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11 GENERAL REQUIREMENTS

This Section of the ECOP sets out Council's requirements for designing streets, and other access linkages, that not only function well but are also appropriate and safe environments. This Part is not intended to be a detailed design guide or to replace the need for traffic and pavement engineering expertise in some areas of the design process.

Council's expectation is that designers will reference the design guidance provided in this ECOP (including referenced documents), and Council's Development Design Guide

This Part of the ECOP was developed from Christchurch City Council Infrastructure Design Standards (IDS) Part 8 and Christchurch City Council Construction Standard Specifications (CSS) CSS Part 6 – Roads 2019 apply except were updated in the sections below:

Council reserves the right to require changes and design amendments at its own discretion, to meet its planning and strategic objectives for vested infrastructure.

Specific departures from the requirements in the above documents are set out in the following sections.

11.1 REFERENCED DOCUMENTS

Refer also to Clause 2.1 in Part 2: General Requirements

Relevant Legislation and associated requirements

- Land Transport Act (1998)
- Traffic Regulations (1976)
- Selwyn District Council Speed Limits Bylaw (2018)
- Selwyn District Council Traffic and Parking Bylaw (2009)
- Ministry of Transport Land Transport Rule Traffic Control Devices 2004 https://www.nzta.govt.nz/resources/rules/traffic-control-devices-2004/
- Waka Kotahi NZ Transport Agency, Ministry of Transport Land Transport Rule Setting of Speed Limits 2022 https://nzta.govt.nz/resources/rules/setting-of-speed-limits-2022/

Strategies and planning

- Selwyn District Council -Walking and Cycling Strategy & Action Plan 2018 https://www.selwyn.govt.nz/services/roads-And-transport/policies-and-strategies/walking-and-cycling-strategy-2018
- Waka Kotahi NZ Transport Agency Cycling standards and guidance https://www.nzta.govt.nz/walking-cycling-and-public-transport/cycling/cycling-standards-and-guidance/
- Selwyn District Council's Charter: Accessible Selwyn Te Arataki Taero Kore https://www.selwyn.govt.nz/community/policies-And-plans/accessible-selwyn-te-arataki-taero-kore
- Canterbury Regional Council Regional Land Transport Plan https://www.ecan.govt.nz/your-region/plans-strategies-and-bylaws/canterbury-transport-plans/
- Greater Christchurch 2050 http://www.greaterchristchurch.org.nz
- Ministry of Transport Strategic Direction https://www.transport.govt.nz/about-us/what-we-do/our-strategic-direction/
- Waka Kotahi NZ Transport Agency Planning Policy Manual – for integrated planning & development of state highways https://www.nzta.govt.nz/resources/planning-policy-manual/
- Walking, cycling and public transport | Waka Kotahi NZ Transport Agency (nzta.govt.nz)

- Bus Services in Selwyn https://www.selwyn.govt.nz/services/roads-And-transport/selwyn-bus-services
- Connect Canterbury Public Transport Canterbury Regional Public Transport Plan 2018 – 2028. https://www.ecan.govt.nz/document/download?uri=3582320

Design

- Selwyn District Council Urban Design Guides (https://www.selwyn.govt.nz/property-And-building/planning/design-guides):
    - Selwyn District Council Subdivision Design Guide
    - Subdividing Large Rural Style Lots Guide
    - Selwyn District Council Medium Density Housing Guide
- Selwyn District Council Commercial Design Guide https://www.selwyn.govt.nz/property-And-building/planning/strategies-and-plans/selwyn-district-plan/district-plan-updates/operative-plan-changes/plan-change-29-design-of-development-in-business-1-zones
- Selwyn District Council Trees and Vegetation in Selwyn District Management Policy Manual https://www.selwyn.govt.nz/recreation-And-facilities/parks-And-reserves/plans-and-policies/trees-and-vegetation-policy
- Christchurch City Council Traffic signal operation and design https://ccc.govt.nz/consents-and-licences/construction-requirements/
- Safer Canterbury Crime Prevention Through Environmental Design (CPTED) https://www.ccc.govt.nz/assets/Documents/Culture-Community/Community-Safety/CPTEDFull-docs.pdf
- Waka Kotahi NZ Transport Agency Manuals and Guidelines including:
    - Road and traffic standards RTS series https://www.nzta.govt.nz/resources/road-traffic-standards/rts.html (Note requirements in RTS 18 - On Road Tracking Curves)
    - Manuals and standards including the Bridge Manual, Criteria and Guidelines https://www.nzta.govt.nz/planning-and-investment/planning-and-investment-knowledge-base/resources/manuals-and-guidelines/
    - NZTA Pedestrian Planning and Design Guide https://www.nzta.govt.nz/resources/pedestrian-planning-guide/
    - https://nzta.govt.nz/walking-cycling-and-public-transport/walking/walking-standards-and-guidelines/pedestrian-network-guidance/
    - Road Safety Audit Procedures for Projects https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/safety-and-geometric-design/safety/road-safety-audits
    - Cycling parking planning and design: Cycling Network Guidance technical note - published May 2019 (nzta.govt.nz)
    - Waka Kotahi NZ Transport Agency Health and Safety in Design Minimum Standard https://www.nzta.govt.nz/assets/resources/contractor-health-and-safety-expectations/ZHMS-01-Health-and-safety-in-design-minimum-standard.pdf
    - Waka Kotahi NZ Transport Agency Manual of Traffic Signs and Markings (MOTSAM), Parts 1 & 2 https://www.nzta.govt.nz/resources/motsam/
    - Ministry of Economic Development: Cycle trail design guide: 2015
- Austroads Guides to Road Design, Road Safety, Traffic Management Sets (2009) https://austroads.com.au/safety-and-design/road-design/guide-to-road-design
- SNZ HB 8630:2004 Tracks and Outdoor Visitor Structures
- NZS 4121:2001 Design for Access and Mobility: Buildings and Associated Facilities https://www.standards.govt.nz/shop/nzs-41212001
- AS/NZS 1428.3:1992 Design for Access and Mobility - Requirements for children and adolescents with physical disabilities
- AS/NZS 1428.4:2009 Design for Access and Mobility - Tactile Indicators
- Waka Kotahi NZ Transport Agency Cycling network guidance – planning and design https://www.nzta.govt.nz/walking-cycling-and-public-transport/cycling/cycling-standards-and-guidance/cycling-network-guidance
- NZ Supplement to Austroads Guide to Traffic Engineering Practise Part 14 Bicycles: 2008

- AUSTROADS: AGRD06A 17 Guide to Road Design - Part 6A- Pedestrian and Cyclist Paths: 2017
- AS/NZS 1158 Set Lighting for roads and public spaces -series
- AS/NZS 2890.1:2004 Parking facilities Part 1: Off-street car parking
- AS 2890.3:2015 Parking facilities - Bicycle parking facilities
- NZUAG National Code of Practice for Utilities' Access to the Transport Corridors 2019 www.nzuag.org.nz/national-code/
- CCC Cycle Design Guidelines https://www.ccc.govt.nz/assets/Documents/The-Council/Plans-Strategies-Policies-Bylaws/Strategies/ChristchurchCycleDesignGuidelinesWEB.pdf
- Worksafe Health and safety by design https://www.worksafe.govt.nz/topic-and-industry/health-and-safety-by-design/health-and-safety-by-design-gpg/

Construction

- Christchurch City Council Civil Engineering Construction Standard Specifications Parts 1-7 (CSS)
- Waka Kotahi NZ Transport Agency T/10 Skid Resistance Investigation and Treatment Selection https://www.nzta.govt.nz/resources/skid-resistance-investigation-treatment-selection/
- Waka Kotahi NZ Transport Agency Traffic Control Devices Manual (2008) https://www.nzta.govt.nz/resources/traffic-control-devices-manual/
- Waka Kotahi NZ Transport Agency NZTA P24:2020 Specification for Permanent Traffic Signs https://www.nzta.govt.nz/assets/resources/traffic-signs-perf-based-specs/docs/traffic-signs-perf-based-specs.pdf
- NZS 8603:2005 Design and application of outdoor recreation symbols https://www.standards.govt.nz/shop/nzs-86032005/
- SNZ HB 2002:2003 Code of Practice for Working in the Road https://www.standards.govt.nz/shop/snz-hb-20022003/
- Waka Kotahi NZ Transport Agency Code of Practice for Temporary Traffic Management COPTTM https://www.nzta.govt.nz/resources/code-temp-traffic-management/
- Contractor health and safety expectations: guidance for supply chain partners https://www.nzta.govt.nz/resources/contractor-health-and-safety-expectations/

Where a conflict exists between any Standard and the specific requirements outlined in the Engineering Code of Practice (ECOP), the ECOP takes preference (at the discretion of the Council).

11.2 LEGAL REQUIREMENTS

All traffic control devices, as defined in the Land Transport Act, on roads and rights of way, must comply with:

- Land Transport Act
- Traffic Regulations
- Traffic Control Devices 2004 Rule
- Selwyn District Council's Traffic and Parking Bylaw
- Selwyn District Council's Speed Limits Bylaw

11.3 Design Deliverables

A list of deliverables specific for transportation and roading where new or upgraded Council vested roads and pathways are proposed is shown below in Table *1*. The specific requirements may be varied for projects and by agreement with Council.

Table 1 – Specific Design Deliverables for Council vested roads and pathways

Deliverable	Required for:	Deliver document:
Preliminary Design Philosophy Statement	Council Capital Projects	Prior to options development and assessment
Design Philosophy Statement	Council Capital Projects	With option assessments
	Subdivisions (reference how the project meets or ties into ODP and Council Strategies and Accessible Selwyn Te Arataki Taero Kore)	As part of submission of resource consent
Design Statement	Council Capital Projects	With detailed Design Report
	Subdivisions	With Engineering Approval Application Design Report

11.4 DESIGN PHILOSOPHY

Streets can serve a wide range of functions, whilst providing valuable and unique areas of community space.

Council's design guides and transportation strategies must be considered by designers when developing roading layouts. Noting that guidance included in these documents does not override specific requirements of the District Plan and this Code of Practice.

In addition to the referenced documents in Part 1 and 11.1 of this Code of Practice, Council requires designers and developers to examine any relevant Outline Development Plan (ODP) included in the District Plan.

For subdivisions early engagement with Council and ECan regarding transportation networks, linkages and strategies is recommended. These discussions may also cover proposed District Plan variations that impact on the subdivision. These aspects should be discussed at the pre-application meeting with Council as part of the resource consent application process. Resolving and agreeing key transportation and roading features of the design is a key step in confirming subdivision layout. (Refer to Section 2.6 for more guidance on the Pre-Application meeting process.). Requirements to resolve early include:

- Speed environment
- Capacity
- Extent of existing road upgrades (required for tie in points and along subdivision road frontages).
- Intersection design and spacing
- Legal and formed road widths
- Future road linkages to unzoned land
- Pedestrian and cycle path provision, linkages and widths
- Accessibility provisions for vision and mobility impaired pedestrians
- Access & manoeuvrability for service vehicles including refuse collection trucks – particularly for tight turning areas
- Parking requirements including cycle parking at key commercial areas/bus stop locations
- Public Transport routes (including bus stop locations and facilities such as accessible bus shelters and seating)

To achieve these outcomes Council will apply the requirements of this Part of the ECOP to a development. While the layout of the subdivision may be agreed in principle as part of the resource consent for the subdivision the detailed design of the roading will still need to be submitted for Engineering Approval.

Areas that require particular attention in the transport detailed design are:

- Connections and intersections with the existing transport network
- Safety
- Accessibility
- Pedestrian and cycle paths
- Road crossings for pedestrians
- The connection of off-road facilities to roads and property access
- Lighting including pole clearances/setbacks
- Road surfacing
- Drainage

When considering connections or accesses from a development the safety and efficiency of the existing roads must be maintained or improved.

11.5 DESIGN PRINCIPLES AND GUIDANCE

The potential for crashes to occur at intersections is higher than other areas of the road network, due to the number of conflicting vehicles, cycle, and pedestrian movements. Proper design of intersections can reduce the number of conflicts, while providing for a range of turning movements at the intersection. Consider traffic safety issues due to the location of existing above-ground structures e.g., poles or trees, at the time of design. Refer to the District Plan for specific requirements for intersection and accessways separations and requirements.

Use the Guide to Road Safety, Part 8: Treatment of Crash Locations, for safe design practices.

11.5.1 Road Safety Audit (RSA)

The Road Safety Audit (RSA) process is an important component in the design of all facilities on legal road. RSAs provide a check that the proposed design is safe for all users and should be integrated throughout the design of new transport facilities.

For subdivisions the need for an independent safety audit process will generally be identified as part of the processing of the resource consent.

Independent RSAs are to be carried out in accordance with NZTA's Road Safety Audit Procedures for Projects and Austroads Guide to Road Safety Part 6: Road Safety Audit. Generally, where an RSA process is required, this will carry through three stages of the design process:

- Concept and scheme/preliminary design/subdivision consent stage (specific Council projects may require additional audits at this stage).
- Detailed design stage/engineering acceptance stage
- Pre-opening or post-construction stage where it will form part of the as-built record. The 224 Certificate will not be issued until safety audit requirements have been addressed.

Consideration of the accessibility provisions will be a focus of Road Safety Audit reviews.

Specific projects may have additional hold points for safety audits identified.

Variations to design that impact on transport layouts may also require an RSA. RSAs are to consider the development's potential to generate high trip volumes requiring specific changes to the wider road infrastructure network.

11.5.2 Design for Comprehensibility (Self-explaining Roads)

Comprehensibility of the network improves the ease with which people can negotiate their way through and around an area.

Generally, the geometry of any road intersection should be designed so that the major route is the through road and has traffic priority. Wherever the roads are of equal classification or one classification different, a roundabout may be used. This can also limit vehicle speeds. Wherever a local road intersects with a classified road, a perimeter threshold treatment may be appropriate to reinforce traffic priority and assist with comprehending the layout.

Improve comprehension by designing each classification of road to reflect its function, through consistency of appearance, width and geometric design of the road, e.g., the main arterial roads may have a central median. Minimise the use of cul-de-sacs. **Cul-de-sacs accessing other cul-de-sacs will not be permitted by Council.** (See clause 11.6.4 Cul-de-sac/Hammerheads/No exit streets.)

11.5.3 Speed Environment and Design Speed

It is important to design for the appropriate speed of the roads involved. Designers shall refer to NZTA's Speed Management Guide. The speed environment of roads can have a huge impact on the actual and perceived safety of the facilities.

Designers should determine the speed environment for the road classification first as the primary design control. Consult with Council early to understand specific speed environment areas, such as 40 km/h urban traffic areas.

All other factors relate to and can reinforce the design speed e.g., road alignment, width, intersection location and treatment, landscaping. Ensure that the speed environment is consistent along the road section. Traffic management devices should not be installed where the speed environment does not require alteration.

Traffic speed for lower speed environments may be controlled, so that it is conducive to a mixed-use street environment and function, through a variety of means:

- Roadway width – a narrow roadway may provide space for only one vehicle at a time. Parked vehicles reduce the available space for moving vehicles so that there may only be a single usable lane.
- If cyclists use the road, their presence may control the traffic speed and the design requirements of the road.
- Landscaping – appropriately designed on-street landscaping can visually narrow the road. It can also be used with changes to the kerb alignment to physically narrow the roadway.
- Corners – the use and spacing of tight corners to maintain short lengths of straight road makes it difficult to gain speed.
- Intersection spacing – short lengths of road between intersections make it difficult to reach high speeds.
- Intersection design – tight kerb radii force motorists to slow down when turning at an intersection. This can be combined with an intersection treatment (e.g., change in road width or surfacing) to indicate a change in the speed environment to drivers.
- Traffic calming – localised road narrowing, changes in road texture, changes in the road alignment (both horizontal and vertical) can all be used to reduce speeds on local roads and to create safe crossing points for pedestrians and cyclists.
- Rural thresholds – localised narrowing of the road through kerbs, road markings, signage and/or roadside planting can provide a signal to drivers that they are entering a residential area with lower speed limits.

Use standards for the design of higher speed environments, such as are appropriate on various classified and rural roads, in the Austroads series and NZTA (TNZ) manuals and State Highway Design Guide.

Classified roads such as arterials and collectors are typically designed to a higher speed than local roads. *Austroads Road Design Guides* states that major urban roads should be designed for an operating speed 10km/hr above the legal speed limit. The desired speed environment or target speed for local urban roads may determine the design speed. When designing road speed environments consider the following:

- Refer to Austroads Guide to Traffic Management Part 8: Local Area Traffic Management.
- *Austroads Rural Road Design* states that rural roads should be designed for the 85th percentile operating speed.
- Also refer to the NZTA Speed Management Guide and Setting of Speed Limits Rule 2017.

- The *Speed Limits Bylaw* and its related register of speed limits, found on SDC's website (link here) set out the speed limits for listed roads. Use the Speed Limits New Zealand Schedule 1 incorporated in the Setting of Speed Limits Land Transport Rule to estimate the relevant speed limit for new or reclassified roads in Selwyn. The Council will determine the relevant speed limit using the Setting of Speed Limits Land Transport Rule.

11.5.4 Sight Distances

Adequate sight distances at an intersection must be provided. Sight distance is fundamental to safe intersection design.

When designing intersections and/or small radius curves, use Austroads *Guides to Road Design and Traffic Managemen*t, which provides guidance on the minimum sight distance requirements.

Refer to the District Plan, Appendix 10 Rural and Appendix 13 Townships for minimum sight distances for intersecting roads from Vehicle Crossings and minimum spacings required between adjacent vehicle crossings.

11.5.5 Traffic Volumes

Identify the likely volumes of traffic that will be generated by a development, using Table C.1 of the Trips and parking related to land use study conducted by Abley Transport Consultants (NZ Transport Agency research report 453, November 2011). Table *2* (shown below) is a sample of table C.1 for more traffic volumes refer to the original document.

Note: If relevant surveyed data is available, this may be used instead.

Table 2 - Household trip generation rates

		No. Sites Surveyed			85th Percentile		
Land use category		**Parking**	**Peak Hour Trips**	**Daily Trips**	**Parking Demand**	**Peak Hour Trips**	**Daily Trips**
Residential	Inner City (Multi Unit)	1	2	0	-	0.3	-
	Dwelling (inner Suburban)	0	15	38	-	1.2	10.9
	Dwelling (Outer Suburban)	0	1	6	-	0.9	8.2
	Dwelling (Rural)	0	4	4	-	1.4	10.1
	Retirement Home	5	4	4	0.4	0.4	2.4
	Retirement Units	4	1	1	1	0.3	2.6

*Note: table content derived from NZ Transport Agency research report 453 (November 2011)

11.6 ROAD CLASSIFICATION

The road network is the system of interconnected road links that provides for the movement needs of people and goods, property access, and servicing needs. It is arranged and operated in a manner to recognise and best serve the varying demands expected of different elements (usually using a hierarchical classification system). Developments must provide road networks internally to achieve these purposes and connect appropriately to the existing network.

The length and arrangement of roads within developments and connections to the existing network determine the amount of traffic each element is likely to carry and the role it plays in providing for property access or longer journeys. New road classifications will be determined by Council considering the function of each link, surrounding land uses, preferred speed regime and geometric characteristics. The classification of existing roads in Selwyn District is listed in the District Plan Rural Volume, Appendix E9 and Townships Volume, Appendix E7.

Designers and developers should review all available information and consult with Council staff to ensure they are aware of any local area traffic management schemes, outline development plans or structure plans which may incorporate street requirements for the area.

Table 3 below is from the Proposed District Plan and it identifies minimum road standards including legal width, carriageway width, traffic lanes, parking lanes, provision for cycleways and pedestrian provisions, cul-de-sac requirements. These requirements are to be followed along with specific amendments stated below.

11.6.1 Local Roads

The primary purpose of local roads is to provide access to properties. These are not intended as a through road for vehicles to other streets. New local township roads are further classified into the following categories:

- Local Business Road (includes cul-de-sacs) – serves a commercial or industrial area within a business zone in the district. These roads are of a higher standard than a residential local road as they need to cater for larger and heavier vehicles with higher demands on vehicle manoeuvring, parking, and property access.
- Local Major Road – is a local road that ideally connects to a collector or possibly to an arterial road and other local roads. They are also known as “local area streets” that may form part of a wider network.
- Local Intermediate Road including cul-de-sacs (also known as “Neighbourhood Streets”) – is a local road with lower traffic volumes and speeds:
    - Primarily providing only property access in urban areas
    - While maintaining some degree of connectivity best suited for walking and cycling between streets.
    - Their design should encourage a low-speed environment of 30 – 40kph. These roads are likely to be closer to areas of demand such as shops and schools.
- Local Minor Road widths as identified in the District Plan are not to be used. The minimum carriageway width is 7 metres. Other features may be used to reinforce some categorisation as a Local Minor Road (also known as “Residents Streets”) – these can include cul-de-sacs and roads that primarily provide for property access under certain conditions that maximise street amenity:
    - They may also allow pedestrians and cyclists to mix with vehicular traffic
    - They may provide a maximum travel distance of 150 metres in any direction in a low-speed environment of 30 kph or less.

Local intermediate and minor roads should not generally connect to arterial roads, except in exceptional circumstances and with the Council's approval.

11.6.2 Collector Roads

The function of collector roads is to provide the link between local roads and arterial roads. In urban areas, collector roads usually have predominantly residential frontage and will often contain the bus routes within the neighbourhood. A speed environment of up to 50kph or 60kph in urban areas is expected.

In rural areas collector roads may link smaller rural communities to the arterial road network.

11.6.3 Arterial Roads

Arterial roads cater primarily for traffic movement, and property access is a secondary function. Arterial roads are the dominant elements of the roading network connecting the major localities of the region, generally reaching to and around urban boundaries. They are constructed and managed to minimise their local access function and are subject to tighter access controls than collector and local roads to promote efficient traffic flow. Arterial roads inter-connect rural, suburban, commercial, and industrial areas. Generally, they cater for trips of intermediate length, and some are essential routes to more remote parts of the region. These roads must be designed in conjunction with the appropriate roading authority.

Discuss access to the existing road network with the Council and Waka Kotahi NZ Transport Agency at pre-application stage if a state highway will be affected. Use the Waka Kotahi Planning Policy Manual and State Highway Geometric Design Guide for the design of any works on or adjacent to a state highway.

11.6.4 Cul-de-sac/Hammerheads/No exit streets

Refer to the District Plan for further information on cul-de-sac.

Cul-de-sacs are preferred for dead-end streets and can provide pleasant residential environments with a sense of community and little traffic, but a balanced approach to their use is required. Hammerheads shall only be used with Council approval, which will require demonstration that cul-de-sacs are not achievable.

Cul-de-sacs should be no longer than 150 metres. Refer to the Selwyn District Council Subdivision Design Guide – Design Guide for residential subdivision in the urban living zones for further information.

Ensure safe egress is addressed in the design of ROWs. This should be addressed in the Design Report.

All turning heads and hammerheads shall be surfaced with asphaltic concrete in urban areas. Cul-de-sac surfacing shall be appropriately designed 50mm depth asphalt to accommodate frequent turning movements.

See Standard Drawing RD3.5 for an example of a turning circle complying with the District Plan. Figure 3.5 of NZS 4404 details hammerheads.

A dead-end road that leads to a future stage requires a temporary metal turn around area that is to be maintained by the developer. A dead-end road that leads to a future development requires chevron boards attached to timber posts or a timber structure.

Table 3 - Road formation and operational standards

Road Type[1]	Legal width (m)		Carriageway width (m)		Traffic lanes	Parking lanes	Specific provision for cycles (on road or off road)	Pedestrian Provision
	Min.	Max.	Min.	Max.	Min. No.	Min. No.		Minimum
State Highways	Refer to NZTA's road formation standards							
Arterial (except in the GRUZ, GRAZ, SKIZ, TEZ, MPZ)	20	25	13	14	2	2	Yes	Both sides
Arterial and collector (GRUZ, GRAZ, SKIZ, TEZ, MPZ)	20	20	8.5	9	NA	NA	NA	NA
Collector (except in the CMUZ, GRUZ, GRAZ, SKIZ, TEZ, MPZ)	20	25	11	12	2	1	Yes	Both sides
Collector (in the CMUZ)	20	25	13	14	2	2	Yes	Both sides
Local (in CMUZ, GIZ)	20	25	12	13	2	2 Both sides	Optional	Both sides
Local (in LLRZ)	18	20	6	6.5	2	NA	NA	One side
Local (in all other RESZ)	13	15	7	8	2	1	NA	One side
Local (GRUZ, GRAZ, SKIZ, TEZ, MPZ)	15	20	7	7	NA	NA	NA	NA
Cycle/pedestrian accessways	6	10	2.5	3	NA	NA	Yes	Yes

[1] See definitions of abbreviations below.

Definitions:

- CMUZ - 'Commercial and Mixed Use Zones' being the Neighbourhood Centre Zone, Local Centre Zone, Town Centre Zone and Large Format Retail Zone.
- GIZ - General Industrial Zone
- GRUZ- General Rural Zone
- GRAZ - Grasmere Zone
- LLRZ - Large Lot Residential Zone
- MPZ - Māori Purpose Zone
- RESZ - All Residential Zones
- SKIZ - Porter's Ski Zone
- TEZ - Terrace Downs Zone

Advisory notes:

1. Carriageway widths are to be measured from the kerb face to kerb face.
2. Where the road has split zoning, each side of the road will be subject to the specific zone requirements listed in TABLE7.
3. Advice should be sought from the NZTA and approval provided before any physical works are carried out within the State Highway.
4. Table *3* does not apply to roads within the Rolleston Industrial Precinct, which are to be formed in accordance with the road cross sections in the proposed District Plan TRAN-DIAG9 and TRAN-DIAG10 (refer to TRAN-R1, TRAN-R3 and TRAN-REQ23.
5. Where one parking lane is required the placement of this can alternate between respective sides of the road in the form of parking bays.

11.7 GEOMETRIC DESIGN

Generally, geometric design should conform to Austroads Guide to Road Design, Part 3: Geometric Design. Reference also Parts 2, 3, 4, 6, 7 and various, as appropriate.

11.7.1 Horizontal Alignment

Horizontal alignment designs shall consider the following:

- Design the elements of the road network for the appropriate design speed.
- Design the kerb radii at local road intersections for a 2-axle truck, as detailed in *Guide to Road Design, Part 4: Intersections and Crossings - General*, whilst minimising pedestrian crossing distances. Design the kerb radii at road intersections generally as detailed in Table 4 & Table 5 below. To minimise pedestrian crossing distances, it may be appropriate to have lower kerb radii to be confirmed with Council. Also, road widths and traffic volumes or the traffic type may suggest an alternative radius is more appropriate.
- Design intersections of a collector or arterial road to meet the tracking curve requirements in *New Zealand on road tracking curves for heavy vehicles RTS 18.*

Table 4 Vehicle Types - Road Classification Rural or Rural/Residential

Road Classification	Vehicle Type	Minimum intersection kerb radius (m)
Arterial	B Train	14.0
Collector	Semi-trailer HCV	12.5
Local Business	B Train	12.5
Local Major	Semi-trailer HCV	9.0
Local Intermediate	Single unit HCV	9.0
Local Minor	Single unit HCV	6.0

Table 5 - Vehicle Types - Road Classification Urban

Road classification	Vehicle Type	Minimum intersection kerb radius (m)
Arterial	B Train	14.0
Collector	Semi-trailer HCV	12.5
Local Business	B Train	12.5
Local Major	Semi-trailer HCV	9.0
Local Intermediate	Single unit HCV	6.0
Local Minor	Single unit HCV	4.5

Avoid reverse curves where possible. If they are necessary, balance and separate them by a sufficient length of straight road to allow for a satisfactory rate of super elevation reversal (where the design speed is greater than 50kph).

Curves in the same direction in close proximity must be compounded. Avoid “broken back” curves.

Where horizontal curves of less than 60m radius are necessary for topographical or other reasons, depending on the road classification extra widening of between 0.5m and 1.5m may be required, according to the width of carriageway available to moving traffic and the radius of the curve. The *Austroads Guide to Road Design, Part 3: Geometric Design Table 7.11* provides further information to calculate this extra widening.

Horizontal curves in 50kph areas are usually circular with a minimum centreline radius of 80m for through streets, reducing to 20m for cul-de-sacs unless designing to reduce vehicle speeds.

11.7.2 Vertical Alignment

Where the change of gradient between two road sections exceeds 1%, the change in grade should be joined with an appropriate vertical curve. Gradient lengths must be as long as possible. Curve lengths (L) should be not less than 30m for through roads, or 20m for cul-de-sacs.

Gradients should not exceed 1:6 at any point on the kerb line. Where a vertical curve occurs over a straight running road section the gradient (G) at any point on the kerb line should not be less than 1:500. Where a vertical curve coincides with a horizontal curve there must be a minimum gradient (G) of 1:300 on the outside kerb line.

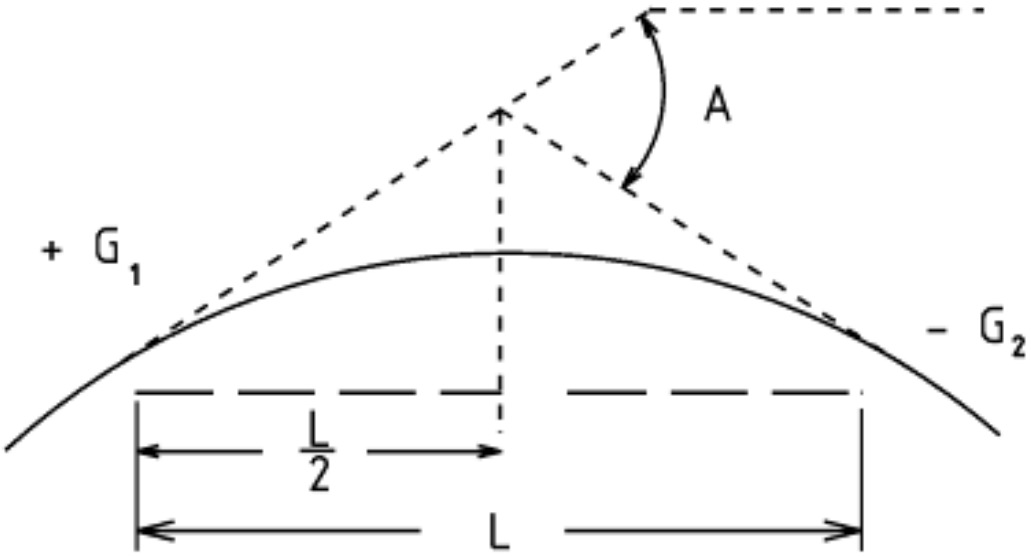

Figure 1 - Vertical Curve Dimensions (Austroads Guide to Road design Part 3: Geometric Design)

Kerb grades less than 1:500 require specific design justification.

Design the crown line at intersections to ensure a smooth ride on the main road. Normally, this means running the crown of the minor road into the nearside edge of the main road lane line or quarter point.

11.7.3 Crossfalls

Normal carriageway crossfalls should be 3% for urban roads and unsealed crossfall should not exceed 4%. The carriageway crossfall must be formed in accordance with the *CSS: Part 6* camber detail, SD 623.

Some variation from this requirement may be necessary in cases where a differential level between kerb lines is adopted and/or the crown is offset from the centreline.

Design turning circles to avoid an excessive differential between the crown and fender. Minimum crossfall must be 2% for asphaltic concrete and 2.5% for chipseal. Wherever an off-centre cul-de-sac head is used, offset the road crown to create symmetrical crossfall conditions.

Generally, crossfall for rural unsealed roads should not exceed 6%, when measured from the carriageway edge to the crown.

11.7.4 Superelevation

Normally superelevation is not applied to urban local roads. For speed limits over 50kph, specific design of superelevation will be required. Where superelevation is required, the maximum value on local and collector roads is 5%. For arterial roads confirm super elevation design with Council as higher values may be accepted.

11.7.5 Hillside Areas

Where the road is or will be constructed on a slope, this can affect the ability to provide all the required elements of a streetscape and therefore impact on the achievable widths for some or all of those elements. Consider batter stability and property access, in addition to issues detailed in clause 8.14.6 - Cross-section design.

Options available for hillside areas:

- Design narrower legal road widths. Wider widths may be impracticable as it may be impossible to utilise more than a certain width due to crossfall restrictions. Property access may also be compromised if wide roads require high cuts or retaining walls.
- Use localised widening to construct passing or parking bays or to accommodate heavy vehicles.
- Provide a lesser standard of elements; through restricted parking, constructing only one footpath or combining elements e.g., shared cycle paths and footpaths.
- Construct retaining walls – note specific design and Producer Statement 1 required
- Locate pedestrian and cycle facilities separately from the carriageway.

11.8 INTERSECTION TYPES AND CONTROLS

To support the safety and efficiency of the road network, roads should preferably only intersect if they are classified the same or are one level different in status. If it is unavoidable that roads more than two classification levels apart must intersect, then the Council may require movement controls such as left in/out only or entry only.

Intersection separation distances shall comply with the requirements set out in the District Plan.

11.8.1 New Residential Areas

Within new residential areas, appropriate intersection types include:

- Priority or roundabout controlled T or Y-intersections (3-way), depending on the balance of traffic flows and classification of the approach roads.
  - All approach legs to Y junctions should be separated by 120 degrees, and
  - T junctions by 90, 90 and 180 degrees.
- Four-way intersections at grade should be roundabout or signal controlled due to their high crash risk. Local roads should not intersect with the main road network as crossroads and should only form cross junctions with themselves where necessary. Where unavoidable and, where a reasonable volume of traffic across the busier road is anticipated, offset the quieter roads as a right–left stagger to minimise the risk of crashes.

Wherever traffic from the planned roading network for a development will access a classified road, the intersection may require roundabout control or have certain movements restricted.

Consult with the Council at pre-application stage and before submitting the Design Report, to ensure that the intersection conforms to the Council's requirements.

11.8.2 Unsignalised Urban Intersection Spacing

Locate intersections sufficiently far apart to separate their traffic movements and provide drivers with sufficient lead-time for decision making

The minimum spacing requirements must be the greater than the minimum of those listed in the District Plan (Townships and Rural volumes).

Discuss spacings for arterial – arterial intersections, and all other road intersections, with the Council before the Design Report is submitted.

Use the following standards and guidelines for the design and operation of intersections and vehicle crossings:

- Guidelines for the Implementation of Traffic Controls at Crossroads, RTS 1
- Austroads Guides to Road Design and Traffic Management
- CSS: Parts 1-7

11.8.3 Roundabouts

Roundabouts provide control at intersections, control speeds and improve traffic flows.

Their location must be agreed with the Council at the consent stage and designers are encouraged to consult with Council at pre-application stage to agree roundabout configurations.

Consider these issues in the design:

- The classification of the intersecting roads
- The vehicle types expected to use the intersection
- The speed environment
- The distribution of turning traffic
- Pedestrian and cyclist safety
- Landscaping
- Heavy vehicle access requirements

Roundabouts at the intersection of local roads can be used to control speeds and may be designed with semi-mountable aprons for effective traffic calming. The semi-mountable apron slows cars (it must be high enough to discourage drivers from over-running it), whilst providing for the larger turning requirements of vehicles such as rubbish trucks and emergency vehicles. Discuss the geometric design of such roundabouts with the Council.

Use the following standards and guidelines for the design and operation of roundabouts:

- Austroads Guides –
  - Guide to Road Design, Part 4: Intersections and Crossings
  - Guide to Road Design, Part 4B: Roundabouts
  - Guide to Road Design, Part 6A: Pedestrian and Cyclist Paths
- CSS: Parts 1-7

If planting is proposed in roundabouts the designer is to address maintenance, protection of sightlines and associated safety requirements in the Design Report.

Council prefers splitter islands to be used where there are roundabouts to deter wrong-way movements on streets. These need to be designed to cater for narrow streets and larger vehicles. In some circumstances the splitter island and roundabouts may need to be designed to allow larger vehicles to drive over them.

Pavement markings and signage at roundabouts must comply with MOTSAM.

11.8.4 Traffic Signals

If Council decides that traffic signals are necessary to provide safe and efficient access to the area, designers shall refer to:

- The guidelines in the Austroads *Guides Traffic Management Parts* 6,9,10, and
- Road Design Part 4, and
- NZS 5431 Specification for Traffic Signals for the design and operation of the traffic signals.

The location and design of each installation must conform to the requirements and approvals set by the Council, to enable coordination of the traffic signals. Designers shall consult closely with Council's roading team as part of designing and specifying traffic signals.

11.9 PAVEMENT DESIGN

Design roads to have an infinite design life for the subbase. The basecourse should have a design life of 50-years. Use a traffic growth rate of 2% per annum for design purposes.

Design roads to preferably be flexible pavements using the general principles of the current New Zealand Supplement of the *Austroads Guide to Pavement Technology.*

The subgrade foundation shall have a minimum CBR of 8 for roads and 5 for private rights of way.

Deflection testing by Benkleman Beam is required to be carried out on the completed road and accessway carriageway metal course as part of the construction works. Where less than 20 readings are taken then all results shall read less than 1.5mm.

All roading to vest in Council must comply with the Benkelman Beam criteria shown in Table 6. Construction on State highways is to meet Waka Kotahi NZ Transport Agency requirements.

Table 6 - Benkelman Beam Criteria

Road Classification	95% readings (mm)	Maximum (mm)
Arterials	< 1.2	1.5
Collectors and Local Roads including cul-de-sacs	< 1.6	2.0
Private Right of Ways	< 2.0	2.5

Note:

1) See CSS: Part 6 clause 11.6.3 – By Benkelman Beam for more detail on analysing test results.

The pavement design must detail the:

- Asphaltic mix type and layer thickness. Refer to NZTA M/10 for further information
- Geotechnical requirements – test the subgrade and establish an in-situ or soaked CBR. Establish a correlation between the local soils and the test methods used
- Structural design – design pavements to meet the (modified) life-cycle requirements of the New Zealand Infrastructure Asset Valuation and Depreciation Guidelines as modified by the Council. The pavement designs are, however, restricted to a 50-year life for the basecourse layer.

Other considerations in the design may include, but should not be restricted to:

- Type of edge restraints – in most urban environments a concrete edge restraint or kerb and channel must be provided. In other areas, provide road shoulders, as defined in clause 11.3 Shoulders , to prevent edge break
- Semi-rigid and rigid pavements – semi-rigid and rigid pavements (e.g., those that require structural layers of asphaltic concrete, cement, or bitumen stabilised metalcourses, concrete roads and similar) require specific design
- Coal tar - determine its presence through testing for PAHs and either specify to dispose of, encapsulate or reuse on site, whilst applying contaminated material handling methodologies
- Specifying the asphaltic mix type under the TNZ specification e.g., PA15HS for high traffic shear stress or PA20 otherwise
- The local subgrade – many sites have subgrades where the CBR values are so low that the pavement design requires a sacrificial layer of aggregate, sand or the use of geotextiles
- The subsurface drainage – the Council recognises that the lack of subsurface drainage outfalls often results in the inability to avoid a “bath-tub” design where the pavement materials will, at times, become saturated. However, the acceptance criteria related to life-cycle traffic loadings still apply
- The local water table – basecourse layers must be above the water table during a 1 in 10-year flood event
- Cover to underground services – maintain adequate cover to utilities when the project proposes lowering the road level or crown.

Footpath and vehicle crossing finished basecourse surfaces shall be treated with proprietary weed killer granules at the manufacturers recommended rate prior to sealing.

11.9.1 Pavement Materials

The design and construction of the road must comply with the following criteria:

- materials – see CSS: Part 1 for details of approved pavement materials, gradings, etc. Any proposed variations from these materials, such as the use of cement- stabilised metalcourses or concrete roads, will require specific design
- the extent of work – pavement materials must extend at the same thickness beyond the edge control devices, such as kerb and channel or the concrete edge restraints, as detailed in CSS: Part 6

Road metal must be sourced from a quarry supplying certified metal. Council reserves the right to request grading results.

Subbase and/or basecourse surfaces are expected to achieve a minimum Clegg Impact Value (CIV) of 35 in trafficable areas and 25 in residential pedestrian areas.

Additionally concrete footpath foundations shall be hard and unyielding and of uniform bearing and shall be compacted to a minimum Dry Density of 2,100 kg/m3 and 75% of the readings shall be equal to or exceed 2,150 kg/m3.

11.9.2 Road Surfacing

All surfacing must meet site-specific traffic loading requirements including skid resistance requirements as defined in TNZ T/10 *Skid Resistance Investigation and Treatment Selection*. Skid resistance should exceed either the values in Table 7 or a British Pendulum number of 50.

The selection of surfacing material is critical. Consider the benefit, performance, and life-cycle costs of the material, particularly for pavers as these surfaces have higher maintenance costs i.e., select pavers for traffic management purposes, not just aesthetic reasons.

Table 7 - Skid resistance criteria – sourced from TNZ M/10:1998

Site Category	Site Definition	Sideways Force Coefficient (SFC)
1	Approaches to railway level crossings, traffic lights, pedestrian crossings, roundabouts	0.55
2	Curve < 250m radius Down gradients > 10%	0.50
3	Approaches to road intersections Down gradients 5 – 10% Motorway junction area	0.45
4	Undivided carriageway (event – free)	0.40
5	Divided carriageway (event – free)	0.35

All newly constructed road surfaces must comply with the NAASRA roughness counts in

Table *8*.

Table 8 - NAASRA Roughness criteria

Surfacing	Average (mm/km)	Maximum (mm/km)
asphalt surfaces	55	75
Asphaltic concrete and open graded porous asphalt overlays and shape corrections	65	90
Chipseal through streets with 10,000-20,000+ vehicles per day (Pavement Use T6 and T7).	60	80
Chipseal through streets with 2,000-9,999 vehicles per day (Pavement Use T4 and T5).	65	85
Chipseal through streets, culs-de-sac and rights of way with 0-1,999 vehicles per day (Pavement Use T1-T3).	70	90

Note:

1. See CSS: Part 6 clause 11.7 – Testing for more detail on analysing test results.
2. Pavement use codes refer to RAMM categories.

All surfacing materials must meet the appropriate CSS requirements.

The general minimum surfacing requirement is a two-coat (wet lock) chipseal – grade 4 and grade 6. At the head of a cul-de-sac, the minimum surfacing requirement is a 50mm layer of paver laid AC10 laid over a Grade 5 chipseal.

Skid resistance on the new surface through all intersections must match that of the existing road, particularly back to the transition point (TP) of the road. Skid resistance can be improved through grooving in asphaltic concrete.

11.9.3 Pavers

Do not use pavers in narrow road medians or small islands as this location significantly increases maintenance difficulties. Where pavers are proposed for use in the road carriageway, designers shall demonstrate how the risk of movement of individual paving tiles will be managed in the Design Report. Due to the increased maintenance associated with pavers Council may reject proposed paving where the designer has not adequately addressed the risk of paver movement over the life of the asset.

All newly constructed road surfaces must comply with the NAASRA roughness counts in Table 8.

11.9.4 Minimum Surfacing Requirements

All surfacing materials must meet the appropriate CSS requirements. When designing pavements for new roading infrastructure consider the following:

- The condition of the existing roads at the point of connection
- Selection of the pavement type shall meet the requirements of TNZ M/10 and associated documents
- Minimum depth of asphaltic concrete (AC) shall be:
    - Roads and streets = 35mm
    - Cul-de-sac Heads = 50mm
    - Private accessways = 25mm
    - Residential vehicle crossings = 25mm
    - Commercial vehicle crossings = 40mm
    - Footpaths = 20mm
- All asphaltic roads require a Chipseal prime coat of Grade 5 chip
- In rural areas if the intersecting road is sealed the new road should be sealed with a two-coat (wet-lock) chipseal – grade 4 and grade 6
- Specific pavement design will be required for roundabouts

The minimum pavements depths mentioned above do not remove the responsibility from the designer to conduct a complete and thorough pavement design that meets industry's best practice.

Note that all joints against existing asphaltic concrete shall be bandaged at the completion of works.

Any cobblestone or similar interlocking block formations in trafficable areas are to be laid to a herringbone pattern, with a 150 mm minimum deep AP65 subbase. All block paving shall conform to NZS 3116:2002, Concrete Segmental and Flagstone Paving. Cobblestone areas shall be restrained within the carriageway with suitable concrete edge restraints as per CSS Part 6: SD 633 & 634

Cast in place exposed aggregate concrete paving is not preferred on roadways due to concerns with skid resistance and long-term maintenance issues. Council may agree to small areas of such paving and may depending on likely vehicle operating speeds agree to use of this paving in isolated areas.

Skid resistance on the new surface through all intersections must match that of the existing road, particularly back to the transition point (TP) of the road. Skid resistance can be improved through grooving in asphaltic concrete.

11.10 TRAFFIC CONTROL DEVICES

Designers shall refer to the Safe System approach in designing roads and transport infrastructure (https://www.saferjourneys.govt.nz/about-safer-journeys/the-safe-system-approach/)

Design a road at the outset for its environment and function, as it may be difficult to retrospectively alter the speed environment. Analyse the existing speed environment, including the 85th percentile speeds, for assessment against the design operating speed and comparison to the constructed speed environment.

The installation of traffic control devices (TCD) to slow vehicles down may be appropriate in local residential streets where:

- The posted speed limit < 85th percentile operating speed < posted speed limit + 20km/hr
- Peak hour traffic volumes are relatively high
- The length of the road segment under consideration > 250m
- The road has a documented crash history of the type that could be corrected by the devices considered for implementation
- There are significant pedestrian safety issues

Install TCDs in classified or rural roads:

- At the transition from the open road to a lower speed limit
- To enhance pedestrian safety
- To reduce conflict points

Use the following standards and guidelines for the design and operation of traffic management devices:

- Road Safety to Strategy 2010-2020
- Guidelines for Urban-Rural Thresholds, RTS 15
- Austroads Guide Traffic Management Part 10
- AS/NZS 1158 Set Lighting for roads and public spaces - series
- CSS: Parts 1-7
- Manual of Traffic Signs and Markings Part 1and 2

11.10.1 Device Selection

When designing traffic management, be clear about the objective of the measure's installation and the strategy that the device should achieve.

- Compare objective against impact - consider the impact of new traffic devices on the wider transport network to prevent unintended effects
- Make the objective measurable as per Table 9, to allow an assessment of its effectiveness

Both the street environment and traffic control management must be in tune with each other, and compatible with the desired character of the street.

Select traffic control devices which reinforce the road function, through inhibiting inappropriate behaviour or through changing the user's perception of the environment.

Where alternative devices support the same objectives, consider the degree of effectiveness required and the likely environmental effects.

Ensure that alternative devices do not create inequitable barriers for disabled people.

Factors such as traffic noise and air pollution can have significant impacts both locally and remotely. When selecting the device, consider other environmental effects e.g., noise from deceleration and acceleration, increases in travel distances or traffic volumes on arterial roads.

The four main types of measure are listed in Table *9*, with an indication of the objectives to which they are most applicable and of their degree of effectiveness. The environmental effects are also indicated.

Refer to Guide to Traffic Management, Part 8: Local Area Traffic Management for an in-depth examination of these devices, their application, advantages, and disadvantages.

Table 9 - Traffic Control Devices and Objectives (Information obtained from CCC IDS Part 8)

Traffic Control Measures and Objectives The number of ticks indicate the degree of effectiveness. The number of crosses indicate their negative impact.		**Objectives**				
Measure		**Reduce speeds**	**Reduce traffic volume**	**Increase pedestrian safety**	**Reduce crash risk**	**Traffic related environmental effects**
Vertical deflection devices	Raised mid-block tables	√√	√√	√	√√	XX
	Wombat crossings	√√	√√	√√√	√√	X
	Road humps	√√√	√√	√	√√	XX
	Road cushions	√√	√√	√	√√	X
	Raised intersection platforms	√√	√√	√	√√	XX
	Perimeter threshold treatments with hump	√√	√√	√	√√	XX
Horizontal deflection devices	Lane narrowings/kerb extensions	√		√√√	√	
	Splitter islands	√		√√√	√X	
	Slow points – one lane	√√√	√√√	√	X	
	Slow points – two lanes	√	√			
	Blister (wide) islands	√	√	√		
	Driveway links	√√√√	√√√√	√√√√	X	√√
	Mid-block flush median treatment	√		√√	√√√	
	Mid-block raised median treatment	√		√√√	√√√	
	Roundabouts	√√√		√	√	XX
Diversion devices	Full road closure		√√√√√	√√√√√	√√√√√	XX√√
	Half road closure	√√√	√√√	√√√	√√√	X√√
	Diagonal road closure	√√	√√√√	√√√√	√√√√	X√
	Modified t-intersection	√√	√√		X√	

Traffic Control Measures and Objectives The number of ticks indicate the degree of effectiveness. The number of crosses indicate their negative impact.		**Objectives**				
Measure		**Reduce speeds**	**Reduce traffic volume**	**Increase pedestrian safety**	**Reduce crash risk**	**Traffic related environmental effects**
	Left in/Left out islands		√√√	√√√	√√√	X√
Signage, Road marking and other treatments	Speed limit signs	√		√	√	
	Prohibited traffic movement signs		√√√√	√√	√√√√	X√√
	One-way signs	X	√√√	√√√	√√√	X
	Stop signs/ Give way signs	√	√	√	√	
	Pedestrian crossings	√		√√√	√	X√
	Perimeter threshold treatments			√		√√
	Rural threshold	√				√√
	Tactile surface treatments	√				XX√√
	Bicycle facilities				√√	√√
	Bus only treatments		√			√√
	Shared zones	√√√	√√√	√√√	√√√	√√√

11.10.2 Design Considerations

Aim for a degree of consistency in the use of TCMs within a development, and within the wider district.

Avoid overuse of devices, as this will reduce their effectiveness globally. Also consider that over time their local impact will reduce as driver familiarity increases.

When designing TCD's consider the following:

- Use similar devices in similar ways
- Design devices so that drivers can recognise and react to them appropriately both in approach speed and alignment
- Provide roadmarking, signage and lighting to support the device's purpose
- Ensure sight distances comply with sight distances in Austroads 8.11.4 - Sight distances and the Guide to Road Design, Part 3: Geometric Design
- When designing the device layout, first consider where in the street the device is best placed to achieve the objectives
- Design longitudinal vertical gradients under 3% at intersections where traffic management devices will be installed

Install devices with operating speeds that are within 20km/hr of the speed environment.

Commentary 18 Figure C18.2, in the *Guide to Traffic Management, Part 8: Local Area Traffic Management,* has a range of indicative operating speeds for various devices. Space devices with a high degree of restraint, like road humps, 80 -120m apart.

Design devices to remove any confusion with pedestrian crossings. Surface footpaths and traffic devices in different colours, to help define their limits. Use tactile surface treatments where there is no level difference between the footpath and the road. Designs must follow guidelines included in Walking standards and guidance | Waka Kotahi NZ Transport Agency (nzta.govt.nz).

Use landscaping or different surfacing to clarify pedestrian routes and to enhance the effectiveness and safety of the devices. Where devices are used as pedestrian or cycle refuges, ensure that landscaping does not obstruct sightlines.

Select lane widths carefully. Generally, only either a vehicle or bicycle can use a 3.0m lane. Both cars and bicycles can use wide kerbside lanes (3.7m or over) at the same time, which are best for roads over 60km/hr or where devices must cater for buses or heavy vehicles. Avoid intermediate widths as these can create squeeze points for cyclists.

11.10.3 Vertical Deflection Devices

Design the type of treatment stated in Table 10 for the intersection of a local street with the relevant through-road classification. Figure 2 illustrates how this hierarchy of treatments may be applied.

Table 10 - Intersection treatment types

Through-road classification	Threshold type
Local	Raised platform
Collector	Threshold type B
Minor Arterial	Threshold type C
Major Arterial	Threshold type C wit median island closure on arterial

Notes:

1. Thresholds type B and Type C are shown in Fig 8 and 9
2. Type A is obsolete

Locate mid-block devices on local roads that are intended to deter traffic and to control speed between 90m and 150m from intersections. They may be shifted around 30m in either direction without affecting their effectiveness if their location conflicts with vehicle entrances or to position the device under an existing streetlight.

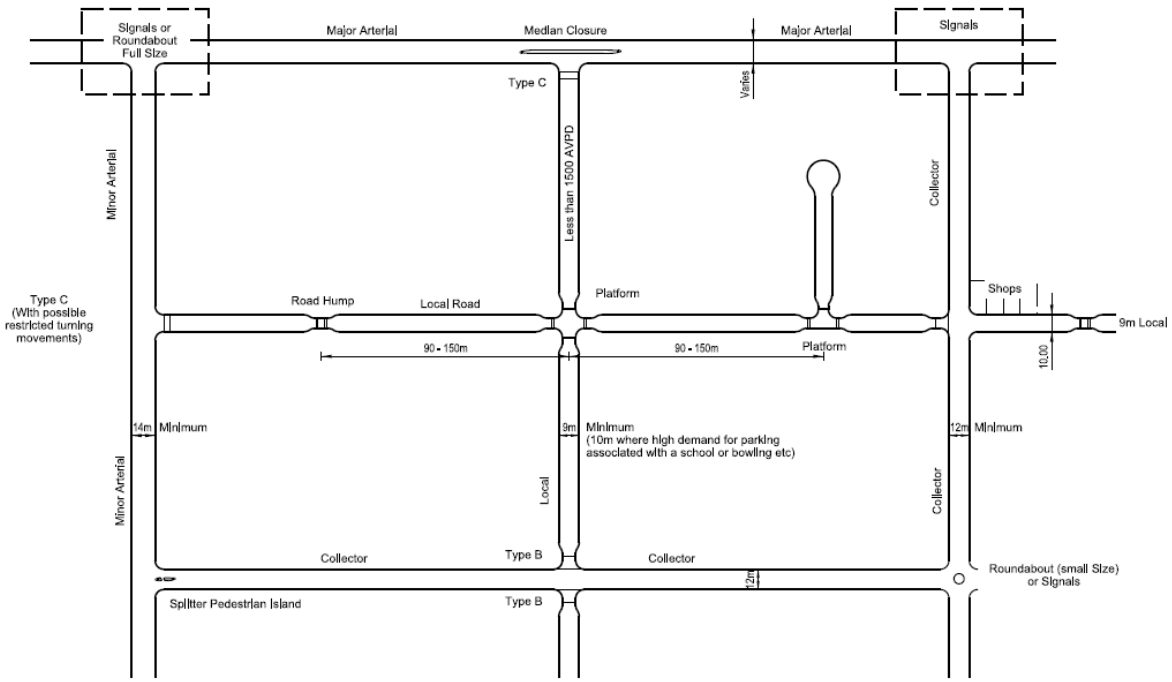

Figure 2 - Roading Hierarchy

Design raised tables and platforms to be 75 – 100mm above the road surface, with flat platforms between 2 – 6m long.

Ensure the design height of the table or platform is appropriate for the type of transition from the ramp to the platform or road surface. Rounded transitions are smoother to travel over than sharp transitions so may require a greater height increase.

Road humps constructed in accordance with *CSS: Part 6* SD 631 may be used depending on the device operating speed required.

Consider the types of traffic which will negotiate these devices. Where buses and heavy vehicles will regularly negotiate devices, specify flatter ramps (1 in 20) and longer platforms (6.0m). Cyclists also prefer longer ramps (1 in 15) but these do not reduce speed as effectively as short ramps (1 in 12).

11.10.4 Horizontal deflection devices

Design bicycle lanes to bypass horizontal deflection devices where demand warrants it and particularly on higher traffic volume roads. If cycles use the traffic lane, eliminate squeeze points in, before and after devices.

Assume operating speeds of 10-20 km/hr for slow points and design them with deflection angles between 10 to 30 degrees. Where bicycle usage is not significant, design lane widths between 2.8 and 3.0m. Detail blister islands at least 2.0m wide and 3.0m long.

Roundabouts are also horizontal deflection devices and are discussed in clause 8.12.7 - Roundabouts.

11.10.5 Diversion devices

Construct pathways through diversion devices for bicycles and pedestrians and ensure that the devices can cater for the permitted users.

Design modified ‘T’ intersections with mountable kerbs and reinforce changed priorities where appropriate. Carefully consider the use of full road closures and design them to minimise disruption. Design half road closures to make prohibited manoeuvres difficult. Provide turning facilities for both forms of road closure. Maintain two-way movement through diagonal closures for all users.

Combine left in/left out islands with central median islands to improve efficiency.

11.10.6 Permanent signs

When signs are used within the road corridor, they must comply with the following standards and guidelines and be placed where they can be readily seen by approaching motorists:

- Setting of Speed Limits 2017 Rule
- Traffic & Parking Bylaw
- Guidelines for Street Name Signs, RTS2
- Traffic Control Devices Manual, Part 9, Level Crossings
- NZS 8603 Design and application of outdoor recreation symbols
- CSS: Parts 1-7
- Compliance Standard for Traffic Signs
- Manual of Traffic Signs and Markings Part 1

The Council has delegated the approval of the regulatory signage and roadmarking on existing roads to Council’s roading department. This is separate from and additional to engineering acceptance.

It is noted that Council policy R430 – Road Names Signs Format Policy (refer to SDC policy manual).

All required signage shall be installed as part of the works. Developers shall supply and install Council approved signage including street name signs.

Locate street name signs between 450mm and 1500mm behind new kerb, or 600mm and 1500mm behind the new shoulder and within the area formed by the intersecting legal road boundaries, as specified in RTS 2. Consider the proximity of overhead power lines: design signs and other infrastructure

to provide the clearances required in the Code of Practice for Electrical Safe Distances. Position signs at least 1500 mm away from a vehicle entrance or kerb cutdown where possible.

Where possible reinforce the effectiveness of signage by combining it with other devices.

Reconstruction projects include the relocation of street name signs, if the works make its old position inappropriate.

11.10.7 Road markings

Any road marking and associated signage shall be shown on the plans for approval. The assessment for road marking and signage shall be in accordance with NZTA (Transit NZ)'s Manual of Traffic Signs and Markings (MOTSAM). The application of any road markings shall be undertaken by a certified road marking contractor. This shall be in accordance with the specific performance standards required by Council and shall be at the developers cost.

All road markings on rural roads shall be installed in accordance with NZTA's RT5 – Guidelines for rural road marking and delineation

(https://www.nzta.govt.nz/assets/resources/road-traffic-standards/docs/rts-05.pdf).

On classified urban roads install parking lines to encourage better parking.

Check and discuss requirements for no overtaking and no stopping lines with Council during the design process. Any no-overtaking, no-parking or no-stopping lines will need to be included in the application for Engineering Approval, to allow Council to assess. These need to be reported to Council in order to become enforceable under the Selwyn District Council Traffic and Parking Bylaw 2009.

Where road markings are required, use the following standards and guidelines:

- Manual of Traffic Signs and Markings Part 2
- Guidelines for Flush Medians, RTS 4
- Guidelines for Safe Kerbline Protection, RTS 8
- Guidelines for Rural Road Marking and Delineation, RTS 5
- NZ Supplement to Guide to Traffic Engineering Practice, Part 14: Bicycles
- CSS: Parts 1-7

The marking of all pavements on roads and shared cycleways is the responsibility of the developer.

11.11 ROAD CORRIDOR CROSS-SECTION DESIGN

Provide carriageway and legal road widths that comply with the *District Plan*. Note the minimum width of roads is to be 7 metres. Design these widths as part of an optimal road cross-section, to achieve the following objectives:

- Provide a safe layout for all users
- Provide the required capacity for all road users including cyclists and pedestrians where required
- Minimise the capital costs of construction by not exceeding the desirable widths for high-cost elements like carriageway, cycleway and footpath
- Minimise the ongoing maintenance costs by designing and constructing elements to achieve their design life
- Provide all the specified roadway elements – also refer to the following sections:
    - 11.12 PATHS, TRAILS AND TRACKS
    - 11.13 STREETSCAPE DESIGN
    - 11.14 ROAD RESERVE DRAINAGE DESIGN
    - 11.15 PARKING
    - 11.16 PUBLIC TRANSPORT
- Reinforce the speed environment through appropriate lane and carriageway widths
- Provide an attractive streetscape, adding to the amenity and character of the area
- Facilitate a safe, efficient, and effective drainage system by ensuring that the new works do not detrimentally affect the existing drainage pattern or road users.

11.11.1 Kerb & Channel

The selection of kerb and channel profile must be governed by:

- Stormwater catchment requirements
- Protection of open waterways
- Incorporating proposed design into existing landscapes and features

Note in Rolleston township low profile kerb and channel is generally used.

Justification of kerb and channel profile must be outlined in the design report for approval by Council engineers.

Kerb foundations shall be hard, unyielding, and of uniform bearing and shall be compacted to a minimum Dry Density of 2,100 kg/m3 and 75% of the readings shall be equal to or exceed 2,150 kg/m3.

11.11.2 Carriageway Widths

Design traffic lane widths to the Guide to road Design, Part 3: Geometric Design.

The desirable traffic lane width excluding in local roads is 3.5m. This width is only appropriate where a discrete cycle facility is provided e.g., a marked or separated lane. This may be increased to 4.2-4.5m to provide shared wide kerbside lanes where parking is not provided. Do not design widths between these values as they cause cyclist/vehicle conflicts. Where cyclists are expected to mix with general traffic, refer to the guidance for mixed lanes in the Cycling Network Guidance. When proposing narrower widths or where all elements may not be provided, carefully consider the reasons and balance them against the above objectives. Submit a non-conformance report detailing the process of trading off these

objectives to arrive at the non-complying design widths, as part of the Design Report. For cycle lanes a minimum lane width of 1.2 metres is preferred.

Additional road widths are recommended for cycle lanes on roads with higher operating speeds. The absolute minimum lane width of 2.5m may be acceptable where:

- The legal road is limited
- The road is in a low-speed environment
- There are few heavy vehicles

When proposing narrower widths or where all elements may not be provided, carefully consider the reasons and balance them against the above objectives. Submit a non-conformance report detailing the process of trading off these objectives to arrive at the non-complying design widths, as part of the Design Report.

11.11.3 Shoulders

Refer to the District Plan for overall road corridor dimensions. *Austroads Guide to Road Design, Part 3: Geometric Design* states that the minimum formed shoulder width for a rural road with traffic volumes over 150 vehicles per day is 1.5m. Make an allowance for off-road parking areas on roads with 1.0m shoulders.

Table 11 - Rural Shoulder Width (derived from Austroads)

Design Traffic Volume (AADT)	Formed widths (m)	Sealed widths (m)
Single lane road <150	2.0	0.5
150 - 500	1.5	0.5
500 – 1000	1.5	0.5
>1000	2.0	0.5

Sealing of the shoulder will vary depending on traffic volumes and site conditions. Mark edgelines to prevent shoulders being incorporated in the traffic lane. Marking of edge lines shall be in accordance with NZTA RTS5 – Guidelines for rural road marking and delineation control (link here). On local rural roads, the shoulder widths may be determined by the width required to provide cycle facilities.

11.11.4 Medians

Refer to the District Plan for median requirements for new roads.

Medians may be either formed or road marked islands (flush medians) as approved.

Determining median widths is typically dictated by the function of the median and intersection details. *Austroads* provides guidance on median functions, types, and widths.

11.12 PATHS, TRAILS AND TRACKS

The District Plan and Council's Walking and Cycling Strategy & Action Plan provide the principal guidance applicable to the development of pedestrian and cyclist facilities throughout the district. Austroads Design Standards, the NZ Transport Agency, Christchurch City Council, and the Ministry of Business Innovation and Employment NZ Cycle Trail Design Guide 2019 provides specific design and guidance information.

The number of footpaths required for each road classification must comply with the requirements in the *District Plan*. Note that these are minimum requirements only, and Council may require wider or different footpath widths to meet local strategies, recent policy changes and/or integration with existing adjacent networks.

Footpath widths are measured from the footpath edge to the kerb or service strip. The service strip may be sealed with the path. The minimum widths set out in Table 12 to Table 16 must **be clear of all obstructions** such as vegetation when fully mature, light standards, traffic signs, utility furniture and bollards. Extra widening will be required wherever such obstructions cannot be avoided.

The design of all walking and cycling facilities in urban areas shall include the principles of CPTED (Crime Prevention through Environmental Design) see "Safer Canterbury, Creating Safer Communities" 2004, Canterbury Safety Working Party.

Accessibility for both mobility and vision impaired members of the public is a key design consideration. Access for wheelchairs, prams, and mobility scooters requires appropriate ramps to be used on footpaths within public roads, unless approved by the Council. Tactile pavers for vision impaired pedestrians are also required.

This section includes requirements for the following:

- Standard Township Footpaths
- Shared Use Connecting Path
- Recreational Rural Paths
- On-Road Cycle Lanes
- Walking Track

Provide on road or off-road cycle lanes on all collector and arterial roads. Separate off carriageway cycle/walkway pathways on arterial and collector roads are preferred and required where identified in the Walking and Cycling Strategy or ODP. For local urban roads, cycle facilities can be provided through wide kerbside lanes.

11.12.1 Standard Township Footpaths

Footpaths in urban areas shall meet the requirements set out in Table 12.

Table 12 - Standard Township Footpaths – Detailed Engineering Requirements

Property	Design Specifications
Width	• 1.8m minimum clear width (including around obstructions like poles) • 2.5m minimum (or up to the road boundary if appropriate) where there are high volumes of pedestrians such as near schools, in shopping centres and outside churches in urban areas.
Crossfalls and gradients	• Maximum footpath crossfall of 2.0% (minimum 1.25%) • Maximum longitudinal footpath gradient of 3% or up to 7.1% if treated as a ramp under NZS 4121: 2001
Materials	Footpaths (Construction and Renewal):
	• 25mm asphaltic concrete (hotmix) on 150mm AP40, or • unreinforced concrete with a broom finish; or • interlocking concrete pavers
	Driveways crossing berms and/or footpaths (Construction and Renewal):
	• asphaltic concrete (hotmix)*, or • interlocking concrete pavers for township/commercial areas
	Prohibited materials (on footpaths or driveways):
	• Stamped concrete • Concrete with a float finish (steel or wood) • Patterned concrete • Cobble stones
Accessibility Standards	• NZS 4121: 2001 Design for Access and Mobility: Buildings and Associated facilities
Lighting	• AS/NZS 1158.3.1:2005 Road lighting - Pedestrian areas • AS/NZS 1158.6:2010 Road lighting - Luminaires • Higher levels of illumination than NZS 1158.3.1 will be provided when adjacent carriageways are lit to high standards and if Selwyn Council considers that additional illumination is required to improve public safety.

*The design specification for Driveway construction and renewal shall be in accordance with the requirements of the “Vehicle Crossing Information Pack”.

11.12.2 Shared Use Connecting Path

Use green linkages between cul-de-sacs, through public reserves or adjacent to waterways, or other natural features. Design paths to suit pedestrians, cyclists & e-cyclists, electric scooters, skateboarders, skaters, prams, and people with mobility issues. Allow a width for motorised wheelchairs of 1.2m clear width.

Council’s requirements for landscaping and reserves in Part 10: Reserves, Streetscape and Open Spaces provides landscaping guidelines will need to be considered when designing paths in reserves.

The overall width of the linkage needs to be adequate for the expected path volumes and appropriate landscaping. Off road minimal legal width linkages of 2.5 to 3.0m with little or no landscaping are unattractive to use and may have perceived security problems associated with them. Therefore, providing wide, open, and well-lit areas is extremely important to create a secure and useable linkage.

Council is continually reviewing its transportation provision and may require footpaths to be constructed wider than the current minimum.

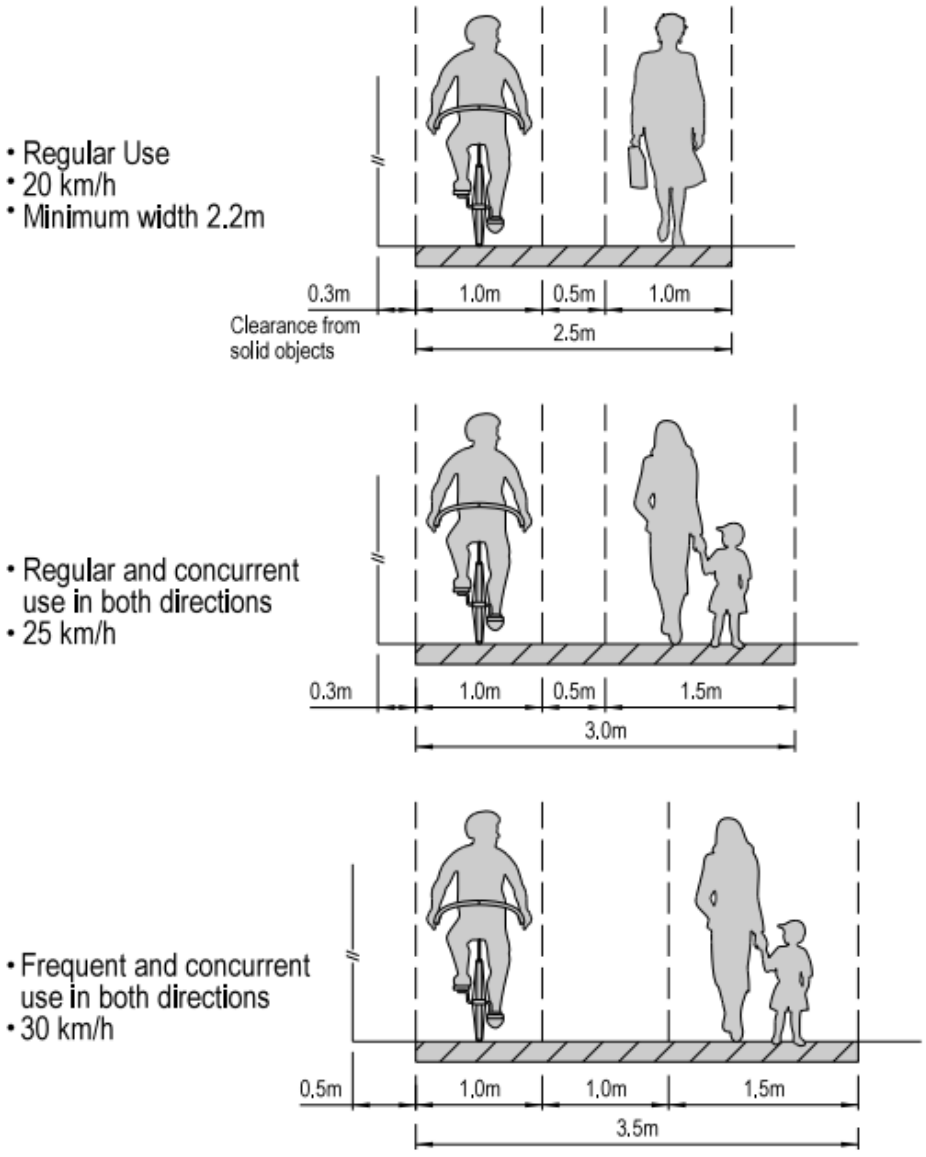

Figure 3 - Pedestrian/shared path widths

The formed width should be widened wherever a lot of people are expected to use the facility, as illustrated in Figure 3 (shown below). Council may require a safety audit to be undertaken for shared paths before approval of these.

Designers shall landscape the remaining land in a manner that does not compromise the security of people using the facility. Table 13 (shown below) includes requirements for the detailed design of off-road paths.

Discourage vehicle access to berms, footpaths, and swales by using landscape elements (e.g., kerbing, bollards, plantings, or fence.

The cycleway types (major, local, and recreational) are defined in clause 1.2 of Christchurch Cycle Design Guidelines. Design major cycleways to the requirements in the Major Cycleway Design Guide.

Design local and recreational cycle facilities to the requirements of the Christchurch Cycle Design Guidelines. Refer also to Cycling Network Guidance – Planning and Design, the Guide to Road Design, Part 4: Intersections and Crossings or Part 6A: Pedestrian and Cyclist Paths. Mark the road marking in accordance with CSS: Part 6.

Design the cycle facilities and widths in general compliance with the New Zealand Supplement to Guide to Traffic Engineering Practice, Part 14: Bicycles.

Table 13 - Shared Use Connecting Path - Detailed Engineering Requirements

Property	Design Specifications
Width	Urban • 2.5m minimum width • Dimensions for mobility access as detailed in: NZS 4121:2001; • Austroads: AP_G88-11 Cycling Aspects of Austroads Guides 2011 • Austroads: AGRD06A 09 Guide to Road Design - Part 6A - Pedestrian and Cyclist Paths • Austroads: AP-R287/06 Pedestrian and cyclist conflict minimisation on shared paths: 2006 Rural • 1.5m minimum clear width with ability to be widened up to 2.5m in the future • Paths wider than 2.5m not permitted adjacent to road carriageways and may require measures to prevent by cars and/or truck use
Crossfalls and gradients	• Maximum footpath crossfall of 2.0% (minimum 1.25%) • Maximum longitudinal footpath gradient of 3% or up to 7.1% if treated as a ramp under NZS 4121: 2001
Materials	Paths (Construction and Renewal):
	• asphaltic concrete (hotmix), or • unreinforced concrete with a broom finish • small areas of interlocking concrete pavers are permitted.
	Driveways crossing berms and/or footpaths (Construction and Renewal):
	• As for the section of path being crossed • Any driveway surfacing that crosses the path and by its appearance • suggests that the driveway traffic has precedence over those using the path
	Prohibited materials (on footpaths or driveways):
	• Stamped concrete, • Concrete with a float finish (steel or wood) • Patterned concrete • Cobble stones
Accessibility Standards	• As required by cycling standards • NZS 4121: 2001 Design for Access and Mobility: Buildings and Associated facilities
Lighting	• Lit only in urban areas or where there is high night-time demand. Consider CPTED principles in any decisions • AS/NZS 1158.3.1:2005 Road lighting - Pedestrian areas • AS/NZS 1158.6:2010 Road lighting - Luminaires • Higher levels of illumination than NZS 1158.3.1 will be provided when adjacent carriageways are lit to high standards and if Selwyn Council considers that additional illumination is required to improve public safety.

11.12.3 Recreational Rural Paths

Recreational rural paths (e.g., off road sections of the Little River Rail Trail) shall comply with the requirements of Table 14.

Table 14 - Recreational Rural Paths - Detailed Engineering Requirements

Property	Design Specifications
Width	1.5m wide minimum designed according to a Grade 2 trail as specified by: NZ Cycle Trail Design Guide, Ministry of Business Innovation and Employment: 2019*
Materials	Path: • Well graded GAP20 Aggregate • Asphaltic concrete (hotmix) on short sections if needed for road and bridge approaches and traction
	Driveways crossing berms and/or footpaths: • As for the section of path being crossed as a minimum
	Prohibited materials (on footpaths or driveways • Stamped concrete, • Concrete with a float finish (steel or wood) • Patterned concrete • Cobble stones
Accessibility Standards	• Where appropriate SNZ HB 8630:2004 Tracks and outdoor visitor structures and NZ Cycle Trail Design Guide, Ministry of Business Innovation and Employment: 2019
Lighting	• Not required

* This assumes a path located in the plains area of the district where terrain is conducive to this being realistic to achieve. Where paths are located in hill and high-country areas the grade and level of difficulty may increase based on what's practical and affordable.

11.12.4 On-Road Cycle Lanes

Provide on road cycle lanes on all collector and arterial roads as agreed with Council. Separate off carriageway cycle/walkway pathways on arterial and collector roads may be provided as an alternative as agreed with Council in accordance with clause 11.12.2 above . For local urban roads, cycle facilities maybe provided through wide kerbside lanes.

Table 15 - On-Road Cycle Lanes- Detailed Engineering Requirements*

Property	Design Specifications
Width	Depends on vehicle speeds, refer to: • NZTA: NZ Supplement to the Austroads Guide to Traffic Engineering Practice Part 14: Bicycles 2008
Materials	• Maximum size 10 mm stone chip seal suggested by: o Austroads: AP G88-11 Cycling Aspects of Austroads Guides 2011
Lighting	• AS/NZS 1158.6:2004 Road lighting - Lighting for roads and public spaces

In addition, detailed design of cycle lanes and other on-road cycling facilities such as wide kerbside lanes, wide shoulders and bus-cycle lanes must refer to:

- NZTA: NZ Supplement to the Austroads Guide to Traffic Engineering Practice Part 14: Bicycles 2008.
- Austroads: AP_G88-11 Cycling Aspects of Austroads Guides 2011.
- NZTA: Manual of Traffic Signs and Markings, Part 1 Traffic Signs.
- NZTA: Manual of Traffic Signs and Markings, Part 2 Markings.

11.12.5 Walking Track

Walking tracks will need to have specific approval. Requirements are set out in Table 16.

Table 16 - Walking Track - Detailed Engineering Requirements

Property	Design Specifications
Width	• Approximately 0.5m minimum at ground level. • Wider at shoulder level etc. as suggested by: SNZ HB 8630:2004 Tracks and Outdoor Visitor Structures
Materials	Track: • Natural ground cleared of vegetation or short grass, or • in areas where volumes are heavier or there are particular needs: o Compacted metal. o Timber ‘board-walks’ or o Other appropriate materials as determined
	Driveways crossing berms and/or footpaths: • As for the section of track being crossed. If the driveway crossing is sealed the track should also be sealed for approximately 3m on either side of the driveway to avoid the appearance of a right of way in favour of the driveway.
	Prohibited materials (on footpaths or driveways • Stamped concrete, • Concrete with a float finish (steel or wood) • Patterned concrete • Cobble stones

Property	Design Specifications
	• Any driveway surfacing that crosses the path and by its appearance suggests that the driveway traffic has precedence over path users (but see "Driveways crossing berms and/or footpaths" immediately above)
Accessibility Standards	• SNZ HB 8630:2004 Tracks and Outdoor Visitor Structures • Compliance with NZS 4121:2001 Design for Access and Mobility: Buildings and Associated Facilities may be provided/required in some circumstances.
Lighting	• Not required

11.12.6 Design of Crossing Facilities and Intersection Treatments

Design of pedestrian crossing facilities should be made in accordance with the NZTA: Pedestrian Planning and Design Guide: 2007.

Design of cycle crossing facilities and intersection treatments should be made in accordance with:

- AUSTROADS: AP G88 11 Cycling Aspects of Austroads Guides: 2011.
- NZ Supplement to Austroads Guide to Traffic Engineering Practise Part 14 Bicycles: 2008.

The minimum widths at pedestrian and cycle refuges will be 2 metres is required at cycle/pedestrian crossings.

11.12.7 Tactile Pavers

Tactile Ground Surface Indicators (also called Tactile Pavers) shall be provided in accordance with NZS 4121:2001 and NZTA RTS 14 – Guidelines for facilities for blind and vision-impaired pedestrians.

Further to these standards, Council will require tactile pavers to be solid concrete pavers. Council will not accept studs as they become loose and increase maintenance costs.

Tactile pavers must be fully grouted in, with a cementitious grout. Placement in bedding sand, and filling between pavers with sand will not be accepted by Council, due to the risk of weed growth and paver displacement.

11.13 STREETSCAPE DESIGN

The streetscape elements include paths, grassed berms, trees, shrub beds, streetlights, and hard landscaping. These can provide various benefits including:

- A network of safe, pleasant, comfortable, convenient, and efficient paths
- Positive guidance for pedestrians, cyclists, and motorists
- Seats, lighting, litter bins (where required) and other facilities
- Enhancement of the street environment by the inclusion of grassed areas, specimen street trees and plant beds
- Attractive 'rain gardens' with safe overflow provision, which can provide a water quality and air quality improvement component for air and water borne vehicle pollutants

Council's preference is that there are no hard landscaping or structures located within the road reserve. All proposed streetscape designs must be submitted with the design report for Council approval.

Discourage vehicle access to berms, footpaths, and swales by using landscape elements (e.g., kerbing, bollards, planting or fences). Detail surfacing or treatment interfaces, e.g., where a path/berm intersects with a kerb, to avoid acute angles and so facilitate compaction and reduce maintenance issues.

11.13.1 Minimum widths

Table 17 (shown below) identifies the minimum widths of key elements in urban areas. This table should be read in conjunction with Section 11.12 which details requirements for paths, trails, and tracks.

The proposed layout and positioning of the footpath should consider the specific planting requirements for the proposed street trees and be agreed in principle prior to resource consent or detailed design being completed.

Table 17 - Minimum widths of key streetscape elements in urban areas.

Adjacent land use	Minimum width	Street furniture/services strip	Berm/landscaping	Berm with street trees
Town centre/suburban activity area and shared pedestrian/cycle paths	2.5 m	1.2m	0.7m	1.8m minimum measure to back of kerb (may increase depending on approved tree species)
Other / residential / industrial	1.8m	1.0m (may include the berm)	0.7m	1.8m minimum measure to back of kerb (may increase depending on approved tree species)

***Note: The berm with street tree's width shown in Table 17 over-rides the width given in Section 10**

Council criteria for footpath widths are as follows:

- The primary or main road through a subdivision shall have a minimum footpath width of 2.5m. The primary road is considered to be the widest road in a subdivision. Note that there may be more than one primary road within larger subdivisions – this requirement applies to all such roads.
- Collector roads shall have footpath provision on both sides of the road, or as provided for in the District Plan
- All other roads shall have a minimum footpath width of 1.8 metres and on both sides of streets in urban areas unless otherwise approved specifically by the Transport Asset Manager/Development Engineering Manager
- Narrow berms shall be avoided

Notes:

1) Residential footpaths are normally separated from the kerb by a grass berm and from the road boundary by a service strip.
2) Allow for any planting (e.g., trees) between the footpath and the kerb.
3) On slopes, it is most practicable to construct the footpath against the kerb.
4) Transitional widths may be required on the boundary between residential and retail/town centres.
5) The kerb width is not to be included as part of the berm or any other feature.

Where topography or existing features preclude providing the minimum widths in Table 17, discuss options with the Council.

Lateral changes of the footpath direction should normally be achieved using smooth continuous curves. This is particularly relevant where the path deviates around obstacles (e.g., utility boxes, poles) or adjacent berm areas (e.g., trees, shrubs, or structures) or shifts laterally to join another footpath.

Wherever the footpath deviates from pedestrian desire lines and positive guidance is required, install plant beds, fences, or comparable barriers. Wherever possible, plant shrubs to soften the appearance of the guidance element. Also consider the needs of people with disabilities e.g., mitigate the possible safety risks for a person with a visual impairment by indicating the change.

Grass areas and plant beds between the footpath and the carriageway or on median islands must have crossfalls flatter than 6% for ease of maintenance.

11.13.2 Grassed berms

Berms may be planted in selected areas with the approval of Council.

Where the width from the legal boundary to the kerb or road edge exceeds 2.5m in residential areas, install a berm.

The minimum width for grassed berms is 0.7m. Typical cross sections, showing minimum berm widths, are shown in CSS: Part 6. Service strips against property boundaries may be a minimum width of 300mm. The smallest area of berm permitted is $2m^2$ and areas smaller than this must be formed and sealed/paved as footpath.

Where adjoining pavement surfaces meet, forming a point in the grass area with an angle of less than 60 degrees, square or round off the point of the grass berm to be no narrower than 0.7m.

Grassed areas with tree planting beside the berm, must be specifically designed. In these areas, steeper slopes may be permitted provided that the area can be mown or otherwise easily maintained. Gradients up to one in two may be planted. The treatment of all gradients steeper than one in four requires Council approval

Bank battering on berm and property areas shall be formed to a standard that allows easy hand mowing.

11.13.3 Batters

Generally, batters should match any existing stable slope of similar material. Flatter slopes that are integrated into the natural landscape are preferred.

Where the formed batter is not required to cater for foot traffic, grassed batters are permitted, to a maximum of one in four. These must be mowable, as defined in clause 11.13.2.

The top edge of every fill, and the toe of every cut, must have a crossfall of 3% and extend at least 500mm beyond the outside edge of the footpath. If there is no footpath, measure this dimension from the back of the kerb or the outside edge of the trafficable shoulder as applicable.

Retain all new cut faces or stabilise with vegetation. Slopes steeper than one in two must be retained. Structures supporting the road must be located on legal road. Locate stabilised faces, walls, or retaining structures that support private assets or property outside of the legal road. Some of these structures may require building consent.

11.13.4 Utilities

Show any existing utilities and services on the drawings.

Both existing and proposed underground and above-ground utility services can impact on the design through conflicts with the proposed carriageway elements. The cost of relocating existing utilities is significant and may therefore not be a viable option. Existing roads are often reconstructed at a lower finished level but restrictions on lowering carriageways, and the corresponding kerb, due to the presence of utilities can lead to property and upstream drainage problems.

To ensure there is no conflict with the road geometrics or between any utilities and proposed street features or planting, become familiar with the required clearances from both existing and proposed above ground and underground utilities. Ensure they do not create a safety risk for people who are blind or visually impaired. Refer to clause 12.4.3 – Typical services layout and clearances (Utilities) for guidance and standards for the work. Any conflicts should be resolved during the design process.

Pothole existing underground services, to confirm both their location and depth. When utilities constraint the design, there are a range of solutions available:

- Consider moving the carriageway alignment. This can allow either underground utilities to be positioned towards the centreline or underground utilities and poles to be positioned outside of the carriageway or footpath
- Design element widths to achieve the same result as moving the carriageway alignment
- Provide a lesser standard of elements, through restricting parking or constructing only one footpath

11.13.5 Clear zones

The clear zone is the width from the edge of the traffic lane in which an errant vehicle can recover. To provide this zone, locate new hazards (e.g., above-ground utilities, street furniture and trees, streetlights) at a distance from the edge of the traffic lane greater than the widths shown below in Table 18.

Remove or treat existing roadside hazards within this distance.

Table 18 - Clear Zone widths - arterial or collector roads

One Way AADT	<50 km/h	70 km/h	100 km/h
<1000	3.0 m [1]	3.4m	6.0m
>5000	3.0 m[1]	5.4 m	9.0 m

Notes:

1. Where the above setbacks are not achievable, discuss alternative options with the Council early in the design process
2. Interpolate between the given values for AADT between 1000 and 5000
3. This table is sourced from Austroads

Some on-street structures in urban areas cannot feasibly be relocated. If they are not frangible, they should be protected. Formal barriers may not be the best option. Alternatives to barriers that could be considered in low-speed urban areas include frangible planting and bollards.

When providing a barrier to a hazard within the clear zone, include the barrier deflection when determining the offset between the edgeline and the structure.

Austroads Guide to Road Design RD 2,3,4,6 & 7 and *various* provide details on clear zones, hazards, and safety barriers.

11.13.6 Pole clearances/setbacks

Where work involves new roads or seal widening, designers shall ensure that safety clearances from light and/or power poles are met. Constructors shall also comply with NZECP34 safety distances for constructing or working near overhead structures.

Designers shall obtain written approval from Orion confirming that the design meets safety requirements. A copy of this approval shall be provided to Council on request or may be submitted as part of the Engineering Approval process.

Poles adjacent to roads must be set back with the following minimum lateral distances. The appropriate value for urban areas is indicated in brackets.

Table 19 - Pole setback distance

Speed zone Restriction	Pole setback distance	
	All state highways	Local authority roads
50 km/h	2m (1m)	1m (0.6m)
70 km/h	3m	2m
>70 km/h	On boundary where possible, but 4m min	3m

The pole setback distance is taken from the painted road edge line, the kerb, or in the case where neither exist, the edge of seal.

11.13.7 On-street Planting

Plant beds are generally used to soften the street environment and to provide visual guidance to pedestrians, cyclists, and drivers. Landscaping is also an important component of traffic management devices but must be carefully designed to enhance the safety and effectiveness of these devices.

Submit on-street planting designs with the design report for Engineering approval. Designers are required to consider the following in the design report:

- Streetlight location
- Sight line visibility
- Hazard identification
- Crime Prevention Principles

Council is particularly keen to ensure planting at intersections does not have potential to affect sight distances and visibility of signs. Designers are expected to present planting plans that have been developed with safety and visibility in mind, and the Design Report shall document how this risk has been addressed – by plant species selection, location, for example,

Refer to the *Tree Planting Policy* and clause 10.8 - Landscape Planting (Reserves, Streetscape and Open Spaces), before designing plant beds or street trees.

11.13.8 Street furniture

Landscaping structures such as planter boxes, seats, bins, sculptures, memorials, and entrance structures on legal roads must be constructed in long-life materials (20-year minimum). Vandal resistant material shall be used and elaborate brass fittings etc are not acceptable. Materials used must be low maintenance and require specific Council approval. Refer to Section 10 of the ECOP for further information.

In low-speed environments, locate continuous structures like low walls at least 450mm behind the kerb, with a maximum height of 700mm if adjoining the footpath. Locate them so that they do not obstruct the sightlines of intersections, pedestrian crossings, or signs. Ensure they do not create a safety risk for people who are blind or visually impaired.

Some of these structures may require building consent, which the developer must obtain.

11.13.9 Rural Mailboxes

The property owner is responsible for installing a mailbox for each new property to meet the requirements of the rural post-delivery operator and New Zealand Post.

Requirements for mailboxes are set out on Council's website.

11.13.10 Road crossings for pedestrians

Generally old-style zebra crossings are not commonly used in the district. Zebra crossings or signalised pedestrian crossings will only be installed where they meet the warrant for it, as defined in *Manual of Traffic Signs and Markings Part2: Markings 4.02.01(c).*

Preferably provide pedestrian crossing facilities that comply with CCC's *Intersection & Pedestrian Crossing Design for People with Disabilities Policy and CSS: Part 6* at all road intersections and other locations, wherever these will provide logical and safe movement of pedestrians. Mid-block crossing facilities may be combined with kerb buildouts and pedestrian islands, to minimise the crossing distance for users.

Provide a one metre separation between new pedestrian cutdowns and existing poles or signs.

Pedestrian islands or other facilities, to aid safe crossing of roads, may be required in areas where high numbers of pedestrians are expected to be crossing (e.g., local commercial areas, reserves, schools, retirement homes, public facilities).

Provide tactile warning pavers for vision-impaired pedestrians on public footpaths at all pedestrian crossing kerb cut-downs in collector and arterial roads.

Avoid designing pedestrian crossing facilities that can be interpreted by pedestrians as official zebra crossings.

Ensure that all the traffic control devices are visible. Signs or raised studs, which comply with *CSS: Part 6*, or supplementary lighting, may be required. For lighting, refer to Section 11 of this ECOP and 11.13.10 Road Crossings for pedestrians.

Use the following standards and guidelines for the design and operation of pedestrian crossing facilities:

- NZTA Pedestrian Planning and Design Guide (2007)
- Traffic Control Devices 2004 Rule
- Guide to Road Design, Part 4: Intersections and Crossings –General
- Guide to Road Design, Part 4a - Unsignalised and Signalised Intersections
- Guide to Traffic Management, Part 6 - Intersections, Interchanges & Crossing
- Guidelines for Facilities for Blind and Vision-Impaired Pedestrians RTS 14
- CSS: Parts 1-7

11.13.11 Design for Refuse & Recycling Collection

The specific requirements for either refuse/recycling truck access or refuse/recycling container storage areas at the road boundary needs shall be clearly addressed by designers. Designers and developers are encouraged to engage with Council's waste collection contractor to ensure the proposed design accommodates truck access, and collection operations properly. This would include ensuring designers are using the correct vehicle specifications when developing turning circles.

Some items to consider when developing design of road corridors:

- Council refuse and recycling trucks use a mechanical arm to lift and empty bins and need to be able to access the bins to lift these
- Some properties can have up to three wheelie bins for rubbish, recycling and organics
- Adequate space along the kerbside of the serviced carriageway is required so that the mechanical lifting arms on the collection vehicles can reach the bins from the carriageway and empty them
- Bins are approximately 550 mm wide, and a space of 500 mm is required between bins or between bins and street poles
- For the short-term storage of refuse/recycling wheelie bin containers, an area should be set aside as a collection point close to the vested road carriageway if approved by Council. This must be accessible so that the containers can be mechanically lifted by the refuse truck working from the road. Adequate clearance and a level platform needs to be provided away from water races, road side swales, trees and landscaping

Refuse and recycling collections will not be provided within private rights of way or service lanes.

11.14 ROAD RESERVE DRAINAGE DESIGN

All road runoff must be contained in the legal road or within land over which drainage easements have been created in favour of Council.

Guidance and standards for the work can be found in:

- Integrated Catchment Management Plans (ICMP) for the development area
- Part 5: Stormwater and Land Drainage
- CSS: Parts 1-7

11.14.1 Primary system

On-street treatment of stormwater is a required part of the design. Design for the removal of contaminants throughout the stormwater system, but particularly before the stormwater enters existing open waterbodies. Collect surface water in kerbs and channels or within grassed swales, depending upon the requirements of that particular water catchment area, as detailed in the resource consent or project brief.

All pipework downstream from sumps contained within the carriageway must have a minimum internal diameter of 225mm. Sump or access chamber spacing must not exceed 90m, for maintenance purposes.

Provide a stormwater outfall in classified roads whenever the channel flow exceeds 25 litres/sec at a grade of 1in 500 for a 10-year event. Provide a stormwater outfall in local roads whenever the channel flow exceeds 50 litres/sec at a grade of 1 in 500 for a 10-year event. Refer to *WWDG Part B* chapter 22.10.

Do not detail sumps in kerb crossings. Where sumps are located in this position, consider the relocation of either the sump or crossing or detail the installation of a corner sump top and provide additional drainage capacity elsewhere if necessary.

Typically, treatment is provided via grassed swales – however Council may accept other proposed devices or methods at its sole discretion. The design approach should be discussed with Council at the pre-application meeting, to streamline approvals at Engineering Approval stage.

11.14.2 Swales

Design swales for temporary water storage or retention as this provides attenuation of stormwater peaks. It may also reduce the downstream flood peak. Normally this design consists of shaped grass berms, with no permeability built into the construction materials. Primary treatment is achieved by a detailed design that uses suitable permeable material to allow soakage to subsoil levels. Volumes undergoing primary treatment through infiltration can be increased through longer resident times in permeable swales. Provide opportunities for sediment to settle out in swales through slower velocities, longer resident times and dense grass cover, as these all slow overland flows.

Planting installed in the swale should not include bark, similar organic mulch or other loose easily transported material.

Note that repeated use of vehicles or the heavier ride-on mowers will substantially reduce the permeability of swales that have been constructed for primary treatment - take this into account. See Part 5: Stormwater and Land Drainage and Part 10: Reserves, Streetscape and Open Spaces, for guidance on design of swales.

11.14.3 Subsoil drainage

In areas of high groundwater, install subsoil drainage to protect the carriageway subgrade and/or metalcourse.

The subsoil drainage pipework must be drilled PVC or other approved perforated pipe.

11.14.4 Overland flow

The existing overland flow or drainage pattern may provide a constraint on possible design solutions. Ensure that the upstream catchment, including existing channels, can drain through the new works without ponding and that property outfalls, either at the kerb or at the boundary, are not raised above inlet levels. Thoroughly investigate the catchment around the project area, to determine accurate falls, transition levels and the most effective outfall.

11.15 PARKING

The off-street parking requirements for various activities are listed in the District Plan.

Acceptable widths for parking lanes vary from 2.2m minimum to 3.0m for high turnover areas. Refer to Manual of Traffic Signs and Markings for further information.

Provide mobility/accessible car parks which meet the requirements of NZS 4121 where appropriate, and where required by the brief or resource consent.

On higher category roads the movement function of the route becomes more critical. Therefore, consider the removal of on-street parking were indicated by capacity/road safety/road space allocation requirements.

11.15.1 Parking bays

Designers shall anticipate future location of accessways. Generally, these will be constructed on either side of a property frontage. When parking bays are in front of properties, consider the likely location of the property access, which may need restriction by a Consent Notice or Covenant on the land title.

11.15.2 Kerbside parking

Designers shall refer to the Selwyn District Plan for parking requirements.

Generally, Council prefers parallel parking on streets, and encourages designers to avoid angle parking including perpendicular angle parking. For specific areas of developments where angled parking in proposed, refer to the District Plan for requirements on carpark numbers and dimensions.

Requirements for mobility parking including number of parks to be provided are set out in the Selwyn District Plan. Provide mobility car parks to the dimensions specified in NZS 4121. Make allowance for additional footpath width for a 0.8m overhang wherever the kerb is to act as a wheel stop (included in the 5.0m stall depth).

Wherever reconstructed street-side parking in residential areas is provided in bays, rather than as part of the carriageway, it should be evenly distributed along the street. Construct all parking bays to the same design loading as the adjacent road pavement and with a minimum width of 2.5m for parallel parking. Radii should match those shown in Figure 4 below.

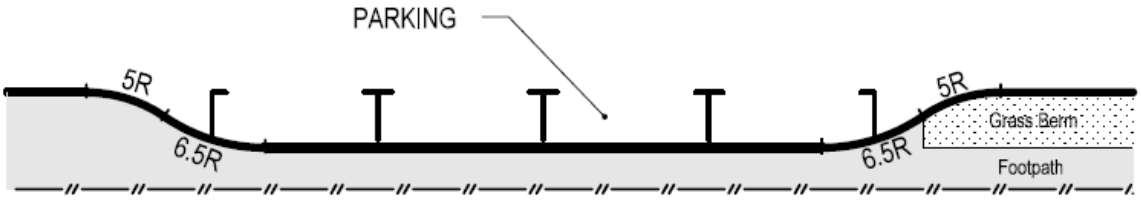

Figure 4- Parking bays

11.15.3 Parking space markings

Marking is required for all angle parking and where parking restrictions are in place. Mark mobility car parks in accordance with the Manual of Traffic Signs and Markings or as agreed with Council. There will also be other circumstances where roadmarking of parking is advisable (e.g., outside schools and on arterial roads in urban areas).

The Council approves the installation of parking signs and parking restrictions in accordance with the Traffic and Parking Bylaw. This is separate from and additional to engineering acceptance.

11.15.4 Manoeuvring Areas for on-site parking

The manoeuvring area to and from any parking space and parking aisle shall be designed to accommodate a B85 vehicle in accordance with AS/NZS 2890.1:2004.

In areas where a hazard or congestion is likely at the manoeuvring area to and from an access driveway or ramp these shall be designed to accommodate a B99 vehicle in accordance with AS/NZS 2890.1:2004 Parking Facilities.

If there are special circumstances or severe space limitations and relatively low traffic volumes a B85 vehicle may be used. The manoeuvring area to and from a loading space and loading aisle shall be designed to accommodate an 8.0 metre medium rigid track with a turn radius of 10.0 metres as referenced in Land Transport RTS 18 NZ On-Road Tracking Curves 2007.

11.15.5 Cycle Stands

The design and location of cycle stands is important to people who cycle and supports the promotion of active travel. In the past cycle stands have been poorly designed and often ineffective - for example cycle stands that are too low and may damage bike wheels.

The staple design, as shown in CCC CSS Part 6, is a simple and effective system preferred by cyclists if the height is no less than 750mm (such that it can support the bike frame rather than just “hold” the wheel) and no greater than 1000mm.

Other cycle parking systems are available and will be considered if they meet the outcomes indicated in Cycling parking planning and design: Cycling Network Guidance technical note - published May 2019 (nzta.govt.nz)The District Plan requires that cycle parking be provided on the same site as the activity and located as close as practicable to the building main entrance, and be clearly visible to cyclists entering the site, and be well-lit and secure.

Consideration of longer cargo bike configurations is required at Council facilities.

Design guidance is also available from Christchurch City Council's Christchurch Cycle Design Guidelines.

Further information on best practice cycle parking can found in the Cycling parking planning and design: Cycling Network Guidance technical note - published May 2019 (nzta.govt.nz).

11.16 PUBLIC TRANSPORT

Consider the specific needs for public transport at an early stage of the design process to ensure:

- Roads can cater for the manoeuvring requirements of public transport vehicles (including turning around at a terminus)
- Termini of routes are identified
- Routes are efficient and easily accessible by public transport vehicles
- Proposed routes form a coherent new bus route or an extension to an existing route
- Adequate space for bus stops and associated facilities (e.g. shelters)

The provision of bus routes in new development areas must be discussed with Canterbury Regional Council (Environment Canterbury) staff. New bus routes may be provided by the Regional Council where it is economic and practical to do so.

Infrastructure will need to be provided by the developer as a condition of a resource consent.

- Wherever there is an existing bus route which can service the area (as defined in the previous sentence), there should be easy and direct access to it for pedestrians.
- Wherever cul-de-sacs are used to provide access to properties, footpath linkages should put in place where these will provide direct pedestrian linkages to bus routes.
- Higher density housing and community facilities, such as schools, parks, shops, or retirement villages, must be located close to existing or potential future bus routes to enhance access to the services and encourage use of sustainable transport

Wherever the bus route travels through a development, now or is likely to in the future, design the relevant roads to ensure:

- The bus can travel and manoeuvre along the proposed route easily
- No obstructions
- No traffic delays
- Adequate space for bus stops and associated facilities without obstructing footpaths or cycle routes

Bus routes are generally along collector or arterial roads. Routes need to be as direct as possible to reduce travel times and should avoid or minimise complicated turning manoeuvres at intersections. Avoid right turns when accessing arterial roads. Consult with Environment Canterbury to discuss potential routes with their staff.

Bus priority measures such as bus lanes will be required in certain locations. Consult with Selwyn District Council before submitting engineering drawings to ensure that design and intersections conform to the Council's requirements.

Plan and co-ordinate the bus stop locations and associated infrastructure on the street with Selwyn District Council and Environment Canterbury at the consent stage.

11.17 BRIDGES, CULVERTS, RETAINING WALLS AND OTHER STRUCTURES

Bridges, culverts, retaining walls and other structures within the legal road perform a key role in ensuring continuity of access for the public. Design these items to ensure their continuous function (including during extreme events) throughout their design life as per Table 20 shown below.

Note: where works affect water races, refer to Section 9 Water Races.

Table 20 - Design life for structures

Structure type	Design life
Timber bridges	75 years
Steel or concrete bridges & culverts	100 years
All other structures	50 years

Other design issues include, but are not limited to:

- Legal compliance – building and resource consents are required for retaining walls. The Policy on Structures on Roads details the requirements for the Deed of Licence
- Aesthetic contribution – use the design of the new structure and any fall protection to enhance the attractiveness of the built environment
- Heritage – protect and retain existing historic retaining walls and design adjacent structures in context with these features
- Existing structures – ensure lane widths are not compromised when retrofitting existing
- Structures to cater for future traffic needs
- Maintenance – ensure access for mowing and other maintenance activities.

State the key achievement criteria and assumptions in the Design Report, as detailed in clause 3.3.2 – Design Report. Specify hold points for construction, for inclusion in the Contract Quality Plan and required material or performance tests to be included in the Contractors Inspection and Test Plan.

11.17.1 Bridges

Refer to the Bridge Manual for specific design information.

Determine the width of bridges and culverts in conjunction with the site-specific current and future road requirements for carriageway widths. The length of these structures is also site-specific and must make

allowance for waterway requirements during extreme events and the requirement for footpaths. Design the wing wall and anti-scour structures to provide support and to prevent scour, as required.

Peer review processes for new structures and works impacting on the function of existing structures will generally be required.

11.17.2 Retaining Walls

Only retaining structures that will be vested in Selwyn District Council may be located on legal road. Retaining structures that support private assets or private property e.g., driveways, must be located outside of the legal road unless approved otherwise by Council.

Design retaining walls to ensure their continuous function (including during extreme events) throughout their design life as detailed in Table 21 (shown below).

Table 21 - Design & Durability of Retaining Walls

Wall Type	Design Life (years)
a) Uphill of road	75
b) Uphill of road directly supporting infrastructure to be vested or existing private buildings structures ad urban gardens	100
c) Directly supporting road	100*
d) Not directly supporting road	75

Note*:

The design life of minor walls (less than 1.5m height that can be maintained or replaced without impeding the function of the adjacent road) may be reduced to 50 years with the approval of Council.

11.17.3 Culverts

Ensure all culverts can support fire appliance loading, including for accessway culverts.

Determine the width of bridges and culverts in conjunction with the site-specific current and future road requirements for carriageway widths. Consider the land drainage requirements, as set out in section 8 and Chapter 13 of the *WWDG*. The length of these structures is also site-specific and must make allowance for waterway requirements during extreme events. Design the wing wall and anti-scour structures to provide support and to prevent scour, as required.

Other design issues include, but are not limited to:

- Legal compliance – building and resource consents are required for bridges, culverts, retaining walls and other structures, as appropriate
- Technical requirements – bridges and culverts must have separated footpaths, space for cyclists and suitable guard-rails/handrails. The surfacing of bridge decks must meet the site-specific traffic loading requirements including skid resistance requirements
- Waterway requirements - consider the effect of the road on the secondary flow path for any waterway crossing. Refer to clause 811.7.2 Vertical Alignment

- Aesthetic contribution – use the design of the new structure to enhance the attractiveness of the built environment
- Existing structures – ensure lane widths are not compromised when retrofitting existing structures to cater for future traffic needs.

11.17.4 Safety Barriers

Where required by Council road safety barriers systems are to be installed to Waka Kotahi NZ Transport Agency requirements.

For bridges and culverts design guardrails generally in accordance with the Bridge Manual except that:

- Side protection in low-speed environments (under 50km/hr) is not always required to comply with Appendix B of the Bridge Manual. Where Appendix B requirements are not achieved, provide a road safety audit or assessment with the site-specific design in the design report, confirming the design impact speed used in the guardrail design.
- Guard rail transition distances in speed zones of 50km/hr or less may be reduced.

Design barriers for cycle or shared paths over bridges and culverts to be 1.4m high and in accordance with the Bridge Manual. Design the barrier to resist the loads detailed in Appendix B clause B6.4 of the Bridge Manual. The application of CSS: Part 6 SD 621 Pedestrian Safety Fence is still appropriate for situations where the impact from cars and cycles is not being mitigated.

The application of CSS: Part 6 SD 621 Pedestrian Safety Fence is still appropriate for situations where the impact from cars and cycles is not being mitigated.

11.18 VEHICLE ACCESS

Refer to the District Plan for requirements for access to existing roads including location and distance from intersections. Discuss access to the existing road network with the Council, and New Zealand Transport Agency, if a State Highway is affected.

The safety and efficiency of the existing roads must be maintained, when considering connections or accesses from the development.

11.18.1 Vehicle Accessways

Formed and sealed vehicle entranceways (between the sealed edge of carriageway and the property boundary) are to be provided to each ROW or back lot (servicing 2 or more lots) to the minimum standards as outlined in the Selwyn District Plan. Refer also to SDC's website for more information relating to the requirements for Vehicle Crossings and the associated design and approval process (link here).

The vehicle crossing to each lot shall be formed and sealed. Designers shall ensure that manoeuvrability is addressed in the design to ensure adequate accessway turning for vehicles including service vehicles.

Designers are expected to anticipate the location of property vehicle crossings, even if crossings do not form part of the subdivision physical works. Designers should consider the following:

- Vehicle crossing proximity to intersections
- Planted area's
- Streetlights

When low profile kerb is used, cut downs are to be installed for right-of-way crossings only.

Vehicle crossings to ROW's are required to have a kerb cutdown and heavy-duty beam as per CSS SD611 Case B for ROW's servicing 3 or more lots, for less than 3 lots SDC Dwg RD02.A should be referenced.

Ensure that all access culverts, including for residential lots, are suitable for fire appliance loading. Confirmation shall be provided in the Design Report.

11.18.2 Service Lanes, Private Rights of Way (ROWs) and Access Lots

Designers are expected to consider the long-term maintenance costs for residents against the benefits of providing access through a vested road. Council may require designers to provide this information in the Design Report where there the reason for accessway provision is unclear.

Ensure that safe egress is considered in the design of narrow roads, service lanes and ROWs. Confirmation that this has been addressed shall be included in the Design Report.

Vehicle access to a site (or sites) that will be provided by a private right of way must comply with the requirements of the District Plan, Rural Volume Appendix 10, and Townships Volume Appendix 13. The design and construction of accessways and ROWs must comply with the requirements for equivalent construction within legal road, including the design life. This includes the provision of a secondary flowpath for stormwater, as detailed in clause 5.6 –Drainage System Design.

There shall be no more than 5 individual vehicles entrances (crossings) on each side along any 1 km section of State Highway and Arterial Road, measured 500 metres either side of a proposed entrance.

11.18.3 Site access

Designers shall anticipate likely vehicle crossing locations for individual property lots when carrying out design, even when property access formation does not form part of the subdivision works, and consider this carefully in the location of features such as light poles, trees, power boxes etc. Placement of street light poles in front of properties is likely to cause issues, so alignment of streetlight poles with property boundaries is preferred. Demonstration of this consideration shall be clearly shown in the Design Report. Vehicle crossings can be located anywhere along a property frontage unless a specific requirement is identified in an associated resource consent or in the District Plan.

Design all kerb crossings and cut-downs to ensure the satisfactory passage of the design vehicle, as laid out in AS/NZS 2890.1:2004 *Parking Facilities Part 1: Off- street Parking.*

Wherever access to property is required across a swale, the crossing design must be specific for the affected site(s). The designs shown in *CSS: Part 6* are acceptable design solutions.

For access to property required across a water race, the crossing design shall be as noted in Stock Water Races – 13.6.13 Bridges and Culverts.

The dimensions of all vehicle crossings must comply with the District Plan.

Use the following standards and guidelines for the design and operation of intersections and vehicle crossings:

- Austroads Guide to Road Design Parts 4, 4A,4B,4C and Guide to Traffic Management Part 6
- Guidelines for the Implementation of Traffic Controls at Cross Roads, RTS 1
- CSS: Parts 1-7
- Application to form a vehicle crossing (link here) or refer to SDC website

11.18.4 Rural vehicle entrance and roadside drains

Council requires vehicle entrances to be formed across roadside drains with appropriately sized Class 2 reinforced concrete pipes. A number of these drains carry high volumes of water. Specific design may be required to confirm pipe size. Confirm with Council staff. Minimum pipe diameter for roadside drains is 300mm. Pipe size is also typically driven by the pipe sizes used immediately upstream or downstream of the proposed crossing. Concrete headwalls will be required to ensure there is adequate support as approved by Council.

11.19 CONSTRUCTION REQUIREMENTS

Unless specific construction requirements are agreed or amended by this document the construction requirements set out in CSS Part 6 – Roads 2019 apply.

Contractors are to follow the requirements for Corridor Access Requests and Temporary Traffic Management set out in Section 3.

11.20 COMPLETION DOCUMENTATION

Records that comply with the requirements in Part 3.7: Completion Documentation are to be provided. The specific requirements related to roading and transportation are detailed below.

The amount and type of completion documentation required for 224 will depend on the nature of works completed under the Resource Consent.

The list below is an indication of Completion documentation that may be required for capital works:

- Material specification compliance test results
- Subgrade test results and corresponding recalculations of metalcourse depths
- Compaction test results
- Benkelman Beam test results
- As-built levels of the top of kerb, manhole covers and the road centreline
- Surface profile test results for roads and rights of way greater than 100m in length i.e. NAASRA/International Roughness Index
- Surface texture test results
- Concrete or asphalt core test results
- Post-construction safety audit.

The Consultant shall supply a copy of specific test results as part of the application for S224c. Standard requirements are as shown below in Table 22.

Table 22 - Transport and roading records required as part of subdivision S224c application

Completion Document	Section Name	File Format	Test requirements
Nuclear Density Tests – Kerb and channel with location plan	ND Tests Kerb	pdf	See section 11.11.1
Nuclear Density Tests - concrete footpath foundations with location plan	ND Tests Footpath	pdf	See section 11.9.1
Benkelman Beam Tests with location plan	BBM	pdf	See section 11.9
Roading Footpath Clegg Tests with location plan	Clegg Tests Footpath	pdf	See section 11.9.1
Roading Vehicle Crossing Clegg Tests with location plan	Clegg Tests Crossing	pdf	See section 11.9.1
Schedule of Vested Assets	Vested Assets	excel	See Section 4
RAMM As-built Spreadsheet	RAMM	excel	See Section 4
Roading As-builts		dwg	See Section 4
Final Safety Audit Report	RSA	pdf	See Section 11.5.1

APPENDIX 1 – STANDARD DRAWINGS

Drawing Number		Name/Description
RD	1.0	Standard kerb & channel
RD	1.0A	Standard kerb & channel with expansion Heavy Duty
RD	2.0	Low Profile kerb & channel
RD	2.0A	Low profile kerb & channel with expansion Heavy Duty
RD	2.1	Detail strengthened kerb & channel
RD	2.2	Dish channel
RD	2.3	Kerb & nib, flush kerb
RD	2.4	Standard concrete nib
RD	2.5	Standard concrete nib for paved entranceways and footpaths
RD	2.6	Brick haunching
RD	3.0	Standard road construction
RD	3.1	Standard footpath construction
RD	3.2	Standard vehicle entranceways
RD	3.2A	Rural vehicle entranceway standard (local roads)
RD	3.2B	Rural vehicle entranceway standard (arteria and collector roads)
RD	3.2C	Commercial and heavy entranceway standards (all roads)
RD	3.2D	Rural vehicle entranceway with culvert standard (local roads)
RD	3.3	Standard driveway
RD	3.4	Standard rural road cross-section
RD	3.5	Typical plan cul-de-sac
RD	3.6	Standard detail of ROW section
RD	3.7	Typical cross section vehicle entranceway (rural type)
RD	3.7A	Typical cross section vehicle entranceway (one way crossfall)
RD	3.7B	Typical cross section vehicle entranceway (showing both on one page)
RD	4.0	Standard island detail
RD	4.1	Pedestrian refuge island
RD	4.1B	Pedestrian refuge island
RD	4.3	Cycle holding rails
RD	4.5	Township vehicle entranceway
RD	7.0	Cutdown