WAIMAKARIRI DISTRICT COUNCIL

ENGINEERING CODE OF PRACTICE

PART EIGHT

ROADING

April 2009

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8.1 INTRODUCTION

This Part of the CoP provides guidelines and standards as a basis 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. The standards included in this Part are one way of achieving the desired outcomes and performance criteria of the network components described below.

8.1.1 Philosophy

Access to, and within, areas to be developed includes more than the road network constructed to provide formal access to properties. It also includes public transport access and purpose-built green linkages that provide for pedestrians and cyclists to use areas such as reserves and waterways.

These linkages need to reflect desire lines, within and outside the area, and make the area attractive so that people are encouraged to walk or cycle rather than use their car where practicable, particularly for shorter local trips. When this can be achieved, it results in energy savings and creates a safer and more pleasant neighbourhood.

Urban streets can serve a wide range of functions, whilst providing valuable and unique areas of community space (see Figure 8.1). Use the design process to challenge the assumption that motor vehicles have "automatic" priority (particularly on local roads) and consider all the demands and functions of the street space, in order to achieve a better balance for all those who use it.

This Council supports the "Living Streets" concept developed by the Christchurch City Council (CCC). Information about creating Living Streets is available on the CCC website.

Roads through rural communities tend to serve both low-speed and high-speed traffic. Pedestrians, cyclists, horse riders and moving stock should be allowed for in the design, as well as motor vehicles. Where vehicles are rare, the tendency to consider the road as open space increases. Combined with higher speed limits, this means that providing good sight-lines and clear zones become even more important. Rural roads often have a lower level-of-service requirement than urban streets, but this should not be allowed to reduce safety.

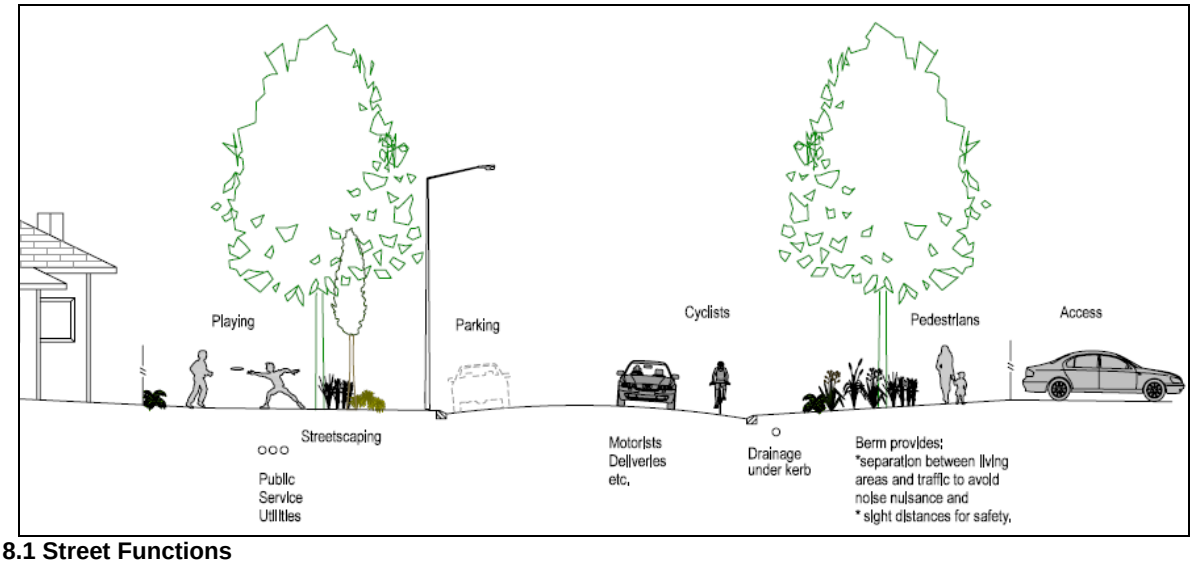

Figure 8.1 Street Functions

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The Council encourages innovative design, for access and roading, which satisfies the following objectives:

- Safe – the layout must be safe for pedestrians, cyclists, public transport and motorists;
- Secure – the design of the roads and other linkages must not compromise the personal security of the users;
- Energy efficient – the layout should minimise the number and length of vehicle trips and promote alternatives to motor vehicle use;
- Linked – the layout of a development should be extended on a hierarchical network basis for all modes. In particular, good traffic permeability is important in a development. It should promote walking and cycling, particularly for short trips to local facilities, and should provide direct access to public transport routes. Linkages to existing areas of development must also be provided.
- Suitable traffic speeds – the road design must encourage traffic speeds that are appropriate for the road classification and context;
- Comprehensible – the road layout must be easy to read and follow, for both residents and visitors;
- Enhances environment – the road design should incorporate carriageway and residential stormwater quality improvements or design features as part of the grass berm design e.g. encouraging sheet flow over grass berms, swales protected from traffic use;
- Attractive – the design of the street landscaping and other features can add significantly to the amenity, environment and character of the area.

In addition, the different purposes of roads in the hierarchy should be appropriately considered. Generally, access onto roads with higher classifications should be limited.

Where the above objectives may be achieved through other mechanisms, the Council may reconsider applying the specific requirements of this part of the CoP to a development.

Be familiar with the following documents when considering the design of the development:

- ECan *Regional Land Transport Strategy*
- WDC *Parking Bylaw*
- WDC *Walking and Cycling Strategy*
- WDC *Road Safety Strategy*
- NZS 4121:2001 *Design for Access and Mobility: Buildings and Associated Facilities*
- AS/NZS 1158 *Lighting for roads and public spaces – series*

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8.2 CONSENT AND COMPLIANCE ISSUES

The consent and compliance information set out in Part 2: *General Requirements* applies to all works within the Waimakariri District, with the addition of the clauses below.

8.2.1 Legislation

The Land Transport Act 1998 and amendments is the principal statute that controls roads and highways.

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

- Land Transport Management Act (2003)
- Land Transport Act (1998);
- Traffic Regulations (1976);
- Land Transport NZ *Traffic Control Devices Rule*;

8.2.2 District Council Requirements

Requirements in all bylaws relating to traffic and roadworks must be met. New roads require approval from the District Council, which is generally granted as part of the standard subdivision consent.

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8.3 QUALITY ASSURANCE REQUIREMENTS AND RECORDS

Provide quality assurance records that comply with the requirements in CoP Part 3: *Quality Assurance*, during design and throughout construction.

8.3.1 The Designer

The designer of all road networks that are to be taken over by Waimakariri District Council must be suitably experienced.

The design reviewer must have at least equivalent experience to the designer.

8.3.2 Design Report

Provide the following information as a minimum, to support the engineering drawings and Design Report:

- A clear description of the purpose of the work;
- Transport infrastructure and services issues (e.g. vehicle, cycle, public transport, pedestrian);
- Traffic-loading, traffic modelling and volume data and projections used and calculations;
- Geometric data;
- Geotechnical data, including subgrade information and CBR's;
- Pavement design methodologies used and corresponding metalcourse calculations;
- Surface treatments;
- Road drainage control and edge treatment;
- Hydraulic data (e.g. road level, flood level);
- Slope retention;
- Utility services conflicts and programmed work issues;
- Preliminary traffic safety audits;
- Streetscape and amenity features;
- All assumptions used as a basis for calculations;
- Details of investigations such as ground water levels, profiles, infiltration testing and effects on the environment and geological or water quality assessments.
- All options considered and the reason for choosing the submitted design;

8.3.3 Safety Audit

A safety audit of the design for all roading, pedestrian and cycle facilities should be undertaken by an independent qualified road safety auditor, and submitted as part of the design. Safety auditors should be totally independent of the project team and must be appointed separately from the professional services contract for the project development. The safety audit provides a check that the proposed design is safe and complies with all of the legal requirements for road marking, lighting and signage.

A safety audit of the constructed asset must also be undertaken by a qualified road safety auditor and submitted as part of the As-Built record.

Carry out safety audits in accordance with the Land Transport New Zealand Guideline *Road Safety Audit Procedures for Projects*. Use the Austroads *Guide to Traffic Engineering Practice, Part 4: Treatment of Crash Locations,* for safe design practices.

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8.3.4 Construction Records

Provide the information detailed in CoP Part 3: *Quality Assurance* and the CCC *Construction Standard Specifications (CSS)*, including where applicable:

- Material specification compliance test results;
- Subgrade test results and corresponding recalculations of metalcourse depths;
- Compaction test results;
- Benkelman Beam test results;
- Surface profile test results i.e. NAASRA/International Roughness Index;
- Surface texture test results;
- Concrete or asphalt core test results;

8.3.5 Post-Construction Records

Provide the information detailed in CoP Part 3: *Quality Assurance*, CoP Part 12: *As-Builts*, and CCC *CSS Parts 1-7*, including where applicable:

- Design report
- Completion certificates;
- Producer statements – design, construction, construction review
- Post-construction safety audit;
- Commissioning report, including all test results
- As-built plans and records

8.3.6 Approved Materials

All materials shall comply with the appropriate standards and with manufacturer's requirements.

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8.4 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 usually 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 these roads within the development, 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.

The traffic volume, surrounding land uses and the function of each link, determines its classification, and therefore its geometric characteristics and preferred speed regime. The classification of existing roads within the District is listed in the *District Plan*, plans 135-137.

Be aware of any local area traffic management schemes or neighbourhood improvement plans which may incorporate street requirements for the area.

8.4.1 Strategic Roads

Strategic roads are generally present, former or proposed State Highway roads serving as the main traffic routes into, through and out of the District. They are constructed and managed to minimise their local access function

These roads must be designed in conjunction with the appropriate roading authority. Discuss access to the existing road network with the Council and Transit New Zealand (if a State Highway will be affected) at the consent stage. Use the TNZ *Planning Policy Manual* for the design of any works on or adjacent to a state highway.

8.4.2 Arterial Roads

Arterial roads cater primarily for traffic movement feeding onto the strategic roads. They are constructed and managed to minimise their local access function.

These roads must be designed in conjunction with the appropriate roading authority. Discuss access to the existing road network with the Council and Transit New Zealand at the consent stage, if a State Highway will be affected. Use the TNZ *Planning Policy Manual* for the design of any works on or adjacent to a state highway.

8.4.3 Collector Roads

Collector roads are generally the preferred route for travel within the District, between areas of population and principal activities. The function of collector roads is to provide the link between the local roads and the strategic/arterial roads.

In the urban area, collector roads usually have predominantly residential frontage and will often contain the bus routes within the neighbourhood. A speed environment of up to 50 km/h is expected.

8.4.4 Local Roads

The primary purpose of local roads is to provide access to properties and other local streets. Their design should encourage a low speed environment of 30-40 km/h, and provide a safe environment for pedestrians and cyclists. These roads are likely to be close to areas of demand such as shops and schools.

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

8.4.5 Traffic Volumes

Identify the likely volumes of traffic that will be generated by a development, using the following average household trip generation rates:

Table 8.1 Household trip generation rates

Areas	Trips/Household/Day
Urban areas	10
Rural areas	8

If surveyed data is available for areas with similar characteristics, use this in preference to the values above, due to the variation in generation rates throughout the District.

Where not specified by the Council, use the expected traffic volume to decide on the appropriate classification of roads within the development area, according to the recommended daily flows as outlined in the *District Plan*.

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8.5 SPEED ENVIRONMENT

The speed environment of roads can have a huge impact on the actual and perceived safety of the facilities; therefore it is important to design for the appropriate speed of the roads involved. Determine the speed environment for the road classification based on the Land Transport Rule *Setting Speed Limits*.

This should be done first as it is the primary design control. 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. Use the flow chart in Figure 8.2 for determining alternative design options.

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 entering 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.

Find standards for the design of higher speed environments, such as are appropriate on various classified and rural roads, in the *Austroads* series and TNZ manuals.

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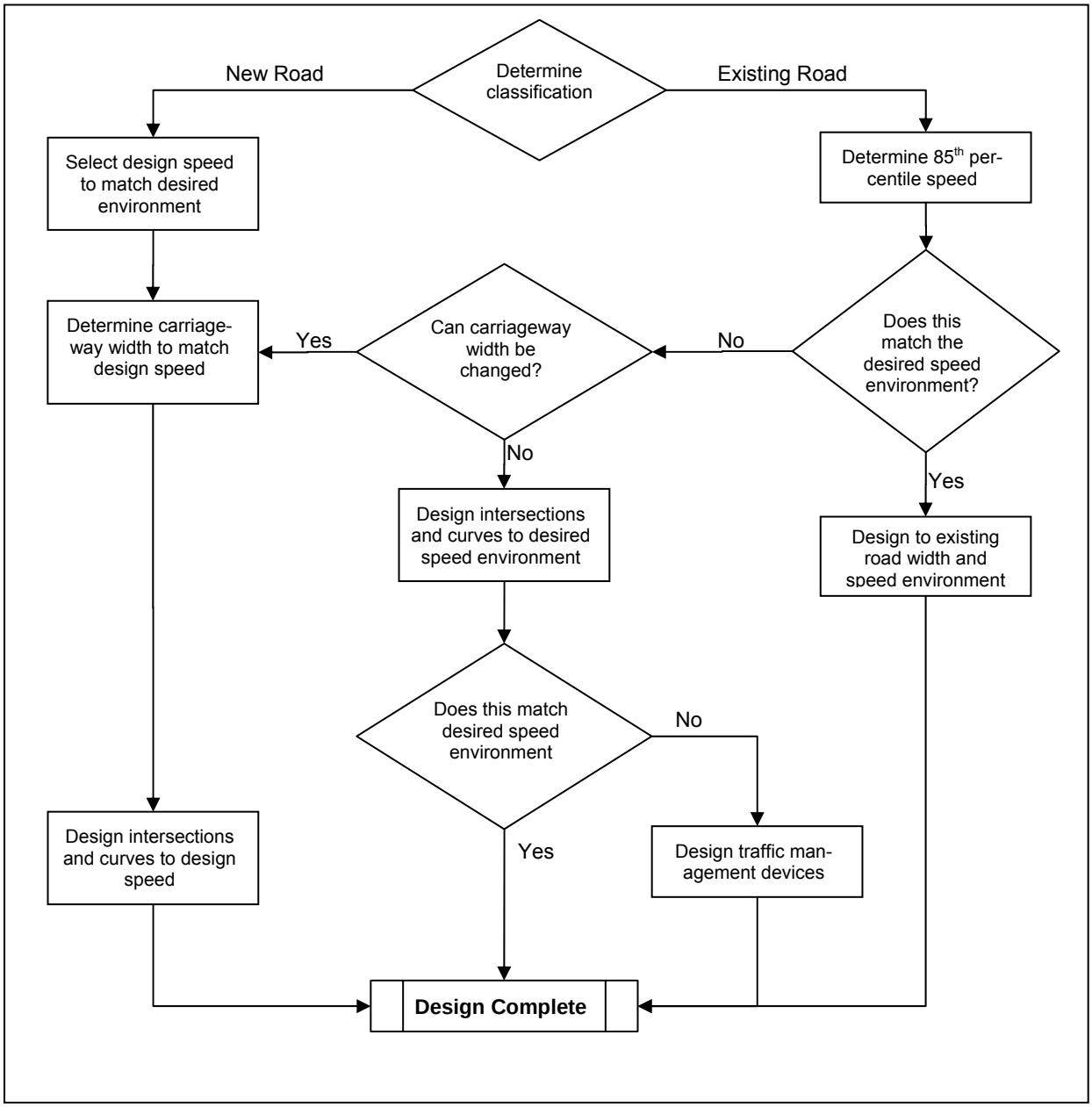

Figure 8.2 Application of traffic management

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8.6 ROAD DESIGN

Areas that require particular attention during road design are:

- Speed environment;
- Intersection design and spacing;
- Pavement design;
- Connections and intersections with the existing transport network;
- Bus movement requirements and bus stop locations and facilities;
- Pedestrian and cycle facilities;
- Parking requirements;
- Road crossings for pedestrians;
- The connection of off-road facilities to roads and property access;
- Lighting;
- Road surfacing.

Consider life cycle costs and benefits for all new road elements. When choosing materials in particular, consider the replacement and maintenance cost whilst ensuring levels of service are met.

8.6.1 Access to Existing Roads

Discuss access to the existing road network with the Council, and also Transit New Zealand, if a State Highway is to be affected.

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

8.6.2 Culs-de-sac / Hammerheads / No-Exit streets

Culs-de-sac can provide pleasant residential environments with little traffic and a sense of community. However, if they are used to excess they can lead to:

- A loss of comprehensibility;
- Inadequate linkage with existing roads;
- No opportunity to link with future roads;
- Inefficient layout of roads and other linkages;
- The discouragement of walking, cycling and public transport use;
- Poor public passenger transport route structures and accessibility;
- The loss of emergency vehicle access, in some situations.

Therefore a balanced approach to their use is required.

The length of culs-de-sac should be no longer than 150 m.

Where possible, provide walking and/or cycling linkages at the end of culs-de-sac to parks, reserves or other roads. When designing large cul-de-sac heads, consider incorporating islands or other measures to break up large expanses of seal. Surface all turning heads and hammerheads with asphaltic concrete.

Cul-de-sac heads that conform to NZS 4404:2004 (Clause 3.3.9) are acceptable.

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8.6.3 Parking

Provide parking on all roads, with improved facilities in business areas. Widths for parking lanes vary from 2.5 m minimum to 3.0 m for high turnover areas. The off-street parking requirements for various activities are listed in the *District Plan*. Refer also to the WDC *Parking Bylaw.*

Wherever on-street parking in residential areas is provided in bays, rather than as part of the carriageway, it should be at the minimum rate of one space per three residential units and evenly distributed along the street. Construct all parking bays to the same standard as the adjacent road pavement and with a minimum width of 2.5 m for parallel parking.

When parking bays are located in front of properties, consider the possible location of the property access, which may need restriction by a Consent Notice.

Marking is required for all angle parking and where parking restrictions are in place. There will also be other circumstances where roadmarking of parking is advisable e.g. outside schools and on arterial or strategic roads.

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8.7 GEOMETRIC DESIGN

8.7.1 Design Speed

Roads classified as higher than a local road are typically designed to a higher speed than local roads. Austroads *Urban Road Design* states that major urban roads should be designed for an operating speed 10 km/h above the legal speed limit. The desired speed environment or target speed for local urban roads may determine the design speed. Refer to Austroads *Part 10: Local Area Traffic Management* clause 4.3.

Austroads *Rural Road Design* states that rural roads should be designed for the 85th percentile operating speed.

The *Speed Limits Bylaw* sets out the speed limits for the listed roads.

8.7.2 Horizontal Alignment

Design the elements of the road network for the appropriate design speed.

Design intersections to meet the tracking curve requirements in the Land Transport NZ *On Road Tracking Curves for Heavy Vehicles* (RTS 18). Pedestrian crossing distances must be minimised at local road intersections.

A design vehicle shall be used of selected dimensions and turning characteristics representative of the 90th percentile vehicle (i.e. the vehicle for which only 10% of vehicles in its category have more critical dimensions).

Table 8.2 Vehicle Types Road Classification

Road Classification	Vehicle Type	Minimum Turning Radius (m)
Strategic and Arterial	B Train	12.5
Collector & Urban Collector	Semi trailer HCV	12.5
Local & Cul-de-sac	Single unit HCV	10.0

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 superelevation reversal (where the design speed is greater than 50 km/h).

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

Where horizontal curves of less than 60 m radius are necessary for topographical or other reasons, extra widening of between 0.5 and 1.5 m may be required, according to the width of carriageway available to moving traffic, the radius of the curve and the classification of the street. Austroads *Urban Road Design* Table 8.7 provides further information to calculate this extra widening.

Generally, horizontal curves shall conform to either Austroads *Urban Road Design* or *Rural Road Design*, as appropriate.

8.7.3 Vertical Alignment

Gradient lengths must be as long as possible, with vertical curves provided in compliance with Austroads *Urban Road Design* or *Rural Road Design*, where necessary.

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Gradients at any point on the kerb line should comply with the following:

- No steeper than 1:6; and
- No shallower than 1:500, and
- No shallower than 1:300 on the outside kerb line of any curve.

Kerb grades less than 1:500 may be acceptable in conjunction with underchannel piping or frequent stormwater outfalls.

Wherever the change of gradient exceeds 1%, join the change with appropriate vertical curves of not less than 30 m for through roads and 20 m in culs-de-sac.

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.

8.7.4 Crossfalls

Normal carriageway crossfalls should be 3% for urban roads, and formed as per Austroads guidelines.

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 edge of seal. 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 should not exceed 6%, when measured from the carriageway edge to the crown.

Transitions from sealed to unsealed roads shall be constructed so that the crossfall on the metal road is never less than 1^{V}: 20^{H} (5%). The transition from the sealed crossfall to metal crossfall shall be taken up in a 20 m transition section of only the sealed carriageway.

8.7.5 Superelevation

Normally superelevation is not applied to urban roads. For speed limits over 50 km/h, specific design of superelevation will be required. Where superelevation is required, it shall be applied in accordance with Austroads guidelines.

8.7.6 Cross-section Design

Provide carriageway and legal road widths that comply with Table 8.3. Design these widths as part of an optimal road cross-section, to achieve the following objectives:

- 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;
- 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;
- Provide a safe layout for all users.

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

Table 8.3 Road Design Attributes by Zone (from Table 30.1, District Plan)

Road Type	Strategic		Arterial		Collector/Urban Collector		Local		Cul-de-sac	
Zone	Rural	Res & Bus	Rural	Res & Bus	Rural	Res & Bus	Rural	Res & Bus	Rural	Res & Bus
Min. width of road (m)		30	20	20	20	20	20	16	20	16
Min. lane width (m)	3.5	3.5	3.7	3.3	3.5	3.3	3	3	3	3
No. of lanes	2	2	2	2	2	2	2	2	2	2
Parking lanes width (m)	-	2.5	-	2.5	-	2.5	-	2	-	2
Min. no. of parking lanes	-	2	-	2	-	2	-	1	-	1
Min. sealed shoulders width (m)	1.5	-	0.75	-	-	-	-	-	-	-
Min. footpath width (m)	-	1.5	-	1.5	-	1.5	-	1.5	-	1.5
Min. no. of footpaths	-	2	-	2	-	2	-	Res = 1 Bus 1 = 1 Bus 2 = 2 Bus 3 = 0	-	2
No. of Cycleways	2	2	2	2	2	2	-	-	-	-

8.7.7 Rural Road Shoulders

Shoulders on rural roads shall be in accordance with Table 8.5. Make an allowance for off-road parking areas on roads with 1.0 m shoulders.

Table 8.4 Shoulder Width

Design Traffic Volume (AADT)	Formed Widths (m)	Sealed widths (m)
Single lane road <150vpd	2.0	0.5
<500	1.5	0.5
500-1000	1.5	0.5
>1000	2.0	1.0
>3000	2.0 – 2.5	1.5

Sealing of the shoulder varies from 0.5 – 1.5 m, depending on traffic volumes and site conditions. Mark edgelines to prevent shoulders being incorporated in the traffic lane. On local rural roads, the shoulder widths may be determined by the width required to provide cycle facilities.

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8.7.8 Medians

The *District Plan* sets out requirements for the installation of medians.

Determining median widths is typically dictated by the function of the median and intersection details. Austroads *Urban Road Design* clause 12.6 provides guidance on median functions, types and widths.

Flush medians may be used for roads in urban areas that have speed restrictions of 70 km/h or less. Flush median uses include provision for right turning traffic to leave through lanes to queue and also for pedestrian refuge points. Splitter islands shall be provided where required by the Council.

8.7.9 Hill-side Construction

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 8.7.6 – *Cross-section Design*.

Options available for hillside construction:

- Design narrower legal road widths. Wider widths may be impractical 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.
- Locate pedestrian and cycle facilities separately from the carriageway.

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8.8 INTERSECTION DESIGN

The potential for crashes to occur at intersections is higher than other areas of the road network, due to the number of conflicting vehicle, cycle and pedestrian movements. Proper design of intersections can reduce the number of conflicts, while providing for a range of turning movements.

Consider traffic safety issues due to the location of existing above-ground structures e.g. poles or trees, at the time of design.

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

- Austroads *Guide to Traffic Engineering, Part 5: Intersections at Grade*
- Land Transport NZ *Guidelines for the Implementation of Traffic Controls at Cross Roads*, RTS 1
- Christchurch City Council, *CSS: Parts 1-7*
- Waimakariri District Council Standard Drawings 600-260A/B through to 600-263A/B

8.8.1 Comprehensibility

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 higher 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. Reduce confusion by minimising the use of culs-de-sac and, in particular, culs-de-sac accessing other culs-de-sac. See clause 8.6.2 above.

8.8.2 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 two classification levels or more apart must intersect, then the Council may consider movement controls such as left in/out only or entry only.

Within new residential areas, appropriate intersection types include:

- Priority, roundabout or signal 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.
- Roundabouts shall be considered for use in four-way intersections at grade, due to the high crash risk. Local roads should not intersect with the main road network as cross roads and should only form cross junctions with themselves where necessary. Where unavoidable and a reasonable volume of traffic across the busier road is anticipated, offset the quieter roads as a left – right stagger, to minimise the risk of crashes.

Wherever traffic from the planned roading network for a development will access a collector, arterial or strategic road, the intersection may require roundabout or traffic signal control or have certain movements restricted. Consult with the Council before submitting engineering drawings, to ensure that the intersection conforms to the Council's requirements.

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8.8.3 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 in accordance with the District Plan. Discuss spacings for major intersections with the Council before engineering drawings are submitted.

8.8.4 Sight Distances

Adequate sight distances at an intersection must be provided as sight distance is fundamental to safe intersection design. When designing intersections and/or small radius curves use Austroads *Guide to Traffic Engineering, Part 5: Intersections at Grade*, which provides guidance on the minimum sight distance requirements.

8.8.5 Traffic Control Signage

When signs are used within the road corridor, they must comply with the following standards and guidelines:

- TNZ & Land Transport NZ *Manual of Traffic Signs and Markings Part 1*
- Land Transport NZ *Guidelines for Street Name Signs*, RTS 2
- Land Transport NZ *Road Signs and Markings for Railway Level Crossings*, RTS 10
- NZS 8603:2005 *Design and application of outdoor recreation symbols*
- RSMA *Compliance Standard for Traffic Signs*
- Christchurch City Council, *CSS: Parts 1-7*
- Land Transport Rule *Setting of Speed Limits* 2003
- Waimakariri District Council *Parking Bylaw* (2007)
- Waimakariri District Council *Guidelines for Street Name Blades*

Ensure that reconstruction projects include the relocation of the street name sign, if the works make its old position inappropriate.

Regulatory signage, as detailed in MOTSAM shall be provided in all the circumstances described in that manual. All roads shall have other signage appropriate to their hierarchical classification.

The following shall be indicated by appropriate signage:

- Bridges: Bridge End Markers shall be located at bridge ends and not behind a kerb
- Culverts: Culvert ends within the road reserve and not behind kerbs shall be indicated by the use of Bridge End Markers. These shall be located at the ends of the culvert or no further than 2 m from the edge of the carriageway
- Curves with a design speed 15 km/h or more below the legally permitted speed: as required by MOTSAM.

8.8.6 Traffic Signals

If the road controlling authority decides that traffic signals are necessary to provide safe and efficient access to the area, use the guidelines in the Austroads *Guide to Traffic Engineering Practice, Part 7: 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.

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8.8.7 Roundabouts

Roundabouts provide control at intersections with 3 or more intersecting roads in a variety of circumstances e.g. they can control speeds or improve traffic flows. Their location must be agreed with the Council at the consent stage.

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 *Guide to Traffic Engineering, Part 6: Roundabouts*
- Austroads *Guide to Traffic Engineering, Part 13: Pedestrians*
- Austroads *Guide to Traffic Engineering, Part 14: Bicycles*
- Christchurch City Council, *CSS: Parts 1-7*

Refer to CoP Part 10 clause 10.4.3.5 – *Protection of Sightlines*.

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8.9 PAVEMENT DESIGN

8.9.1 Pavement and Surface Treatment Design

Design roads to preferably be flexible pavements, with a 50-year life, using the general principles of the current New Zealand Supplement of the Austroads *Pavement Design Manual.* Projected traffic growth volumes shall be calculated based on the existing traffic volumes, available from the Waimakariri District Council, and using an agreed rate of growth.

All roading and private access rights of way must comply with the Benkelman Beam criteria shown in Table 8.5. See CCC *CSS: Part 6* for more detail on analysing test results.

Table 8.5 Benkelman Beam criteria

Traffic Loadings (heavy vehicles/day)	95% of readings (mm)	Maximum (mm)
>500	<1.2	1.5
100-499	<1.6	2.0
<99	<2.0	2.5

The pavement design must detail the:

- Geotechnical requirements – test the sub-grade and establish a CBR. Soaked CBR's shall be used unless it can be shown that the subgrade shall always be in an unsaturated condition. 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*. 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 8.7.7 – Rural Road 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.
- The local sub-grade – many sites have sub-grades 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 set in Table 8.5 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.

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8.9.2 Reducing Waste

When designing the development, consider ways in which waste can be reduced.

- Plan to reduce waste during demolition e.g. minimise earthworks, reuse excavated material elsewhere.
- Design to reduce waste during construction e.g. prescribe waste reduction as a condition of contract.
- Select materials and products that reduce waste by selecting materials with minimum installation wastage rates.
- Use materials with a high recycled content e.g. recycled concrete subbase, foamed bitumen. Proposed recycled materials will need approval from the Council to ensure that environmental contamination does not occur.

See the Resource Efficiency in the Building and Related Industries (REBRI) website for guidelines on incorporating waste reduction in your project www.rebri.org.nz.

8.9.3 Pavement Materials

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

- Materials – see the CCC *CSS* 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 CCC *CSS: Part 6*.

8.9.4 Surfacing

All surfacings must meet site-specific traffic loading requirements, including skid resistance requirements as defined in TNZ T/10 *Skid Resistance Investigation and Treatment Selection*.

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. Pavers shall be accepted subject to specific approval, and not permitted in large surface areas.

All newly constructed road surfaces must comply with the NAASRA roughness counts in Table 8.6. See CCC *CSS: Part 6* for more detail on analysing test results.

Table 8.6 NAASRA roughness criteria

Surfacing	Average (mm/km)	Maximum (mm/km)
All new asphaltic concrete and open graded porous 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 (RAMM Pavement Use T6 and T7)	60	80
Chipseal through streets with 2,000-9,999 vehicles per day (RAMM Pavement Use T4 and T5)	65	85
Chipseal through streets, culs-de-sac and rights of way with 0-1,999 vehicles per day (RAMM Pavement Use T1-T3)	70	90

All surfacing materials must meet the appropriate CCC *CSS* requirements.

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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 30 mm layer of paver-laid AC10 laid over a Grade 5 chipseal.

Skid resistance on any new road that intersects with an existing road must match or exceed that of the existing road though the intersection area. Skid resistance can be improved through grooving in asphaltic concrete.

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8.10 DRAINAGE DESIGN

8.10.1 Road Drainage Control

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:

- CoP Part 5: *Stormwater and Land Drainage*
- Environment Canterbury, *NRRP*
- Catchment Management Plans for the development area
- Christchurch City Council, *CSS: Parts 1-7*

8.10.2 Primary Stormwater 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 water-bodies.

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 225 mm. Sump spacing must not exceed 90 m, for maintenance purposes.

The level of service requirements for stormwater systems are set out in CoP Part 5, Table 5.1.

8.10.3 Secondary Flowpaths

Strategic and arterial road carriageways shall not be used as a secondary flow path. Collector, local and cul-de-sac road carriageways may be used as a secondary flow path, where necessary.

8.10.4 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, installed with the appropriate filler material in accordance with the manufacturer's specifications, and must flow to an acceptable outlet.

8.10.5 Drainage Patterns

The existing 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.

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8.11 TRAFFIC MANAGEMENT DEVICES

Initiatives to enhance road safety are built around the three E's – engineering, education and enforcement. Engineering the environment to 'solve' a problem may not always be the most efficient solution but is likely to be the most expensive. Consider education or enforcement as well as engineering in the design process.

Design a road at the outset for its environment and function, as it is 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 management devices (TMD) is most appropriate to local residential streets where:

- The posted speed limit < 85th percentile operating speed < posted speed limit + 20 km/h;
- Peak hour traffic volumes exceed 60 vehicles (equivalent to approximately 600 vehicles/ day);
- The length of the road segment under consideration > 250 m;
- 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 TMD 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:

- Austroads *Guide to Traffic Engineering, Part 10: Local Area Traffic Management*
- TNZ & Land Transport NZ *Manual Of Traffic Sign and Markings Part 2*
- Christchurch City Council, *CSS: Parts 1-7*
- Land Transport NZ *Guidelines for Urban-Rural Thresholds, RTS 15*
- AS/NZS 1158 *Set Lighting for roads and public spaces - series*

8.11.1 Device Selection

When designing traffic management, be clear about the objective of the measure's installation and the strategy or strategies that the device should achieve. Make the differentiation clear between "neighbourhood improvement" type works and traffic management works, to ensure the measures don't have unexpected effects. Wherever possible, make the objective measurable, to allow an assessment of its effectiveness.

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

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.

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The four main types of measure are listed in the table below, with an indication of the objectives to which they are most applicable and of their degree of effectiveness (by number of ticks) or negative impact (by cross). The environmental effects are also indicated, including the effects on neighbouring residents.

Table 8.7 Measures and Objectives

Measure		Reduce speeds	Reduce traffic volume	Increase pedestrian safety	Reduce crash risk	Environmental effects
Vertical Deflection Devices	Raised mid-block tables	√	√√	√	√√	XX
	Pedestrian platforms	√√	√√	√√√	√√	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-lane	√	√			
	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√	
	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	√√√	√√√	√√√	√√√	√√√

Refer to Austroads *Guide to Traffic Engineering, Part 10: Local Area Traffic Management* and Land Transport NZ *Pedestrian network planning and facilities design guide* for an in-depth examination of these devices, their application, advantages and disadvantages.

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8.11.2 Design Considerations

Overuse of devices will reduce their effectiveness globally, as will the passage of time reduce it locally, as drivers become familiar with them. Regardless of this, ensure a degree of consistency in the use of traffic management devices:

- 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 clause 8.8.4 – Sight Distances and Austroads *Guide to Traffic Engineering, Part 5: Intersections at Grade*.
- 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 20 km/h of the speed environment. Appendix A, Figure A2, in Austroads *Guide to Traffic Engineering, Part 10: 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 -120 m 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.

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

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

8.11.3 Vertical Deflection Devices

Design raised tables and platforms to be 75 – 100 mm above the road surface, with flat platforms between 2 – 6 m long. The design height of the table or platform should be related to 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. Also examine the longitudinal profile of the adjacent centreline to ensure that it doesn't amplify or nullify the vertical deflection experienced by the vehicle.

Install road humps constructed in accordance with Standard Drawing 600-231.

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 m). Cyclists also prefer longer ramps (1 in 15) but these do not reduce speed as effectively as short ramps (1 in 12).

8.11.4 Horizontal Deflection Devices

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

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Assume operating speeds of 10-20 km/h 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 3.0 m. Detail blister islands at least 2 m wide and 3 m long.

Roundabouts are also horizontal deflection devices and are discussed in clause 8.8.7.

8.11.5 Diversion Devices

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

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.

Design modified 'T' intersections with mountable kerbs, and reinforce changed priorities where appropriate. Combine left in/left out islands with central median islands to improve efficiency.

8.11.6 Signage, Road Marking and Other Treatments

Reinforce the effectiveness of signage by combining it with other devices. Install zebra crossings or signalised pedestrian crossings only where there is a warrant for it, as defined in Trafinz *Guide to Pedestrian Crossing Facilities*.

8.11.7 Thresholds

Design perimeter thresholds which are at least 5 m long and entirely flush with the road. Provide for the turning movements of commercial vehicles and buses.

Install rural thresholds only where there is more than 20 km/h between the posted speed limits on each side of the threshold site and where there are no existing constraints which reduce the speed environment. Vertical design elements are an essential component of rural thresholds and include evergreen planting, signs, lights and their poles. Utilise horizontal design elements like planting, medians and lane narrowing. Refer to *Guidelines for Urban-Rural Thresholds* for widths in differing traffic conditions.

8.11.8 Traffic Control Devices

Ensure that all the traffic control devices are visible. Signs or raised studs, which comply with CCC *CSS: Part 6*, or supplementary lighting, may be required. For lighting, refer to CoP Part 11: *Lighting*.

8.11.9 Road Markings

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

- TNZ & Land Transport NZ *Manual Of Traffic Signs and Markings Part 2*
- Land Transport NZ *Guidelines for Flush Medians*, RTS 4
- Land Transport NZ *Guidelines for Safe Kerbline Protection*, RTS 8
- Land Transport NZ *Guidelines for Rural Road Marking and Delineation*, RTS 5
- NZ Supplement to Austroads *Guide to Traffic Engineering Practice, Part 14: Bicycles*
- Christchurch City Council *CSS: Parts 1-7*

Install centrelines on rural roads with an AADT over 250 or where a road with an AADT over 100 has frequent or substandard horizontal or vertical curves. Install centrelines on classified urban roads carrying substantial volumes of non-local traffic.

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Install lane lines wherever there is more than one lane in the same direction. Replace centrelines and lane lines with raised pavement markers on roads with a fine textured surface.

Install edge lines on rural roads with an AADT over 750 or where a road with an AADT over 250 has frequent or substandard horizontal or vertical curves. Install edge lines on urban arterial roads and where the lane requires definition or may conflict with parking.

Consider the requirement for no overtaking and no stopping lines. The Council has delegated the approval of no stopping line installations to the Community boards. This is separate from and additional to engineering acceptance.

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8.12 STREETSCAPE

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

- A network of safe, pleasant, comfortable, convenient and efficient paths.
- Positive guidance for pedestrians and/or cyclists.
- 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, built structures e.g. fences, low walls, art works.
- 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.

Note that maintenance costs are an important consideration when designing streetscapes, and street gardens in particular should be designed with an eye towards minimising future maintenance.

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

Widening and redeveloping existing roads should take into account the current streetscape. Innovative and interesting designs may be considered, such as meandering footpaths and street trees set between parking spaces. Refer also to CoP Part 10: *Reserves, Streetscape and Open Spaces*.

The following documents should also form the basis of the design:

- Christchurch City Council *CSS: Parts 1-7*
- Transit New Zealand *Guidelines for Planting for Road Safety*

Refer to Standard Drawings 600-245A/B/C for roadside layout examples.

8.12.1 Crossfalls and Gradients

Grass areas and plant beds located on roadsides or median islands must have crossfalls under 6% unless agreed by the Council.

8.12.2 Grassed Berms

Berms shall comply with the CCC *CSS Parts 6 and 7*. Where the width from the legal boundary to the kerb or road edge exceeds 2.5 m in residential areas, install a berm. Allow sufficient space for any planting (e.g. trees) between the footpath or property boundary and the kerb.

Typical berm cross sections, showing minimum berm widths, are shown in Standard Drawings 600-245A/B/C. The smallest area of berm permitted is 2 m^2, the minimum width is 0.7 m, and areas or widths smaller than this must be formed and sealed as footpath.

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

8.12.3 Batters

Where the formed batter is not required to cater for foot traffic, grassed batters are permitted, to a maximum of 1 in 4. These must be mowable, as defined in Cop Part 10 clause 10.5.2.6 – G*rass Maintenance*.

The top edge of every fill, and the toe of every cut, must have a crossfall of 3% and extend at least 500 mm 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.

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8.12.4 Slope Stabilisation

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

Retain all new cut faces or stabilise with vegetation. Slopes steeper than 1 in 2 will need to be retained unless otherwise agreed by the Council. Locate stabilised faces or retaining structures that support private assets or property outside of the legal road. Structures supporting the road must be located in the road reserve.

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

8.12.5 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. Refer to CoP Part 9 clause 9.5.4 – *Typical Services Layout and Clearances* and to Standard Drawings 600-245A/B/C 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.

8.12.6 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. The location of streetlights, sight line visibility and hazard criteria are critical when designing the on-street planting.

Refer to CoP Part 10: *Reserves, Streetscapes and Open Spaces* before designing plant beds or street trees.

8.12.7 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). Refer to CoP Part 10 clause 10.5.4 – *Reserve Facilities, Structures and Furniture* for further information.

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In low speed environments, locate continuous structures like low walls at least 450 mm behind the kerb, with a maximum height of 700 mm if adjoining the footpath. In high speed environments, the clear zone rules apply.

Locate street furniture so that it does not obstruct the sight lines of intersections, pedestrian crossings or signs.

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

8.12.8 Rural Mailboxes

In rural areas, mailboxes may be allowed on the road reserve. They shall be designed and placed so as not to endanger the motoring public. Consideration shall be given to frangibility of the base and to location. Refer to Table 8.8 Clear zone widths. See also the WDC Policy *Rural Mailboxes* (yet to be completed).

8.12.9 Site Access

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

Use the following standards and guidelines for the design and operation of intersections, kerb crossings, cut-downs and driveways:

- Austroads *Guide to Traffic Engineering, Part 5: Intersections at Grade*
- LTNZ *Guidelines for the Implementation of Traffic Controls at Cross Roads*, RTS 1
- Christchurch City Council, *CSS: Parts 1-7*
- Waimakariri District Council *District Plan*
- Waimakariri District Council *Vehicle Crossing Bylaw*

8.12.10 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 in Table 8.8. Remove or treat existing roadside hazards within this distance.

Table 8.8 Clear zone widths

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

Where the above setbacks are not achievable, discuss alternative options with the Council early in the design process.

In an urban, 50 km/h speed zone, street trees and other structures placed behind kerb & channel shall be deemed to be outside the clear zone. In other areas, street trees planted within clear zones shall have frangible trunks, defined as less than 100 mm diameter.

Some on-street structures in urban areas cannot feasibly be relocated and should be protected but 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.

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Austroads *Urban Road Design* and *Rural Road Design* provide details on clear zones, hazards and safety barriers.

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8.13 SERVICES LANES, PRIVATE WAYS AND ACCESS LOTS

Access to a site (or sites) that will be provided by a private way must comply with the legal requirements of the *District Plan*.

Private roads may be constructed to lesser standards than this Code, but shall still require the provision of a secondary flowpath for stormwater, as detailed in CoP Part 5 clause 5.5.5 – *Secondary Flow Paths*. Where a private road is proposed at the time of subdivision the Council will require assurance that the road can be managed and maintained on a sustainable basis and in perpetuity. Such assurance may be by way of a body corporate, or similar.

Wherever street or pedestrian accessway lighting will be installed, construct it to the same standard as that required for an equivalent construction within legal road.

Use the Council's *Refuse and Recyclable Material Collection* Policy to determine the requirement for either refuse truck access or refuse bag storage areas at the road boundary. Where there is insufficient space, clear of the footpath and within the legal road, for the short-term storage of rubbish bags and recycling bins, provide a collection point within the accessway but close to the road boundary.

As work within private ways, service lanes and accessways will not be taken over by the Council upon completion; the Council will be placing the onus of confirming both the suitability of design and construction on the developer.

The developer must provide a Design Report with the engineering drawings and a Design Certificate covering the design of these works, before any physical works commence (see CoP Part 3: *Quality Assurance*). This can be incorporated with the design and Design Report for the overall project.

On completion of the works, the developer must provide records, certifying that they have been built in accordance with the design and that the works and materials were inspected, audited and tested, to ensure compliance with the quality requirements. Include copies of documentation relating to 'key' hold or witness points e.g. Benkelman Beam results.

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8.14 STREET LIGHTING

Refer to Part 11: *Lighting* for street lighting requirements.

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8.15 PUBLIC TRANSPORT

8.15.1 Bus Routes

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

- Roads can cater for the manoeuvring requirements of public transport vehicles (including turning around or U-turns 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.

The provision of bus routes in new development areas must be discussed with Environment Canterbury staff.

In any urban subdivision, not less than 90% of households should be within 500 m direct distance from a bus route. 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 culs-de-sac are used to provide access to properties, the heads of these should be extended where appropriate to provide direct pedestrian linkages to bus routes.

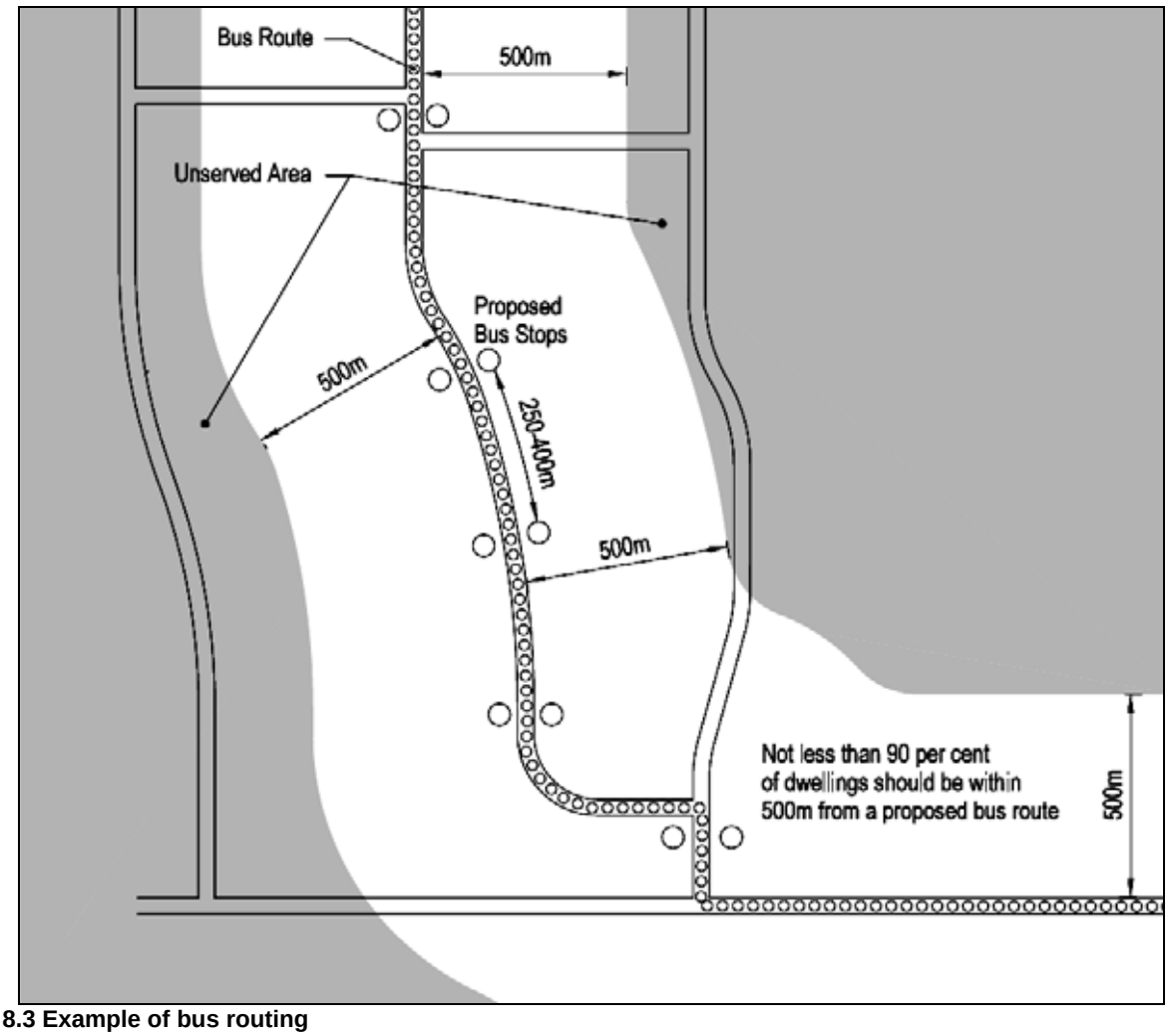

Figure 8.3 Example of bus routing

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Wherever the bus route travels through a development, design the relevant roads to ensure that the bus can travel and manoeuvre along the proposed route easily, ideally without delaying other traffic.

Bus routes are generally along collector or arterial roads. The proposed route needs to be as direct as possible to reduce travel times and should avoid or minimise complicated turning manoeuvres at intersections. In particular, avoid right turns when accessing arterial roads.

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

8.15.2 Bus Stops/Bus Shelters

Plan and co-ordinate the bus stop locations and associated infrastructure on the street with the Council at the consent stage. Extra space may be required to site bus shelters or other required infrastructure, which can be incorporated in the engineering drawings.

Bus stops must be spaced appropriately, with inbound and outbound pairs of stops opposite each other wherever the service travels in both directions along a road.

Bus shelters shall be type E2-Narrow, located and designed in accordance with CCC SD366-07.

If the width of the roadway does not provide for roadside parking, allow for the construction of inset bus bays or bus boarders. Construction details for bus stops may be found in CCC *CSS: Part 6*.

Part 8: Roading

8.16 PEDESTRIAN & CYCLE FACILITIES

Linkages for pedestrians and cyclists must create an attractive, friendly, connected, safe and accessible environment. These linkages must ensure that people can move about the community freely in areas where there are no road linkages (e.g. at the end of culs-de-sac) and provide direct pedestrian access to bus stops. Use green linkages between culs-de-sac, through public reserves or adjacent to waterways, or other natural features.

Make provision for on-street and off-street pedestrian and cycle facilities, as required by the WDC *District Plan* or indicated in the WDC *Walking and Cycling Strategy*, to facilitate an alternative to the car for short to medium length trips. CoP Part 10: *Reserves, Streetscape and Open Spaces* and Part 11: *Lighting* provide further information on off-road facilities.

8.16.1 Pedestrian Footpaths

Footpath widths are measured from the footpath edge of the kerb or service strip. The minimum widths set out in Table 8.9 must **be clear of all obstructions** such as vegetation, light standards, traffic signs, utility furniture and bollards. See Standard Drawings 600-245A/B/C for examples. Extra widening will be required wherever such obstructions cannot be avoided. Where topography or existing features preclude providing the minimum widths, discuss options with the Council.

Table 8.9 Minimum footpath widths

Adjacent land use	Minimum width (m)	Preferred location
Residential	1.5	Adjacent to service strip
Retail/town centre	2.5	Adjacent to kerb
Industrial	1.5	Adjacent to kerb

Note that residential footpaths are normally separated from the kerb by a grass berm and from the road boundary by a service strip.

The optimum crossfall for sealed footpaths is 2.0%, with a minimum of 1.25% and a maximum of 3%. To provide access for wheelchairs and prams, steps must not be used on footpaths on public roads, unless approved by the Council.

In culs-de-sac, footpaths shall extend around the circumference/perimeter of the turning area/head and return to a point where the opposite kerb and channel/edge of seal becomes parallel. At that point the kerb and channel shall terminate with a pram crossing (refer Standard Drawing 600-275 *Turning Areas*).

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 street trees, fences or comparable barriers.

8.16.2 Road Crossings for Pedestrians

Provide pedestrian crossing facilities that comply with CCC *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 build-outs and pedestrian islands, to minimise the crossing distance for users.

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

Part 8: Roading

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

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

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

- Christchurch City Council *CSS: Parts 1-7*
- Trafinz *Guide to Pedestrian Crossing Facilities*
- LTNZ *Traffic Control Devices Rule*;
- LTNZ *Guidelines for Facilities for Blind and Vision-Impaired Pedestrians,* RTS 14

8.16.3 Cycle Facilities

Consider installing cycle parking facilities near bus stops, to ease the transfer between transport modes.

Provide continuous on-street cycle lanes on all collector and arterial roads. For local urban roads, cycle facilities may be provided through wide kerbside lanes.

Design the cycle facilities and widths in general compliance with the New Zealand Supplement to Austroads *Guide to Traffic Engineering Practice, Part 14: Bicycles*. Use the *Guidelines for the Marking of Cycle Lanes on Urban Roads* to design the roadmarking and mark in accordance with CCC *CSS: Part 6*.

8.16.4 Shared Pathways

Design shared paths so that they are suitable for pedestrians, cyclists, skate-boarders, skaters, prams and people with disabilities. Motorised wheelchairs require 1.2 m clear width.

Refer to LTNZ *Pedestrian Planning and Design Guide*, Section 14.

The minimum clear width of formed paths in legal road is 2.5 m for paths shared by pedestrians and cyclists. The formed width should be widened wherever a lot of people are expected to use the facility. CoP Part 10, clause 10.5.3.2 – *Pedestrian and Cycle Paths* details requirements for paths in reserves. The Council must agree to shared paths by resolution.

The overall width of the linkage needs to be adequate for the path and appropriate landscaping. Providing wide, open and well-lit areas is extremely important to provide a secure and useable linkage. The minimum overall width preferred by WDC is 10 m

Part 8: Roading

Off-street accessways:

- Shall be as short and as wide as possible.
- Shall, where possible, have clear line of sight through their length.
- All positions along a pedestrian accessway/walkway shall be visible from at least one of the serving roads.
- Shall be appropriately landscaped, including street trees where possible.
- Shall include provision for transport and disposal of stormwater flowing along the length of the accessway (and to an approved outfall).
- Shall have a minimum reserve width of 10 m.
- Shall, to prevent access by motorcycles and cars, be provided with approved traffic barriers and/or bollards at their ends. Access must still be available to maintenance vehicles.
- May be utilised as overland flow paths for the transportation of surcharge stormwater from stormwater drainage reticulation resulting from a storm event greater than that of a 20% AEP or 1-in-5-year storm.
- Shall generally have fences constructed in accordance with Standard Drawing 600-242.

Seal the path and landscape the remaining land in a manner that does not compromise the security of people using the facility. CoP Part 10: *Reserves, Streetscapes and Open Spaces* provides landscaping guidelines.

To enhance amenity, specific and/or alternative designs for both accessway paths and adjoining fencing is encouraged.

Use the following guidelines for the detailed design of off-road paths:

- Minstry of Justice *National Guidelines for CPTED in NZ*
- Austroads *Guide to Engineering Practice, Part 13: Pedestrians*
- Austroads *Guide to Traffic Engineering Practice, Part 14: Bicycles and the New Zealand Supplement*
- AS/NZS 1158 *Set Lighting for roads and public spaces – series*

Part 8: Roading

8.17 BRIDGES, CULVERTS, UNDERPASSES, RETAINING WALLS & OTHER STRUCTURES

Bridges, culverts, underpasses, 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. For timber bridges, this is 70 years. For steel or concrete bridges and all culverts, this is 100 years. For all other structures, this is 50 years.

All bridges and culverts on the roadway or right of way shall be designed in accordance with the TNZ *Bridge Manual*. Any structures involving waterways or surface water channels shall be designed in accordance with CoP Part 5: *Stormwater and Land Drainage*.

The design loading for bridges and culverts in the Waimakariri District shall be:

- Class I (~85% HN) for private accessways.
- HN-HNO-72 for all public roadways

Determine the width of bridges and culverts in conjunction with the site-specific current and future road requirements for carriageway widths. Take into account the land drainage requirements, as set out in CoP Part 5: *Stormwater and Land Drainage* and Chapter 13 of the CCC *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;
- 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.

Where retaining walls are required to support land or property adjacent to the road reserve, they shall not be built on the road reserve.

Where retaining walls are required to support the road, including the carriageway and ancillary roading features, such walls shall be contained entirely within the road reserve.

Safety barriers shall be provided along carriageways for all structures where the clear zones as set out in clause 8.12.10 are not available.

Bridges and culverts with waterway cross-sectional areas greater than 3 m^2 or 1 m deep (measured from the road surface to the invert) shall be fitted with handrails. Where there is a fair expectation of pedestrian access, the handrails installed shall be in compliance with the Building Act. These shall be provided for the span/crossing length.

Traffic widths shall be in accordance with Table 30.1 of the District Plan.

Specific design shall be required for culverts in urban areas and for underpasses.

Part 8: Roading

8.18 AS-BUILT INFORMATION

Provide as-built information as set out in Part 12: *As-Builts*, including a safety audit of the constructed works.

Part 8: Roading

8.19 ASSOCIATED DOCUMENTS

Appendix A Standard Specification – Street Name Blades (QP-C842)

Appendix B Standard Specification – Road Openings (QP-C843)

Street Name Blades

Street Name Blades

1. INTRODUCTION

Within the Waimakariri District, the requirements for street name blades shall be as specified in the *Guidelines for Street Name Signs* 1990, produced by the Land Transport Safety Authority, with the additions and alterations indicated in the WDC standard specification (this document).

Street Name Blades

2. DESIGN OF STREET NAME SIGNS

2.1 Colour

The whole blade background, including any fabrication, is to be the same shade of green. Where "paint" is used its colour is to be powder-coat "BP GREEN".

Letters and numbers are to be white.

2.2 Reflectorisation

Sign lettering shall be reflectorised with High Intensity Reflective materials on local roads and at local-local intersections, and Diamond Grade Reflective materials on all other road and intersection types.

2.3 Lettering

The standard size lettering used in the Waimakariri District for street names is 100mm. At intersections with state highways 150mm lettering should be used.

Property numbers and "No Exit" supplements shall be 75mm.

2.3.1 Letter Size & Spacing

Letters and numbers are to be single-spaced. There is to be a single blank space between arrows and adjacent letters or numbers. There is to be a single blank space between the "-" in number ranges and the adjacent numbers.

The alphabet used shall be Series C 100mm as defined in the LTNZ *Manual of Traffic Signs and Markings Part 1, Appendix A1 – Standard Alphabets*.

2.3.2 Names

All names are to be fully spelt out, not abbreviated. The street type suffix to the name itself, such as "Street", "Road" etc. (i.e. the "label"), should be abbreviated and capitalised in accordance with section 4.

The name should always be capitalised except for the "ac" or "c" in "Mac" and "Mc" and other letters in similar circumstances.

Punctuation should be used only where it is part of the name, e.g. in O'Rourkes Road. It should not otherwise be used, especially for denoting the possessive, e.g. Browns Rd, not Brown's Road. Pronunciation accents, such as, à and ê, should not be used.

2.4 Sign Size & Shape

Size shall be adequate for lettering, with a clear border of background colour at least 50mm wide around the lettering; therefore the maximum width of the sign should be 200mm.

Where the sign is greater than 1200mm in length, two support posts shall be required. Where more than two lines of lettering are required, two signs shall be used.

The blade material shall be rectangular and either one piece extruded "I" section aluminium or fabricated aluminium.

2.5 "No Exit" Supplements

"No Exit" legends shall be incorporated wherever appropriate.

The words "NO EXIT" and any arrows are to be 75mm high. The legend is to be positioned on the name-blade, below the street name.

Street Name Blades

2.6 Locality Identification

Locality identifiers, such as monograms and logos, are not permitted.

2.7 Property Numbers

Property numbers are to be 75mm high, and formatted and located so as not to detract from the main messages of the sign.

Property numbers are to be on the "line" immediately below the street name. The line height is to be appropriate and suitable for the size and style of the numbers. The arrow relating to the property numbers is to be located under the appropriate arrow of the street name.

At cross-roads, the blade should display the property numbers immediately adjacent to each side of the intersection. At T-intersections, the blade should display the range of numbers in the block, in the order they appear on the street when viewed from the location of the sign.

Note that property numbers are not required in the following situations:

- Where it is a "No-Exit" street;
- Where there are no properties opening onto the street;
- Where there is a number mismatch between the sides of the road, e.g. where the intersection breaks the road between numbers 20 and 22 on the left side and numbers 31 and 33 on the right.

2.8 Directional Indication

Retroflective chevrons or arrows at either end of the legend can be used as an indicator for road users. They are recommended on low mounted signs on medians or traffic islands, and in situations where the orientation of the street name sign does not clearly convey the direction of the street to which it refers.

Retroflective chevrons are always required on roundabouts, indicating the direction of travel.

Street Name Blades

3. LOCATION OF STREET NAME SIGNS

Paragraphs in *italic* are specifications from the RTS-02, followed by WDC requirements where these are different from RTS-02.

3.1 Height

Street name signs should be mounted with their underside between 2.5m and 3.5m above ground level.

3.2 Lateral Offset

Signs should generally be mounted within 1500mm of the face of kerb or shoulder edge but at least 450mm behind the face of kerb on kerbed streets, 500mm behind the face of kerb on islands or medians, or 600mm from the shoulder edge on streets without kerbs.

3.3 Number of Signs

The number of signs at an intersection should be increased for more complex backgrounds, more important streets and wide streets.

3.4 Advance Street Name Signs at Major Intersections

Additional street name signs should be mounted on the central median or overhead in advance of intersections between two or more arterial or strategic roads.

3.5 Recommended Sign Locations and Designs

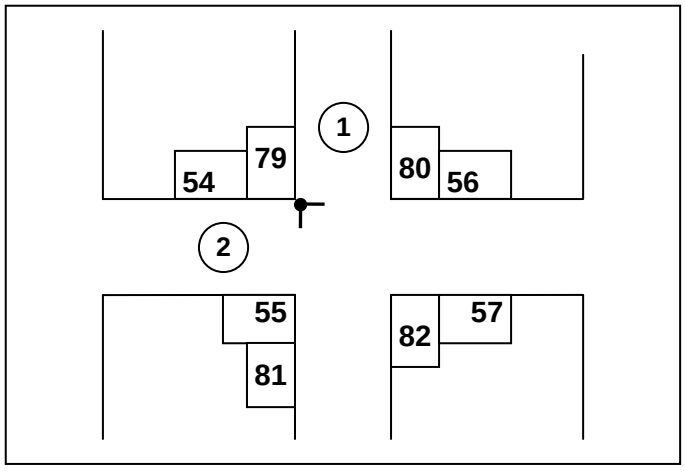
Signs must be located where they are visible over a distance appropriate to the operating speed and where possible within the area of the intersecting road reserve boundaries of the streets to which they apply.

All name blades for an intersection should be affixed to the same post, except when there is more than 1 sign post as detailed in paragraph 3.6. Each name-blade is to be double sided unless detailed otherwise.

The sign should be oriented to provide maximum visibility to the motorists on the major road. This can be achieved by placing the sign on the “traffic” side of the post.

Clauses 3.5.1, 3.5.2 and 3.5.3 show the standard sign layout for WDC roads. For complex, busy or significant roads, (for example, where the street name changes across the intersection), specific design may be required with approval from the Council. For intersections with State Highways, Transit NZ requirements apply.

3.5.1 Cross-intersections



1)

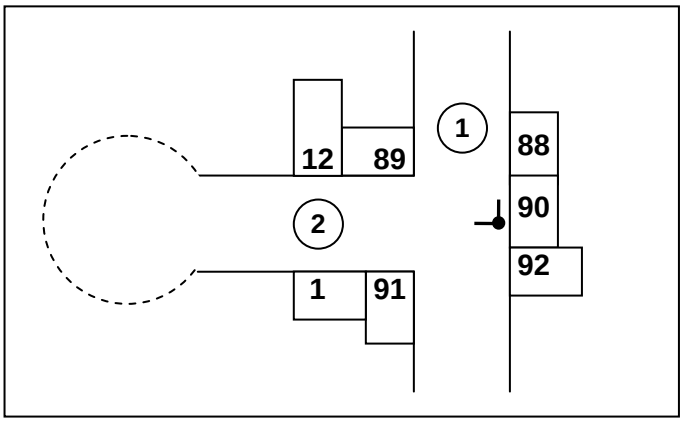
	EXAMPLE St	>
<	80	81 >

2)

<	MODEL St	>
<	55	56 >

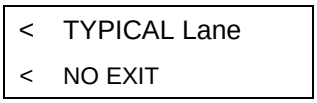
Street Name Blades

3.5.2 Tee-intersections

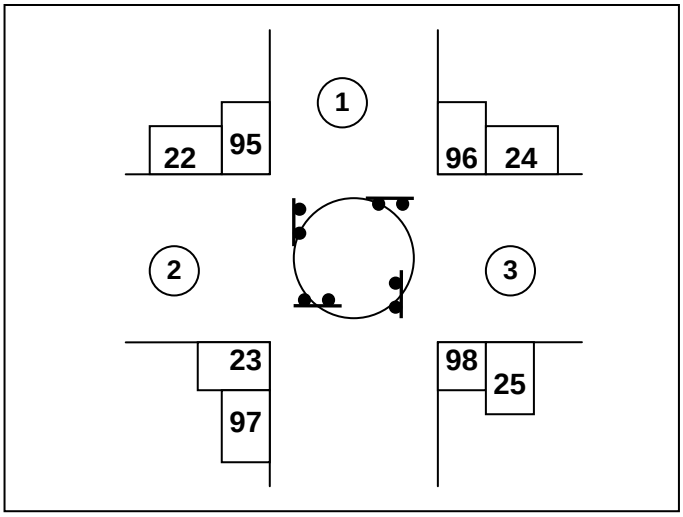


1)

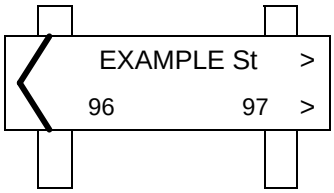
2)



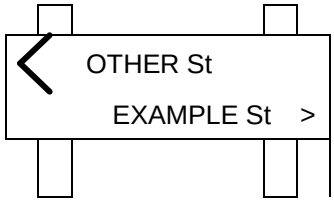
3.5.3 Roundabouts



1)



2) and 3)



A sign showing the name of each street in the centre-left of the roundabout is sufficient. Note that a retroflective chevron or large arrow shall be use to indicate the direction of travel.

3.6 Posts

Where there are existing posts in suitable locations these should be used in preference to placing new posts. “AA” posts and utility poles may be used. There shall be a maximum of four blades of any type on one post.

Where an existing post is suitable, but in a non-preferred or lowly location, and the post can be located to a more preferred location this should be done.

If the existing post is so close to the road that the sign may be hit by traffic the sign should be located on the other, or reverse, side of the post. The use of arrows on the sign will negate any confusion over the direction indicated.

Except on very busy roads (+ 10,000 vehicles / day), divided roads, where there are roundabouts or where the name of one of the roads changes at the intersection, one set of signs should be adequate.

Double Ended signs are to have at least one vertical end to allow use of standard mounting brackets.

Street Name Blades

4. STANDARD STREET LABEL ABBREVIATIONS

Name	Abbreviation	Name	Abbreviation
Anchorage	Ancg	Elbow	Elb
Arcade	Acde	End	END
Avenue	Ave	Entrance	Ent
Belt	BELT	Esplanade	Esp
Bend	BEND	Expressway	Exwy
Boulevard	Blvd	Extension	Extn
Brace	Brc	Fairway	Fawy
Brae	BRAE	Footway	Ftwy
Break	Brk	Formation	Form
Bypass	Bypa	Freeway	Frwy
Causeway	Cwy	Frontage	Frnt
Centre	Ctr	Garden(s)	Gdn(s)
Chase	CHASE	Gate	GATE
Circle	Cir	Glade	Clade
Circlet	Clt	Glen	GLEN
Circuit	Crcs	Green	Green
Close	CLOSE	Grove	Grove
Colonnade	Clde	Heights	Hts
Corner	Cnr	Highway	Hwy
Concourse	Con	Hill	HILL
Court	Court	Interchange	Int
Courtyard	Ctyd	Intersection	Intn
Cove	COVE	Junction	Jnct
Crescent	Cres	Key	KEY
Crest	CREST	Lane	Lane
Cross	CROSS	Line	Line
Crossing	Crsg	Link	Link
Dale	Dale	Loop	Loop
Distribution	Dstr	Mall	MALL
Drive	Drv	Meander	Mndr
Edge	Edge	Mews	MEWS
Motorway	Mwy	Square	Sq
Mount	Mt	Stairs	Strs

Street Name Blades

Name	Abbreviation	Name	Abbreviation
Outlook	Otlk	State Highway	SH
Parade	Pde	Steps	Stps
Park	PARK	Street	St
Parkway	Pkwy	Strip	Strp
Part	PART	Tarn	TARN
Pass	Pass	Terrace	Tce
Path	PATH	Thoroughfare	Thor
Pathway	Place	Tollway	Tlwy
Place	Pl	Top(s)	TOP(S)
Plaza	Plza	Tor	TOR
Point	Tp	Track	Trk
Port	PORT	Trail	Trl
Private Right of Way	R.o.W.	Trunkway	Tkwy
Promenade	Prom	Turn	Turn
Quad	QUAD	Vale	Vale
Quadrant	Qdrt	View	VIEW
Quay	QUAY	Villas	Vlls
Quays	Qys	Vista	VISTA
Ramble	Rmbl	Walk	Walk
Reserve	Res	Walkway	Wkwy
Rest	Rst	Way	WAY
Retreat	Rtt	Wynd	WYND
Ridge	Rdge	Yard	Yd
Rise	RISE		
River	R		
Road(s)	Rd(s)		
Roadway	Rdwy		
Rosebowl	Rsbl		
Rotary	Rty		
Route	Rte		
Row	ROW		
Rue	RUE		

Road Opening

Road Opening

1. INTRODUCTION

1.1 Standards NZ Handbook HB2002:2003 *Code of Practice for Working in the Road* provides national procedures, specifications and methods for carrying out road openings. This handbook has been adopted by the Waimakariri District Council as the basis for all openings in District roads.

1.2 NZS HB 2002:2003 has a stated objective of ensuring *"utilities are installed and maintained with minimal impact on the road environment, community, road users and other utilities*." (NZS HB2002:2003 Clause 4.6). The Code goes on to state " *Reticulation by trenchless construction is the RCA's preferred method of installation within the carriageway, except if it is impractical, unsafe, uneconomic or represents an unacceptable level of risk to other underground utilities or installations."*

1.3 The Telecommunications Act 2001, Gas Act 1992 and the Electricity Act 1992 give operators of those utilities statutory rights to use road corridors subject to any reasonable conditions that the road controlling authority may impose. Other relevant legislation includes, but is not limited to:

- Building Act 1991
- District Plan Provisions
- Health and Safety in Employment Act 1992
- Local Government Act 2002
- Resource Management Act 1991
- Transit New Zealand Act 1989

1.4 Definitions of terms used are detailed in clause 1.4 of NZS HB2002:2003.

Road Opening

2. OBTAINING A ROAD OPENING NOTICE (RON)

2.1 The Principal Provider shall lodge a RON with the Waimakariri District Council in accordance with NZS HB2002:2003 for all works involving excavation in the Council's roads.

2.2 The RON shall be applied for at least:

- Emergency work – no later than 1 working day after the work starts.
- Minor work – 3 working days before work starts.
- Major and project work – at least 15 working days before work starts.

2.3 A Road Opening Notice (RON) does not absolve the Principal Provider from:

- The responsibility of obtaining other consent/s such as those relating to the requirements of the Resource Management and Building Acts, the Council's District Plan or by Environment Canterbury prior to commencement of work.
- Obtaining service plans from other service providers.

2.4 The Road Opening Fee, established from time to time by the Council, must be paid for all road openings on lodgement of the application. The fee, and any exceptions from it, is promulgated in the Council's schedule of fees and charges.

2.5 The duties and responsibilities of the Road Controlling Authority, Principal Providers and Contractors are defined in Section 2 of NZS HB2002:2003.

Road Opening

3. APPENDICES

QP-C843-AA	Preliminary Notification of Road Opening – template
QP-C843-AB	Road Opening Notice
QP-C843-AC	Works Completion Notice – template
QP-C843-AD	Works Maintenance Notice – template

Preliminary notifications should be submitted for major works. This provides the Principal Provider or their consultant with the opportunity to discuss and determine with the Council mutually agreed conditions prior to lodging a Road Opening Notice (RON).

Note that the appendices at the back of NZS HB2002:2003 *Code of Practice for Working in the Road* provide a range of forms that are used for these notifications. It is from these forms that the above documents have been developed. Either the forms in this document or those in the Code may be used.

For additional information please refer to the Code of Practice for Working in the Road SNZ HB 2002:2003.

Road Opening

4. ASSOCIATED DOCUMENTS

SNZ HB2002:2003	*Code of Practice for Working in the Road*
QP-C492-AE	Traffic Management Plan (TMP) – template (Major and project works require a site specific TMP)
COPTTM	Code of Practice for Temporary Traffic Management – with WDC supplement.

Another useful reference is the booklet *"Guide for Safety with Underground Services"* issued in October 2002 by OSH, Department of Labour.

Preliminary Notification of Road Opening

ROAD OPENING FEE$50.63 GST incl.
RON #:

To Roading Unit
Waimakariri District Council
Private Bag 1005
RANGIORA 7440

From _____ (The Principal provider or their consultant)

_____

_____

Date _____

PRELIMINARY NOTIFICATION IS PROVIDED FOR THE FOLLOWING MAJOR WORK

Where: _____

When: _____

☐ The plans _____ are attached

Major work situations that occur on this job are:

☐ A trench is to extend more that 20 m along the road

☐ A traffic lane needs to be closed on a Main Road

☐ A road needs to be closed for more than 2 minutes

☐ Metered parking or other restricted parking areas may be affected

☐ Work may affect a road structure such as a bridge, tunnel, or retaining wall

☐ Work needs to be done outside normal hours of work

☐ A variation is sought from either the requirements of this Code of Practice or any other known requirements of the WDC

☐ A financial contribution is sought, for example towards the reinstatement of the road surface

NOTE: When proposed work is on a State Highway Road Opening Notices/requests need to be addressed to Transit NZ.

COMMENTS (eg about the above situations and when the work is scheduled to start and finish):

_____

_____

_____

_____

Signed: _____ Date: _____

Print Name: _____

Contact Details: _____

_____

Road Opening Notice (RON)

I (name) _____ as Representative for the Principal Provider (party paying for the work to be done eg utility owner, developer) as detailed below, hereby notify you, the Waimakariri District Council (RCA Road Controlling Authority) and the owners of other networks

☐ Council: Help Desk (WDC Water. Sewerage. Stormwater & Water-Race Systems) ☐ Telecommunications: _____

☐ Power: MainPower Network Other: _____

PRINCIPAL PROVIDER'S DETAILS:

Company: _____ Project Manger: _____

Phone: Day: A/H: Fax: Mobile:

of our intention to undertake the following work.

TYPE OF WORK: (tick one) ☐ Project ☐ Major ☐ Minor ☐ Emergency

DETAILS OF PROPOSED WORK (please tick all aspects)**:**

☐ Open trenching ☐ Trenchless construction ☐ Installing chamber(s) ☐ Installing pole(s)

☐ Installing cabinet/s ☐ Installing pedestal(s) ☐ Installing other structure (specify below)

☐ Removing pole/cabinet/pedestal/structure(s) (specify below)

DESCRIPTION OF WORK: _____

ADDRESS OF WORK (incl. street number): _____

Location in Road: ☐ Footpath ☐ Berm ☐ Carriageway Other: _____

Estimated Start Date: _____ Estimated Duration: _____ Proposed Work Hours: _____

Contractor Details:

Role in work to be undertaken: ☐ Principal ☐ Consultant ☐ Contractor Other: _____

Company: _____ Contact person: _____

Postal address: _____

Phone - Day: A/H: Fax: Mobile:

If you seek to impose any conditions on the proposed work, please notify me at the following address:

_____

ACCEPTANCE BY PRINCIPAL PROVIDER

We hereby agree on behalf of the Principal Provider to comply in full with the requirements of the Code of Practice for Working in the Road SNZ HB 2002:2003, any other reasonable conditions required by the Council and to keep this notice on site while work is in progress. This consent is valid for 3 months from date of issue.

Signature: _____ Date: _____

WAIMAKARIRI DISTRICT COUNCIL APPROVAL USE ONLY

☐ Approved Contractor ☐ Route plan submitted ☐ TMP submitted ☐ Stockpiling arrangements

Special additional conditions as attached: _____

Signed on behalf of the Waimakariri District Council: _____ Designation: _____

Print Name: _____ Date of Issue: _____

Copy sent to Maintenance Contractor: ☐

Road Opening Notice (RON)

INFORMATION

1. "SNZ HB2002:2003 Code of Practice for Working in the Road" provides national procedures, specifications and methods for carrying out road openings. This standard has been adopted by the Waimakariri District Council as the basis for all openings in District roads. It details duties and responsibilities of the Road Controlling Authority, Principal Providers and Contractors.

2. * A Road Opening Fee of $50.60 (GST inclusive) must be paid for all road openings except:
   - Those using trenchless construction
   - Those involving the maintenance or installation of utilities in an unsealed rural berm that do not disturb an area of more than 2m x 2m or require a trench more than 0.75m wide and 6m long.

3. The Principal Provider (party paying for the work to be done eg utility owner, developer) shall lodge a RON with the Waimakariri District Council (Road Controlling Authority (RCA)) for all works[i] involving excavation. The RON shall be applied for at least:
   - Emergency work – no later than 1 working day after the work starts
   - Minor work – 3 working days before work starts
   - Major and project work – at least 15 working days before work starts

   Road Opening notifications may be made on this form or on Appendix D – Road Opening Notice in SNZ HB 2002:2003 Code of Practice for Working in the Road

4. A Road Opening Notice (RON) does not absolve the Principal Provider from:
   - The responsibility of obtaining other consent/s such as those relating to the requirements of the Resource Management and Building Acts, the Council's District Plan or by Environment Canterbury prior to commencement of work.
   - Obtaining service plans from other service providers.

5. Please refer to the Code for additional information.

[i] NZS HB2002:2003 Definitions Clause 1.4 (Works – Emergency, Minor, Major, Project)

Works Completion Notice

To Roading Unit
Waimakariri District Council
Private Bag 1005
RANGIORA 7440

From _____ (The Principal provider or their consultant)

_____

_____

Date _____

This is to advise that work on RON Nº. _____

on _____ (Street name) *is now complete.*

Please find attached

☐ Amendments to information provided on the RON as follows:

Type of work: ☐ Project ☐ Major ☐ Minor ☐ Emergency

Details of Proposed Work

Description of work: _____

_____

Address: _____

Location in road: _____

Estimated start date: _____ Duration: _____

Contractor Details

Role in work to be undertaken: ☐ Principal ☐ Consultant ☐ Contractor ☐ Other

Company Name: _____ Contact Person: _____

Postal Address _____

Phone: Day: A/H: Fax: Mobile:

☐ Copy of the compaction tests

☐ An as-built sketch or plan showing the extent and location of the work carried out

☐ A written statement confirming that the completed works fully comply with the conditions of the RON

☐ Details of work for the Waimakariri District Council to complete as follows: _____

Works meet required standards: Date: _____

Accepted by Waimakariri District Council: Date: _____ Print Name: _____

Works comply and 12 months maintenance period commences: Date: _____ Signature: _____

Notice copied to _____ Maintenance Contractor

_____

Works Maintenance Notice

To Roading Unit
Waimakariri District Council
Private Bag 1005
RANGIORA 7440

From _____ (The Principal provider or their consultant)

_____

_____

Date _____

This is to advise that the 12 month maintenance audit of

RON No. _____ on _____(Street name)

TYPE OF WORK: ☐ Project ☐ Major ☐ Minor ☐ Emergency

has been completed and complies with the conditions of the RON.

This Audit was accomplished by:

☐ A site inspection

☐ Not inspected, but was one of a batch covered by random inspections in accordance with the Quality Plan agreed with the Waimakariri District Council.

Signed _____

Work meets required standards: _____

Signed by the principal provider:

_____ Date:_____ Print Name:_____

Work meets required standards: Date of audit undertaken by the Waimakariri District Council:_____

Accepted by the Waimakariri District Council Date:_____ Print Name:_____

Works comply and 12 month warranty period commences: Date:_____ Print Name:_____

Notice copied to_____Maintenance Contractor

_____

_____