Christchurch Central

Te Pūtahi o Ōtautahi

STREETS & SPACES

NGĀ HUANUI ME WĀHI

DESIGN GUIDE

Ārahi Hoahoa

TECHNICAL GUIDANCE

CERA
Canterbury Earthquake Recovery Authority
Te Mana Haumanu ki Waitaha

Christchurch Central Development Unit
Te Uepū Whakabiato

Christchurch City Council

Published in [December 2015] by

Canterbury Earthquake Recovery Authority (CERA)
Private Bag 4999
Christchurch 8140

info@cera.govt.nz
0800 7464 2372
www.cera.govt.nz

ISBNs
[978-0-908343-18-8] (print)
[978-0-908343-19-5] (online)

Contents

Foreword 4

Purpose 5

How to use this document 6

01. Technical guidance design criteria

Strategic guidance 12

Materials and street furniture selection and set-out criteria 13

Street cross-sections 14

02. Street treatments

Overview 19

S / Streetscape set-out 20

T / Surface treatments 42

P / Footpath elements and standard details 48

PK / Kerbs 61

PD / Drains 66

03. Vegetation

Overview 70

VS / Vegetation selection 71

VT / Tree pits 82

VR / Rain gardens - Under Development

04. Street furniture

Overview 91

FS / Seating elements 92

FE / Standalone elements 94

FC / Cycling elements 99

FL / Lighting Elements - Under Development

FW / Wayfinding Elements - Under Development

05. References

Technical notes index 104

List of figures 106

Photography 107

Further references 109

Foreword

This Technical Guidance book provides the suite of materials, street elements and standard details for streets and public space projects in central Christchurch.

The Technical Guidance book is not intended to replace but rather to complement Christchurch City Council Construction Standard Specifications (CSS) and Infrastructure Design Standards (IDS).

The Technical Guidance book should be read in conjunction with the **Strategic Guidance** book of the **Christchurch Central Streets & Spaces Design Guide.**

The Strategic Guidance book provides a design framework to guide the reconstruction of the central city streets and public spaces. It focuses on supporting the delivery of the Christchurch Central Recovery Plan, its anchor projects and transport chapter, *An Accessible City*.

The Strategic Guidance book is available at:

http://ccdu.govt.nz/the-plan/design-guides

The CSS can be accessed at:

http://www.ccc.govt.nz/consents-and-licences/construction-requirements/construction-standard-specifications/

The IDS can be accessed at:

http://www.ccc.govt.nz/consents-and-licences/construction-requirements/infrastructure-design-standards/

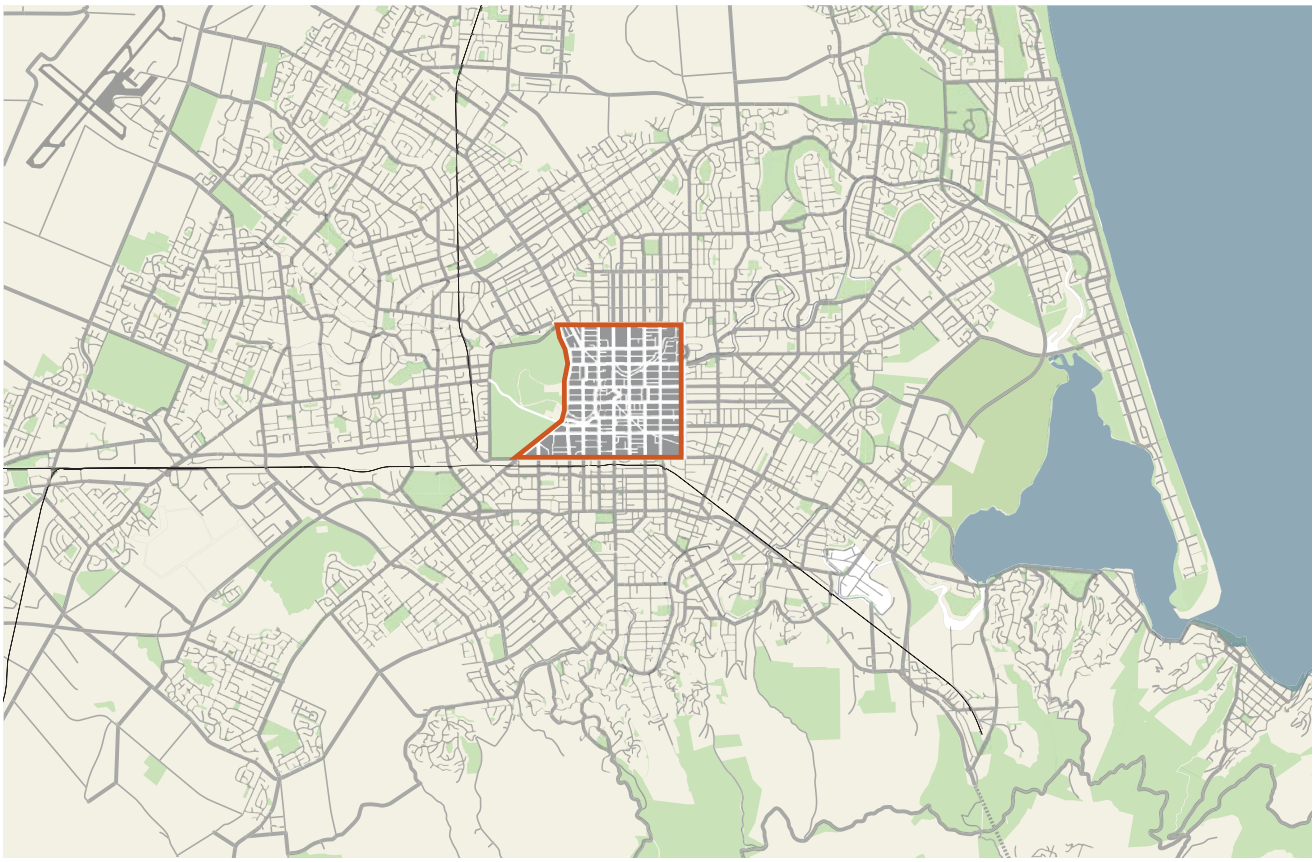


Figure 1 *Streets & Spaces Design Guide application area*

Purpose

This Technical Guidance book has been developed to help realise design, functional, economic and operational benefits for the central city by:

Supporting the delivery of the vision and objectives of the Christchurch Central Streets & Spaces Design Guide.

For example:

- a defined materials and street elements palette will contribute to a city of distinctive identity with a strong sense of place
- the use of similar designs in similar situations will make the city easier to navigate, especially for those with special mobility needs
- a unified design approach will result in a cohesive and well-integrated network of streets and public spaces in the long term, even if projects are built in stages.

Ensuring public realm projects maximise value from infrastructure investment and ongoing asset management efficiencies.

For example:

- a defined palette of materials and street elements will enable economies of scale, making its supply less costly
- a unified design approach will facilitate efficient management and maintenance protocols. As a result, public spaces can be well maintained without unreasonable expense
- a defined suite of materials and street furniture can be pre-tested and proved to perform under demanding conditions, contributing to fit-for-purpose projects
- with a selected suite of materials and street furniture, suitable pieces will be available when replacements are required. In this way the integrity of designs can be effectively preserved.

Scope

The Streets & Spaces Design Guide has been prepared for the area bounded by Park Terrace and Rolleston, Bealey, Fitzgerald, Moorhouse and Hagley avenues. The Streets & Spaces Design Guide does not include Hagley Park. The area to which this Design Guide applies is referred to as the central city or central Christchurch.

While the Streets & Spaces Design Guide focuses specifically on the central city, it has been prepared with regard to the context of greater Christchurch and the values of Ngāi Tahu.

Who is this document for?

This Technical Guidance book has been developed to guide consultant teams, design professionals and anyone involved in designing or delivering public realm projects in central Christchurch.

The technical guidance in this book is applicable in particular to public realm projects that are or will be owned by Christchurch City Council or the Crown.

How to use this document

The Streets & Spaces Design Guide is set out in two books: Strategic Guidance and Technical Guidance.

This **Technical Guidance** book has five chapters:

Chapter 1 sets out the strategic and technical design criteria that should inform the design of public realm projects in the central city.

Chapter 2 provides the suite of surfacing treatments, their application and standard details.

Chapter 3 outlines the suite of planting elements, their application and standard details.

Chapter 4 provides the suite of street furniture elements and their application.

Chapter 5 includes an index of all the technical notes included in this guide, as well as references to other relevant technical documents.

The Technical Guidance should be read in conjunction with Christchurch City Council (CCC) Construction Standard Specifications (CSS) and Infrastructure Design Standards (IDS) and any other applicable legislation.

This **Strategic Guidance** book provides the vision, design principles and criteria, along with general concepts that should guide the design of the public realm projects for the central city. The Strategic Guidance book has seven chapters.

Chapter 1 provides the vision and design principles for the central city's public realm network. It also outlines the value, components and general structure of this network.

Chapter 2 identifies strategic matters that have informed the development of the guidance and concepts set out in the Strategic Guidance book.

Chapter 3 outlines the design criteria that should inform the design of public realm projects in the central city.

Chapter 4 identifies and provides an overview of the gathering places in the central city and how they relate to the anchor projects.

Chapter 5 explains and illustrates plans and design concepts for the central city street network and how they contribute to the implementation of Accessible City.

Chapter 6 describes the public realm component of the anchor projects and identifies important relationships with other anchor projects, gathering places and the street network.

Chapter 7 briefly outlines key aspects for the implementation of public realm projects in the central city.

To make both books as easy as possible to navigate, cross-references to specific topics and interdependencies are included throughout the document.

For example, there is a three-step process to apply the guidance in both books to the individual projects.

1. Understand the strategic approach outlined in Chapter 2 and review the design criteria in Chapter 3 of the Strategic Guidance book. Use these criteria to guide the design process.
2. Identify the public space typology for gathering places in Chapter 4 or the relevant street hierarchy in Chapter 5 of the Strategic Guidance book. Apply relevant design considerations and standards to the design.
3. Use this Technical Guidance book, to select materials, construction details and street furniture.

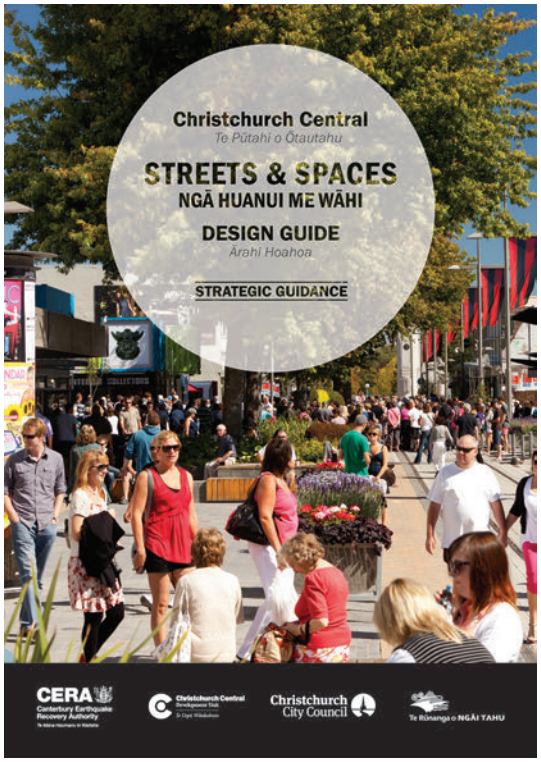


Figure 2 *Strategic Guidance book provides the vision, design principles and criteria, along with general concepts that should guide the design of the public realm projects for the central city*

Figure 3 *Technical Guidance book provides the suite of materials, street furniture and standard details to be used in public realm projects in the central city*

How to use this document

The information in this book has been prepared in the form of technical notes.

A prefix identifying each technical note is located on the top right or left corner of each page, as shown in Figure 4.

The initial characters in the prefix indicate the type of information provided as follows:

'S' for the set-out of specific areas within a central city streetscape, such as footpaths and crossings

'T' for surface materials and treatments

'P*X*' for elements and standard details that make up the central city footpath palette, where 'X' changes depending on the element or detail

'V' for vegetation selection and related elements

'F' for street furniture elements

When the element or detail illustrated in the technical note has been selected from an existing document or standard, the reference is provided at the end of the text columns as shown in Figure 5.

A list of all the technical notes included in each group is provided at the beginning of Chapter 2 to 4.

An index of all technical notes in the Technical Guidance book is provided in Chapter 5.

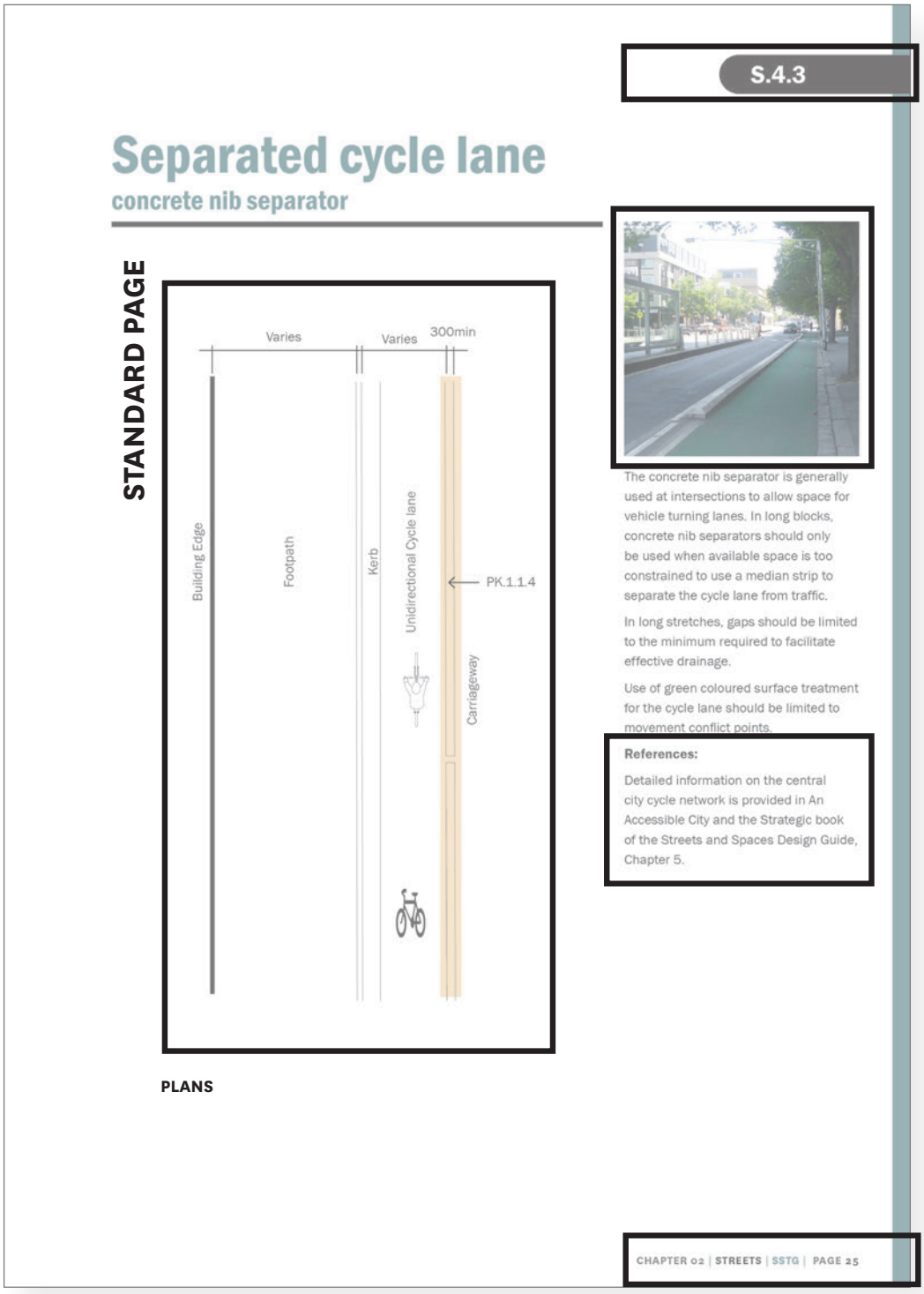


Figure 4 *Reference elements in a standard page of the Technical Guidance book*

"Whatever good things we build end up building us."

Jim Rohn

01

TECHNICAL GUIDANCE DESIGN CRITERIA

Strategic guidance

The design of streets and gathering places in the central city should be informed by the design criteria set out in Chapter 3 of the Strategic Guidance book.

The design criteria identify key design considerations that will assist in making the vision for the streets and public spaces of central Christchurch a reality.

The Strategic Guidance book is available at http://ccdu.govt.nz/the-plan/design-guides

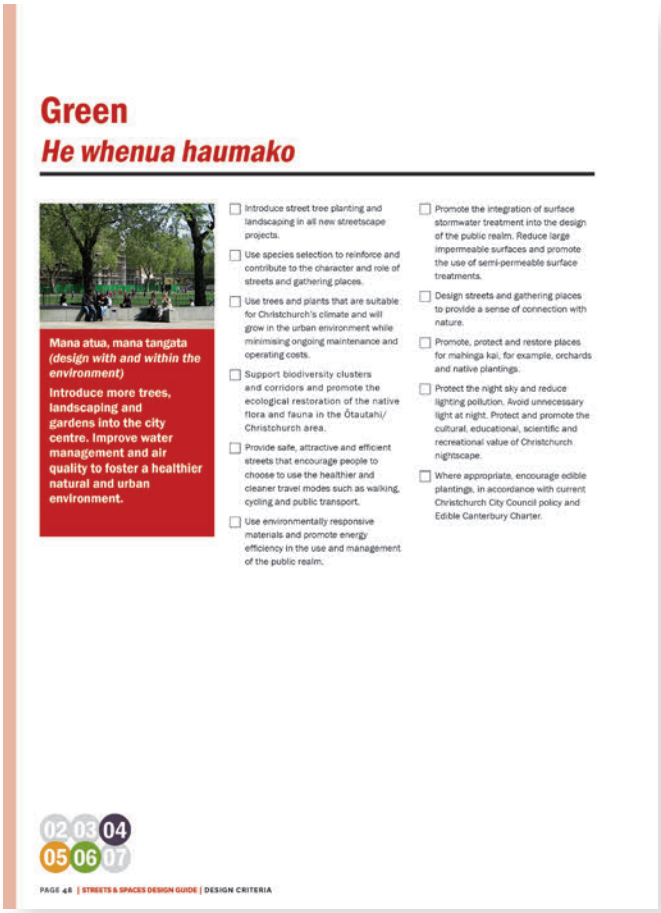
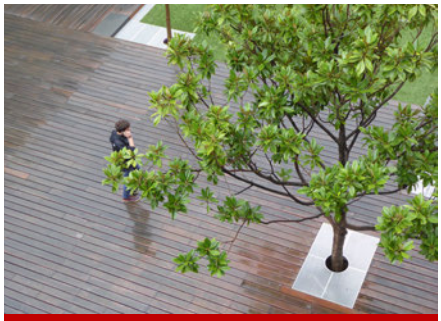


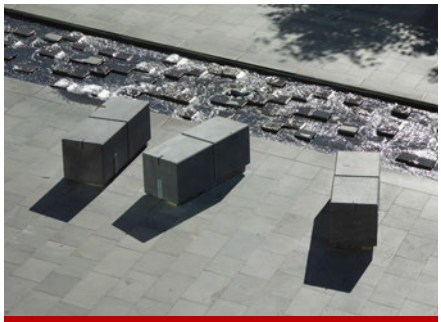
Figure 5 *Example of a Design Criteria page in the Strategic Guidance book*

Materials and street furniture selection and set-out criteria

The selection of materials and street furniture for the central city was based on elements that are fit for purpose, attractive, offer value for money and are cost-effective to maintain.



Provide logical and simple layouts



Consider the wider context and work towards a long-term plan

- [ ] Favour simplicity rather than complexity in the choice and combination of materials, street elements, colour palettes and details. Use simple forms and layouts. Avoid visual clutter.
- [ ] Use elements from the suite of materials, colours, finishes and details provided in the Technical Guidance book.
- [ ] Select a palette of materials, street furniture and planting material that is visually cohesive and contributes to the intended character of the place.
- [ ] Select street furniture elements that have consistent style, materials and colour range.

Non-standard elements and special areas

- [ ] Non-standard streetscape elements may be used in special areas, for example, areas of heritage significance or areas where standard street furniture elements do not fit visually or physically.
- [ ] While new 'feature' areas may use variations of design elements, they should provide considered transitions with existing areas and maintain continuity of movement patterns.
- [ ] For special areas, use long-lasting robust treatments and details. Take into account ease and cost of ongoing maintenance and replacement of materials and street furniture.

Street cross-sections

The **Strategic Guidance book** of the Streets & Spaces Design Guide provides the next level of detail on how the design of the street network supports Accessible City and the wider objectives of the Recovery Plan.

Chapter 5 provides concept cross-sections for groups of streets in the central city that have a similar role or function. The cross-sections illustrate the spatial allocation for each of the streetscape zones according to each street role.

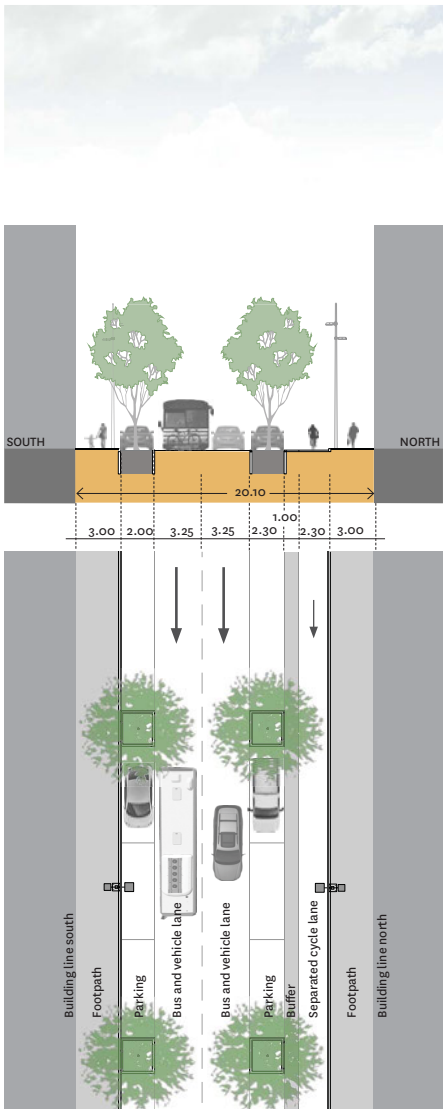


Figure 49 *Tuam Street, west of High Street*

Figure 6 *Example of a concept cross-section in Chapter 5 of the Strategic Guidance book*

Most of the street cross-sections in the central city will have three main spatial components or zones: **the footpath, an amenity zone and the carriageway,** as illustrated in Figure 8.

These zones have been defined to enable the vision for the central city street network outlined in *An Accessible City*, the transport chapter of the Central Central Recovery Plan.

The rationale behind the streetscape zones is explained in **Chapter 2** of the **Strategic Guidance book** of the Streets & Spaces Design Guide.

Detailed information on Accessible City is provided at http://ccdu.govt.nz/the-plan

The Strategic Guidance book is available at http://ccdu.govt.nz/the-plan/design-guides

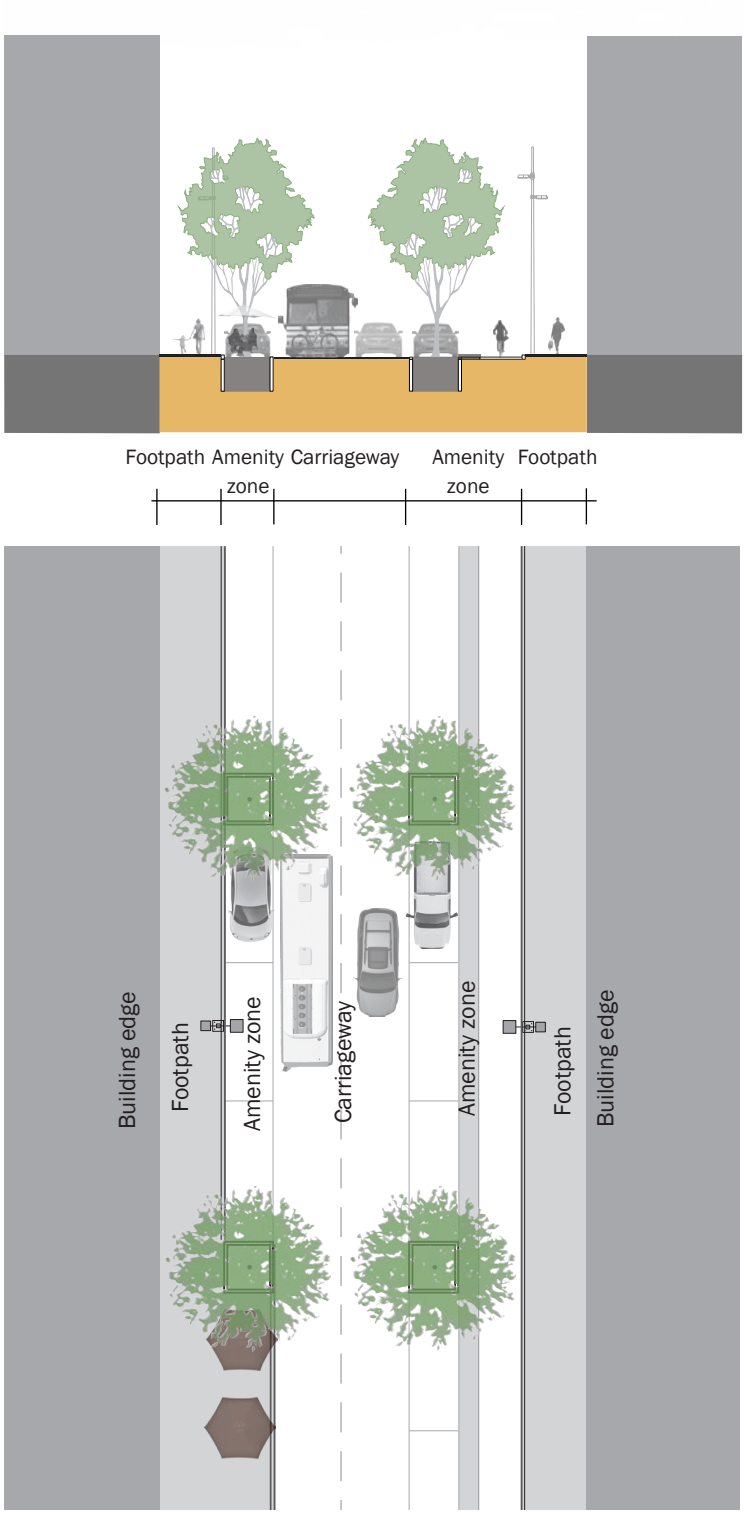


Figure 7. *Example of a concept section showing streetscape zones (not to scale)*

"A street is a spatial entity and not the residue between buildings."

Anonymous

02

STREET TREATMENTS

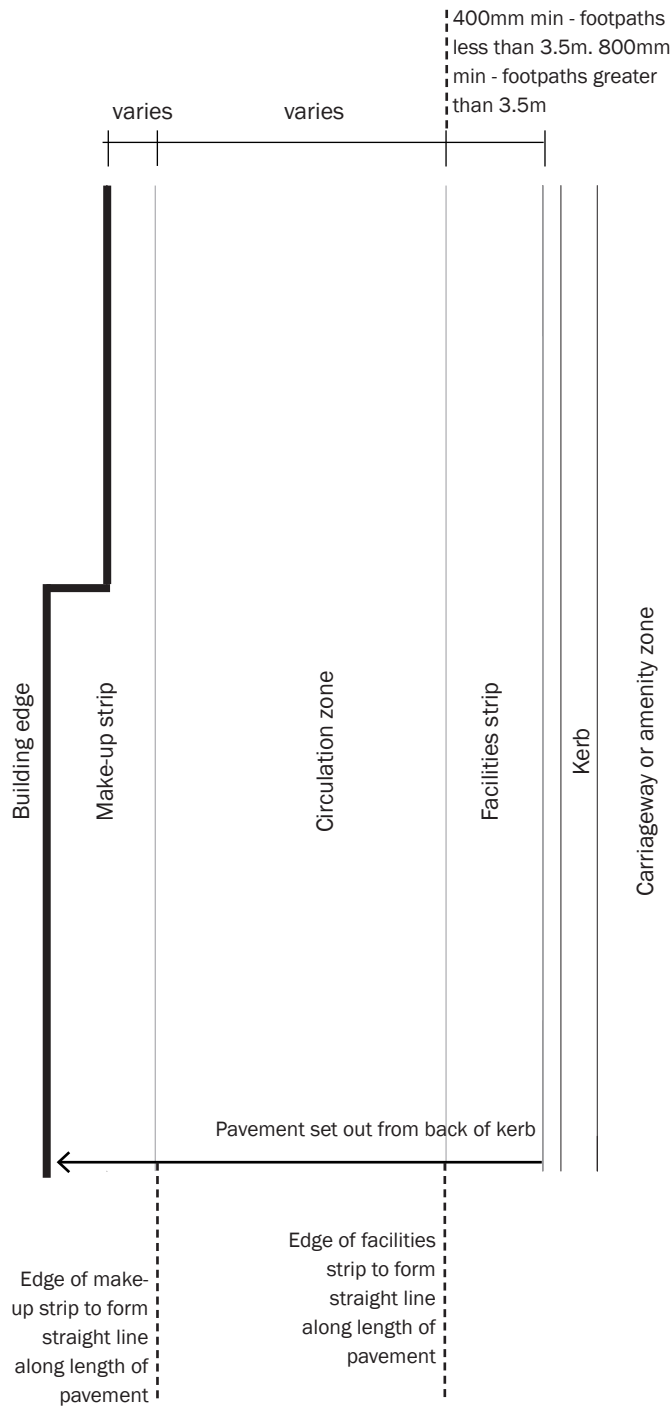
Overview

This chapter includes the following technical notes.

ID	Content	Page
S	**STREETSCAPE SET-OUT**	**20**
S.1.1	Footpath	20
S.2.1	Build-outs	21
S.3.1	On-street car park	22
S.4.1	Separated cycle lane – narrow median separator	23
S.4.2	Separated cycle lane – wide median separator	24
S.4.3	Separated cycle lane – concrete nib separator	25
S.4.4	Separated cycle lane – Copenhagen style	26
S.4.5	Separated cycle lane – Bus stop crossing	27
S.5.1	Mid-block pedestrian crossing – raised platform with footpath build-out	28
S.5.2	Mid-block pedestrian crossing – central island	29
S.5.3	Mid-block pedestrian crossing – across cycle lane	30
S.6.1	Vehicle crossing – access way	31
S.7.0	Intersections – design principles	32
S.7.1	Intersection – pedestrian crossings	34
S.7.2	Intersection – Barnes dance crossing	35
S.7.3	Intersection – advanced stop boxes	36
S.7.4	Intersection – separated bicycle lane approach and hook turn box	37
S.7.5	Intersection – left turn vehicle approach	38
S.8.1	Pedestrian ramp – two kerb crossing	39
S.8.2	Pedestrian ramp – Barnes dance crossing	40
S.8.3	Pedestrian ramp – perpendicular to kerb crossing	41
T	**SURFACING TREATMENTS**	**42**
T.1.1	Bluestone palette – footpaths	44
T.1.2	Bluestone palette – special areas	45
T.2.1	Concrete paving palete – footpaths	46
T.3.1	Asphalt– footpaths	47

ID	Content	Page
P	**FOOTPATH ELEMENTS AND STANDARD DETAILS**	**48**
PB.1.1	Paver units – bluestone	48
PC.1.2	Paver units – concrete	49
PI.1.1	TGSIs	50
PCd.1.1	Paver cutting details – parallel edge	52
PCd.1.2	Paver cutting details – edge greater than 30°	54
PCd.1.3	Paver cutting details – edge less than 30°	55
PCd.2.1	Paver cutting details – fire hydrant and water meter covers	56
PCd.2.2	Paver cutting details – valve and toby box covers	57
PCd.2.3	Paver cutting details – service cover	58
PCd.2.4	Service cover installation – best practice	59
PCd.3.1	Paver cutting details – standalone elements	60
PK	**KERBS**	**61**
PK.1.1.1	Standard kerb	
PK.1.1.2	Dropped kerb	
PK.1.1.3	Stormwater kerb	
PK.1.1.4	Concrete nib kerb	
PK.1.1.5	Reinforced wide kerb	62
PK.1.1.6	Reinforced narrow kerb	
PK.1.1.7	Mountable kerb	
PK.1.1.8	Passive irrigation kerb	
PKd.2.1.1	Stormwater discharge – parallel to carriageway	63
PKd.2.1.2	Stormwater discharge – corner of tree pit or rain garden	64
PKd.2.1.3	Stormwater discharge – kerb	65
PD	**DRAINS**	**66**
PD.1.1.1	Grate drain	
PD.1.1.2	Slot drain	
PD.1.1.3	Interpath channel	

Footpath



New footpaths in the central city should integrate three distinct zones.

Make-up strip

This zone runs against building edges to make up for variation in building shapes and setbacks. The make-up strip should define a straight edge for the circulation zone.

Circulation zone

The circulation zone provides a continuous and unobstructed route for pedestrian movement.

When using pavers in the circulation zone, only full-size pavers should be used. Any excess area should be integrated into the make-up strip.

The make-up strip and circulation zone should be kept clear of temporary or permanent objects such as street furniture or sandwich boards. This requirement is of particular importance for people with visual impairments or special mobility needs.

Facilities strip

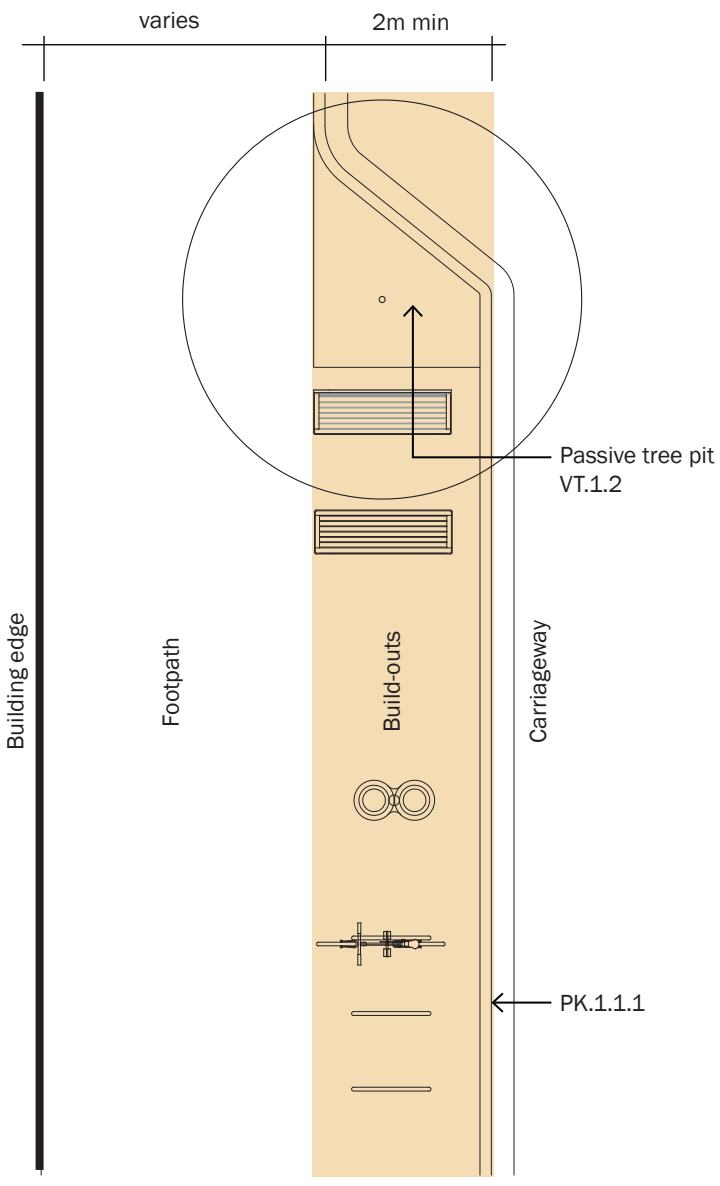
The facilities strip corresponds to the area between the back of the kerb and the circulation zone. This area is where street furniture, trees, signs, above-ground utilities and any other permanent structures should be located.

Care should be taken in organising the various elements to avoid cluttering the streetscape.

Whenever possible a positive footpath cross fall towards the kerb line should be provided.

The preferred palette of materials for each of the footpath zones is described in the **surfacing treatments** notes in this chapter.

Build-outs



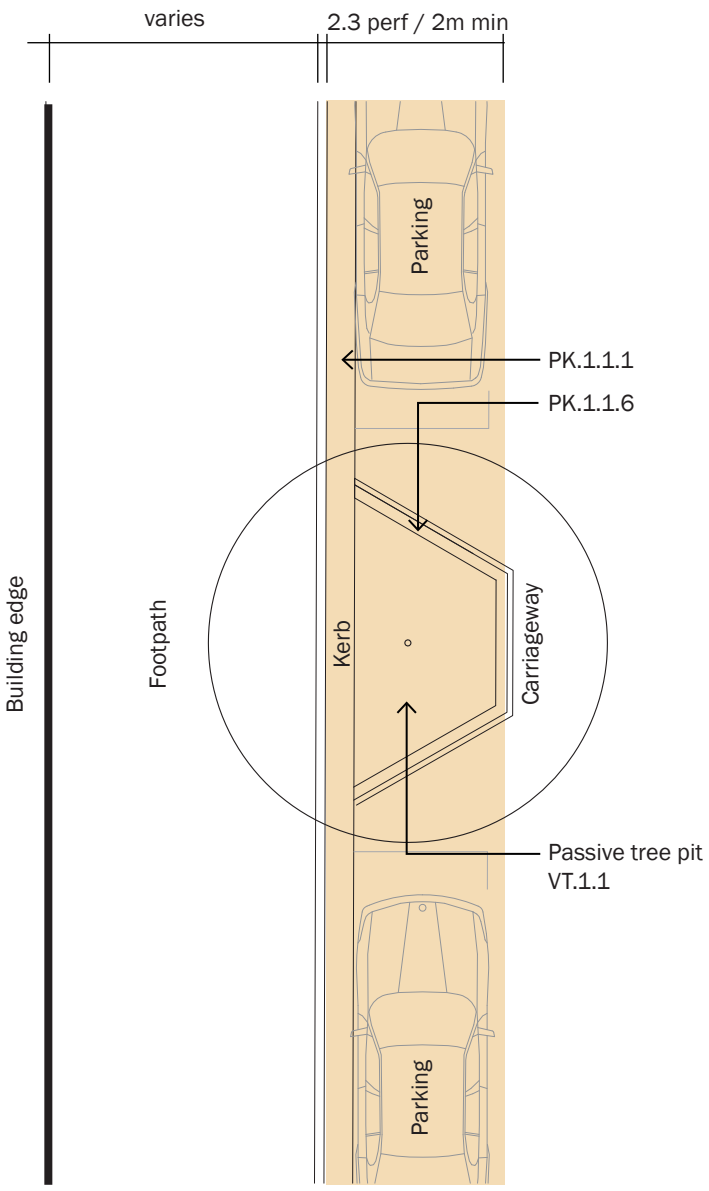
Build-outs provide an extension to the footpath to accommodate stationary activities and street furniture, trees and other fixed structures. Build-out areas enable street activity while maintaining the footpath's circulation zone clear of obstacles. Build-outs can also be used to shorten the walking distance between footpaths at crossing points.

When designing build-out areas:

- ensure the selection and placement of street elements create a flexible, well-organised, and uncluttered space
- limit the placement of street furniture to build-out areas that are within pedestrian priority areas or close to bus stops and intersections
- all street furniture should leave a clearance of minimum 700mm to the front of kerb
- ensure kerb angles and radii define spaces that are easy to maintain.

The preferred palette of materials for built-out areas is described in the **surfacing treatments** notes in this chapter.

On-street car park

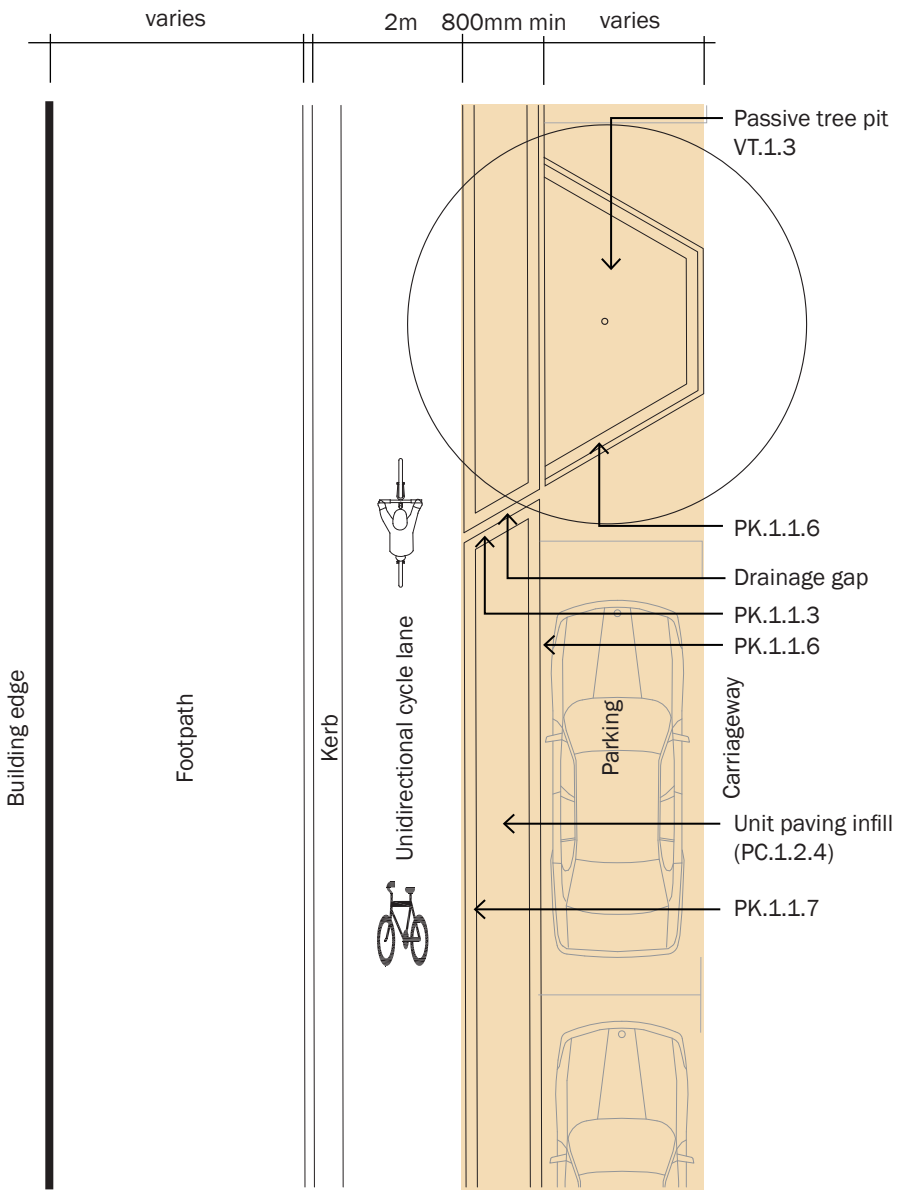


On-street car parking is one of the functions that can be accommodated within the streetscape's amenity zone.

New streetscape works in the central city should integrate street trees in between on-street car parking spaces wherever possible. Where existing footpaths are in good condition, new tree pits should be flush with the carriageway to avoid relocating existing kerbs and drains or re-grading footpaths. Tree pits that are flush with the carriageway provide the opportunity for passive irrigation (refer VT.1.1).

Separated cycle lane

narrow median separator



Narrow medians are the most common way in the central city to separate cycle lanes from on-street car parking or traffic. They allow passengers from parked cars to step out of the car safely without intruding in the cycle lane space.

At some intersections, the narrow median transitions to a concrete nib separator (refer PK.1.1.4) to allow space for vehicle turning lanes.

Narrow medians should be paved. Placing intermittent gaps along the median is required to facilitate drainage.

Use of green surface treatment for the cycle lane should be limited to movement conflict points.

Ensure cycle-related elements such as hand rails and cycle parking are provided along key cycle routes and destinations.

References

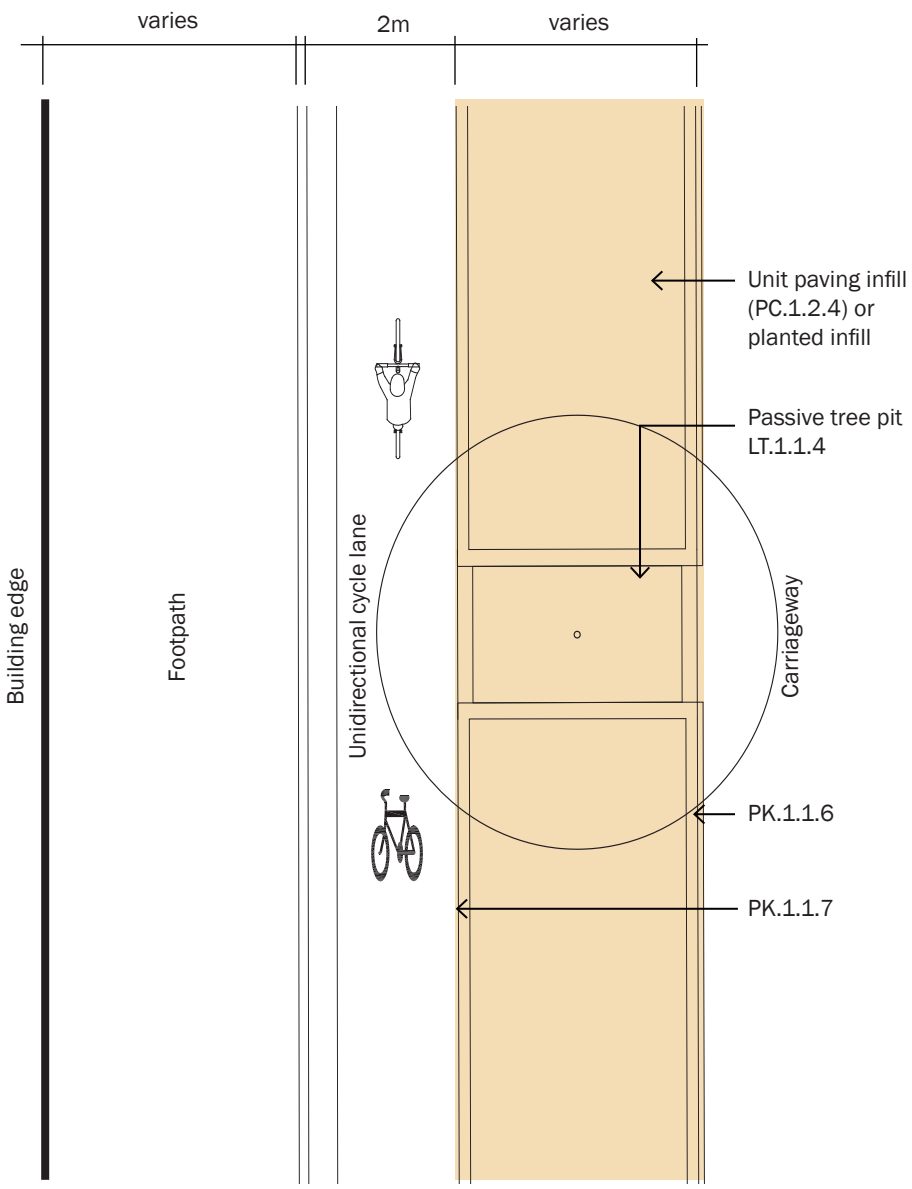
Detailed information on the central city cycle network is provided in Accessible City, the Strategic Guidance book of the Streets & Spaces Design Guide, Chapter 5 and the Christchurch Cycle Design Guidelines.

http://ccdu.govt.nz/the-plan/design-guides

www.ccc.govt.nz/transport/cycling/cycleways/new-cycleways/developing-the-major-cycle-routes/

Separated cycle lane

wide median separator



Wide medians are the preferred cycle lane separator where there is enough space in the road reserve.

In most cases there is no on-street car parking adjacent to a wide median. In long blocks, the wide median may transition to a narrow median (refer S.4.1) to allow space for on-street carparking.

Wide medians should be planted with trees and/or low planting. Tree pits should be integrated into the median and be flush with the carriageway to allow for passive irrigation (refer VT.1.4).

Use of green surface treatment for separated cycle lanes is not needed and should be limited to movement conflict points.

Ensure cycle-related elements such as hand rails and cycle parking are provided along key cycle routes and destinations.

References

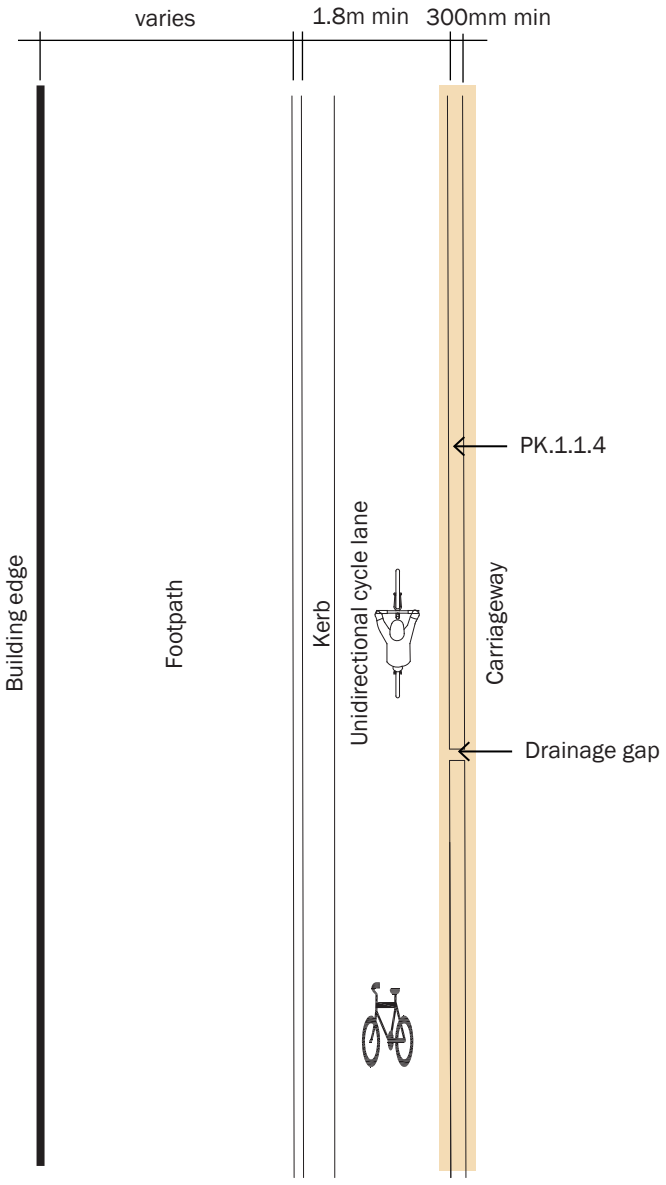
Detailed information on the central city cycle network is provided in Accessible City, the Strategic Guidance book of the Streets & Spaces Design Guide, Chapter 5 and the Christchurch Cycle Design Guidelines.

http://ccdu.govt.nz/the-plan/design-guides

http://www.ccc.govt.nz/transport/cycling/cycleways/new-cycleways/developing-the-major-cycle-routes/

Separated cycle lane

concrete nib separator



The concrete nib separator is generally used at intersections to allow space for vehicle turning lanes. In long blocks, concrete nib separators should only be used when available space is too constrained to use a median strip to separate the cycle lane from traffic.

In long stretches, gaps should be limited to the minimum required to facilitate effective drainage.

Use of green surface treatment for the cycle lane should be limited to movement conflict points.

References

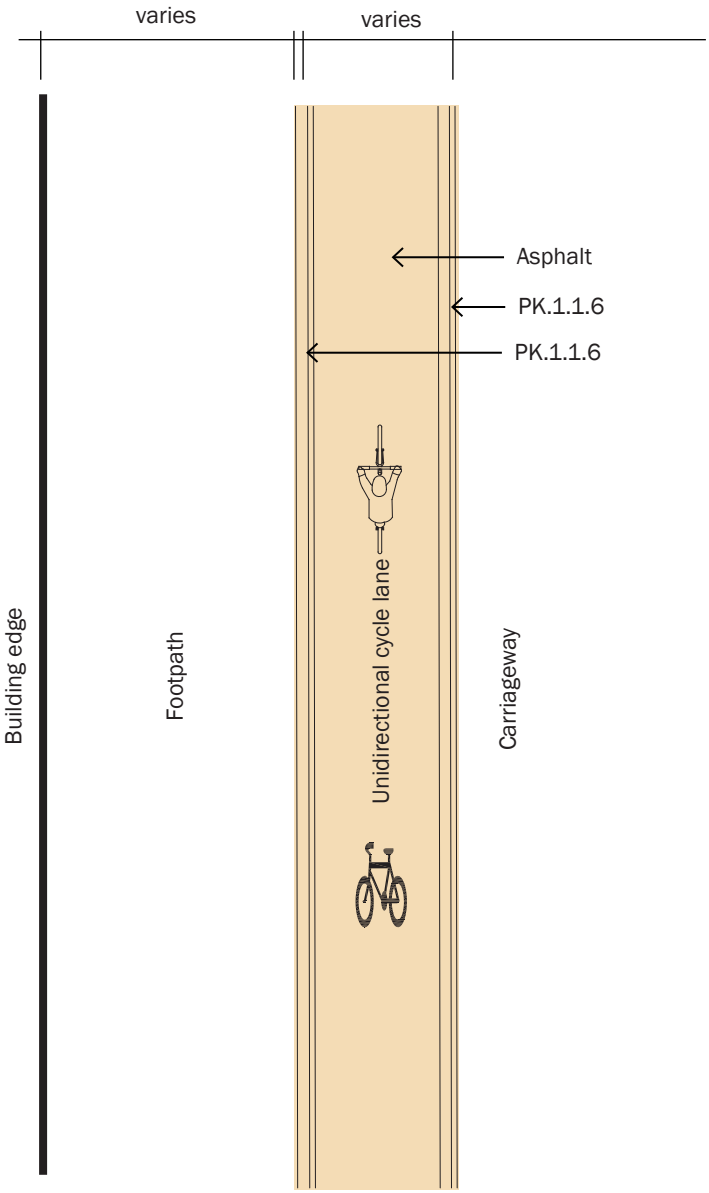
Detailed information on the central city cycle network is provided in Accessible City, the Strategic Guidance book of the Streets & Spaces Design Guide, Chapter 5 and the Christchurch Cycle Design Guidelines.

http://ccdu.govt.nz/the-plan/design-guides

http://www.ccc.govt.nz/transport/cycling/cycleways/new-cycleways/developing-the-major-cycle-routes/

Separated cycle lane

Copenhagen style



The Copenhagen style cycle lane is the preferred approach where available space in the road corridor is too constrained to use a median strip to separate the cycle lane from traffic. This type of cycle lane can only be used when there is no adjacent on-street car parking along the entire cycle lane.

When introducing a new cycle lane into an existing carriageway, care should be taken to maintain drainage service levels.

Use of green surface treatment for the cycle lane should be limited to movement conflict points.

References

Detailed information on the central city cycle network is provided in Accessible City, the Strategic Guidance book of the Streets & Spaces Design Guide, Chapter 5 and the Christchurch Cycle Design Guidelines.

http://ccdu.govt.nz/the-plan/design-guides

http://www.ccc.govt.nz/transport/cycling/cycleways/new-cycleways/developing-the-major-cycle-routes/

Separated cycle lane

Bus stop crossing

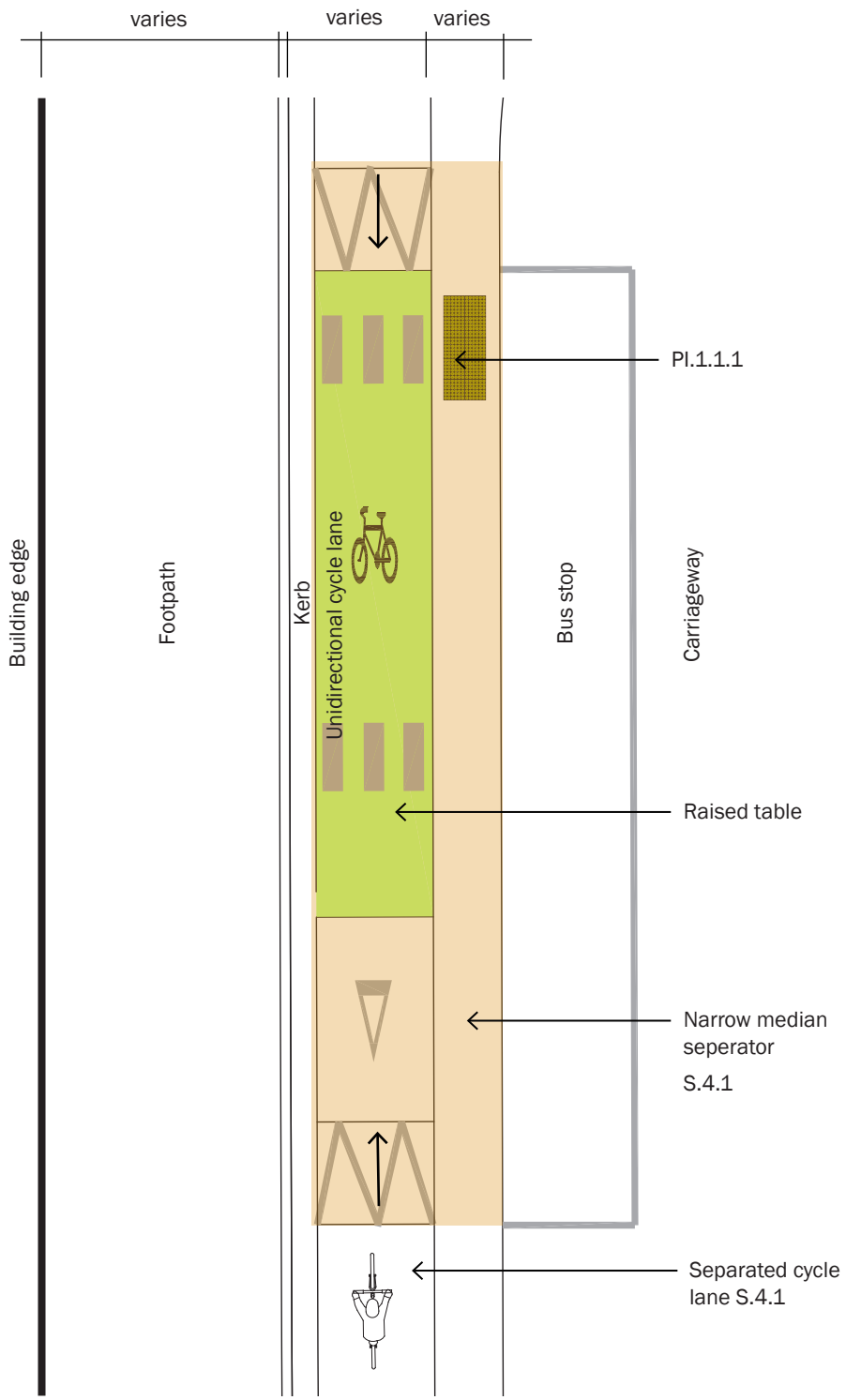


Image to be inserted when built

Bus stops along separated cycle lanes pose as major pedestrian - cyclist conflict points. Careful design is needed to mitigate any potenial risks.

When designing bus stops along separated cycle lanes:

- Appropriate signage and marking should be provided for cyclists to warn them of the bus stop and to yield to passengers crossing the cycleway
- Full height kerbs are required where passengers board and alight the bus
- Consider if any other cycle calming is required
- There should be no sign poles or obstacles in the cycleway
- Bus stops should be marked in accordance with the CCC Bus Stop Design Guide

References

Detailed information on the central city cycle network is provided in Accessible City, the Strategic Guidance book of the Streets & Spaces Design Guide, Chapter 5 and the Christchurch Cycle Design Guidelines.

http://ccdu.govt.nz/the-plan/design-guides

http://www.ccc.govt.nz/transport/cycling/cycleways/new-cycleways/developing-the-major-cycle-routes/

Mid-block pedestrian crossing

raised platform with footpath build-out

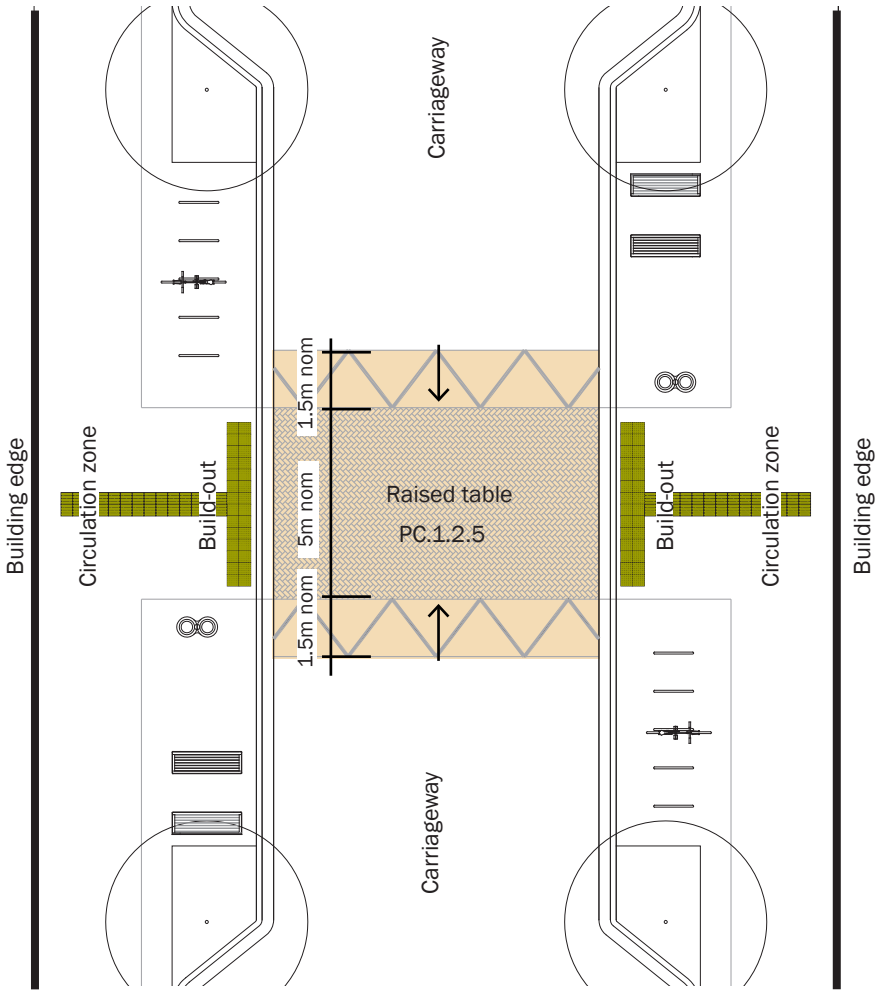


Image to be inserted when built

Raised platforms treatments are an option for high-demand pedestrian crossings in slow speed zones, where traffic and pedestrian volumes allow for it.

References

All pedestrian platforms should be designed in accordance with the New Zealand Transport Agency (NZTA) Pedestrian Planning and Design Guide, the Road and Traffic Standard (RTS) 14 (Guidelines for facilities for blind and vision-impaired pedestrians) and the CCC Construction Standard Specifications.

http://www.nzta.govt.nz/resources/pedestrian-planning-guide/

http://www.ccc.govt.nz/consents-and-licences/construction-requirements/construction-standard-specifications/

Materials–raised table
Concrete unit pavers

Dimension
Refer technical note PC.1.2.5

Finish
PC.1.2.5 Natural

Pattern
PC.1.2.5 45° Herringbone

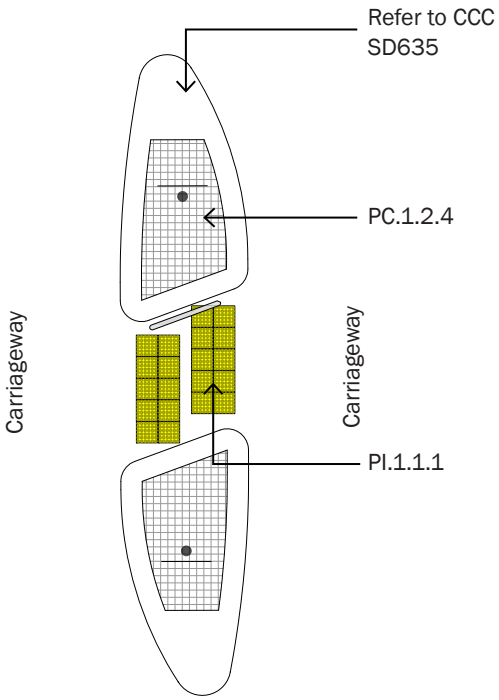
Colour
To approved sample

Jointing
2–3mm wide, stabilised polymer river sand

Bedding, sub-base, base course
As per engineer's specification

Mid-block pedestrian crossing

central island



Central islands provide a mid-point refuge for mid-block crossings in traffic priority streets.

References

Central island crossings should be designed in accordance with the CCC Construction Standard Specifications and NZTA Pedestrian Planning and Design Guide and the RTS 14 (Guidelines for facilities for blind and vision-impaired pedestrians).

http://www.nzta.govt.nz/resources/pedestrian-planning-guide/

http://www.ccc.govt.nz/consents-and-licences/construction-requirements/construction-standard-specifications/

Materials – infill
Concrete unit pavers

Dimension

Refer technical note PC.1

Finish

PC.1.2.4, PC.1.2.5 Bush hammered 70%, Honed 30%

Pattern

PC.1.2.4, PC.1.2.5 90° Herringbone

Colour

PC.1.2.4, PC.1.2.5 Blacksands

PI.1.1.1 Safety yellow

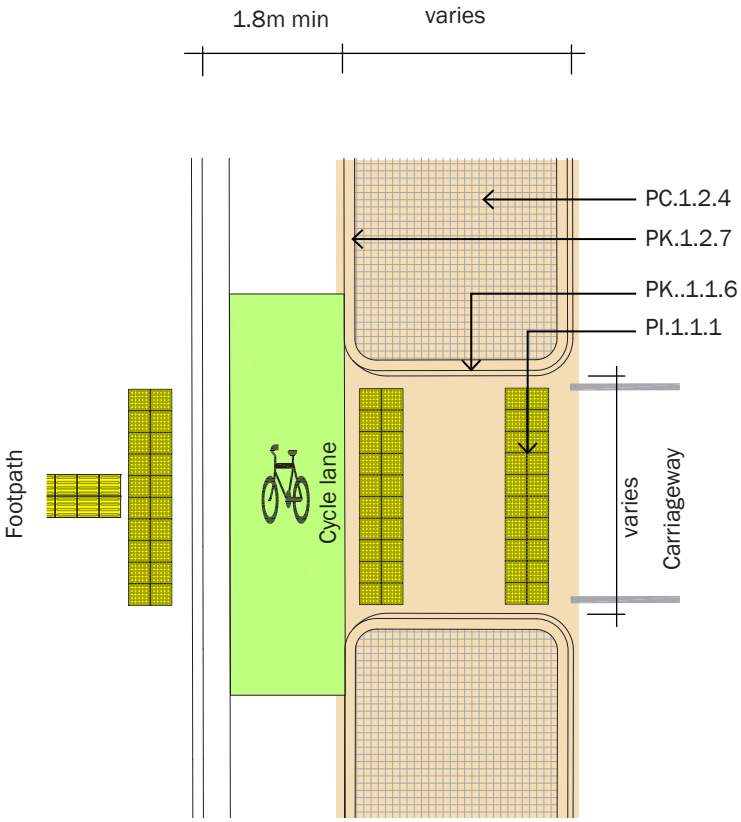
Jointing

2-3mm wide, stabilised polymer river sand

Bedding, sub-base, base course
As per engineer's specification

Mid-block pedestrian crossing

across cycle lane



This is the standard layout for mid-block pedestrian crossings along key cycling routes.

Materials – Infill

Concrete unit pavers

Dimension

Refer technical note PC.1

Finish

PC.1.2.4, PC.1.2.5 Bush hammered 70%, Honed 30%

Pattern

PC.1.2.4, PC.1.2.5 90° Herringbone

Colour

PC.1.2.4, PC.1.2.5 Blacksands

PI.1.1.1 Safety yellow

Jointing

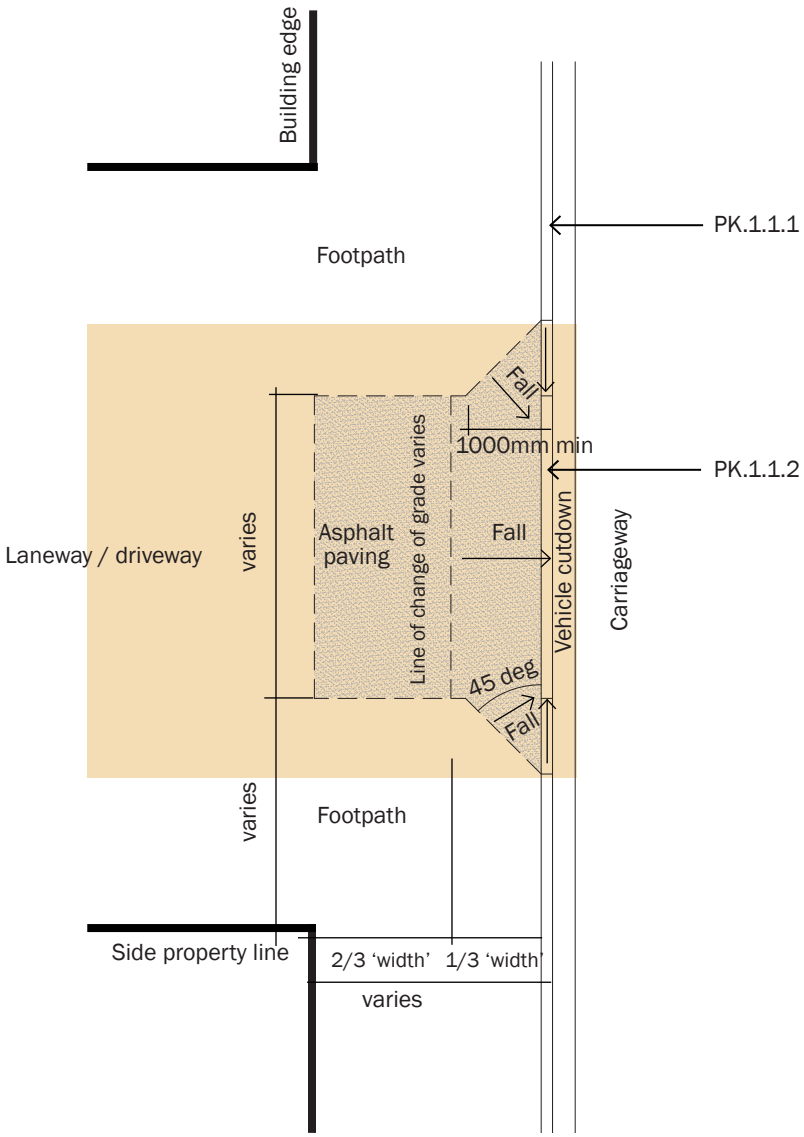
2–3mm wide, stabilised polymer river sand

Bedding, sub-base, base course

As per engineer's specification

Vehicle crossing

access way



This crossing is for use within the central city to create a safe vehicle crossing point over bluestone, concrete unit pavers or asphalt footpaths.

Footpaths, kerbs and channel levels remain consistent with the existing street, providing a flush pedestrian crossing.

References

Kerb crossings should be designed in accordance with CCC Construction Standard Specifications and the Christchurch City Plan, Volume 3, Part 13, Development standards.

http://www.ccc.govt.nz/consents-and-licences/construction-requirements/construction-standard-specifications/

https://cityplan.ccc.govt.nz/pages/plan/book.aspx

S.7.0

Intersections

design principles

Intersections are where all elements of the movement network come together. They need careful design to ensure they function safely for everyone using them.

In the context of the central city, this is particularly challenging due to the many users and needs to be catered for within existing – often limited – space.

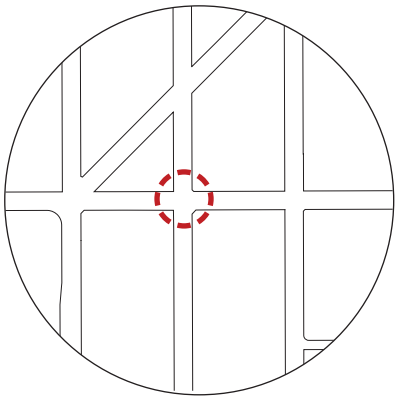
Intersection design should focus only on creating a space in which users are **mutually aware** of one another and **visible and predictable** in their actions, rather than on just reducing conflict.

Their design should aim to provide enhanced conditions for:

- movement
- safety and accessibility for all (universal design)
- urban amenity.

The variety of road classifications, road user priorities and street cross-sections applied in the central city generates a wide range of intersection arrangements. They need to be resolved on a case-by-case basis to respond well to their immediate context and the wider network. The technical notes in this Technical Guidance book provide guidance on elements within an intersection rather than on specific intersection layout.

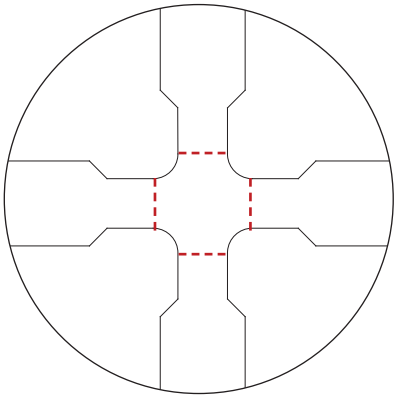
Context: Network



Intersection functionality is closely linked to the wider network capacity, road use hierarchy and traffic volumes.

- Analyse intersections as part of a network, not in isolation.
- Promote consistency with nearby intersections.

Space: Compact geometry



Compact intersections improve safety for all. They reduce pedestrian exposure, increase visibility for all users and slow traffic near conflict points.

- Design for the speed at which drivers should go, not for the existing operating speed.
- Limit the addition of dedicated turn lanes and pockets and remove slip lanes where possible.
- Use small corner radii. Corner radii influence vehicle turning speeds and pedestrian crossing distances.
- Design space to facilitate eye contact between users.

Time: Signal phasing

Traffic signal timing influences delay, compliance, safety and travel mode choice. This system is a key tool to shape the flow and safety of all travel modes.

- Integrate signal timing to reinforce the intended road use hierarchy and speeds defined in Accessible City.
- Adjust timing according to the different levels of activity through the day.

Quality: Urban amenity

Intersections are a constant element of the city's public realm. Intersections that provide a consistently good experience for all users will contribute to a positive experience of the city as a whole.

- Use likely pedestrian behaviours and desire lines to inform the design.
- Convert any excess space into usable and attractive public space.

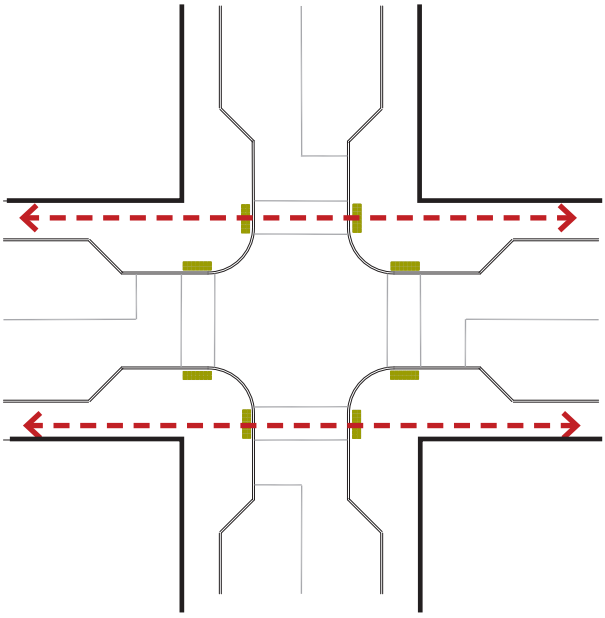
Intersection

pedestrian crossings

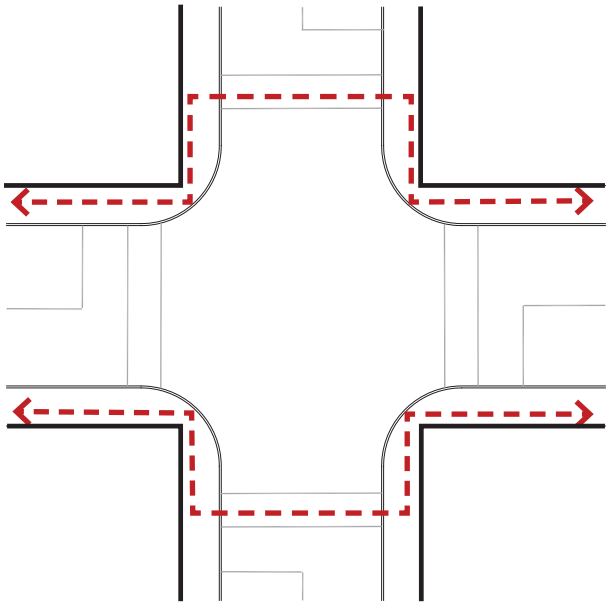
Align crossings as closely as possible with the pedestrian path of travel.

While considering large vehicles' tracking paths, promote tight corner radii, kerb extensions and/or medians to keep crossing distances as short as possible.

Design the crossing to be wide enough for two groups of people to pass each other comfortably.



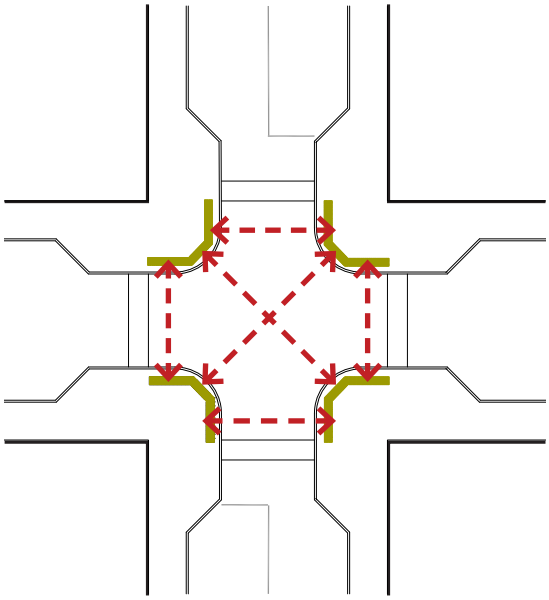
Best practice example



Poor practice example

Intersection

barnes dance crossing

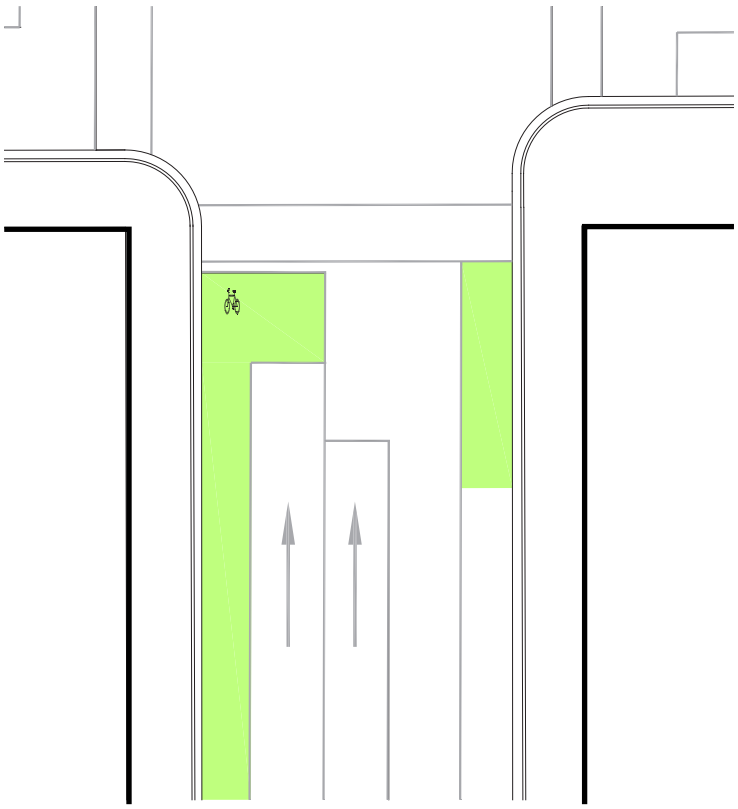


Barnes dance crossings can be used at pedestrian priority intersections, or where there are high numbers of pedestrians needing to cross. In a barnes dance crossing, traffic signals are set to simultaneously stop traffic in all directions, allowing pedestrians to walk either straight or diagonally across the intersection. Accordingly, pedestrian ramps should be designed to suit these movements (refer S.8.2).

Use tight corner radii, kerb extensions and/or medians to keep crossing distances as short as possible.

Intersection

advanced stop boxes



The advanced stop box provides a designated area for cyclists at the head of a traffic lane at a signalised intersection. It provides cyclists with a safe and visible way to get ahead of queuing traffic during the red signal phase.

In the central city, advanced stop boxes should be provided for all on-street bike lanes.

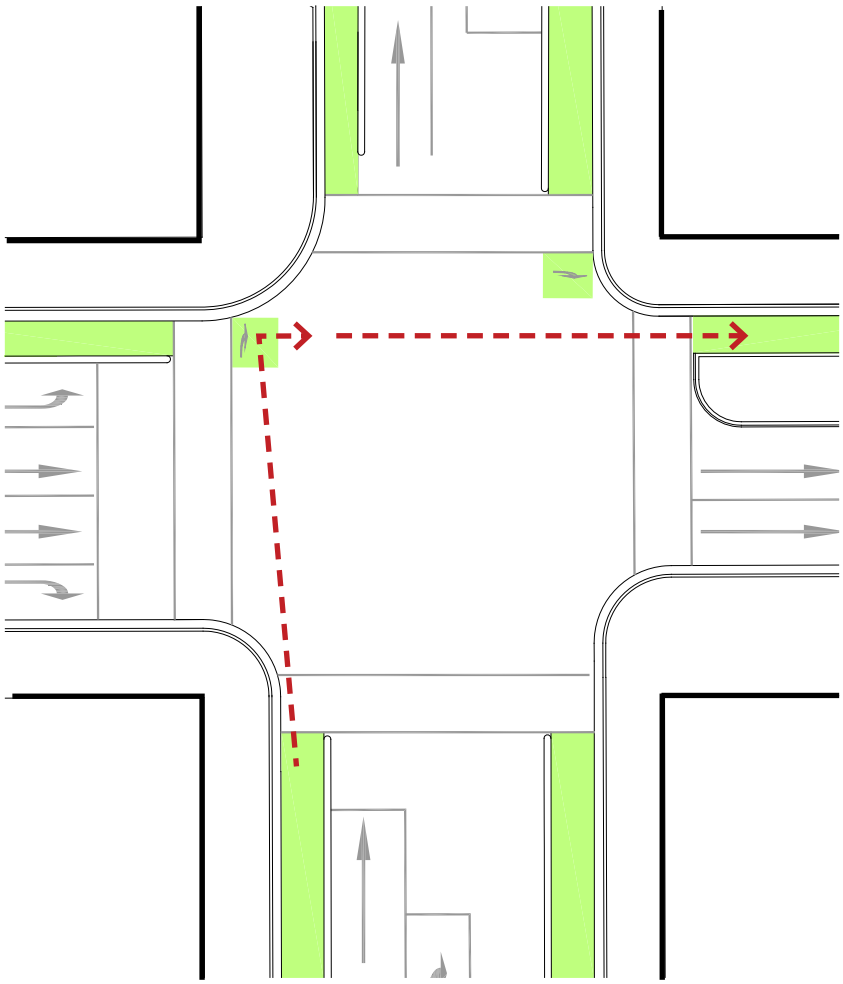
References

All cycleway markings and signage should be designed in accordance with NZTA guidelines.

http://www.nzta.govt.nz/resources/motsam/part-2

Intersection

separated bicycle lane approach and hook turn box



This is the preferred detail for the approach of separated bicycle lanes at intersections.

Cycle hook turn boxes provide cyclists with a safe way to make right turns at signalised intersections.

Hook turn boxes are subject to traffic signal phasing.

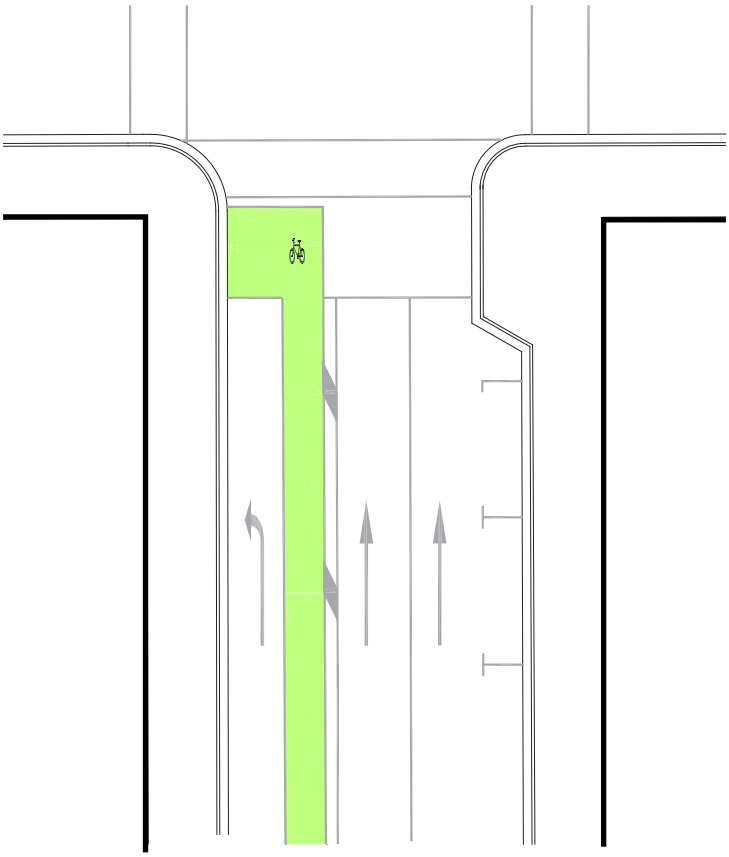
Reference

All cycleway markings and signage should be designed in accordance with NZTA guidelines.

http://www.nzta.govt.nz/resources/motsam/part-2

Intersection

left turn vehicle approach



This detail applies to the approach of on-road cycle lanes to an intersection. It aims to reduce conflict between cyclists and vehicles turning left.

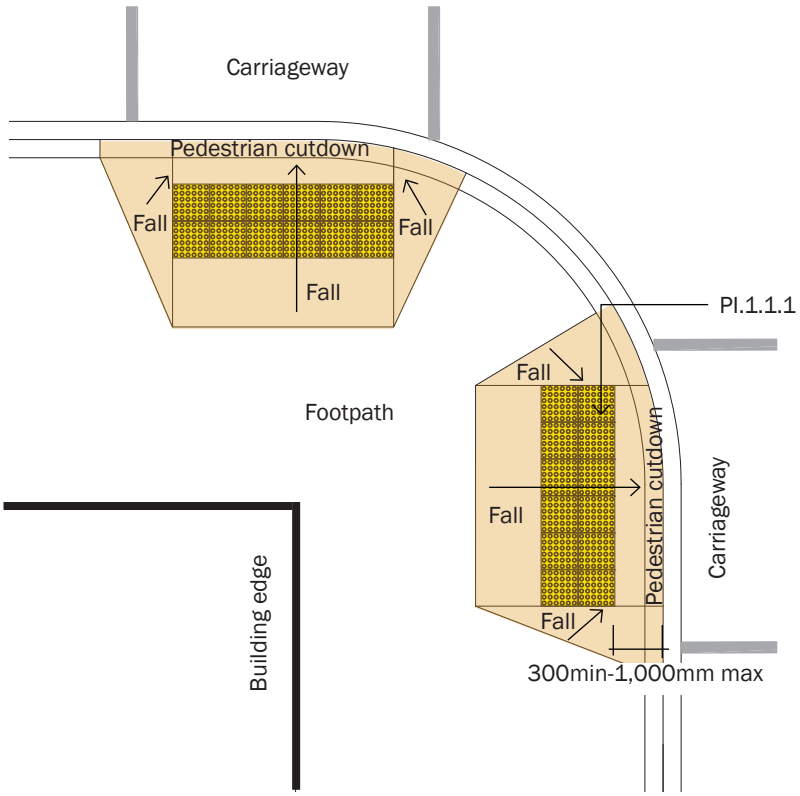
Reference

All cycleway markings and signage should be designed in accordance with NZTA guidelines.

http://www.nzta.govt.nz/resources/motsam/part-2

Pedestrian ramp

two kerb crossing



This access ramp detail is for typical street corners in the central city.

Ramps should generally have a gradient no steeper than 1:12. A shallower gradient of 1:20 is preferred, with 1:8 being the absolute maximum.

Minimise the need for tactile ground surface indicators (TGSIs) by using simple and direct lines of travel to intersections and crossings. Use the minimum appropriate quantity of TGSIs at the crossing point.

Warning TGSIs should be installed at a minimum of 600mm deep and to the full width of the kerb ramp, but should not cover the entire face of the kerb ramp.

In corner situations where the footpath pavement in one street differs from the pavement in the other, extend the use of the higher-quality material around the corner and make a transition at the side of the ramp.

References

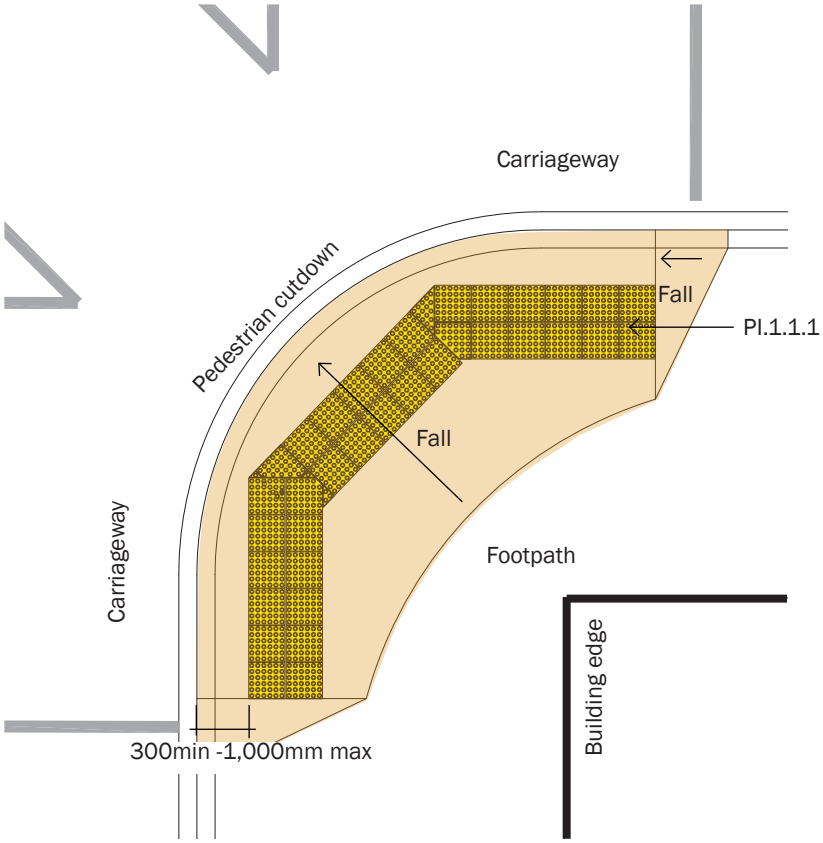
All pedestrian ramps should be designed in accordance with NZTA Pedestrian Planning and Design Guide, the RTS 14 (Guidelines for facilities for blind and vision- impaired pedestrians) and the CCC Construction Standard Specifications.

http://www.nzta.govt.nz/resources/pedestrian-planning-guide/

http://www.ccc.govt.nz/consents-and-licences/construction-requirements/construction-standard-specifications/

Pedestrian ramp

Barnes dance crossing



Ramps in a Barnes dance crossing (S.7.2) should generally have a gradient no steeper than 1:12. A shallower gradient of 1:20 is preferred, with 1:8 being the absolute maximum.

Minimise the need for TGSIs by using simple and direct lines of travel to intersections and crossings. Use the minimum appropriate quantity of TGSIs at the crossing point.

Warning TGSIs should be installed at a minimum of 600mm deep and to the full width of the kerb ramp, but should not cover the entire face of the kerb ramp.

For the general layout of a Barnes dance crossing, refer to technical note S7.2.

References

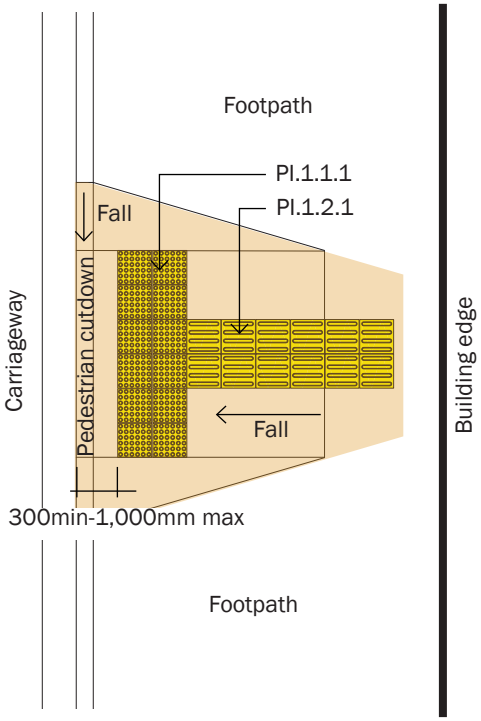
All pedestrian ramps should be designed in accordance with NZTA Pedestrian Planning and Design Guide, the RTS 14 (Guidelines for facilities for blind and vision-impaired pedestrians) and the CCC Construction Standard Specifications.

http://www.nzta.govt.nz/resources/pedestrian-planning-guide/

http://www.ccc.govt.nz/consents-and-licences/construction-requirements/construction-standard-specifications/

Pedestrian ramp

perpendicular to kerb crossing



This access ramp detail is typically used for mid-block crossings in the central city.

Ramps should generally have a gradient no steeper than 1:12. A shallower gradient of 1:20 is preferred, with 1:8 being the absolute maximum.

Ramps' side haunchings should have an abrupt change of gradient steeper than 1:8 but no steeper than 1:6.

Minimise the need for TGSIs by using simple and direct lines of travel to intersections and crossings. Use the minimum appropriate quantity of TGSIs at the crossing point.

Warning TGSIs should be installed at a minimum of 600mm deep and to the full width of the kerb ramp, but should not cover the entire face of the kerb ramp.

References

All pedestrian ramps should be designed in accordance with NZTA Pedestrian Planning and Design Guide, the RTS 14 (Guidelines for facilities for blind and vision-impaired pedestrians) and the CCC Construction Standard Specifications.

http://www.nzta.govt.nz/resources/pedestrian-planning-guide/

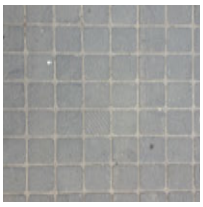
http://www.ccc.govt.nz/consents-and-licences/construction-requirements/construction-standard-specifications/

Surfacing treatments

The surface treatments explained in this section apply to footpaths and gathering places in the central city.

They are of three types.

Type 1

It consists of a sawn basalt (bluestone) paver palette (refer T.1.1).

This is the preferred treatment for public realm areas of particular civic significance such as the city's main civic axis, squares, the city promenade, the area in front of civic buildings and pedestrian priority intersections.

Type 2


It consists of a concrete paver palette (refer T.2.1).

This is the preferred treatment for public realm areas that will accommodate high pedestrian foot traffic, generally the inner zone. This treatment can also be used in areas of special character outside the inner zone.

Type 3

It consists of asphaltic concrete.

This is the preferred treatment for public realm areas in the central city not covered in the Type 1 and Type 2 treatment areas described above (refer T.3.1).

The plan on the opposite page identifies the locations and types of preferred pavement treatments for the central city street network.

Carriageways

The standard surface for carriageways in the central city is asphaltic concrete. Any other pavement materials will be assessed and approved on a case-by-case basis.

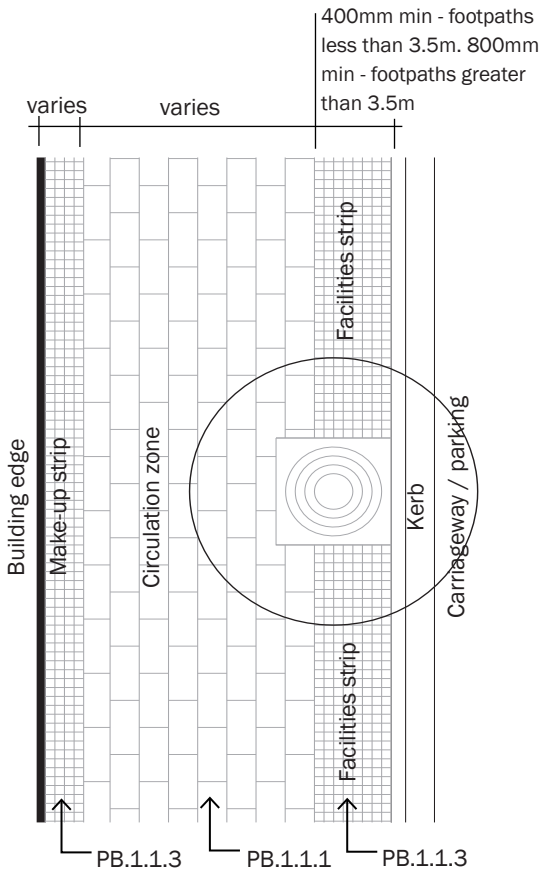
Legend

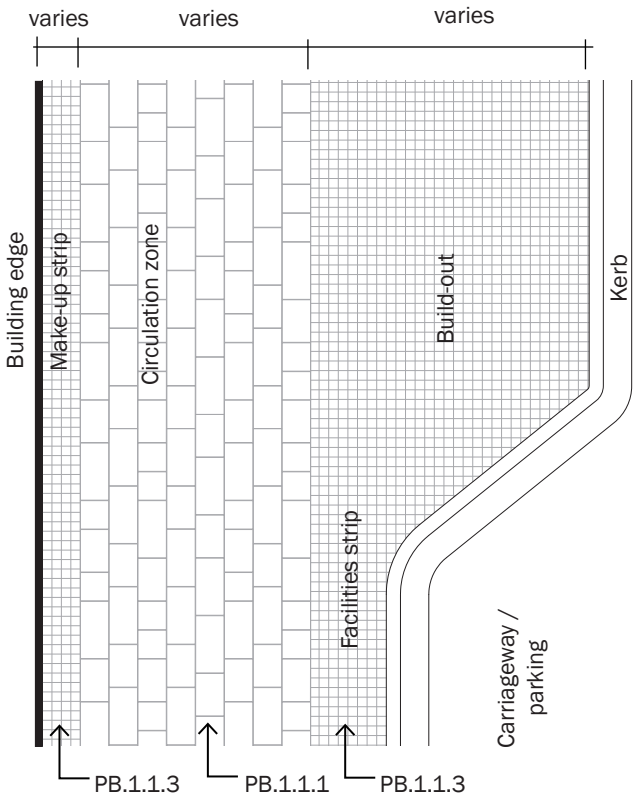
- Type1
- Type2
- Type3
- Maximum 30km/h speed zone

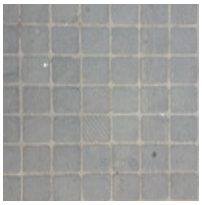
Figure 8 *Proposed footpath surface treatments*

Bluestone palette

footpaths







PB.1.1.3

PB.1.1.1

This is the preferred treatment for streets of particular civic significance such as the city's main civic axis, and sections of the city promenade along the Ōtākaro/Avon River (refer Figure 9).

Materials

Sawn basalt (bluestone) pavers

Dimensions

Refer technical notes PB.1.1.1, PB.1.1.2, PB.1.1.3

Finish

PB.1.1.1, PB.1.1.2 Brushed

Pattern

PB.1.1.1 Stretcher bond

Colour

To approved sample

Jointing

Butt joint. Minimum 150mm between parallel joints

Bedding

As per manufacturer's specification

Sub-base

125mm reinforced concrete slab

Base course

As per engineer's specification

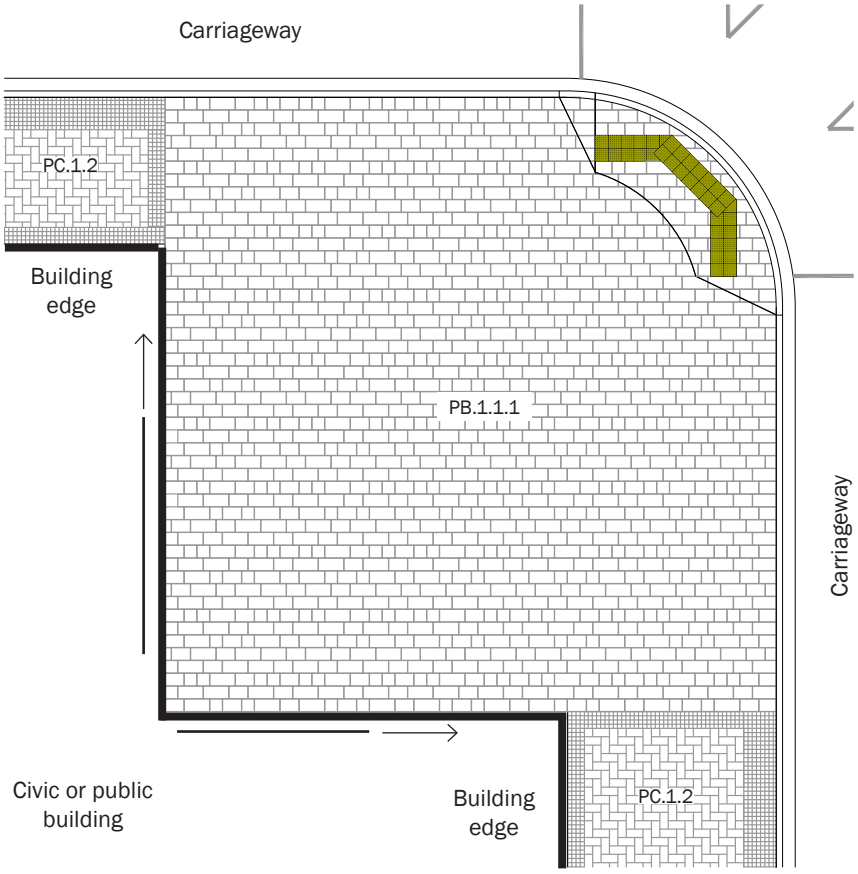
Reference

All paved surfaces should be designed in accordance with New Zealand Standards for slip resistance in outdoor spaces.

http://www.standards.co.nz/

Bluestone palette

special areas



PB.1.1.1

This is the preferred treatment for public realm areas of particular civic significance such as squares, the area in front of civic buildings and pedestrian priority intersections.

Materials

Sawn basalt (bluestone) pavers

Dimensions

Refer technical notes PB.1.1.1

Finish

PB.1.1.1 Brushed

Pattern

PB.1.1.1 Stretcher bond

Colour

To approved sample

Jointing

Butt joint. Min 150mm between parallel joints

Bedding

As per manufacturer's specification

Sub-base

125mm reinforced concrete slab

Base course

As per engineer's specification

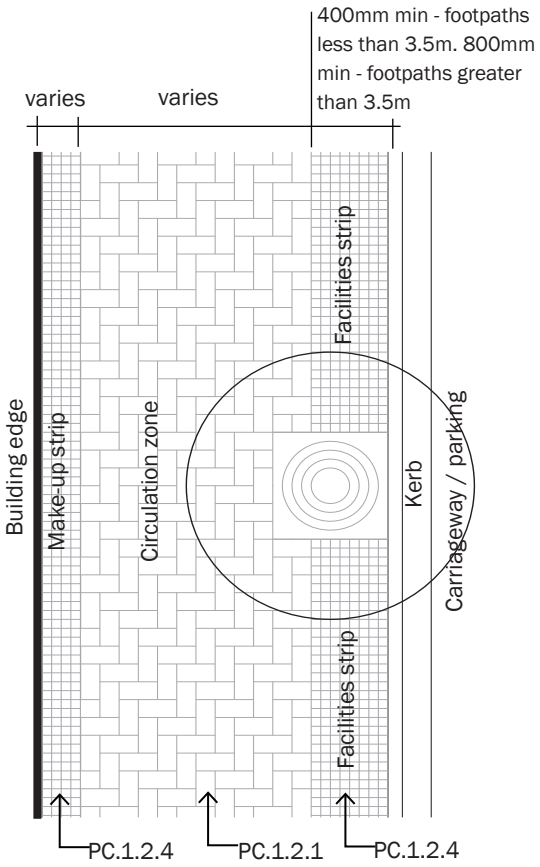
Reference

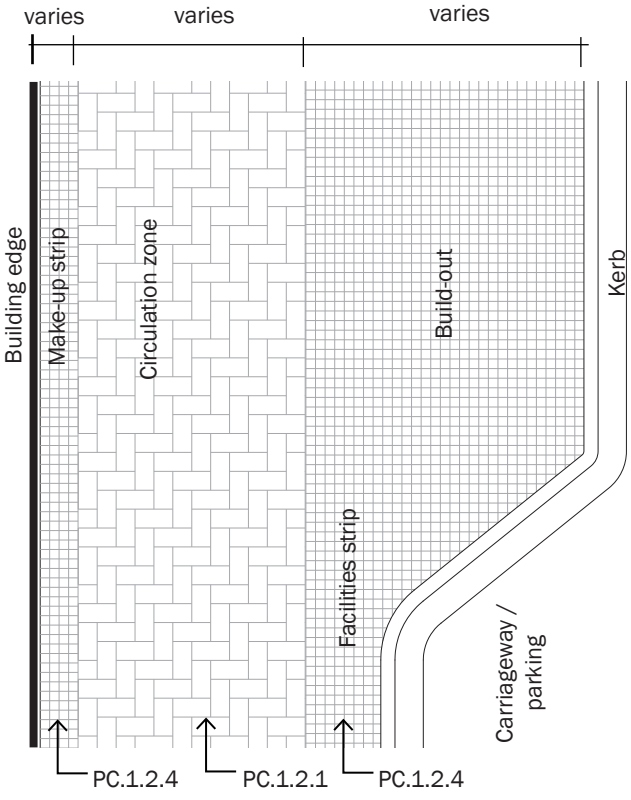
All paved surfaces should be designed in accordance with New Zealand Standards for slip resistance in outdoor spaces.

http://www.standards.co.nz/

Concrete paving palette

footpaths





PC.1.2.4

PC.1.2.1

This is the preferred treatment for public realm areas that will accommodate high pedestrian foot traffic, generally the inner zone. This treatment can also be used in areas of special character outside the inner zone (refer Figure 9).

Materials

Concrete unit pavers

Dimensions

Refer technical notes PC.1.2.1/ PC.1.2.2/ PC.1.2.3/ PC.1.2.4/ PC.1.2.5

Finish

PC.1.2.1/ PC.1.2.2/ PC.1.2.3 Honed

PB.1.2.4/ PC.1.2.5 Bush hammered 70%, Honed 30%

Pattern

PC.1.2.1/ PC.1.2.2/ PC.1.2.3

90° Herringbone

Colour

PC.1.2.1/ PC.1.2.2/ PC.1.2.3 Graphite

PB.1.2.4/ PC.1.2.5 Blacksands

Jointing

2–3mm wide stabilised polymer jointing sand

Base course

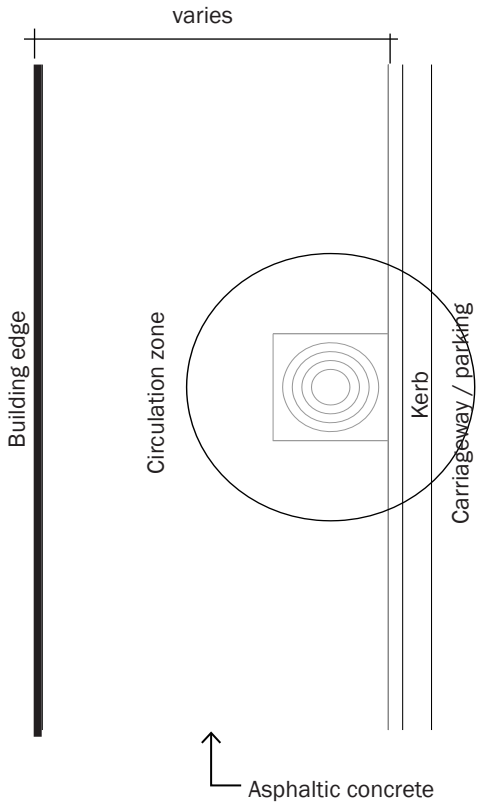
As per engineer's specification

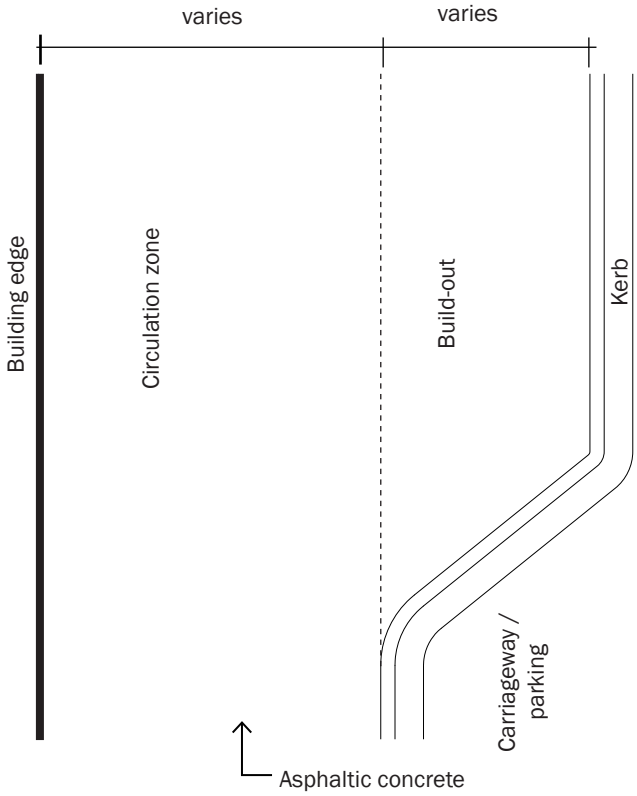
Reference

All paved surfaces to be designed in accordance with New Zealand Standards for slip resistance in outdoor spaces.

http://www.standards.co.nz/

Asphalt
footpaths





Asphaltic concrete

This is the preferred treatment for public realm areas in the central city not covered in the Type 1 and Type 2 pavement treatment areas (refer Figure 9).

Asphalt finishes should be consistent in appearance and be level and flush with existing pavement surfaces.

Where sections of asphalt are to be excavated for underground service repairs or installation, existing paving should be cut in complete sections to avoid patched surfaces.

Materials

Asphaltic concrete

Dimensions

20mm thick

Finish

AC5

Base course

As per engineer's specification

References

Footpaths should be designed in accordance with CCC Construction Standard Specifications and CCC Infrastructure Design Standards.

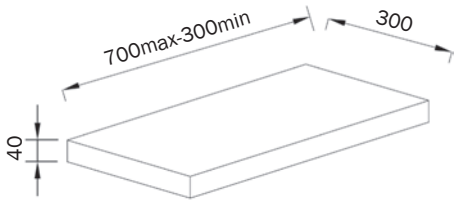
http://www.ccc.govt.nz/consents-and-licences/construction-requirements/construction-standard-specifications/

http://www.ccc.govt.nz/consents-and-licences/construction-requirements/infrastructure-design-standards/

Paver units

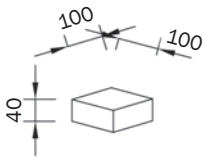
bluestone

PB.1.1.1 Flagstone



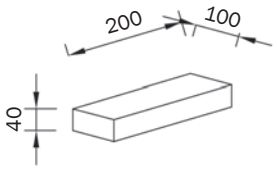
Finish	Brushed
Colour	To approved sample
Location	Footpath's circulation zone and special areas (refer T.1.1.1 and T.1.1.2)

PB.1.1.2 Set



Finish	Brushed
Colour	To approved sample
Location	Footpath's make-up and amenity strips (refer T.1.1.1)

PB.1.1.3 Cutting block



Finish	Brushed
Colour	To approved sample
Location	Cut blocks within the footpath's make-up and amenity strips. Refer to PCd technical notes for paver cutting details

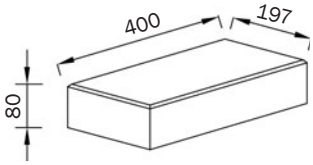
Note

All 40mm pavers require solid substrate (ie, concrete or asphaltic concrete) and consider loading for mechanical sweepers and at vehicle entrances.

Paver units

concrete

PC.1.2.1 Paver unit

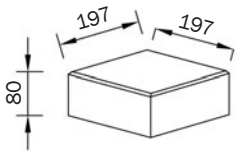


Finish Honed

Colour Graphite

Location Footpath's circulation zone (refer T.1.2.1)

PC.1.2.2 Small cutting unit

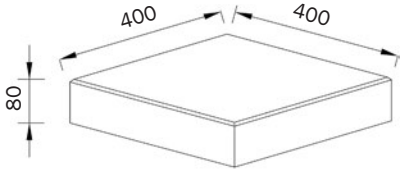


Finish Honed

Colour Graphite

Location Footpath's circulation zone. Refer PCd technical notes for paver cutting details

PC.1.2.3 Large cutting ui

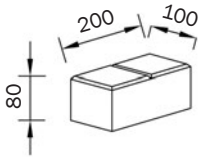


Finish Honed

Colour Graphite

Location Footpath's circulation zone. Refer PCd technical notes for paver cutting details

PC.1.2.4 Set

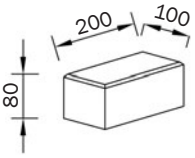


Finish Honed or bush hammered

Colour Blacksands

Location Footpath's make-up and amenity strips (refer T.1.2.4)

PC.1.2.5 Cutting set



Finish Honed or bush hammered

Colour Blacksands

Location Footpath's make-up and amenity strips. Refer PCd technical notes for paver cutting details

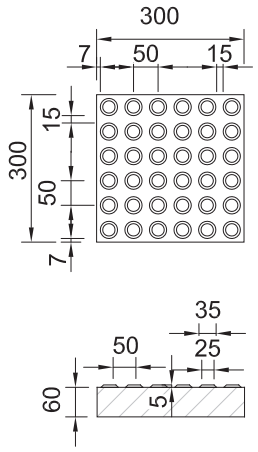
Warning TGSIs

PI.1.1.1 Warning TGSIs – paver

Materials Precast concrete

Colour Safety yellow

Location Pedestrian crossings

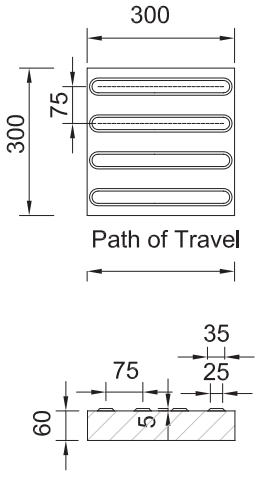


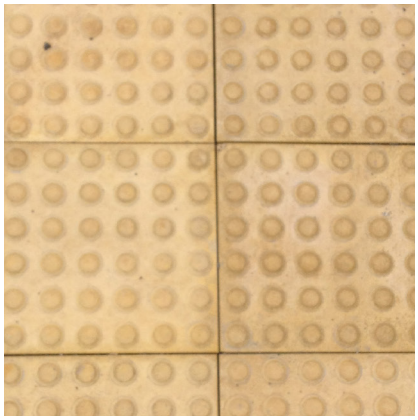
PI.1.2.1 Directional TGSIs – paver

Materials Concrete paver unit

Colour Safety yellow

Location Pedestrian crossings





Tactile ground surface indicators (TGSIs) should be considered early in the design process to ensure they are an integral part of any pavement design.

When using TGSIs:

- minimise the need for TGSIs by using simple and direct lines of travel to intersections and crossings. Use the minimum appropriate quantity of TGSIs
- arrange TGSIs so that it is not possible to bypass them and inadvertently enter the roadway without warning
- provide consistency in the use of TGSIs within a given area
- install warning TGSIs at a minimum of 600mm deep, covering the full width of the kerb ramp, but not covering the entire face of the kerb ramp
- avoid using TGSIs for decorative reasons.

References

All TGSIs to be placed in accordance with NZTA Pedestrian Planning and Design Guide and the RTS 14 (Guidelines for facilities for blind and vision-impaired pedestrians).

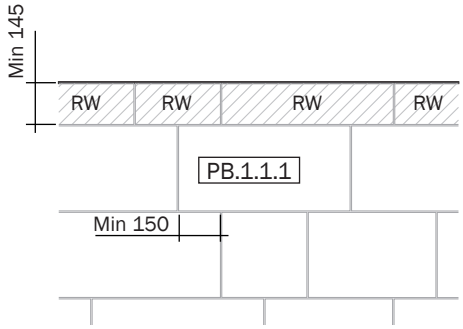
http://www.nzta.govt.nz/resources/pedestrian-planning-guide/


Lichfield
Colombo St
BUS INTERCHANGE
BIDVest
Foodservice
03 384 4300

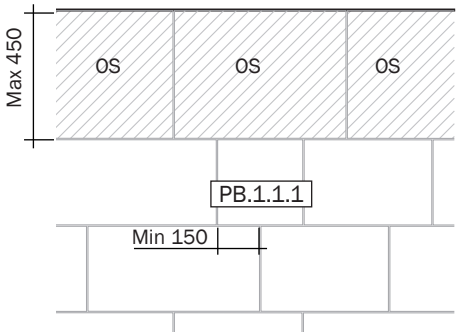
Paver cutting details

parallel edge

PCd.1.1.1 Bluestone reduced width paver stretcher bond pattern



PCd.1.1.2 Bluestone oversized paver stretcher bond pattern



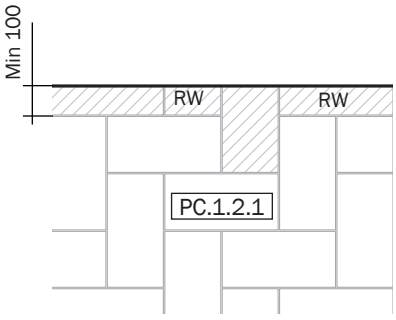
LEGEND

OS — Oversized paver

RW — Reduced width paver

Cut paver

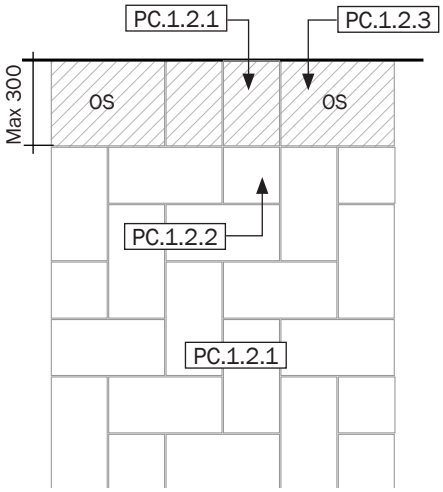
PCd.1.1.3 Concrete reduced width paver 90° herringbone pattern



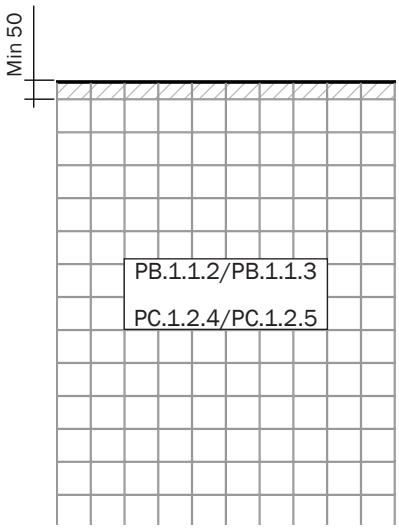
Paver cutting details

parallel edge

PCd.1.1.4 Concrete oversized paver 90° herringbone pattern



PCd.1.1.5 Bluestone or concrete cut set



LEGEND

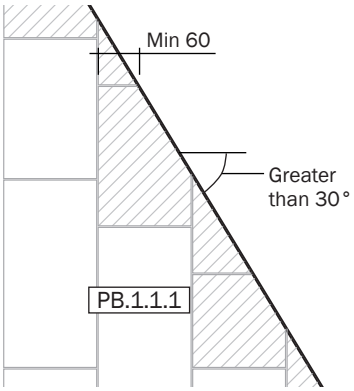
OS — Oversized paver

Cut paver

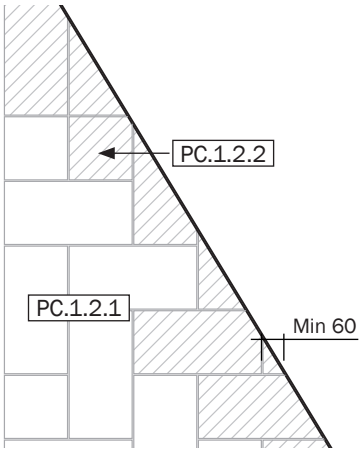
Paver cutting details

edge greater than 30°

PCd.1.2.1 Bluestone paver stretcher bond pattern



PCd.1.2.2 Concrete paver 90° herringbone pattern

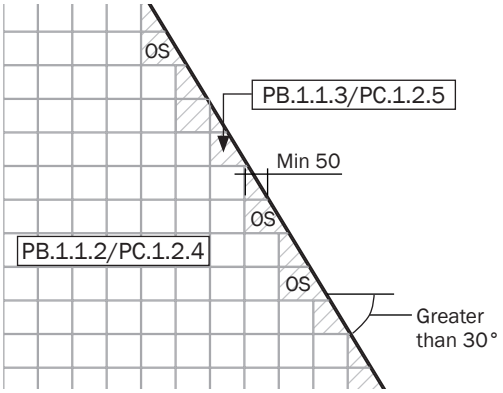


LEGEND

OS — Oversized paver

Cut paver

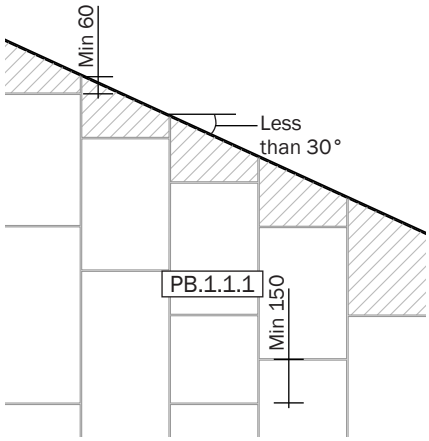
PCd.1.2.3 Bluestone or concrete sets



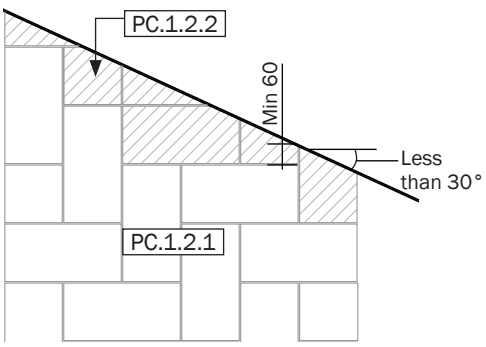
Paver cutting details

edge less than 30°

PCd.1.3.1 Bluestone paver stretcher bond pattern



PCd.1.3.2 Concrete paver 90° herringbone pattern

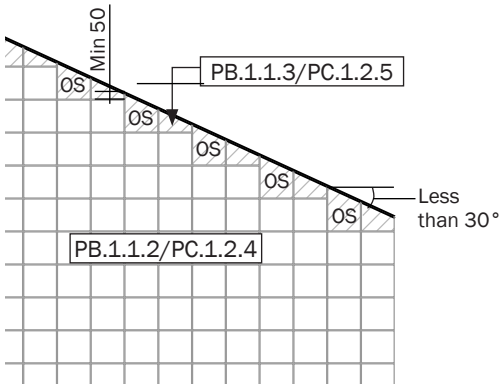


LEGEND

OS — Oversized paver

Cut paver

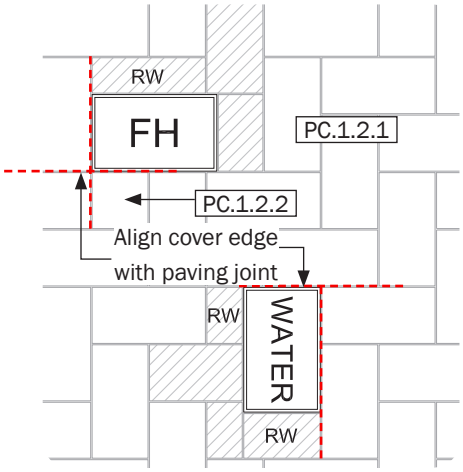
PCd.1.3.3 Bluestone or concrete sets



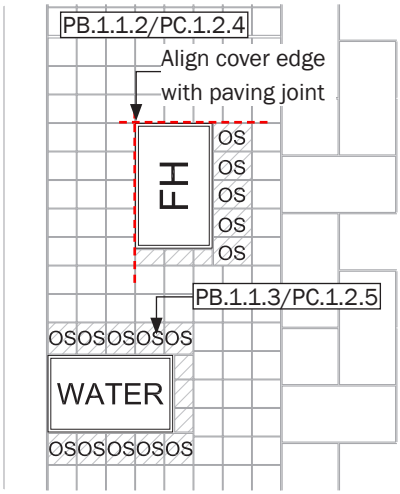
Paver cutting details

fire hydrant and water meter covers

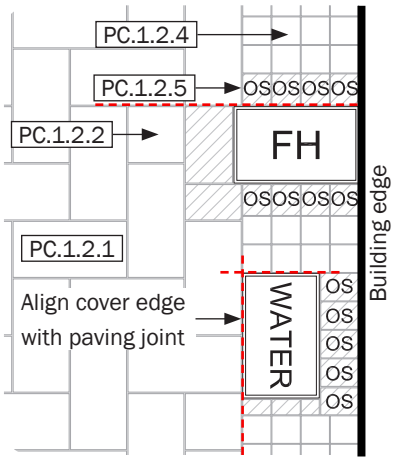
PCd.2.1.1 Within a circulation zone



PCd.2.1.2 Within make-up or amenity strips



PCd.2.1.3 Across two pavement zones



These details apply to paved areas that need to integrate fire hydrant or water meter service covers.

LEGEND

OS — Oversized paver

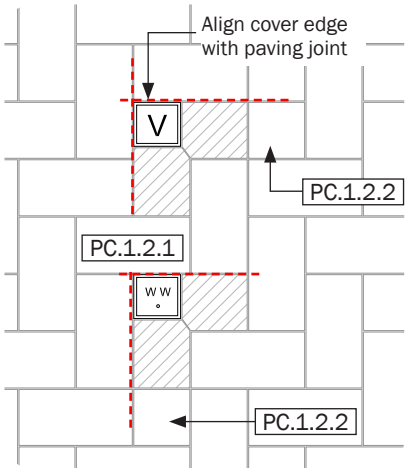
RW — Reduced width paver

Cut paver

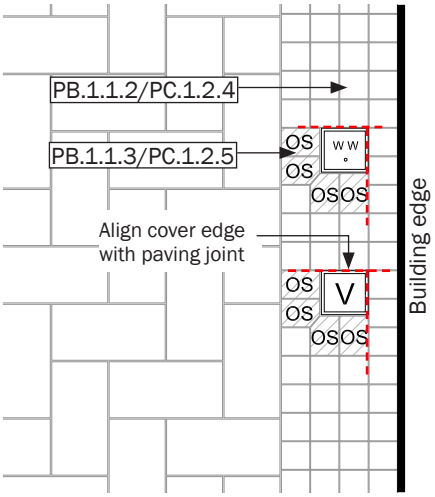
Paver cutting details

valve and toby box covers

PCd.2.2.1 Within a circulation zone



PCd.2.2.2 Within make-up or amenity strips



These details apply to paved areas that need to integrate valve and toby box covers.

LEGEND

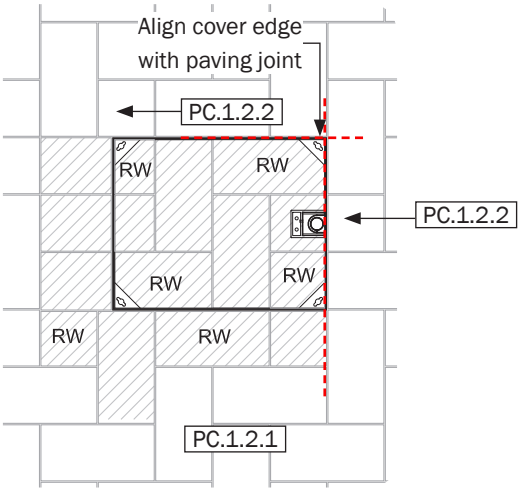
OS Oversized paver

Cut paver

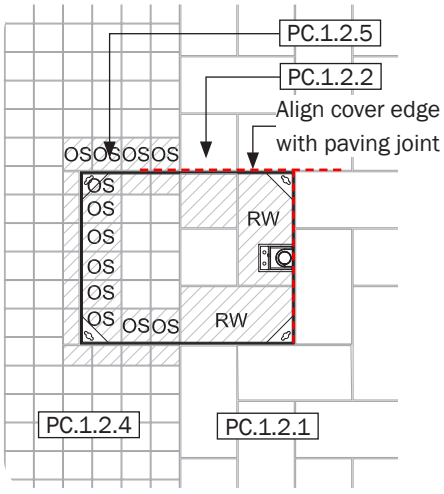
Paver cutting details

service cover

PCd.2.3.1 Within a circulation zone concrete pavers



PCd.2.3.2 Across two pavement zones



These details apply to paved areas that need to integrate service covers.

LEGEND

OS — Oversized paver

RW — Reduced width paver

Cut paver

Service cover installation

best practice

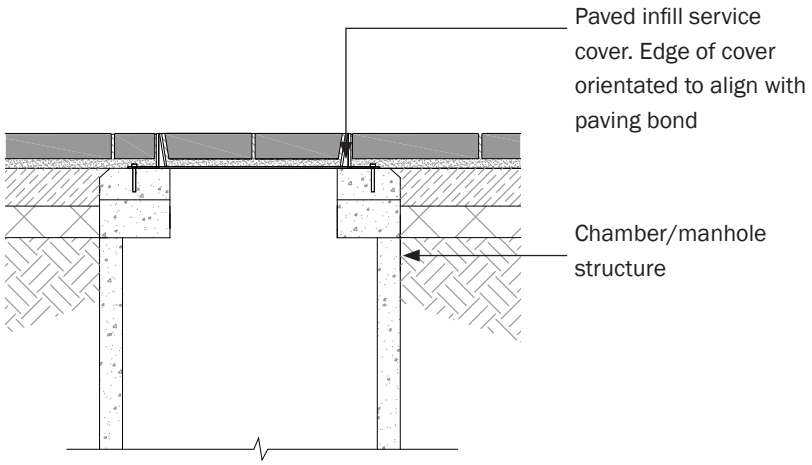
Poor practice example

Best practice example

Service covers should be aligned with the geometry of the footpath, including kerb lines, paving bond and cut lines. Attention given to the detailing around covers can considerably improve the safety and appearance of the footpath.

Footpath paving should neatly abut the edge of the cover frame to avoid the need for unsightly mortar infill. Where the structure of the cover is such that this cannot be achieved with a rigid surfacing material, the below-ground masonry should be lowered and replaced with a deep frame to give increased depth. This allows close laying of the footpath material, and the retention of the shallow infill cover.

Paved infill service chamber covers should be orientated where possible to align the edge of the cover with that of the paving bond to ensure a neat appearance and avoid small cut paving units or mortar joints.



Section (not to scale)

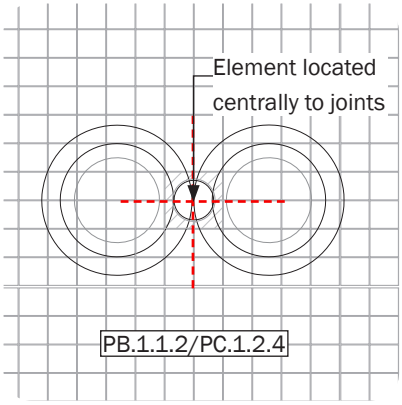
Reference

Refer to technical note PCd.2.3.

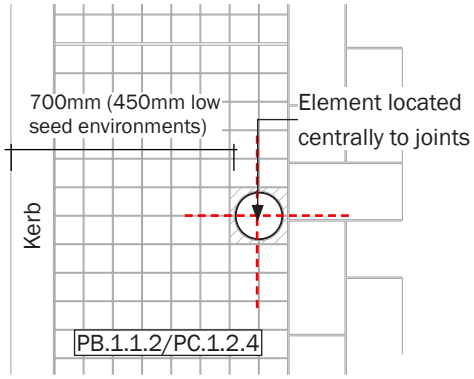
Paver cutting details

standalone elements

PCd.3.3.1 Bin



PCd.3.3.2 Light pole



These details apply to paved areas that need to integrate standalone elements such as street furniture and poles.

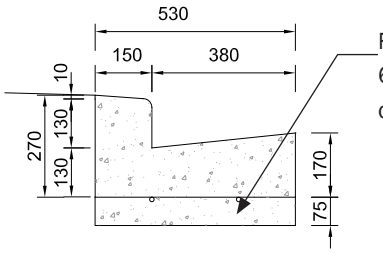
As a general principle, standalone elements should align centrally to paver joints.

LEGEND

Cut paver

Kerbs

PK.1.1.1 Standard kerb

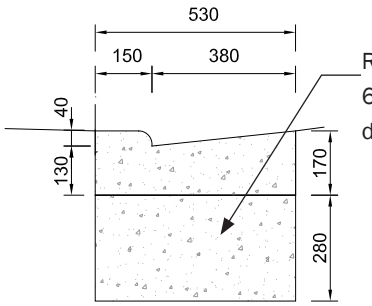


Reference

CCC SD 601

http://www.ccc.govt.nz/consents-and-licences/construction-requirements/construction-standard-specifications/

PK.1.1.2 Dropped kerb

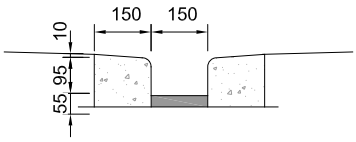


Reference

CCC SD 611

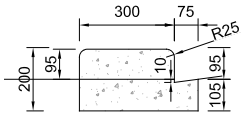
http://www.ccc.govt.nz/consents-and-licences/construction-requirements/construction-standard-specifications/

PK.1.1.3 Stormwater kerb



Material	20MPa concrete
Finish	U3 NZS 3114
Colour	Natural
Reference	n/a
Application	Stormwater channel cycle lane median

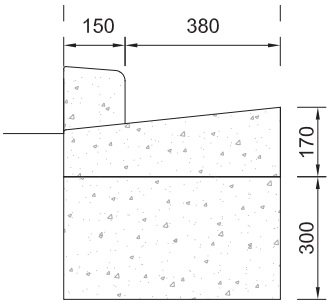
PK.1.1.4 Concrete nib kerb



Material	20MPa concrete
Finish	U3 NZS 3114
Colour	Natural
Reference	n/a
Application	Cycle lane separator, refer S.4.3

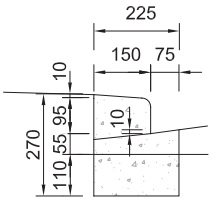
Kerbs

PK.1.1.5 Reinforced wide kerb



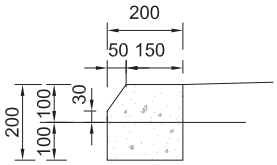
Material	20MPa concrete
Finish	U3 NZS 3114
Colour	Natural
Reference	n/a
Application	Beside rain gardens within footpaths

PK.1.1.6 Reinforced narrow kerb



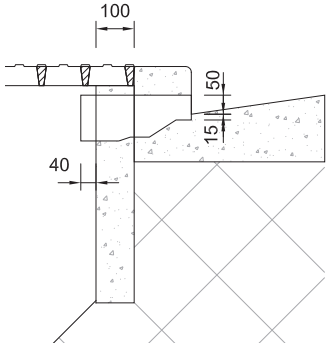
Material	20MPa concrete
Finish	U3 NZS 3114
Colour	Natural
Reference	n/a
Application	Edge of medians and rain gardens with negative stormwater flows

PK.1.1.7 Mountable kerb



Material	20MPa concrete
Finish	U3 NZS 3114
Colour	Natural
Reference	n/a
Application	Cycle lane

PK.1.1.8 Passive irrigation kerb

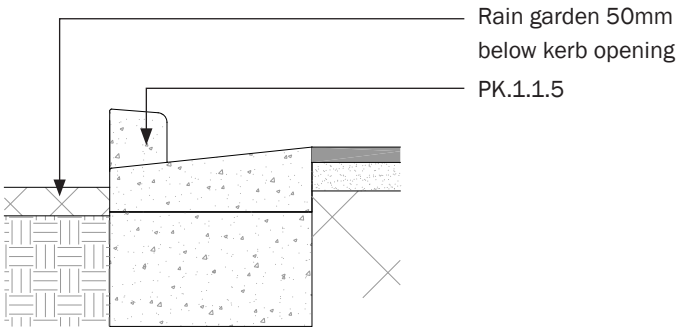


Material	20MPa concrete
Finish	U3 NZS 3114
Colour	Natural
Reference	n/a
Application	Passive irrigation tree pit

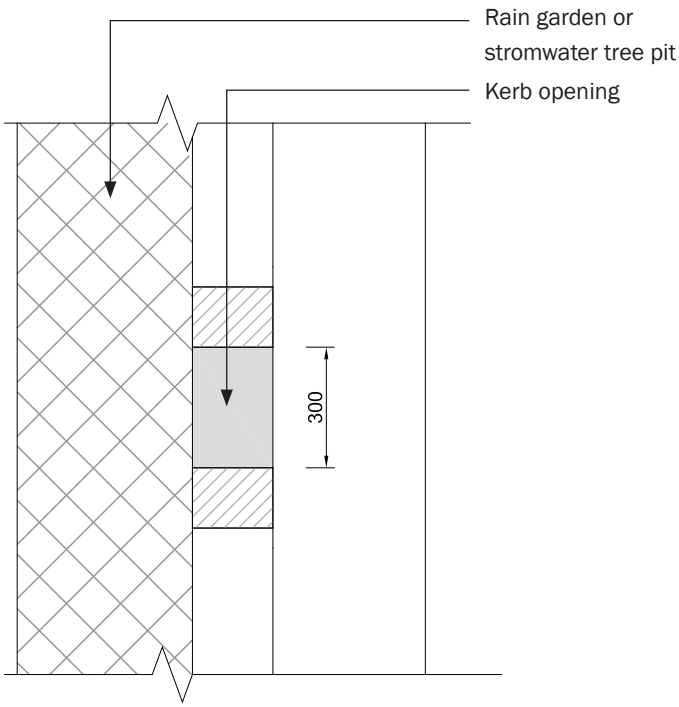
Stormwater discharge

parallel to carriageway

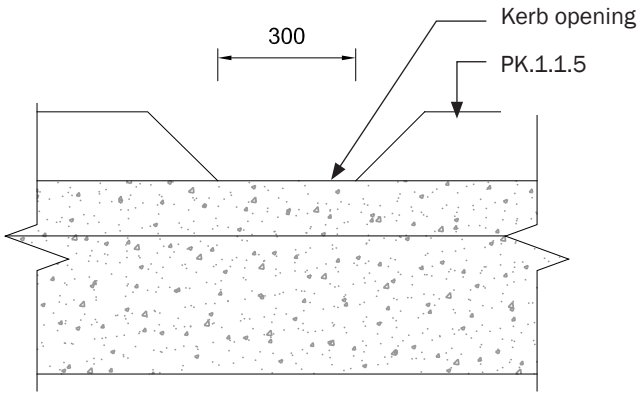
Material	20MPa concrete
Finish	U3 NZS 3114
Colour	Natural
Reference	n/a
Application	Tree pits and rain gardens flush with footpath



Section (not to scale)



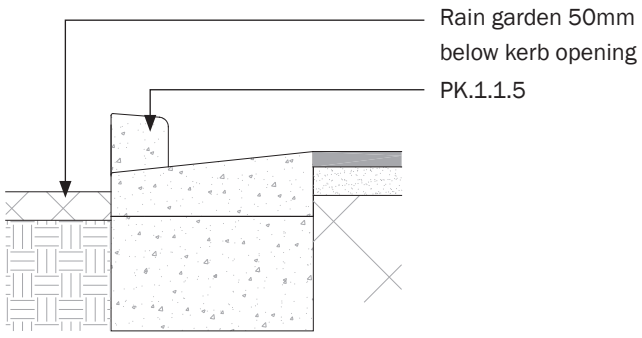
Plan view (not to scale)



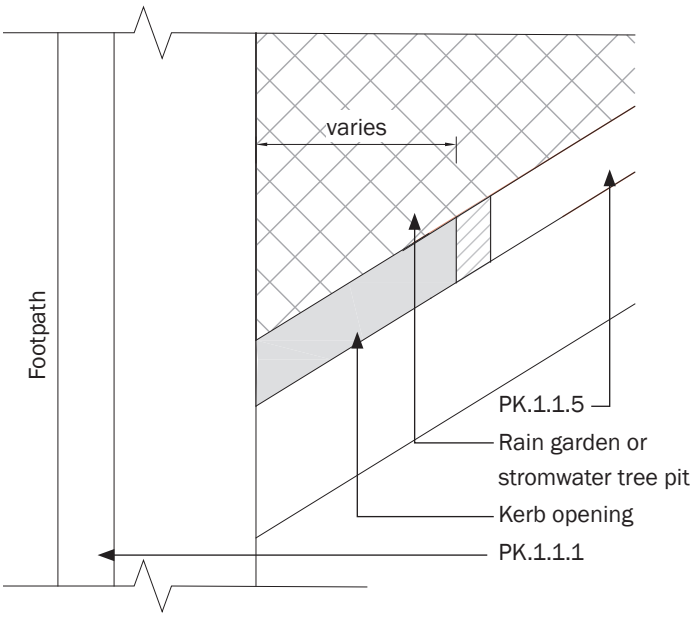
Elevation (not to scale)

Stormwater discharge

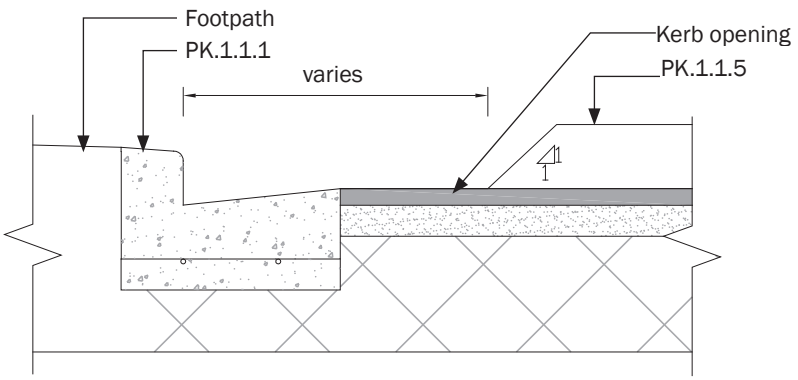
corner of tree pit or rain garden



Section (not to scale)



Plan view (not to scale)



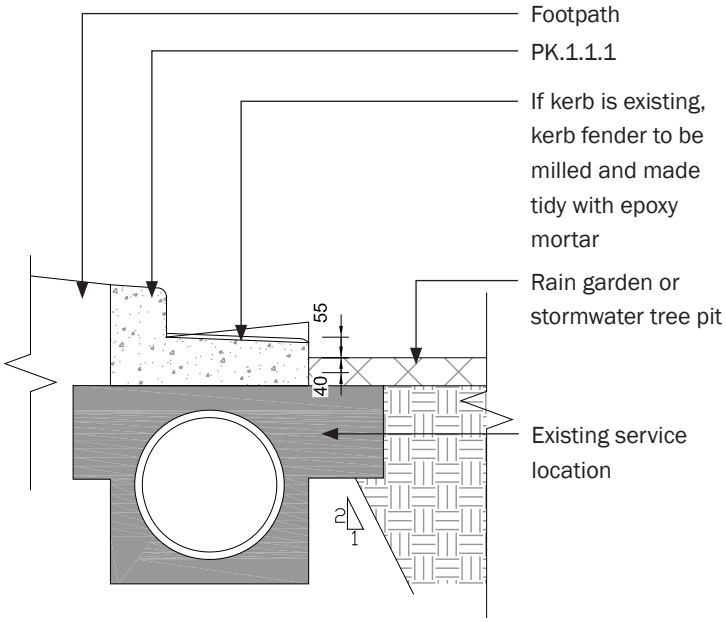
Elevation (not to scale)

Material	20MPa concrete
Finish	U3 NZS 3114
Colour	Natural
Reference	n/a
Application	Tree pits and rain gardens integrated with on-street car parking

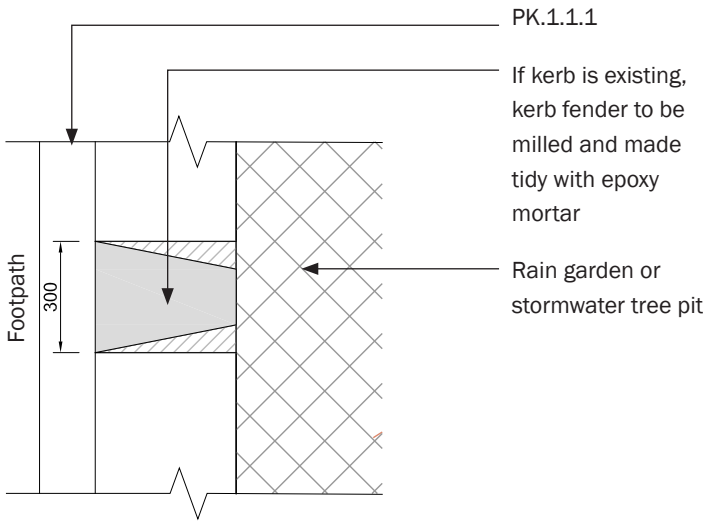
Stormwater discharge

front of kerb

Material	20MPa concrete
Finish	U3 NZS 3114
Colour	Natural
Reference	n/a
Application	New or retrofitted rain garden within carriageway



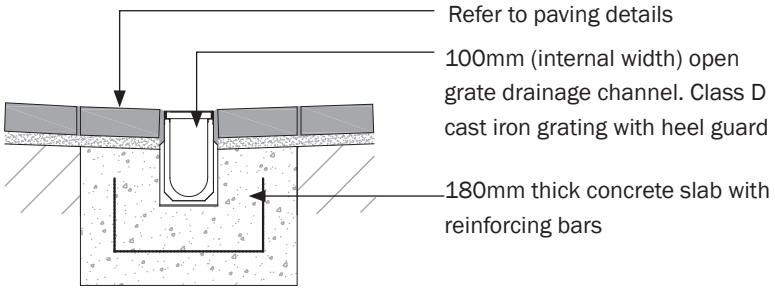
Elevation (not to scale)



Plan view (not to scale)

Drains

PD.1.1.1 Grate drain

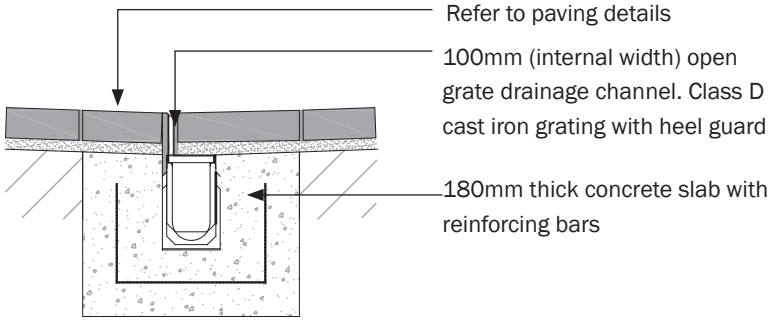


Grate drain

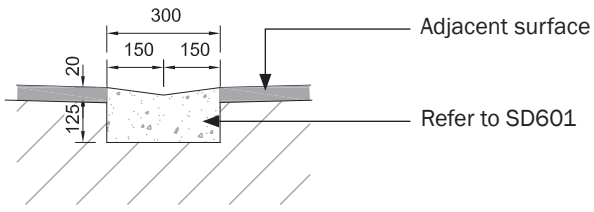
Slot drain

Interpath channel

PD.1.1.2 Slot drain



PD.1.1.3 Interpath channel



Drains are used generally when it is not possible to provide a positive cross fall towards the kerb line. This may be encountered in the following situations:

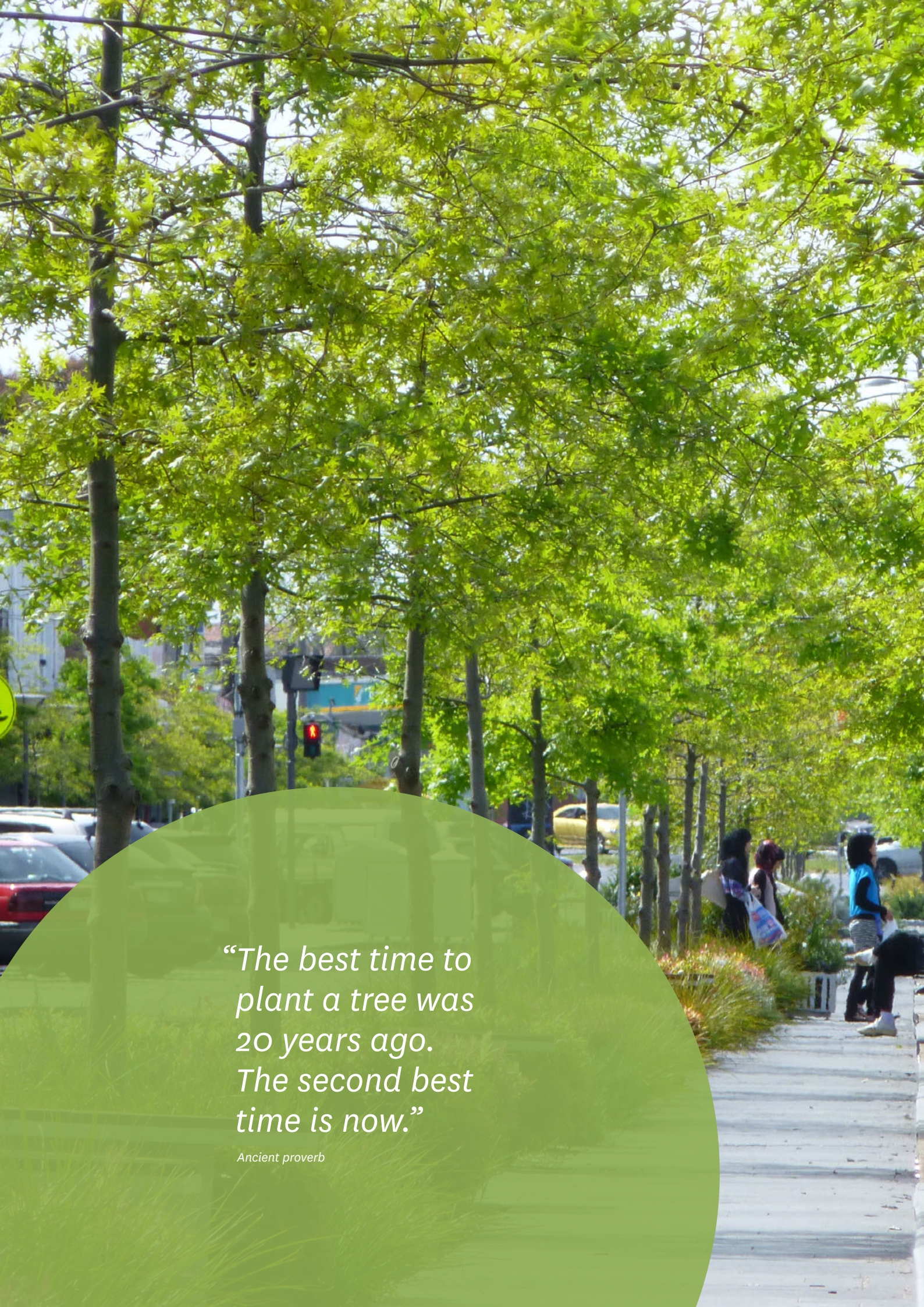
- the floor level of the building and top of the kerb level are very similar
- the width of the footpath prevents the provision of a sufficiently steep gradient for water flow
- the provision of a kerb extension into the carriageway requires a back fall on the paving towards the original kerb line.

The slot drain is the preferred drain type for bluestone paved areas.

Reference

Inter path channel should be designed in accordance with CCC Construction Standard Specifications.

http://www.ccc.govt.nz/consents-and-licences/construction-requirements/construction-standard-specifications/



"The best time to plant a tree was 20 years ago. The second best time is now."

Ancient proverb

03

VEGETATION

Overview

This chapter includes thetechnical notes listed below.

Tree species

Figure 10 and Table 1 illustrate the tree species selected for the central city street network. These species have been selected to strengthen the hierarchy and purpose of each street.

The selection is consistent with the objectives and criteria of the Draft Christchurch City Council Tree Policy. In addition, these species generally are:

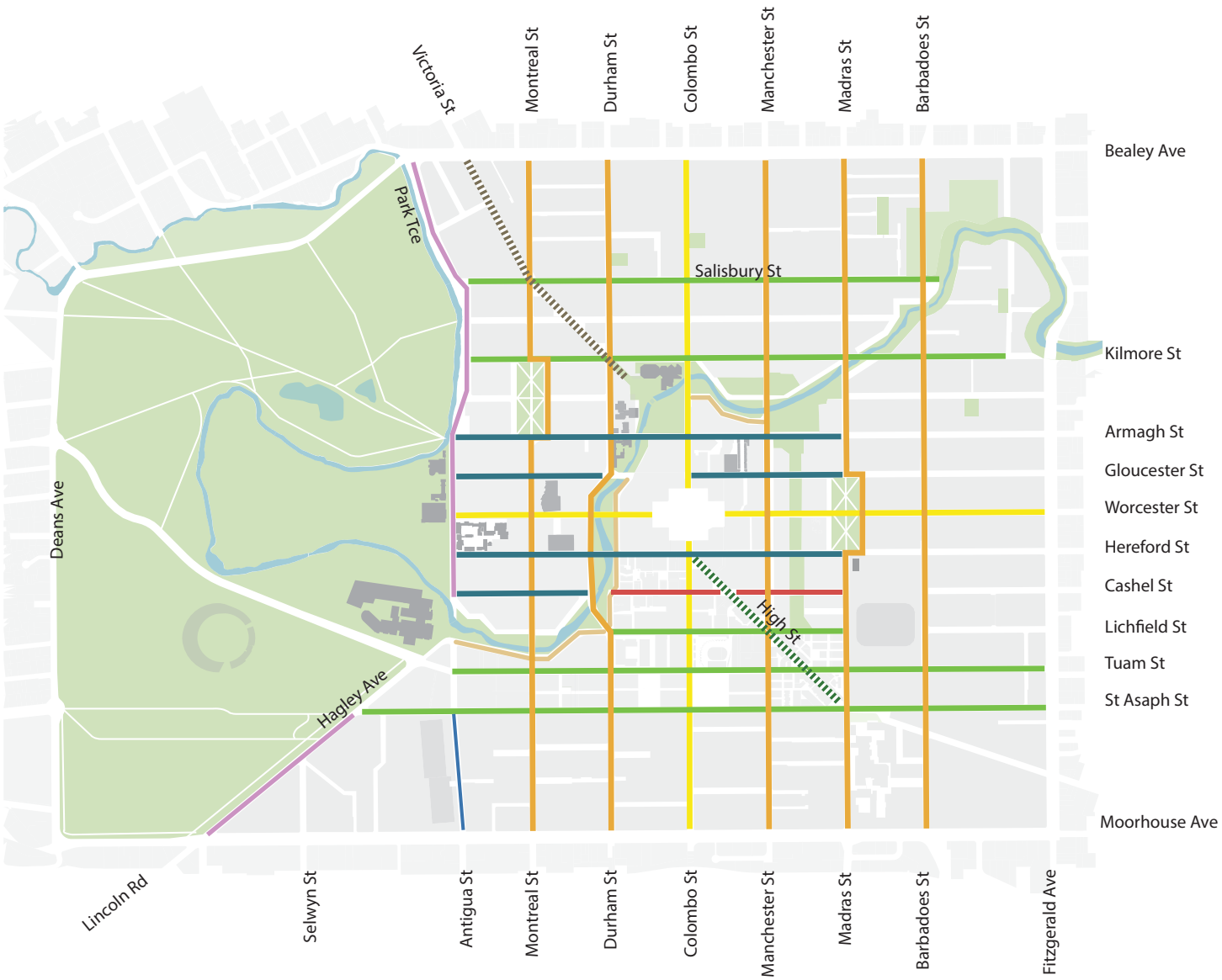
- frost and wind hardy
- tolerant of city soils and pollution
- drought tolerant
- of high visual impact, with attractive foliage and/or bark
- fast growing
- not prone to structural issues, such as falling branches or fragile trunks
- effective at mitigating transport-related greenhouse gases and urban heating.

Establishment of tree species is dependent on site-specific water table depth and therefore the success of species may vary if conditions are inadequate.

ID	Content	Page
VS	VEGETATION SELECTION	70
VS.1.1	Tree species	70
VS.1.2	Low planting – base species	74
VS.1.3	Low planting – complementary species	76

ID	Content	Page
VT	TREE PITS	82
VT.1.1	Tree pit – parking bay	82
VT.1.2	Tree pit – build-out	83
VT.1.3	Tree pit – narrow median extension	84
VT.1.4	Tree pit – median	85
VT.1.5	Tree pit – footpath	86

ID	Content	Page
VR	RAIN GARDENS - UNDER DEVELOPMENT	



Legend

AXIS STREETS

Colombo Street, *Quercus palustris* 'Pin oak'

Worcester Street, *Tilia platyphyllos* 'Broad-leaved lime'

NORTH–SOUTH STREETS

Cambridge Terrace and Montreal, Durham, Madras, Barbadoes and Manchester streets, *Liriodendron tulipifera* 'Tulip tree'

EAST–WEST CENTRAL STREETS (Inner zone)

Armagh, Gloucester, Hereford and Cashel streets, *Corylus colurna* 'Turkish hazel'

EAST–WEST STREETS

Tuam, St Asaph, Salisbury, Kilmore and Lichfield streets, *Tilia platyphyllos* 'Broad-leaved lime'

ŌTĀKARO/AVON RIVER PROMENADE

Oxford Terrace, *Acer rubrum* 'Red maple' and *Sophora microphylla* 'Kōwhai'

NORTH GATEWAY

Victoria Street, *Acer platanoides* 'Norway maple'

SOUTH GATEWAY

High Street, *Quercus robur fastigiata* 'Upright English oak'

PEDESTRIAN MALL

Cashel Street, *Acer rubrum columnare* 'Upright red maple'

METRO SPORTS FACILITY

Antigua Street, *Liriodendron tulipifera fastigiata* 'Upright tulip tree'

HAGLEY PARK EDGE

Park Terrace, *Quercus robur* 'English oak'
Rolleston Avenue, various existing trees
Hagley Avenue, *Prunus x yedoensis* 'Cherry'

Figure 10 *Proposed street trees*

Tree species

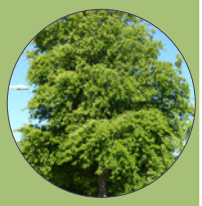
	ASSOCIATED STREET	NOTES	HEIGHT	SPREAD	GROWTH RATE	FLOWER/SEASON	RESILIENCE / ROBUSTNESS	CONSISTENCY IN FORM	SOIL CONDITIONS
Common name: Norway maple **Botanical name:** *Acer platanoides*									
	Victoria Street	Broadly spreading tree. Deeply divided leaves with lobes overlapping. Orange and red in autumn	10–15m	5–10m	Fast	No	Hardy	Good	Moist
Common name: Red maple **Botanical name:** *Acer rubrum*									
	Ōtākaro/ Avon River Promenade and Cashel Mall	Broadly columnar tree noted for its bright-red autumn colour	20–25m	5–10m	Fast	Clusters of small red flowers	Hardy	Good	Moist – wet
Common name: Turkish hazel **Botanical name:** *Corylus colurna*									
	Hereford, Gloucester, Armagh and Cashel streets	Columnar crown broadening as tree ages, forming a beautiful pyramidal shape	10–15m	5–10m	Slow	Long yellow catkins in spring, clusters of edible nuts and good yellow autumn foliage	Very hardy. Extremely tolerant of exposure and paved areas	Good	Moist
Common name: Upright tulip tree **Botanical name:** *Liriodendron tulipifera fastigiata*									
	Antigua Street	Lime-coloured leaves turn a golden yellow in autumn	10–15m	5–10m	Fast	Yellowish-green flowers with orange markings	Hardy	Mixed	Free draining
Common name: Tulip tree **Botanical name:** *Liriodendron tulipifera*									
	Cambridge Terrace and Durham, Montreal, Madras, Barbadoes and Manchester streets	Pyramidal crown. Leaves turn bright yellow in autumn	25–30m	10–15m	Fast	Tulip-shaped greenish, fragrant flowers	Very hardy. Tolerates pollution	Good	Moist

Table 1 *Central city tree species*

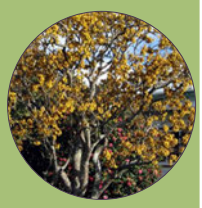
	ASSOCIATED STREET	NOTES	HEIGHT	SPREAD	GROWTH RATE	FLOWER/SEASON	RESILIENCE / ROBUSTNESS	CONSISTENCY IN FORM	SOIL CONDITIONS
Common name: Pin oak **Botanical name:** *Quercus palustris*									
	Colombo Street	Handsome, glossy, green leaves turn scarlet, yellow and red-bronze in autumn	15–20m	10–15m	Medium	No	Very hardy. Withstands drought once established	Good	Well drained – moist
Common name: English oak **Botanical name:** *Quercus robur*									
	Park Terrace	Broad spreading deciduous tree. Leaves dark green, turning red/brown in autumn	25–30m	10–15m	Medium	Catkin flowers appear in spring, followed by acorns in autumn	Hardy	Good	Moist
Common Name: Upright English oak **Botanical Name:** *Quercus robur fastigiata*									
	High Street	Columnar form. Can hold its brown leaves over winter	20–25m	3–5m	Medium	No	Very hardy	Good	Moist
Common name: Kōwhai **Botanical name:** *Sophora microphylla*									
	Oxford Terrace	Small leguminous tree with attractive fern-like foliage. Tangled juvenile stage	5–10m	3–5m	Medium	Flowers profusely in early summer	Hardy	Mixed	Well drained
Common name: Broad-leaved lime **Botanical name:** *Tilia platyphyllos*									
	Worcester Boulevard, Tuam, St Asaph, Lichfield, Salisbury and Kilmore streets	Broadly columnar	15–20m	5–10m	Medium – fast	Small, fragrant flowers	Hardy	Good	Well drained – moist

Table 1 *Central city tree species (continued)*

Low planting

base species

The preferred species for low planting areas in the central city are listed in Table 2.

These plants have been selected for their relevance to the Canterbury landscape, proven performance in garden and rain garden environments and minimum maintenance requirements.

When using low planting in the central city, at least 85% of the planting mix should be formed by species listed in Table 2.

The reason for this planting ratio is twofold: to create a consistent look and enable economies of scale in the sourcing and maintenance of planter beds.

	NOTES	HEIGHT	SPREAD	HARDY	SHADE/SUN	FLOWER/SEASON	MAINTENANCE	HIGH/LOW RAINFALL (CHCH)	SOIL CONDITIONS	MAHINGA KAI
Common name: Dianella **Botanical name:** *Dianella revoluta 'Little Rev'*										
	Upright structure. Flowers bloom a violet blue around spring and summer	400mm	400mm	Hardy. Tolerates cold conditions and drought	Sun / semi-shade	Yes – spring – summer	Low	Low	Dry	
Common name: Mikoikoi, New Zealand iris **Botanical name:** *Libertia grandiflora*										
	Spiked, flax-like plant with white flowers above the foliage in spring and bright-yellow seed pods	500mm	500mm	Very hardy	Sun / semi-shade	Yes – spring	Low	Low	Moist	
Common name: Mikoikoi, New Zealand iris **Botanical name:** *Libertia ixioides*										
	Flax-like plant with white flowers in spring and bright-yellow seed pods. Plant will spread through creeping ribosomes	400mm	400mm	Hardy	Sun / shade	Yes – spring	Low	Low	Moist – dry	

Table 2 *Central city low planting, base species*

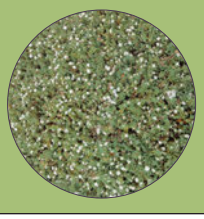
	NOTES	HEIGHT	SPREAD	HARDY	SHADE/SUN	FLOWER/SEASON	MAINTENANCE	HIGH/LOW RAINFALL (CHCH)	SOIL CONDITIONS	MAHINGA KAI
Common name: Pānakenake **Botanical name:** *Lobelia angulata*										
	Groundcover with vigorous growth, bright-green leaves and white flowers and red fruit	100mm	2,000mm	Very hardy	Sun / shade	Yes – spring / autumn	Low	Low – high	Damp – dry	Food
Common name: Pinātoro, New Zealand Daphne **Botanical name:** *Pimelea prostrata*										
	A low-growing groundcover with tight, blue- grey foliage. Tiny white flowers from spring to autumn	100mm	1.000m	Very hardy	Sun	Yes – spring / autumn	Low	Low	Dry	

Table 2 *Central city low planting, base species (continued)*

Low planting
complementary species

Complementary species are generally used to add colour, variety or singularity to a certain area.

When using low planting in the central city, a maximum 15% of the planting mix can be selected from the plant species listed in Table 3.

The remaining 85% of a planter bed should be formed by the base species provided in technical note VS.1.2.

	NOTES	HEIGHT	SPREAD	HARDY	SHADE/SUN	FLOWER/SEASON	MAINTENANCE	HIGH/LOW RAINFALL (CH:CH)	SOIL CONDITIONS	MAHINGA KAI
Common name: Oioi, jointed wire rush **Botanical name:** *Apodasmia similis*										
	Fast growing–spreading from rhizome but is slow spreading. Fine grey-green leaves forming a large dense erect clump	1,000mm	1,000mm	Hardy	Sun	No	Low	High	Dry – moist	Craft
Common name: Rengarenga, NZ rock lily **Botanical name:** *Arthropodium cirratum*										
	A clump-forming plant with grey-green glaucous foliage	500mm	500mm	Best protected from frost	Sun/ shade	Yes – late spring	Low	Low	Moist – dry	
Common name: Astelia, Kakaha **Botanical name:** *Astelia fragrans*										
	Attractive broad green flax-like leaves, stiffly arched and the ribs are often reddish. Has scented flowers in spring and orange berries in summer	1,500mm	1,500mm	Hardy. Best in semi-shade. Prefers shelter	Semi-shade/ shade	Yes – spring	Low	Low	Dry – moist	Craft

Table 3 *Central city low planting, complementary species*

	NOTES	HEIGHT	SPREAD	HARDY	SHADE/SUN	FLOWER/SEASON	MAINTENANCE	HIGH/LOW RAINFALL (CHCH)	SOIL CONDITIONS	MAHINGA KAI
Common name: Mountain kiokio **Botanical name:** *Blechnum montanum*										
	A hardy fern that grows in cold, wet conditions. It forms clumps by a creeping rhizome	300mm	500mm	Hardy	Sun– semi - shade	Pink - orange new fronds	Low	Low	Needs humus to hold the moisture	
Common name: Kiokio **Botanical name:** *Blechnum novae zelandiae*										
	An attractive fern that will grow in deep shade or in a more open site. The new growth has red tones when in sun	1,000mm	1,000mm	Very hardy	Sun – shade	Pink - orange new fronds	Low	High	Needs humus to hold the moisture	Food, traditions
Common name: Mini toetoe **Botanical name:** *Chionochloa flavicans*										
	Strong-growing tussock. Flowering stems which turn from a greenish colour to a tawny colour in summer	800mm	800mm	Hardy	Sun	Yes – summer	Low	Low	Dry – moist	

Table 3 *Central city low planting, complementary species (continued)*

Low planting

complementary species (continued)

	NOTES	HEIGHT	SPREAD	HARDY	SHADE/SUN	FLOWER/SEASON	MAINTENANCE	HIGH/LOW RAINFALL (CHCH)	SOIL CONDITIONS	MAHINGA KAI
Common name: Tūrutu **Botanical name:** *Dianella nigra*										
	Green, flax-like plant. Effective when planted in groups. Best when planted in semi-shade	500mm	300mm	Hardy in dry semi-shade	Sun – semi-shade	Yes – summer	Low	Low	Moist – dry	
Common name: Puniu, prickly shield fern **Botanical name:** *Polystichum vestitum*										
	Dark, leathery foliage. Can develop a small trunk. Tolerates wind if soils stay moist	1,000mm	1,000mm	Prefers cooler conditions. Can handle dry	Sun – shade	No	Low	Low	Needs humus to hold the moisture	Food
Common name: Wild iris **Botanical name:** *Dietes grandiflora*										
	Clump-forming, sword-like foliage. Does well in hot, dry conditions	800mm	600mm	Very hardy, frost and drought tolerant	Sun - semi-shade	Yes – summer	Low	Low	Dry – moist	

Table 3 *Central city low planting, complementary species (continued)*

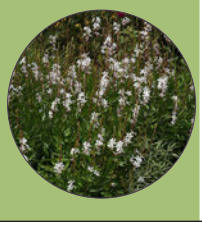
	NOTES	HEIGHT	SPREAD	HARDY	SHADE/SUN	FLOWER/SEASON	MAINTENANCE	HIGH/LOW RAINFALL (CHCH)	SOIL CONDITIONS	MAHINGA KAI
Common name: Waiū-atua, native spurge **Botanical name:** *Euphorbia glauca*										
	Evergreen shrub with attractive vivid blue-grey foliage on tall stems	600mm	500mm	Very hardy	Sun	Yes – summer	Low	Low	Dry – sandy	
Common name: Knobby club rush **Botanical name:** *Ficinia nodosa*										
	Fast-growing, clump-forming rush. Dark-green stems and brown flower heads. Needs full sun	900mm	700mm	Very hardy. Tolerates exposure	Sun	Yes – late spring	Low	Low	Dry – damp	Craft
Common name: Wand flower **Botanical name:** *Gaura lindheimeri* 'Whirling Butterflies'										
	Flowers bloom for the entire summer and autumn. Requires good drainage	800mm	8,000mm	Semi-hardy, tolerant to heat and drought	Sun – semi-shade	Yes – summer – autumn	Some – cut to desired shape once established	Low	Dry	

Table 3 *Central city low planting, complementary species (continued)*

Low planting

complementary species (continued)

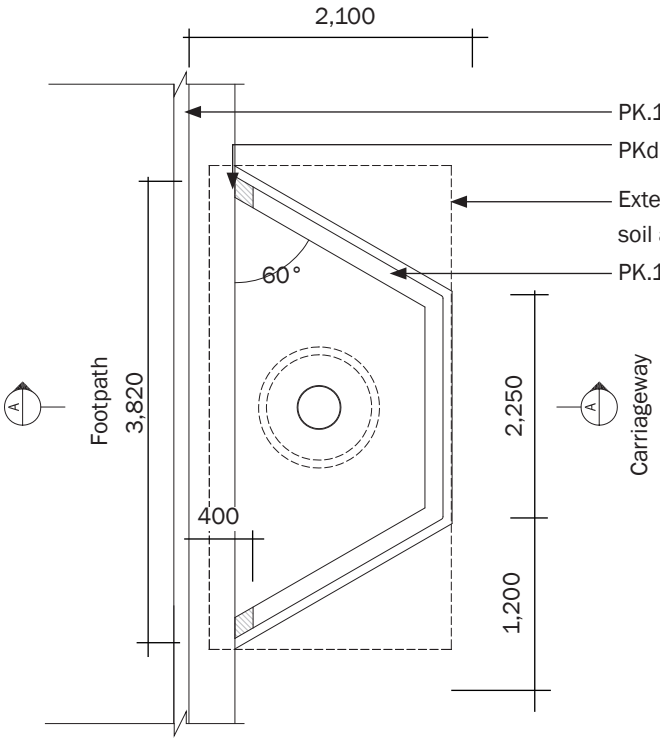
	NOTES	HEIGHT	SPREAD	HARDY	SHADE/SUN	FLOWER/SEASON	MAINTENANCE	HIGH/LOW RAINFALL (CHCH)	SOIL CONDITIONS	MAHINGA KAI
Common name: Hebe **Botanical name:** *Hebe 'Emerald Gem'*										
	Compact shrub forming oval domes of bright-green tightly packed foliage. Clusters of white flowers in spring	500mm	500mm	Very hardy	Sun–semi-shade	Yes – late spring -summer	Low	Low	Dry	
Common name: Hebe **Botanical name:** *Hebe* 'Wiri Mist'										
	Grey-green foliage and a flat-topped habit. White flowers in late spring – early summer	600mm	8,000mm	Very hardy	Sun–semi-shade	Yes – late spring -summer. Can flower again in autumn	Low	Low	Dry – moist	
Common name: Black brass button **Botanical name:** *Leptinella squalida 'Platt's Black'*										
	A carpeting perennial. Easy to grow	50mm	300mm	Hardy	Sun–semi-shade	Yes – summer	Low	Low	Moist	
Common name: Lilyturf, Monkey grass **Botanical name:** *Liriope muscari*										
	A clump-forming evergreen with dark-green, strap-like leaves. Spikes of purple-blue flowers in summer	350mm	350mm	Very hardy	Sun–shade	Yes – summer	Low	Low – med	Dry – moist	
Common name: Hounds tongue fern **Botanical name:** *Microsorum pustulatum*										
	Fern with distinctive thick, glossy bright-green leaves	300mm	1,000mm	Hardy. Best in semi-shade	Shade – semi-shade	No	Low	Low	Needs humus to hold the moisture	Food

Table 3 *Central city low planting, complementary species (continued)*

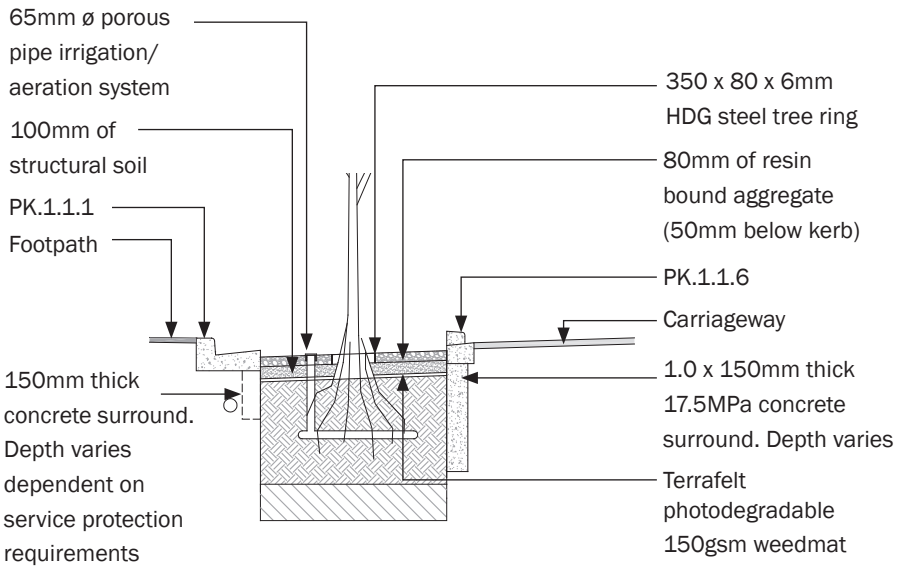
	NOTES	HEIGHT	SPREAD	HARDY	SHADE/SUN	FLOWER/SEASON	MAINTENANCE	HIGH/LOW RAINFALL (CHCH)	SOIL CONDITIONS	MAHINGA KAI
Common name: Chatham Island Forget-me-not **Botanical name:** *Myosotidium hortensia*										
	Large glossy-green, deeply veined leaves and blue flowers in late spring. Prefers a sheltered site	500mm	5,000mm	Semi-hardy, shelter from frost	Sun– shade	Yes – late spring	Low	High	Moist	
Common name: NZ mountain flax, Whaririki **Botanical name:** *Phormium cookianum 'Emerald Green'*										
	Erect green foliage. A yellow flower stalk blooms up to 2m in height. Attracts tui when in flower	1,000mm	1,000mm	Very Hardy	Sun – semi-shade	Yes – spring	Low	Low	Dry	Craft, traditions, food, medicine, building
Common name: Marlborough rock daisy **Botanical name:** *Pachystegia insignis*										
	Silver-grey foliage. White daisy-like flowers in summer. Needs good drainage and prefers poor soils	600mm	600mm	Hardy, tolerates dry soil	Sun	Yes – summer	Low	Low	Dry–sandy	

Table 3 *Central city low planting, complementary species (continued)*

Tree pit
parking bay



Plan view (not to scale)



Section A-A (not to scale)

This is the standard detail for tree pits located between parking bays.

This tree pit is flush with the carriageway, which enables passive irrigation of the pit.

Reference

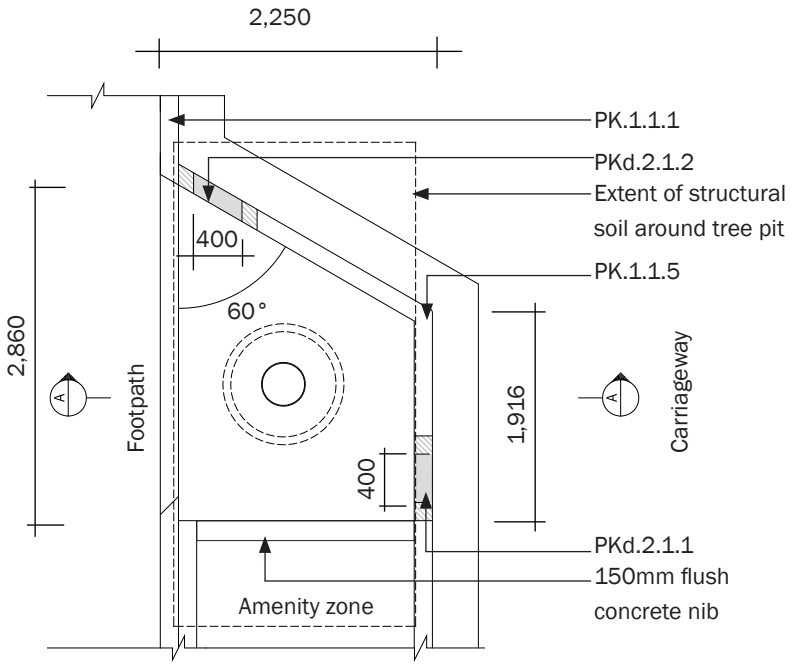
S.3.1 On-street car park

Tree pit
build-out

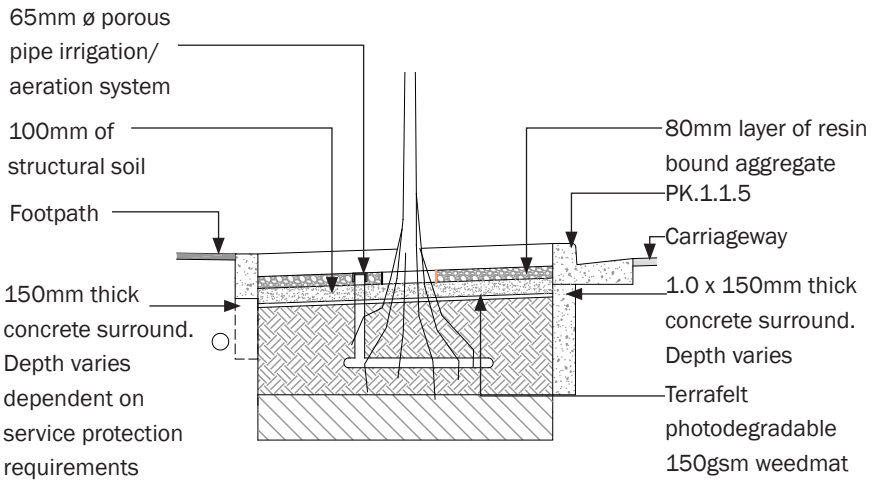
This is the standard detail for tree pits located at the end of build-out areas.

Reference

S.2.1 Build-outs



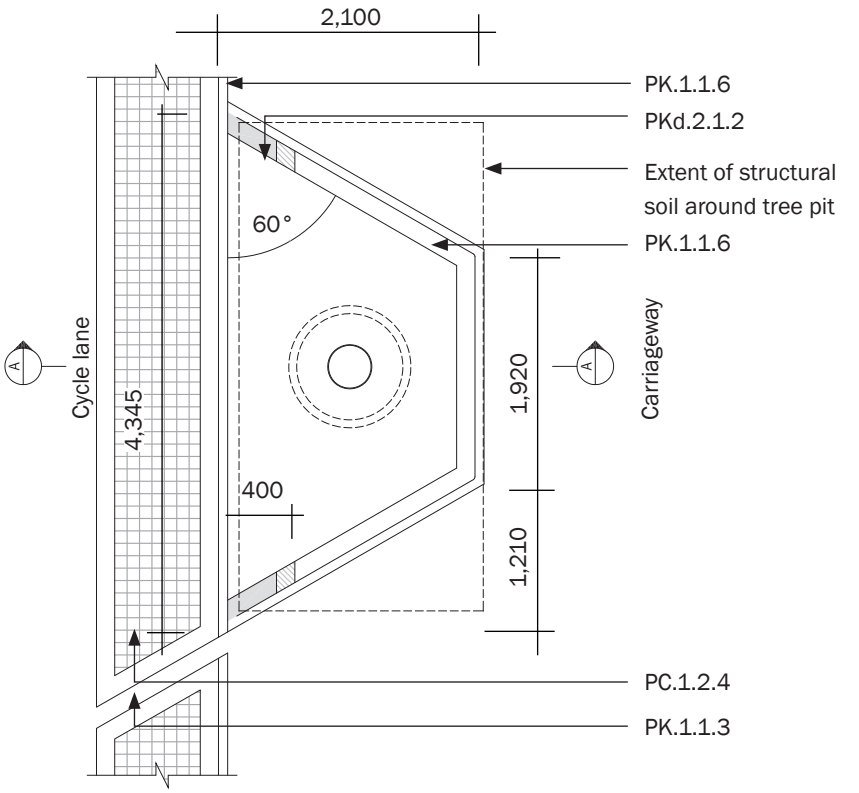
Plan view (not to scale)



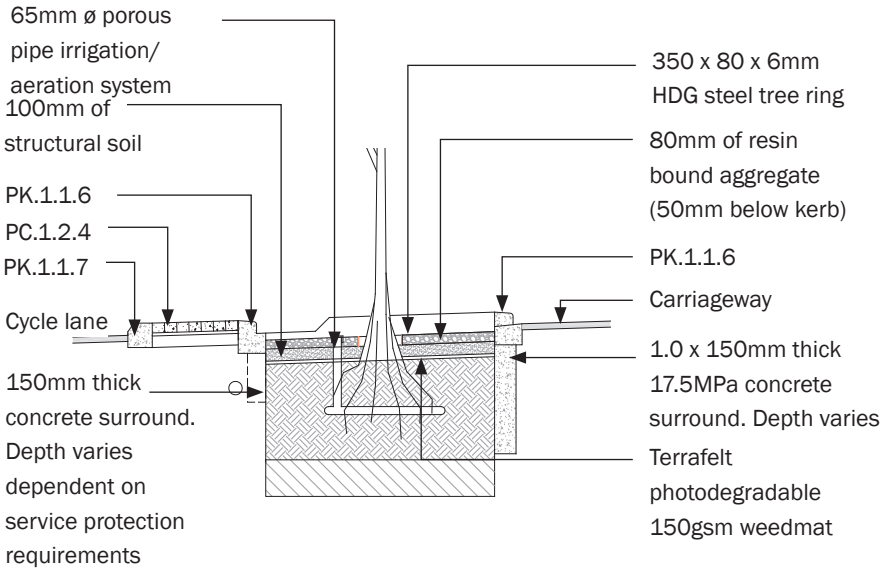
Section A-A (not to scale)

Tree pit

narrow median extension



Plan view (not to scale)



Section A-A (not to scale)

This is the standard detail for tree pits located adjacent to the narrow medians between on-street car parks and a separated cycle lane.

Reference

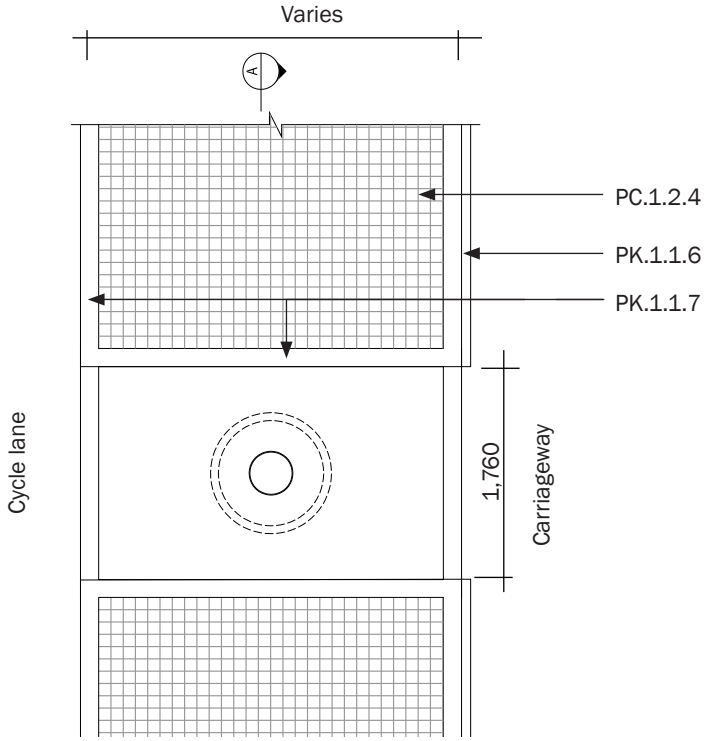
S.4.1 Separated cycle lane – narrow median separator

Tree pit
median

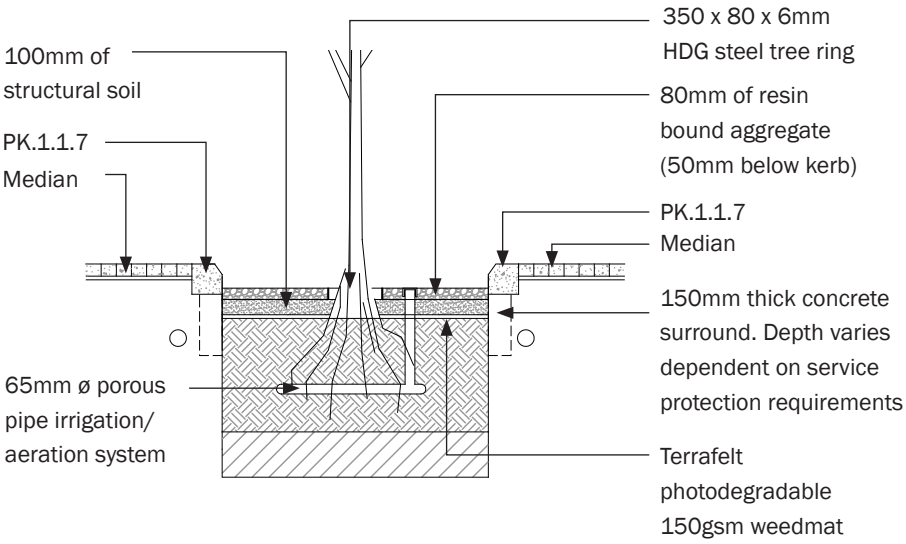
This is the standard detail for tree pits located within wide medians between the carriage way and a separated cycle lane.

Reference

S.4.2 Separated cycle lane – wide median separator



Plan view (not to scale)



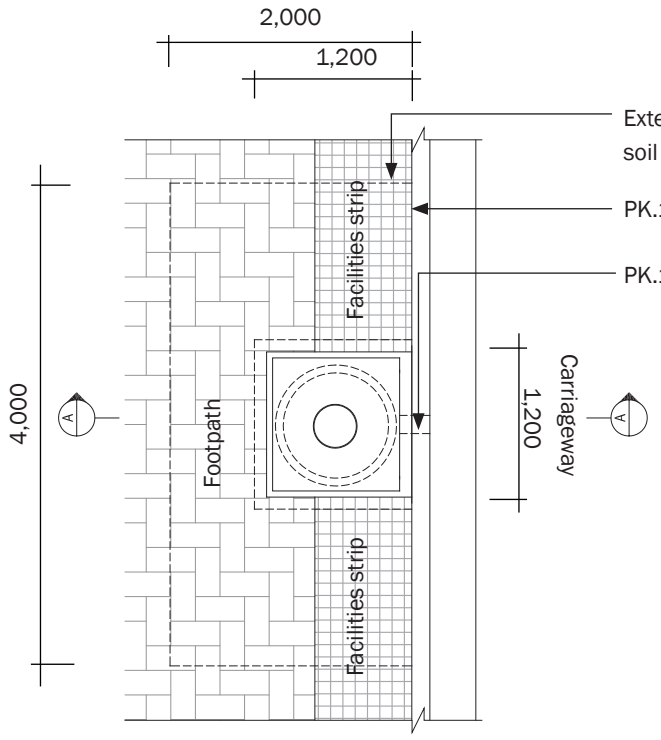
Section A-A (not to scale)

Tree pit
footpath

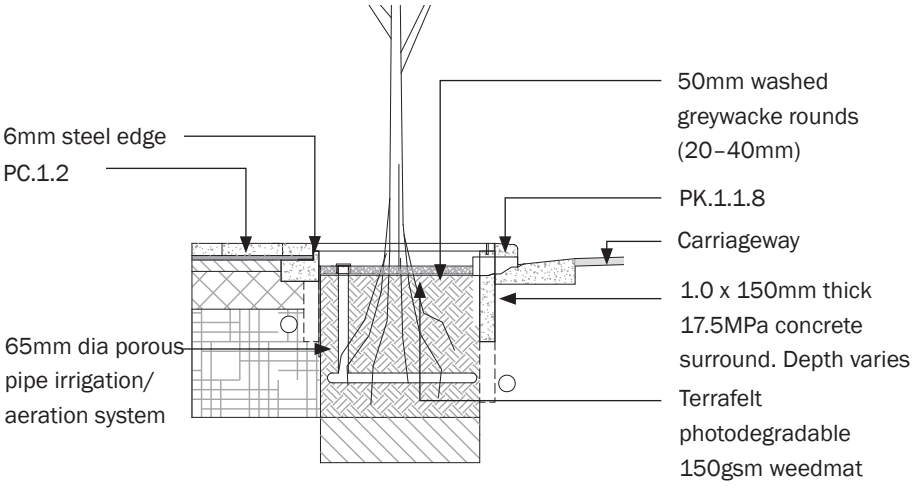
This is the standard detail for tree pits located within footpath areas.

Reference

S.1.1 Footpath



Plan view (not to scale)



Section A-A (not to scale)


"My interest is in the future, because I am going to spend the rest of my life there."
Charles Kettering

04

STREET FURNITURE

Overview

This chapter includes the following technical notes.

ID	Content	Page
FS	SEATING ELEMENTS	92
FS.1.1	Timber seat with backrest	92
FS.1.2	Timber bench	93
FE	STANDALONE ELEMENTS	94
FE.2.1	litter / recycling bin	94
FE.2.2	Bollard	95
FE.2.3	Drinking fountain	96
FE.2.4	Tree grate	97
FE.2.5	Utility cabinets	98

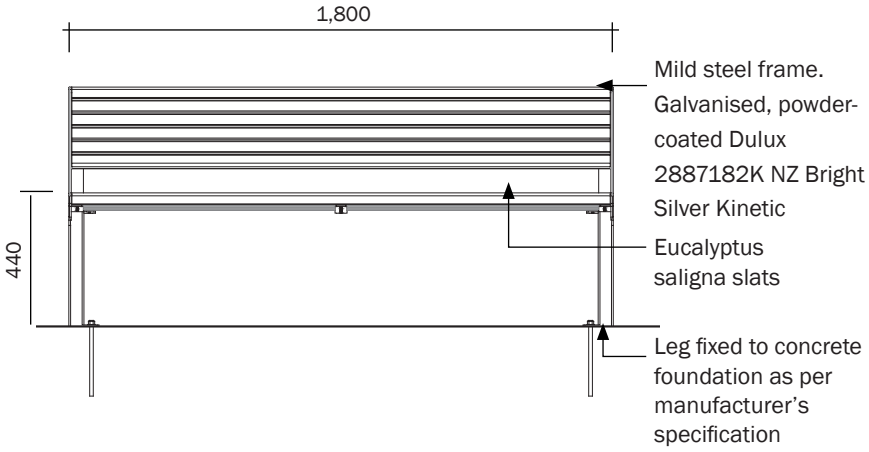
ID	Content	Page
FC	CYCLING ELEMENTS	99
FC.3.1	Cycle stand	99
FC.3.2	Cycle stub pole and hold rail	100
FC.3.3	Cycle repair and pump station	101
FL	LIGHTING ELEMENTS - UNDER DEVELOPMENT	
FW	WAYFINDING ELEMENTS - UNDER DEVELOPMENT	

The suppliers identified in each technical note have been selected through the CERA procurement process, or through standing agreements between CCC and the selected supplier.

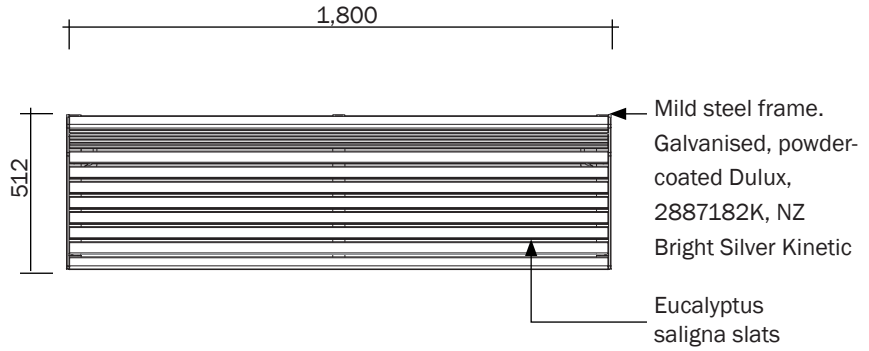
FS.1.1

Timber seat

with backrest



Front elevation (not to scale)



Plan view (not to scale)

Seats with backrest should be provided along key pedestrian routes, in places where people are likely to sit for extended periods.

Seats should be positioned to take advantage of summer shade, winter sun and any interesting views or activities.

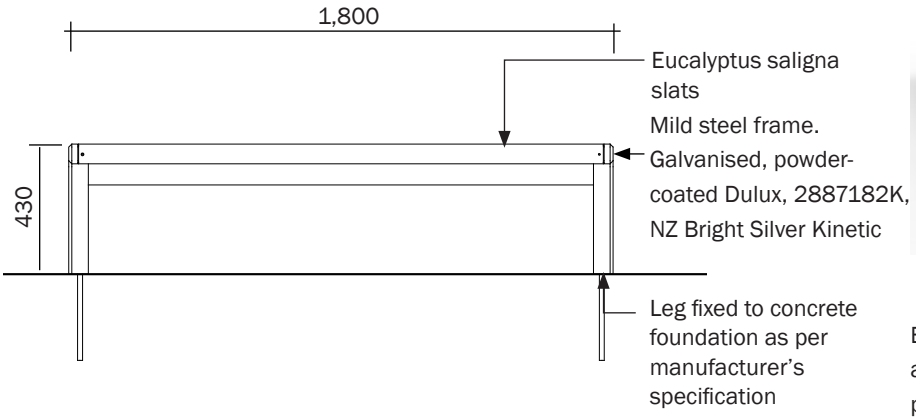
Locating this type of seat along key pedestrian routes provides an incentive to less-able people to walk, as they can stop and rest along the way.

In narrow footpaths, seats should be located within built-out areas in order to maintain a clear circulation zone (refer S.2.1 Build-outs).

Seats should be generally orientated to face away from the kerb with a 700mm setback from the face of the kerb.

Materials	Mild steel frame. Galvanised, powder-coated Dulux, 2887182K, NZ Bright Silver Kinetic, Eucalyptus saligna slats, penetrating oil finish
Product	E_01_CCC
Supplier	Walkspace

Timber bench

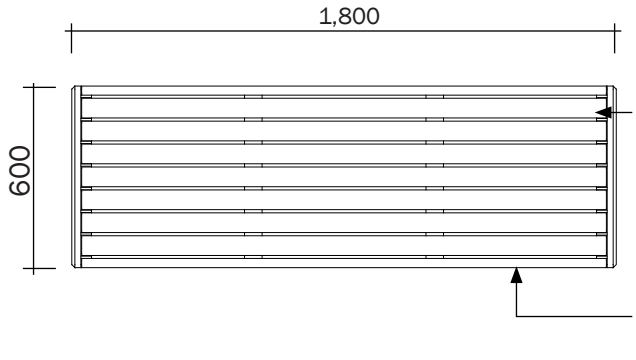


Front elevation (not to scale)

Benches provide flexibility for seating arrangements. They should be positioned to take advantage of summer shade, winter sun and any interesting views or activities.

In narrow footpaths, benches should be located within built-out areas in order to maintain a clear circulation zone (refer S.2.1 Build-outs).

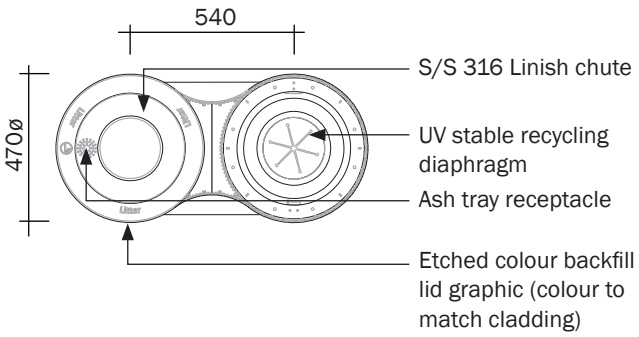
Benches should provide a 700mm clearance from the face of the kerb.



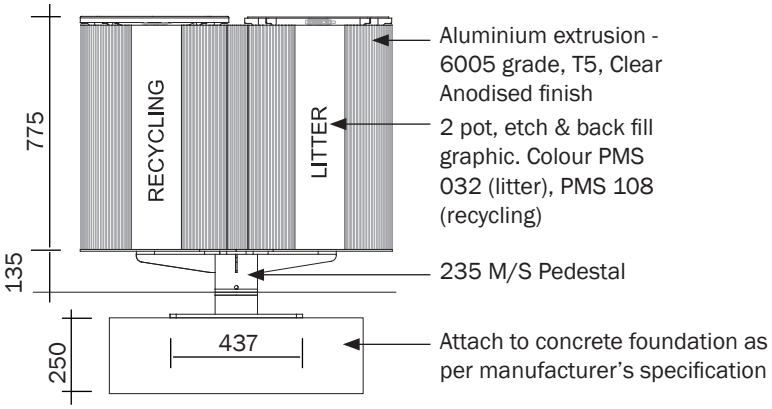
Plan view (not to scale)

Materials	Mild steel frame. Galvanised, powder-coated Dulux, 2887182K, NZ Bright Silver Kinetic, Eucalyptus saligna slats, penetrating oil finish
Product	E_02_CCC
Supplier	Walkspace

Litter / recycling bin



Plan view (not to scale)



Side elevation (not to scale)

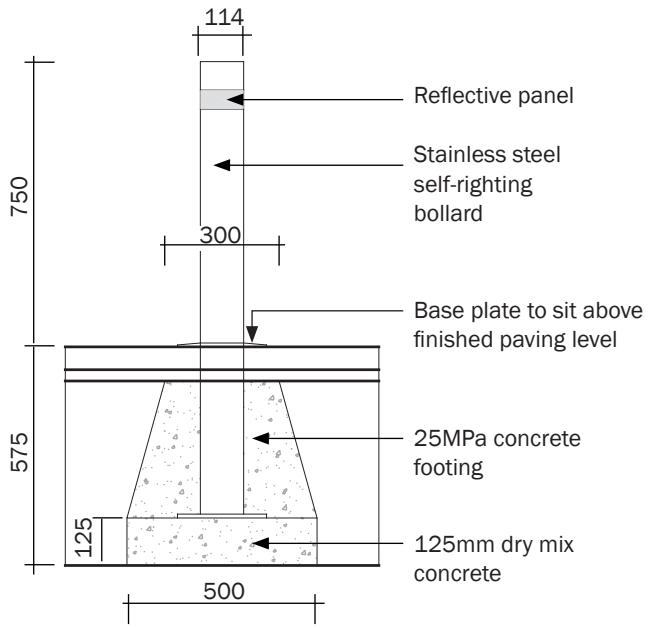
Bins should be placed at regular intervals along footpaths and public spaces with high pedestrian traffic, at intersections and at mid-block pedestrian crossings.

General principles for placing bins include:

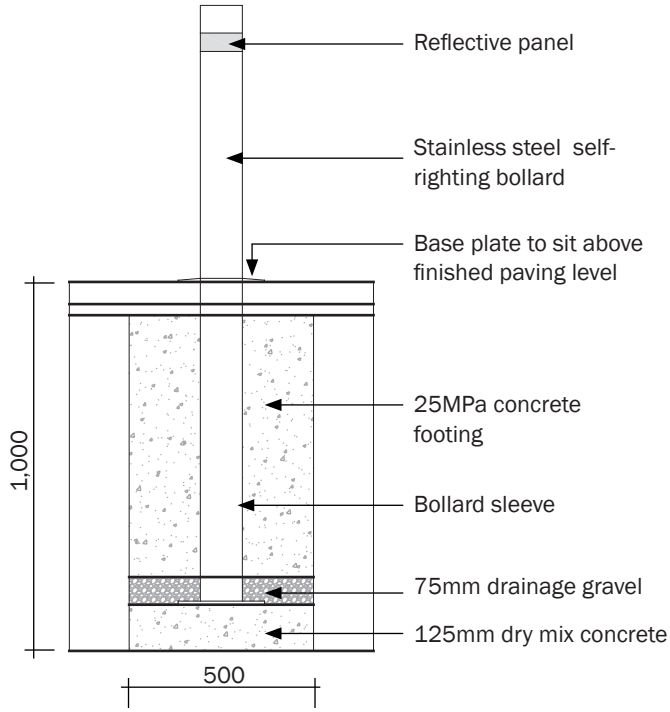
- locate bins to be convenient to seating areas, especially where people are likely to sit and consume food and drinks
- when redesigning existing streets, keep bins in their existing location if feasible
- avoid aligning bins with doorways to buildings
- avoid placing bins within the footpath's circulation zone (refer S.1.1 Footpath)
- consider the location and amount of bins in relation to the overall appearance of the street. Take care to not over-provide bins in any given area, such that they clutter the footpath or detract from the amenity.

Materials	Extruded aluminium with SS frame
Product	TWIN Bin CCC
Supplier	FEL Group
	Walkspace
	HUB Street Equipment

Bollard



Section (not to scale)



Section (not to scale)

Image to be inserted when built

Bollards are generally used instead of kerbs to restrict vehicle access without impeding pedestrian and bicycle access or affecting existing drainage levels.

Bollards must incorporate a reflective panel to ensure visibility for vehicular traffic.

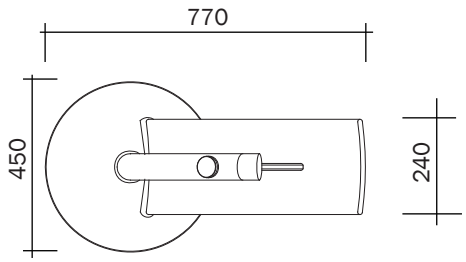
When placing bollards in rows, the clearance between bollards should be a minimum of 1.2m and a maximum of 1.7m.

If using a mix of removable and fixed bollards, all bollards should be the same style.

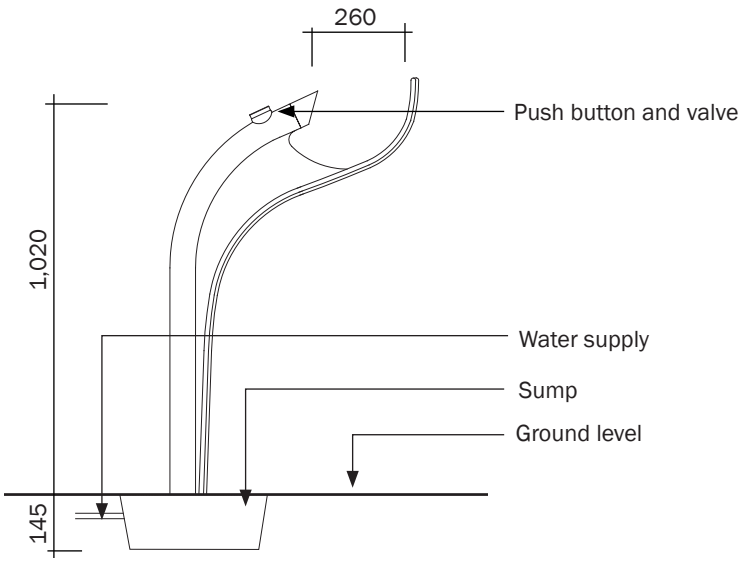
Materials	Linished 316 stainless steel
Product	B2.a / B2.b
Supplier	Maxwood Manufacturing

FE.2.3

Drinking fountain



Plan view (not to scale)



Side elevation (not to scale)

Drinking fountains should be located along pedestrian and cycle priority routes and other civic spaces.

Fountains should be placed consistently in similar types of locations so people can find them easily. Appropriate sites for drinking fountains include near tram and bus stops and entrances to civic and public buildings.

When drinking fountains are installed along pedestrian walkways, they should not encroach into the path of travel.

Fountains should be installed perpendicular to the kerb.

Ensure provision is made to connect the fountain's overflow drainage.

The drinking fountain pictured is accessible from a wheelchair.

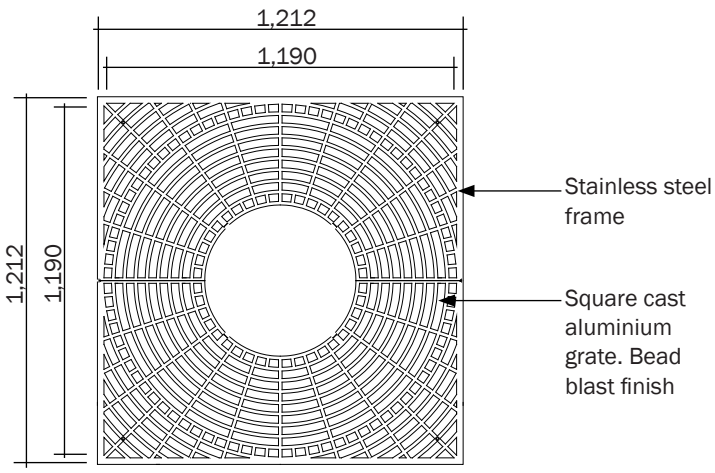
Materials	Bead blast cast aluminium
Product	CERA - DF4 Arqua Fountain
Supplier	A.E. TIlley

Tree grate

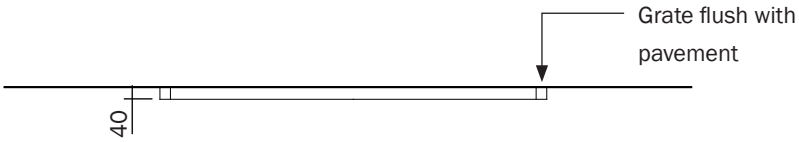
The tree grate is used to increase the extent of walkable areas while protecting trees and allowing water to flow into tree pits.

Tree grates are often used as a component of passive irrigation tree pits.

Materials	Bead blast cast aluminium
Product	CERA – GR2 Silva Square Grate
Supplier	A.E. Tilley

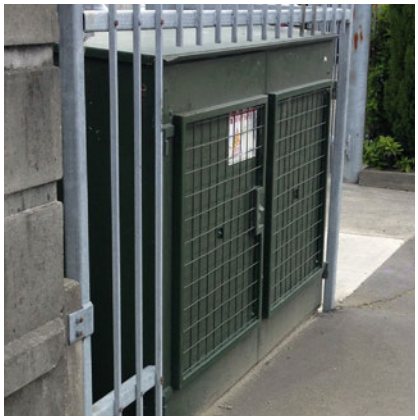


Plan view (not to scale)



Front elevation (not to scale)

Utility cabinets

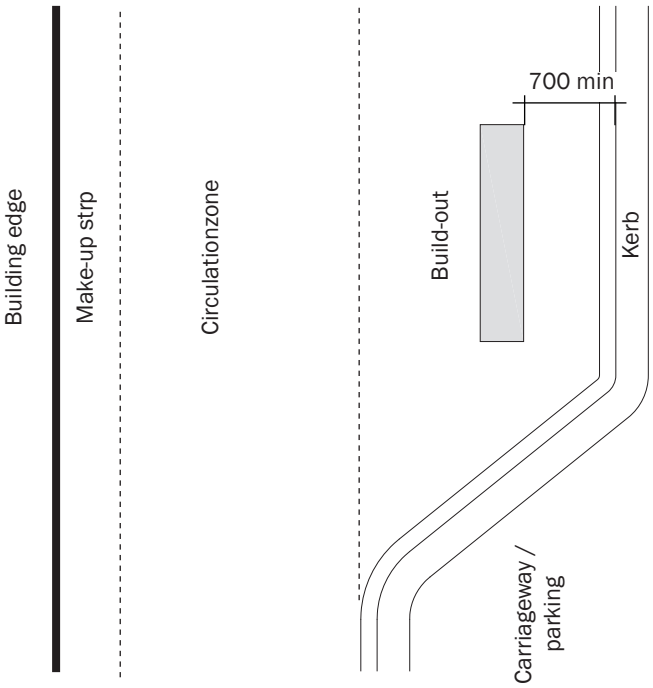


Utility cabinets should be placed to avoid obstruction to pedestrians and to minimise their visual impact on the streetscape.

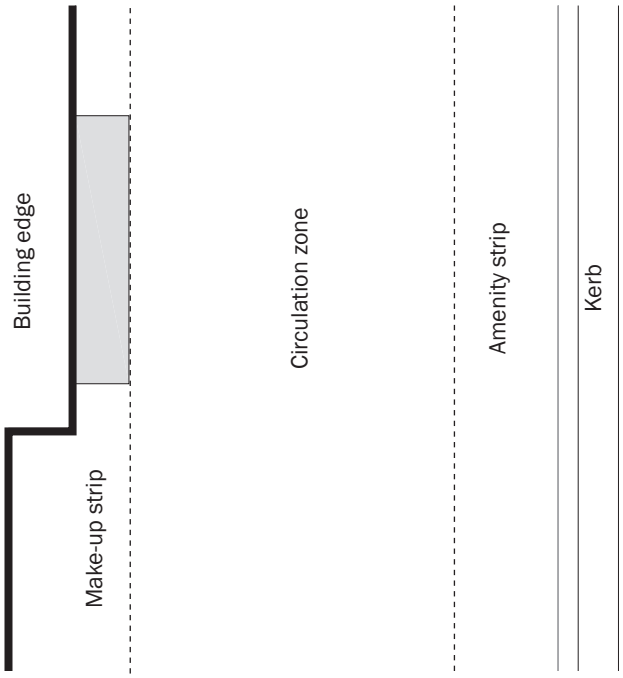
Cabinets should not mask pedestrians from approaching vehicles or obstruct access to and use of street furniture items.

The preferred location for utility cabinets is within built-out areas parallel to the kerb, allowing at least 700mm separation from the front of the kerb.

When locating utility cabinets against buildings or property boundaries cannot be avoided, they should be placed as close as possible to the property boundary and not obstruct doorways, access ways or shop windows. Do not locate utility cabinets in corner areas.

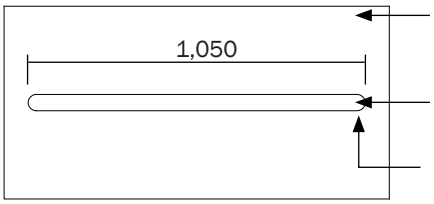


Plan view in build-out (not to scale)



Plan view against building edge (not to scale)

Cycle stand

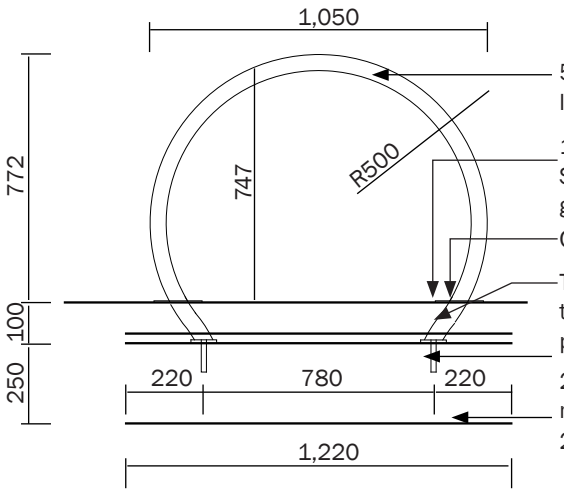


25MPa concrete footing continuous between stands or 600mm wide

150ø x 5mm linished 316 SS cover plate

2 M16 masonry anchors (100mm min embedment) through 160 x 80 x 10mm thick welded baseplate into concrete footing

Plan view (not to scale)



50.8mm OD 1.5mm WT linished 316 SS hand rail tube

150ø x 5mm linished 316 SS cover plate fixed to ground plain with epoxy

Core drill hole in pavers

Tangent point in transition in tube to occur below finished paving level

2 M16 masonry anchors 100mm min embedment into footing 25MPa concrete footing

Side elevation (not to scale)

Cycle stands should be located along cycling routes and at cycle destinations and other public attractions.

Cycle stands can be used singly or in groups of two or more. They can be placed perpendicular, parallel or at an angle to the kerb as long as minimum clearances and setbacks are maintained.

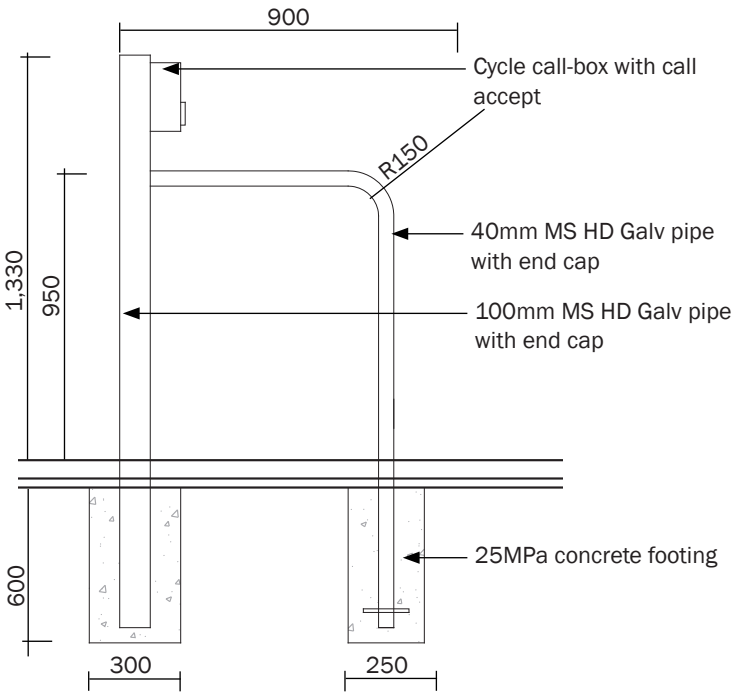
When using a perpendicular or at an angled configuration, stands should be set parallel to each other, spaced 1,000mm apart and kept at least 2,000mm clear of other street furniture.

Cycle stands should provide a clearance of a minimum of 500mm from the kerb, site boundary or building edge.

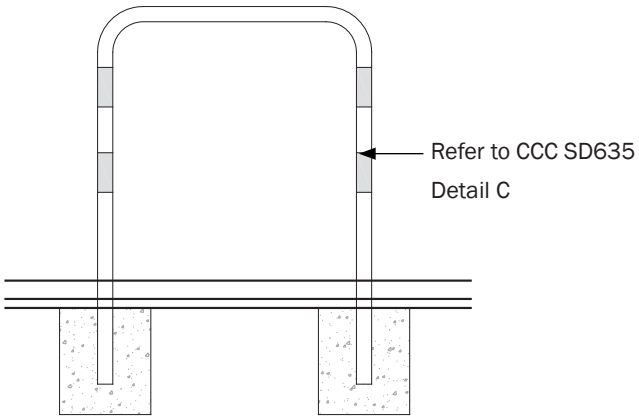
Install cycle stands in visible locations and place them so that more can be added in the future if demand increases.

Materials	Linished 316 stainless steel
Product	CCC standard cycle stand
Supplier	Falcon Hammersley

Cycle stub pole and hold rail



Stub pole and hold rail – side elevation (not to scale)



Hold rail – side elevation (not to scale)

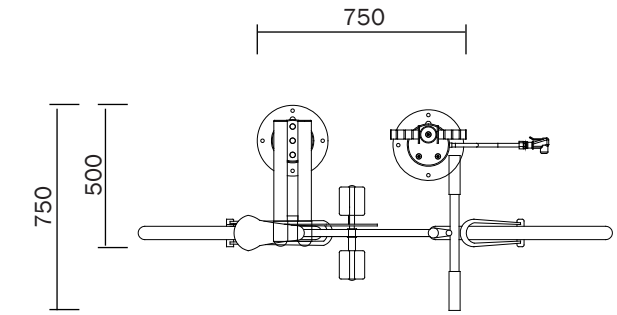
Cycle stub poles and hold rails should be included where cycle paths stop and intersect with other modes of transport. Stub poles should be used at signalised crossings; pedestrian-style call-boxes should be installed with support rails. Rails should be used at non-signalised crossings. Designs are to be reviewed by Christchurch City Council.

Reference

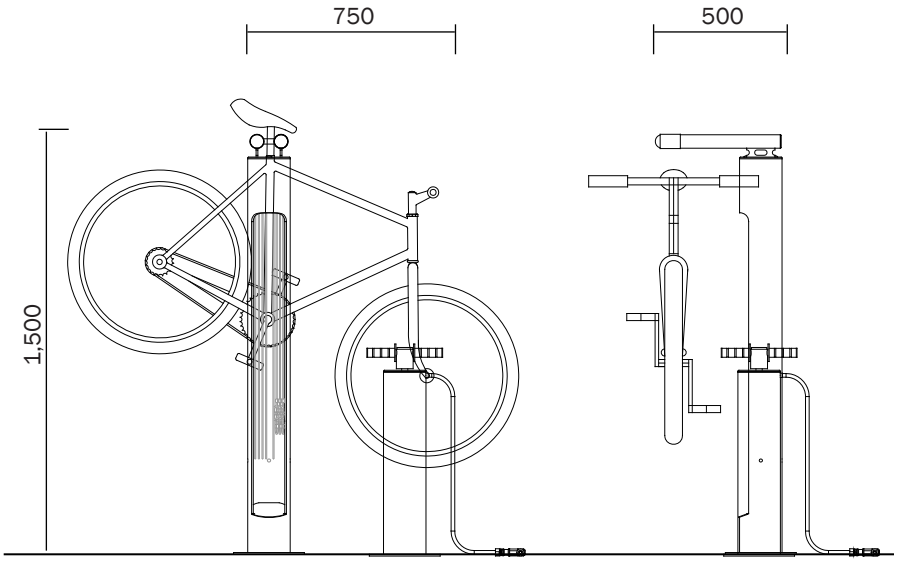
Hold rails should be designed in accordance with the CCC Construction Standard Specifications.

http://www.ccc.govt.nz/consents-and-licences/construction-requirements/construction-standard-specifications/

Cycle repair and pump station



Plan view (not to scale)



Side and front elevations (not to scale)

The cycle repair station includes all the tools necessary to perform basic repairs and maintenance, from changing a flat tyre to adjusting brakes and derailleurs.

The tools and air pump are securely attached to the stand with cables and tamper-proof fasteners.

Hanging the bike from the hanger arms allows the pedals and wheels to spin freely while the cyclist is making adjustments.

Materials	Linished 316 stainless steel
Product	n/a
Supplier	n/a

"All truly great thoughts are conceived by walking."

Friedrich Nietzsche

05

REFERENCES

Technical notes index

ID	Content	Page
S	**STREET TREATMENTS**	**17**
S.1.1	Footpath	20
S.2.1	Build-outs	21
S.3.1	On-street car park	22
S.4.1	Separated cycle lane – narrow median separator	23
S.4.2	Separated cycle lane – wide median separator	24
S.4.3	Separated cycle lane – concrete nib separator	25
S.4.4	Separated cycle lane – Copenhagen style	26
S.4.5	Separated cycle lane – Bus stop crossing	27
S.5.1	Midblock pedestrian crossing – raised platform with footpath build-out	28
S.5.2	Mid-block pedestrian crossing – central island	29
S.5.3	Mid-block pedestrian crossing – across cycle lane	30
S.6.1	Vehicle crossing – access way	31
S.7.0	Intersections – design principles	32
S.7.1	Intersection – pedestrian crossings	34
S.7.2	Intersection – Barnes dance crossing	35
S.7.3	Intersection – advanced stop boxes	36
S.7.4	Intersection – separated bicycle lane approach and hook turn box	37
S.7.5	Intersection – left turn vehicle approach	38
S.8.1	Pedestrian ramp – two kerb crossing	39
S.8.2	Pedestrian ramp – Barnes dance crossing	40
S.8.3	Pedestrian ramp – perpendicular to kerb crossing	41
T	**SURFACING TREATMENTS**	**42**
T.1.1	Bluestone palette – footpaths	44
T.1.2	Bluestone palette – special areas	45
T.2.1	Concrete paving palette – footpaths	46
T.3.1	Asphalt	47

ID	Content	Page
P	**FOOTPATH ELEMENTS AND STANDARD DETAILS**	**48**
PB.1.1	Paver units – bluestone	48
PC.1.2	Paver units – concrete	49
PI.1.1	TGSIs	50
PCd.1.1	Paver cutting details – parallel edge	52
PCd.1.2	Paver cutting details – edge greater than 30°	54
PCd.1.3	Paver cutting details – edge less than 30°	55
PCd.2.1	Paver cutting details – fire hydrant and water meter covers	56
PCd.2.2	Paver cutting details – valve and toby box covers	57
PCd.2.3	Paver cutting details – service cover	58
PCd.2.4	Service cover installation – best practice	59
PCd.3.1	Paver cutting details – standalone elements	60
PK	**KERBS**	**61**
PK.1.1.1	Standard kerb	61
PK.1.1.2	Dropped kerb	61
PK.1.1.3	Stormwater kerb	61
PK.1.1.4	Concrete nib kerb	61
PK.1.1.5	Reinforced wide kerb	62
PK.1.1.6	Reinforced narrow kerb	62
PK.1.1.7	Mountable kerb	62
PK.1.1.8	Passive irrigation kerb	62
PKd.2.1.1	Stormwater discharge – paralle to carriageway	63
PKd.2.1.2	Stormwater discharge – corner of tree pit or rain garden	64
PKd.2.1.3	Stormwater discharge – front of kerb	65
PD	**DRAINS**	**66**
PD.1.1.1	Grate drain	66
PD.1.1.2	Slot drain	66
PD.1.1.3	Interpath channel	66

ID	Content	Page
VS	VEGETATION SELECTION	69
VS.1.1	Tree species	70
VS.1.2	Low planting – base species	74
VS.1.3	Low planting – complementary species	76
VT	TREE PITS	82
VT.1.1	Tree pit – parking bay	82
VT.1.2	Tree pit – build-out	83
VT.1.3	Tree pit – narrow median extension	84
VT.1.4	Tree pit – median	85
VT.1.5	Tree pit – footpath	86
VR	RAIN GARDENS - Under Development	

ID	Content	Page
FS	SEATING ELEMENTS	92
FS.1.2	Timber seat with backrest	92
FS.1.4	Timber bench	93
FE	STANDALONE ELEMENTS	94
FE.2.1	Litter / recycling Bin	94
FE.2.2	Bollard	95
FE.2.3	Drinking fountain	96
FE.2.4	Tree grate	97
FE.2.5	Utility cabinets	98
FC	CYCLING ELEMENTS	99
FC.3.1	Cycle stand	99
FC.3.2	Cycle stub and hold rail	100
FC.3.3	Cycle repair station and pump station	101
FL	LIGHTING ELEMENTS - Under Development	
FW	WAYFINDING ELEMENTS - Under Development	

List of figures and tables

Figure 1	*Streets & Spaces Design Guide application area*	*4*
Figure 2	*Graphic reference to the Strategic Guidance book*	*7*
Figure 3	*Graphic reference to the Technical Guidance book*	*7*
Figure 4	*Reference elements in a standard page of the Technical Guidance book*	*9*
Figure 5	*Example of a Design Criteria page in the Strategic Guidance book*	*12*
Figure 6	*Example of a concept cross section in Chapter 5 of the Strategic Guidance book*	*14*
Figure 7	*Example of a concept cross section showing streetscape zones*	*15*
Figure 8	*Proposed footpath surface treatments*	*43*
Table 1	*Proposed street trees*	*71*
Table 2	*Central city low planting, base species*	*74*
Figure 3	*Central city low planting, complementary species*	*76*

Photography

All photographs are credited as below. Many thanks to those that provided images on a voluntary basis.

Cover	**Central city, Christchurch (New Zealand)** Melizza Morales-Hoyos, 2015
Page 10	**Civic Way, Rouse Hill, Sydney (Australia)** Melizza Morales-Hoyos, 2014
Page 13	Top to bottom **RMIT, Melbourne (Australia)** Melizza Morales-Hoyos, 2014 **Christchurch City Council Civic Offices plaza (New Zealand)** Melizza Morales-Hoyos
Page 16	**Melbourne (Australia)** Melizza Morales-Hoyos, 2014
Page 18	**Central city, Christchurch (New Zealand)** Cameron McLean, 2009
Page 21	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 22	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 23	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 24	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 25	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 26	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 29	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 30	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 31	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 34	**Central city, Christchurch (New Zealand)** Melizza Morales-Hoyos, 2015
Page 35	**Central city, Christchurch (New Zealand)** Melizza Morales-Hoyos, 2015
Page 35	**Central city, Christchurch (New Zealand)** Melizza Morales-Hoyos, 2015
Page 36	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 37	**Central city, Christchurch (New Zealand)** Melizza Morales-Hoyos, 2015
Page 38	**Central city, Christchurch (New Zealand)** CERA, 2015
Page 39	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 40	**Central city, Christchurch (New Zealand)** Melizza Morales-Hoyos, 2015
Page 41	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 42	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 44	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 45	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 46	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 47	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 50	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 51	**Central city, Christchurch (New Zealand)** Melizza Morales-Hoyos, 2015
Page 59	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 66	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 63	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page64	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 65	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 66	**Central city, Christchurch (New Zealand)** Cameron McLean, 2015
Page 67	**Central city, Christchurch (New Zealand)** Melizza Morales-Hoyos, 2015
Page 68	**Melbourne (Australia)** Melizza Morales-Hoyos, 2014
Page 72	**Norway maple.** http://plants.makeitgreen.ca/Content/Images/Photos/A247-18.jpg **Red maple.** www.wunderground.com/wximage/ronbweather/18?gallery= **Turkish hazel.** www.plantoregon.com/images/products/CoryluscolurnaTREE.jpg **Upright tulip tree.** www.lappen.de/en/assortment/?tx_sksimplegallery_pi1%5Bid%5D=8&tx_sksimplegallery_pi1%5Bsingle%5D=136&cHash=629993dbce **Tulip tree.** www.whatgrowsthere.com/grow/wp-content/uploads/2011/06/Liriodendron-tulipifera-11.jpg

Photography (continued)

Page 73
Pin oak and Broad-leaved lime. CERA, 2014
English oak. http://s0.geograph.org.uk/geophotos/04/03/89/4038950_17e2bd23.jpg
Upright English oak. http://upload.wikimedia.org/wikipedia/en/thumb/4/4b/Quercus_robur_%E2%80%98Fastigiata%E2%80%99.JPG/768px-
Kōwhai. http://static.panoramio.com/photos/large/7495396.jpg

Page 74
Dianella. https://commons.wikimedia.org/wiki/File:Dianella_(5067572460).jpg
Mikoikoi, New Zealand Iris (Libertia graniflora). www.theguardian.com/lifeandstyle/gallery/2013/jul/03/new-zealand-plants-uk-gardens#img-5
Mikoikoi, New Zealand Iris (Libertia ixioides). www.gardeningsolutionz.co.nz/plant-catalogue/libertia-ixiodes/Libertia-Ixiodes-2.JPG/image_view_fullscreen

Page 75
Panakenake. https://commons.wikimedia.org/wiki/File:Pratia_pedunculata_1.JPG
Pinātoro, New Zealand daphne. https://commons.wikimedia.org/wiki/File:Pimelea_prostrata_cushion.JPG

Page 76
Oioi, jointed wire rush. https://en.wikipedia.org/wiki/Apodasmia_(plant)#/media/File:Apodasmia_chilensis.jpg
Rengarenga, NZ rock lily. https://commons.wikimedia.org/wiki/File:Arthropodium_cirratum.jpg
Astelia, kakaha. https://en.wikipedia.org/wiki/Astelia#/media/File:Astelia_hemichrysa-DenisBarthelEdit.JPG

Page 77
Mountain kiokio. http://naturewatch.org.nz/observations/1253602
Kiokio. https://www.flickr.com/photos/84829097@N04/8242400374/
Mini toetoe. https://en.wikipedia.org/wiki/Chionochloa#/media/File:Chionochloa-flavicans.jpg

Page 78
Tūrutu. www.phytotrend.it/foto23.htm
Oikopiko, tuoke, prickly shield fern. https://commons.wikimedia.org/wiki/File:Prickly-Shield-Fern-closeup.jpg
Wild iris. https://commons.wikimedia.org/wiki/File:Dietes_grandiflora_Flower_BotGardBln0806b.JPG

Page 79
Waiu-atua, native spurge. https://commons.wikimedia.org/wiki/File:Euphorbia_glauca.jpg
Knobby club rush. https://commons.wikimedia.org/wiki/File:Ficinia_nodosa_(3394706440).jpg
Wand flower. https://commons.wikimedia.org/wiki/File:Gaura_lindheimeri_A.jpg

Page 80
Hebe 'Emerald Gem'. www.greenleafnurseries.co.nz/index.php?route=product/product&product_id=217
Hebe 'Wiri Mist'. www.pukeraunursery.co.nz/product/hebe-wiri-mist
Black brass button. www.gardenworldimages.com/Details.aspx?ID=191191&TypeID=1
Lilyturf, monkey grass. www.flickr.com/photos/fayncbikerjaa/10477894955
Hounds tongue fern. www.flickr.com/photos/mollivan_jon/8013470000

Page 81
Chatham Island forget-me-not. https://commons.wikimedia.org/wiki/File:Myosotidium_hortensia_(8749109473).jpg
NZ mountain flax, whaririki. Cameron McLean, 2009
Marlborough rock daisy. https://commons.wikimedia.org/wiki/File:Marguerite_Prachystegia_insginis_daizea.JPG

Page 82
Central city, Christchurch (New Zealand) Cameron McLean, 2015

Page 83
Central city, Christchurch (New Zealand) Cameron McLean, 2015

Page 84
Central city, Christchurch (New Zealand) Cameron McLean, 2015

Page 85
Central city, Christchurch (New Zealand) Cameron McLean, 2015

Page 86
Central city, Christchurch (New Zealand) Cameron McLean, 2015

Page 87
Central city, Christchurch (New Zealand) Melizza Morales-Hoyos, 2015

Page 88
Melbourne (Australia) Melizza Morales-Hoyos, 2014

Page 90
Christchurch City Council Civic Offices plaza (New Zealand) Melizza Morales-Hoyos

Page 92
Timber seat (model render). ww.walkspace.co.nz/#!

Page 93
Timber bench (model render). www.walkspace.co.nz/#!

Page 94
Litter / recycling Bin. Melizza Morales-Hoyos, 2015

Page 95
Bollard. Cameron McLean, 2015

Page 97
Tree great. Cameron McLean, 2015

Page 98
Utility cabinets. Cameron McLean, 2015

Page 99
Cycle stand. Cameron McLean, 2015

Page 100
Cycle stub pole. Cameron McLean, 2015

Page 101
Cycle repair and pump station. www.dero.com

Page 102
Central city, Christchurch (New Zealand) CERA, 2015

Further references

Topic	Title	Author	Link
General	NZS 3910:2003	New Zealand Standards	http://www.standards.co.nz/
	NZS 3915:2005	New Zealand Standards	http://www.standards.co.nz/
City-wide strategies & plans	Christchurch Central Recovery Plan, Canterbury Earthquake Recovery Authority	Christchurch Central Development Unit	http://ccdu.govt.nz/the-plan
	Christchurch Transport Strategic Plan (June 2012–2042)	Christchurch City Council	http://www.ccc.govt.nz/the-council/plans-strategies-policies-and-bylaws/strategies/transport-strategic-plan-2012/
	An Accessible City	Christchurch Central Development Unit	http://ccdu.govt.nz/the-plan/accessible-city
	Streets & Spaces Design Guide	Christchurch Central Development Unit	http://ccdu.govt.nz/the-plan/design-guides
	Central City Street Tree and Gardens Master Plan	Christchurch City Council	http://resources.ccc.govt.nz/files/CentralCityDecember2011/CentralCityStreetTreesAndGardensMasterPlan.pdf
	Christchurch Cycle Design Guidelines (2013)	Christchurch City Council	http://www.ccc.govt.nz/transport/cycling/cycleways/new-cycleways/developing-the-major-cycle-routes/
	Waterways and Wetlands Drainage Guides	Christchurch City Council	http://www.ccc.govt.nz/environment/water/policy-and-strategy/waterways-wetlands-and-drainage-guide/
	Lanes Design Guide	Christchurch City Council	http://resources.ccc.govt.nz/files/lanesdesignguide-programmes.pdf

Further references (continued)

Topic	Title	Author	Link
Street	Streets & Spaces Design Guide	Christchurch Central Development Unit	http://ccdu.govt.nz/the-plan/design-guides
	Infrastructure Design Standards (IDS)	Christchurch City Council	http://www.ccc.govt.nz/consents-and-licences/construction-requirements/infrastructure-design-standards/
	Construction Standard Specifications (CSS)	Christchurch City Council	http://www.ccc.govt.nz/consents-and-licences/construction-requirements/construction-standard-specifications/
	Manual of Traffic Signs and Markings (MOTSAM)	NZTA	http://www.nzta.govt.nz/resources/motsam/part-2
	Road and Traffic Guidelines (RTS 18, RTS 14)	NZTA	http://www.nzta.govt.nz/resources/road-traffic-standards/rts.html
	Auckland Transport Code of Practice: Street Amenities	Auckland Transport	https://at.govt.nz/about-us/auckland-transport-code-of-practice
	Austroads: Guide to Road Design	Austroads	https://www.onlinepublications.austroads.com.au/
Pedestrian	Pedestrian Planning and Design Guide	NZTA	http://www.nzta.govt.nz/resources/pedestrian-planning-guide/
	Guide to Road Design Part 6A: Pedestrian and Cyclist Paths	Austroads	https://www.onlinepublications.austroads.com.au/
	Barrier Free Built Environments	Barrier Free NZ Trust	http://www.barrierfreenz.org.nz/
	RTS 14: Guidelines for facilities for vision impaired-pedestrians	Land Transport NZ	http://www.nzta.govt.nz/resources/pedestrian-planning-guide/
Cycle	Cycle Network and Route Planning Guide	Land Transport NZ	http://www.nzta.govt.nz/resources/cycle-network-and-route-planning
	Manual of Traffic Signs and Markings (MOTSAM)	NZTA	http://www.nzta.govt.nz/resources/motsam/part-2/
	Auckland Transport Code of Practice: Cycling Infrastructure Design	Auckland Transport	https://at.govt.nz/about-us/auckland-transport-code-of-practice
	New Zealand supplement to Austroads Guide to Traffic Engineering Practice Part 14 Bicycles	NZTA	http://www.nzta.govt.nz/resources/nz-supplement-austroads-gtep-part-14-bicycles
Public transport	Guidelines for Public Transport Infrastruture and Facilities - interim consultation draft	NZTA	http://www.nzta.govt.nz/about-us/consultations/guidelines-for-public-transport-infrastructure-and-facilities-interim-consultation-draft/

Further references (continued)

Topic	Title	Author	Link
Shared space	Shared Space (Guidelines) Local Transport Note 1/11	UK Department for Transport	https://www.gov.uk/government/publications/shared-space
	An Evaluation of Shared Space in Fort Street Auckland	Auckland Council	http://www.aucklandcouncil.govt.nz/en/planspoliciesprojects/councilprojects/sharedspaces/Pages/home.aspx
Emergency services	Fire Appliance Access Requirements	NZ Fire Service	http://www.fire.org.nz/
Freight	Keeping Freight on the Move, An Onsite design guide for Handling Freight	Environment Canterbury	http://ecan.govt.nz/publications/Pages/default.aspx
Environment	Landscape and Ecology Values within Stormwater Management	Auckland Council	http://www.aucklandcity.govt.nz/council/documents/technicalpublications/TR2009083.pdf
	Green Infrastructure International Review	Auckland University	https://cdn.auckland.ac.nz/assets/creative/schools-programmes-centres/transforming%20cities/Greening_Cities_Report.pdf
	How to put nature into our neighbourhoods – application of Low Impact Urban Design and Development (LIUDD) principles, with a biodiversity focus, for New Zealand developers and homeowners	Landcare Research Science Series No. 35, Manaaki Whenua Press, Lincoln	http://www.mwpress.co.nz/science-series/how-to-put-nature-into-our-neighbourhoodss