	Potential Associates	Biodiversity Values	Mature Size H(m)xW(m)
Clump-forming. Bright green, flax-like leaves.	<i>Blechnum minus</i> ; <i>Carex secta</i>	Female plants produce berries that attract birds	2 x 2
Winter-flowering bulb	<i>Carex flagellifera</i> ; <i>Lobelia angulata</i>		0.35 x spreading
Rosette of arching, deep green fronds.	<i>Dichondra brevifolia</i> ; <i>Doodia australis</i>	A member of Auckland's original lava forests.	1 x 1
Trailing shrub.	<i>Veronica</i> (syn. <i>obtusata</i> )	Now rare in the wild; fruits offer food for native fauna.	0.15 x 2
Shrubby groundcover	<i>Podocarpus nivalis</i> ; <i>Lobelia angulata</i>	Scented flowers attractive to insects	0.1 x 1
Compact with bronze-tinted foliage	<i>Leptostigma setulosum</i>	Rhizome-spreading, forming ground coverage over time	0.4 x 1
Sword-leaved, clump-forming; attractive white flowers	<i>Jovellana sinclairii</i>	Critically endangered	0.4 x 1
Low, sprawling shrub	<i>Veronica</i> (syn. <i>Hebe</i> ) <i>stenophylla</i> var. <i>stenophylla</i>	Critically endangered, only found on Te Mata Peak	0.25 x 0.5
Ground-hugging shrub. Fine, bright green foliage	<i>Scandia rosifolia</i> ; <i>Pimelea carnosa</i> ; <i>Ficinia nodosa</i>	Undescribed species of South Taranaki	0.1 x 2
Clumping perennial; soft pink flowers for seasonal change.	<i>Pimelea urvilleana</i>		0.3 x 0.4
Dense clumps of weeping, deep green foliage	<i>Hydrocotyle elongata</i> ; <i>Leptostigma setulosum</i>		0.6 x 0.6
Compact, flax-like form; attractive flowers and berries	<i>Microsorium pustulatum</i>	Native <i>Dianella</i> should never be substituted for exotic varieties	0.5 x 1

## APPENDIX 8

## PLANTING DESIGN - SITE

## Groundcover (Continued)

Biome	Species	Habitat Types	Factors for Resilience
Nelson	Coprosma 'Wharariki Beach'	Coastal, sandy habitat	Tolerant of exposure and drought
	Melicytus crassifolius	Coastal and open grassland	Salt and drought tolerant. Robust growth form
West Coast	Gunnera prorepens	Damp habitats	Thrives in damp conditions and tolerant of frost
	Astelia fragrans	Forest species; widely distributed.	Grows within shady conditions
Rainshadow	Pachystegia minor	Coastal and rocky lowland sites	Drought tolerant and able to grow within restricted soil volumes
	Chionochloa rigida subsp. rigida	Open grassland; cold areas	Long-lived
Otago/Southland	Muehlenbeckia axillaris	Rocky habitats	Resilient in a range of conditions
	Libertia peregrinans	Coastal dunes and cliffs	Tolerant of high winds and light levels. Stoloniferous habit
	Chionochloa rubra	Subalpine to alpine	Adapted to low-fertility soils associated with bogs. Also tolerant of some dry.
	Veronica (syn. Hebe) odora	Montane and shrubland	Drought and wind resistant
	Carex tenuiculmis	Damp lowland to montane areas	Withstands fluctuating soil moisture levels
	Carex trifida	Coastal	Tolerant of salt and exposed conditions

Growth Form	Potential Associates	Biodiversity Values	Mature Size H(m)xW(m)
Creeping, deep green shrub	Metrosideros perforata; Leptinella calcarea		0.2 x 0.7
Rigid, dense shrub with a twiggy habit	Metrosideros diffusa; Pimelea carnososa	At-risk species. Fruit for lizards	1 x 1
Creeping foliage, red berries on spikes in autumn.	Astelia grandis; Leptinella squalida	Berries for local fauna	0.05 x 0.5
Bright green, sword-shaped leaves; fragrant flower in spring	Microsorium pustulatum		1.5 x 1.5
Low shrub with distinctive white daisy flowerheads	Olearia cymbifolia; Coprosma cheesemanii	Rare species, local to South Marlborough	0.4 x 0.4
Tussock form with tall flowerheads in summer	Olearia nummulariifolia; Muehlenbeckia axillaris	Seasonal flowers and seeds attract local fauna	1 x 1
Low, mat-forming with wiry stems and very small leaves	Austroblechnum penna-marina	Wiry form provides habitat for native butterflies	0.15 x 1
Linear orange leaves and white flowers	Leptinella dioica	Nationally threatened, and now absent from large parts of its range.	0.3 x 0.4
Tussock form with copper-toned narrow, curled leaves	Coprosma cheesemanii; Coprosma dumosa	An important tussockland species that descends to the coast in Southland.	1 x 1
Compact, rounded shrub with an ordered growth form	Austroblechnum penna-marina; Chionochloa rubra	White flowers visited by insects	0.5 x 0.5
Bronze-red tinted foliage	Gunnera monoica; Blechnum minus	Attractive habitat for insects	1 x 1.5
Blue-green, wide foliage; attractive clumps	Carex fretalis; Selliera radicans		1 x 1

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