SM012 State Highway Control Manual
Part 14 - Consolidated Projects Sections

Index

Safe System principles in design

Principle	The road system needs to be managed and designed in such a way that impact energy on the human body is: • Firstly avoided - this includes considering the ways in which people respond to road conditions and design roads to minimise opportunities for error. • Secondly managed at tolerable levels, in the event a crash occurs - design a system that is error tolerant – i.e. design that is resilient to human error and will minimise harm when something goes wrong.
Embedding	For the Safe System approach to be fully embedded into New Zealand we need systematic application of these principles in road design, operations and maintenance.
Translation	To translate the Safe System approach into application, the following questions should guide us: • Is it possible to have a head-on crash at a speed greater than 70 km/h? • Is it possible to have an intersection (right-angle) crash at a speed greater than 50 km/h? • Is it possible to have a run-off-road (side impact with a rigid object) crash at a speed greater than 40 km/h? • Is it possible to have a vulnerable person (e.g. pedestrian, cyclist and motorcyclist) crash at a speed greater than 30 km/h?
Outcome	Through implementing the Safe System approach there will be potential reductions of human error and, preventing crashes occurring, the priority is reducing the level of harm (death and serious injuries) when crashes do occur.
Targets	Infrastructure and speed management improvement projects and programmes should address high severity, head-on, run-off-road, intersection (side impact) and vulnerable road user casualties where the appropriate value for money can be achieved.

Issue	Traditional approach	Safe System approach
Belief	**Some deaths are inevitable** As long as we were making a good go at improving things, people accepted that some road deaths would still occur, and would be satisfied with some improvement.	**Road deaths are preventable** We know road deaths are preventable. It's not acceptable to accept the status quo. By taking a system approach, and choosing Safe System interventions, we can drastically reduce the level of harm on our roads.
Human error	**Expect perfect human behaviour** Human error was often seen as the excuse for inaction, and effort was focused toward improving driver behaviour rather than infrastructure.	**Plan and design for mistakes, people are fallible and vulnerable** A 'forgiving' transport network is core to the Safe System. Death and serious injury crashes should not occur as a result of driver error. Vehicle and infrastructure/speed improvements should be used to reduce impact forces (should a crash occur) to within human biomechanical tolerances, and therefore reduce the harm.
Responsibility	**Blame the road user** The focus was on driver education to address road user error which consequently lowered the responsibility of system designers.	**System designers and operators are also responsible for creating a Safe System** System designers and operators share the responsibility for safe travel outcomes by accommodating people's errors.
Crash severity addressed	**Total number of crashes** Total crashes (of all severities) was often used to identify problem sites.	**Crashes resulting in death or serious injury** Death and serious injury crashes and/or high-risk crash types should be the starting point in site identification. Minor injury and non-injury crashes may be useful to provide additional information but are not the core focus.
Understanding speed at which deaths and serious injuries (DSI) occur for different crash types	**Biomechanical tolerances known but not core to decision making** Information on biomechanical tolerances was available but was not core to the understanding of how to address risk.	**Biomechanical tolerances core to decision making to eliminate DSI** Biomechanical tolerances are core to the vision of eliminating death and serious injury crashes. We need to understand and be guided by the speed at which DSI occur for different crash types.

Design requirements	**High Benefit Cost Ratios (BCRs) favoured rather than eliminating death and serious injury** Treatment types were often selected based on high BCRs rather than eliminating death and serious injury.	**Must focus on eliminating death and serious injury** It is paramount that new infrastructure assists in eliminating death and serious injuries. This also includes speed management and prioritisation/separation of different transport users travelling in different directions or modes.

Highway Design Details

Introduction	This section points to guidelines to be used for new or reconstructed highways. These guidelines should not be applied as rigid standards and variations may be approved by the National Manager Maintenance and Operations, as appropriate, to take account of local engineering and economic considerations. This approval shall be adequately documented.
Motorway design	Motorways shall be designed for a design speed of 110 km/h. Any exception to this policy must have the approval of the National Manager System Design. Ramps on or off a motorway may have lower design speed values provided they are safe and appropriate speed values are posted.
Geometric design	Vertical and horizontal alignment should be in accordance with the latest editions of the following publications: 1. *State Highway Geometric Design Manual* (SHGDM) –New Zealand Transport Agency 2. *Guide to Road Design (in particular Parts 2 and 3),* AUSTROADS. 3. *Guide Policy for Geometric Design of Freeways and Expressways*, NAASRA. 4. *Guide to the Geometric Design of Major Urban Roads*, AUSTROADS
Intersection design	Intersection design should be in accordance with the latest editions of the following publications: 1. *Guide to Road Design (in particular Parts 4, 4A, 4B and 4C),* AUSTROADS. 2. *Traffic Control Devices Manual, Part 4: Traffic Control Devices for General Use – for Intersections*.
Private, commercial access and minor side road intersections	The layout design for accesses and intersections not requiring any special facilities for traffic management should be in accordance with *Planning Policy Manual (PPM)*. Minor side roads should be in accordance with Diagram 4 of the *PPM*. Private and commercial accesses and intersections should be in accordance with Diagrams 1, 2, 3, 4, and 7 of the *PPM*.
Cross sectional width	Guidelines for widths of rural State highways are given in the Austroads Guide to Road Design Part 3, the *Specification for Design, Construction and Maintenance of Walking and Cycling Facilities* and the safety guidelines, pages 14 to 20 below. Guidelines for widths of urban State highways are given in the Austroads Guide to Road Design Part 3 and with further information in *NZS 4404: Code of Practice for Urban Land Subdivision,* SANZ.
Parking	Parking design should be in accordance with the appropriate parts of the AUSTROADS *Guide to Road Design*.

Traffic flow and capacity	Considerations of traffic flow and capacity should be in accordance with the Austroads Guide to Traffic Management.
Cycle facilities	Guidelines for the design and use of cycle facilities are detailed in the various parts of AUSTROADS *Guide to Road Design*. These guidelines are also summarised in the *Cycling Aspects of Austroads Guides.* Further advice for practitioners is given in the Cycling Network Guidance and the *Specification for Design, Construction and Maintenance of Walking and Cycling Facilities*.
Footpaths	Guidelines for the design and detailing of pedestrian footpaths are given in *NZS 4404: Code of Practice for Urban Land Subdivision,* SANZ.
Drainage design details	Adequate drainage shall be provided for both surface and subsurface water. Guidance on the design of surface drainage systems is found in: 1. Highway Surface Drainage: a Design Guide for Highways with a Positive Collection System, NRB. 2. Guide to Road Design (in particular Part 5), AUSTROADS. In general, if a positive stormwater collection system is not used, a slope not flatter than 5H: 1V should be provided from the edge of seal. Typical side slope details are shown page 20 below.

Bridge and Culvert Design Details

Introduction	This section gives guidelines for the design of new or replacement bridges, and culverts.
New and replacement bridges	All bridges are to be designed in accordance with *Bridge Manual: Design and Evaluation*, NZTA, with reference to the Austroads *Guide to Bridge Technology*.
Repaired bridges	In general capacity for Class I loadings should be provided. Proposals for other levels of structural capacity require the approval of the GMTS.
Culvert structural design	All culverts shall be designed for dead loads plus Class I live loads.

Materials and Equipment Requirements

General	All materials and equipment used on State highway works must be of good quality and appropriate for their intended use. A large number of more commonly used materials and equipment have specific NZTA requirements and these must be complied with as a standard for all State highway works. Dispensations can be obtained from the National Manager Programme and Standards, the National Manager System Design or the Chief Engineer as appropriate so long as the scope and the intent of the standard are achieved.
NZTA materials and equipment specifications	Details of materials covered by specific NZTA requirements are detailed in *Specifications List*, NZTA, under the headings *Materials* and *Equipment.*
Other materials and equipment	Materials or equipment not covered by specific NZTA requirements shall comply with one of the following as appropriate: 1. A SANZ *Standard* or *Specification* where one exists. 2. A manufacturer's specification where no SANZ standard or specification exists. 3. A custom-made engineer's specification. 4. A specification from overseas or from other references referred to in other NZTA Manuals.

Road Pavement, Surfacing, Markings and Road Furniture

Introduction	This section specifies the requirements for pavement design, carriageways, surfacings and traffic aids either on or adjacent to the carriageway.
Funding of Second Coat Seals	The *Planning and Investment Knowledge Base* does not explicitly exclude second coat seals from being funded as project works. However it is expected that the allocation of funding is done effectively and efficiently in order to retain value. Therefore it is not in the interest of the NZTA to hold project funding in excess of 12 months to fund second coat sealing as a project cost. Past experience shows this to be administratively difficult and the funding tends to be forgotten when the works are finally actioned. The funding source needs to be given proper consideration and resolved and recorded early in the project process. A sensible approach is to consider the scale and timing of second coat seals at the time of project scoping, and certainly by the preliminary design stage. If the project is highly trafficked, and will either have an asphaltic concrete surfacing or the second coat seal is likely to be required within 12 months of substantial completion, the cost of the surfacing should be included in the project cost. If the project is rural and has relatively low traffic volumes, the second coat seal should be provided for within the maintenance allocation. This allocation will generally need to be made allowance for in the following financial year's maintenance funding. Given that maintenance is being funded in three-year blocks, there is a responsibility between capital and operations managers to ensure that the allocation for the second coat seals for projects has been properly pre-programmed so as not to become an onerous requirement. This process was agreed between Regional Partnerships & Programmes and Highways & Network Operations in February 2009.
Pavement design	Pavement structural design shall be in accordance with the *AUSTROADS Guide to Pavement Technology Part 2: Pavement Structural Design* and *Part 5: Pavement Evaluation and Treatment Design* together with the latest *New Zealand Supplement.*
Surfacing technical requirements	Surfacing should be in accordance with the following guidelines: 1. *Chipsealing in New Zealand 2005* (Transit New Zealand, *Road* Controlling Authorities, Roading New Zealand) and subsequent amendments and updates. 2. *Chipseal Design*, New Zealand Institute of Highway Technology, 3. *Applying Bitumen Emulsions and Polymer-Modified Binders*, New Zealand Institute of Highway Technology, 4. *Pavement Surfacing Supervisor Chipsealing*, New Zealand Institute of Highway Technology.

Pavement markings	The legal requirements for pavement markings are described in the Land Transport Rule: Traffic Control Devices 2004, with its amendments. Pavement markings shall be in accordance with the following guidelines: 1. Land Transport Rule: Traffic Control Devices 2004, with its amendments. 2. *Manual of Traffic Signs and Markings and Traffic Control Devices Manual with relevant Technical Advice Notes.*
Intersection controls and medians	These should conform with the following guidelines: 1. *RTS 1: Guidelines for the Implementation of Traffic Control at Crossroads*, NZTA. 2. *Traffic Control Devices Manual Part 5: Traffic Control Devices for General Use – Between Intersections*, NZTA. 3. *Guidance on Medians and Centreline Treatments to Reduce Head-on Casualties*, Austroads (2016). 4. *Austroads Guides*: • *Road Design Part 4A: Signalised and Unsignalised Intersections, 2021* • *Road Design Part 4B: Roundabouts, 2021* • *Guide to Traffic Management Part 10: Transport Control - Types of Devices, 2020*.
Pedestrian crossings	The requirements for pedestrian crossings are contained in the Land Transport Rule: Traffic Control Devices 2004. Note that pedestrian crossings shall not be installed on roads where the speed limit is greater than 50km/h unless approval is obtained from the Senior Manager Systems Integrity. Details of pavement markings are specified in the *Traffic Control Devices Manual* and the *Manual of Traffic Signs and Markings Part II: Markings*, NZTA. No stopping lines may need extensions for visibility especially where school patrols operate. Lighting shall be in accordance with AS/NZS 1158.4:2015. New installations shall be constructed only where they meet the warrant requirements set out in the *Traffic Control Devices Manual* and the *Manual of Traffic Signs and Markings*.
Safety barriers and median barriers	These should comply with the following guidelines: AUSTOADS *Guide to Road Design (in particular Part 6), M/23 Roadside Safety Barrier Systems* and *AASHTO Roadside Design Guide*
Skid Resistance	The management of skid resistance shall be in accordance with the *Specification for State Highway Skid Resistance*, T10.

Lighting

General	With the exception of intersections with physical islands and pedestrian crossings there are no specific requirements for State highways to be lit. The necessity for lighting is normally based on the likelihood of conflict between vehicles, pedestrians or cyclists. Lighting is generally unnecessary outside urban areas, except for motorways, major rural intersections and sections of highway where it is justified to address high night-time crash rates.
Technical standards	New or upgraded state highway lighting installations shall comply with *AS/NZS 1158.1.1:2005 Lighting for roads and public spaces - Vehicular traffic (Category V) lighting – Performance and design requirements.* New or upgraded pedestrian crossings shall comply with *AS/NZS 1158.4:2015 Lighting for roads and public spaces – Lighting of pedestrian crossings.* Installation guidance for traffic route lighting is given in *AS/NZS 1158.1.2:2010 Lighting for public spaces - Vehicular traffic (Category V) lighting - Guide to design, installation, operation and maintenance.*
Lighting poles	All new lighting poles shall comply with NZTA specification M26. Poles installed in urban or pedestrian frequented areas must not be of slip-base design. Guidance about types of poles suitable for use in various areas is given in NZTA specification M26.
New lighting installation	The need for new light installations will generally be determined by project evaluation criteria specified in Chapter 2 Section 2.3 of NZTA's *Economic Evaluation Manual Volume 1*.
Pedestrian Crossings	All pedestrian crossings on State highways must be kept illuminated during the hours of darkness and must be provided with either operating Belisha Beacons or 400mm diameter (min.) fluorescent reflectorised discs fitted to poles at each end.
Flag lighting	Flag lighting is intended to indicate the presence of a minor intersection or important access particularly in rural areas. The installation shall normally consist of no more than 2 lanterns. Capital costs can be a SH or TLA responsibility. The annual costs of flag lighting on State highways in rural areas are a State highway cost. Specific approval can be given by System Managers for flag lighting on State highway road reserves requested by a private developer or lighting for a private development required by regional office to mitigate adverse effects on the State highway. This usually only occurs in rural areas. Capital and annual costs are the responsibility of the developer.
Motorway lighting	Capital and annual costs are a State highway responsibility. Other sections of State highway which are fully access controlled may also qualify, with the GMTS's approval.
Ambiguities	Any installation not clearly covered by policy shall have the specific approval of the GMTS.

Schedule of SH operational lighting	A schedule of all light installations that are an annual State highway operational responsibility shall be kept by the System Manager.
Maintenance	The maintenance of highway lighting shall comply with NZTA Maintenance Specification in the Network Outcomes Contract, under section 6: Physical Works.

Traffic Signals and Traffic Signs

Introduction	This section specifies the requirements for off-carriageway traffic aids.
Legal requirements	All traffic control devices when installed must comply with the Land Transport Rule: Traffic Control Devices 2004 and its amendments.
Traffic signal technical standards	Guidance on the design and maintenance of traffic signal installations is contained in the following: 1. Land Transport Rule: Traffic Control Devices 2004. 2. *Traffic Signals, A Guide to the Design of Traffic Signal Installations*, AUSTROADS. 3.
Traffic signal funding	All traffic signals installation and operational costs at a State highway intersection or a State highway motorway ramp terminal are a State highway charge. A TLA may install approved signals as part of its subsidised works programme where programming priorities do not permit State highway funding. Operational costs will in this case be funded by the State highway.
Traffic signs	1. The description and use of all traffic signs is contained in the Land Transport Rule: Traffic Control Devices 2004 with its amendments and gazette notices. 2. Graphics of traffic signs are shown in the NZTA *Traffic Control Devices Specifications.* 3. All traffic signs, delegations and procedures shall comply with the NZTA *Manual of Traffic Signs and Markings* and/or the NZTA *Traffic Control Devices Manual*. 4. Signs advising a speed restriction shall be placed within 20 metres of the gazetted positions. 5. All permanent warning and information signs shall display a NZTA logo as illustrated in Part 2 on page 11.

Cross Section Guidelines for Two-lane Rural State Highways

1. Background

This guideline has been developed from a review of cross section guidelines for two lane rural roads from a motorist safety perspective and are not a definitive requirement for shoulder width. The review was undertaken to look at the safety performance of the State highway network and consider optimal widths to address safety only. Additional consideration for cyclist safety is required and suggested widths are included in the *Specification for Design, Construction and Maintenance of Walking and Cycling Facilities*. Additional width should also be considered adjacent to passing lanes and for sections with central median barriers due to errant vehicle tracking affecting vulnerable road users.

The guideline is to be used by New Zealand Transport Agency (NZTA) Offices as a first-cut assessment for the setting of cross-section widths over State highway links. Refer to 5. *Links*, below, for the definition of a road link. On both State highways and local roads, road controlling authorities are recommended to use the guidelines given in the *Austroads Guide to Road Design Part 3: Geometric Design* (see table 4.5) and to consider the needs of all road users.

In developing the guidelines, source data was drawn from *VicRoads draft width study report*. This was later published as *Optimum traffic lane, seal and pavement widths for non-urban roads,* by John McLean for the Australian Road Research Board, 1990.

Expected motorist accident rate reductions were used to determine safety cross section configurations on a national basis to ensure that they are considered as part of the assessment process. An integrated approach will then be used to determine what cross section configurations would best apply to varying multi-traffic volume ranges.

2. Procedure

Each NZTA office is to establish appropriate cross section standards for defined roading links over its State highway network. Details of the safety assessment procedure are given in the body of this report as the first step of this process.

3. The Cross Section Review

The emphasis of the review of cross section guidelines for two lane rural roads was, in terms of safety, to establish the best safety layouts. The review findings were as follows.

(a) Widening lane widths to 3.5 m provides the best benefit in terms of reductions in motorist accident rates. There was little saving for increasing lane widths above 3.5 m.

(b) For sealed roadways up to 7.0 m wide, it is desirable to allocate available seal width into traffic lane rather than sealed shoulder.

(c) Sealed shoulders provide better utilisation of space in safety terms compared with metal shoulders and provide some separation for cyclists and pedestrians.

(d) Where possible, it is preferable to use available cross section width for wider shoulders rather than for side slopes flatter than the recommended to provide better safety for other road users.

Analysis of varying cross-section configurations for varying traffic volumes resulted in the ideal cross sections being selected for given traffic volumes. (See Fig. A3A.1.)

The recommended seal widths to be applied on a link-by-link basis are as follows:

(a)	Up to 500 vehicles per day	:	7m seal width
(c)	2000 to 4000 vpd	:	8.5m seal width
			or 10m seal width if B/C >1*

(d) Over 4000 vpd : 10m seal width

or 11m or 12m seal width if the link B/C exceeds cut-off value*

* NOTE: A B/C of 1 is to be used when determining a standard for a link, but it is not to be regarded as the funding cut off on a project-by-project basis. Refer to 7. *Application*, below.

Intermediate cross section widths are not to be adopted when establishing link cross-section widths, so if the widths recommended for other purposes are less these should be the target. If the widths recommended overall are greater, then they should be the targets adopted.

4. Accident Savings Tables

Average accident rates per 100 million vehicle kilometres (Ax/10^8 veh-kms) can be obtained from the Table A3A.1.

The accident rates have been calculated using New Zealand average accident rates applied to the formula obtained in the VicRoads width study report. The data is admittedly coarse and only indicative of the expected accident savings that can be achieved.

Table A3A.1 and the method set out below can be used to estimate an annual accident rate (A) for a section of road.

(a) Establish an annual reported non-intersection injury accident rate** for the section of road. (R)

(b) Use Table A3A.1 to determine the estimated accident rate for the section of road based on its existing cross section configuration. (E)

(c) Use Table A3A.1 to determine the estimated accident rate for the two or three possible options for the cross-section configuration (Fig A3A.1). (P)

(d) Establish an expected annual accident rate using the following formula.

$$A = R \times \frac{P}{E}$$

** NOTE: Non-intersection injury accident rate also includes fatal accidents.

Example:

An existing two-lane rural road has an existing cross section consisting of 3.25m lanes, 0.25m of metal shoulder and 0.25m of sealed shoulder. Ten non-intersection injury accidents were reported over its 2 kilometre length over the last five years. The road is carrying 3000 vehicles per day.

What is the estimated accident savings if the road cross section was to be upgraded to 3.5m lanes and 750mm sealed shoulders?

(a) Calculate the reported accident rate for section of road. (R)

$$AxRate(R) = \frac{10}{5 \times 3000 \times 365 \times 2} Ax$$
$$= 91.32\ Ax/10^8\ veh\ km$$

(b) Establish the estimated accident rate for existing cross section. (E)

Using Table A3A.1: 3.25m lane, 0.5m shoulder, 0.25m of which is sealed

= 22.97 Ax/10^8 veh-km.

(c) Establish the estimated accident rate for proposed cross section. (P)

Using Table A3A.1: 3.5m lane, 0.75 shoulder totally sealed = 19.57 Ax/10^8 veh-km.

(d) Calculate the expected annual accident rate per year. (A)

$$A = 91.32 \times \frac{19.57}{22.97}$$

$$A = 77.80 \;\; Ax/10^8 \, veh\, km$$

5. Links

Cross sections should not vary arbitrarily along a road length. They should only vary at points where the reason is obvious to road users as follows:

(a) At points where there are major intersections that change traffic flows significantly, or

(b) Points where there are terrain changes that impose significant changes in construction cost.

A link is defined as the road length between the points as defined above.

Link lengths should not be related to features that are not perceived by a driver. An example of this would be where extra construction costs are incurred where a road travelling across flat open country then crosses a swamp. To the driver there is no visible change to the driving environment.

Desirably a link should be as long as possible. It may be over 50 km in length where there is no substantial change to the road environment. Conversely there are practical situations where a link may be only 3 to 5 km long.

6. Side Slopes

The side slope of the road cross-section is that slope which applies from the shoulder edge to the base of the adjacent drainage channel or to the top of a fill batter. It incorporates that section over which the metal pavement layer is tapered out. This section provides lateral support to the pavement layers.

The side slope is not intended for normal use by vehicles. It does not play a part in the recovery of vehicles which may stray from the traffic lane in the same way that a shoulder does. Nevertheless, it should be flat enough not to worsen the consequences of an accident when a vehicle runs off the road. Beyond this there is no documented safety benefit to be derived from flatter side slopes.

At the same time, the side slope must be steep enough to drain water from the surface and pavement layers into the drainage channel.

International literature recommends side slopes in the range 4:1 to 6:1 for safety reasons.

Refer to the paragraphs below and to Fig. A3A.2 for recommended side slope details. A side slope of 5:1 is adopted for normal use. A maximum side slope of 4:1 may be acceptable in constrained situations where, for safety reasons, it is preferable to invest available space into shoulder width rather than side slope width.

Existing side slopes flatter than 5:1 should remain unless there is evidence of inadequate drainage.

The side slope shall fall from the metal strip outside the seal edge for a distance that enables the greater of the following two criteria to be obtained before either a drainage channel, a cut batter, or a fill batter.

The side slope shall terminate at either:

(a) 400 mm below the seal edge, or

(b) 150 mm below the pavement/subgrade interface.

7. Application

The appropriate cross-section standard from Fig. A3A.1 is to be determined for road links along rural State highways in conformity with the processes established in this guideline.

To establish the appropriate cross section the following methodology is recommended:

(a) Determine the bounds of the road link under consideration as defined in 5. *Links*, above.

(b) Determine the traffic volume representative of the link.

(c) Obtain the number of reported non-intersection injury accidents for the link, using the most recent five years of MOT reported injury accidents. Calculate the existing accident rate.

(d) Obtain representative data of the existing cross-section configuration over the link to establish a calculated accident rate. Also obtain details on the length of highway and width of seal below each of the cross section options for costing purposes.

(e) Calculate expected accident savings for the link using the method given in 4. *Accident saving tables*, above, and using Table A3A.1.

(f) Determine the rough order cost for seal widening to the proposed cross section standard over the link. The cost may have to be calculated for more than one cross section option to establish the optimum.

(g) Carry out benefit cost analysis for seal width options.

(h) Select the appropriate minimum safety seal width assessed for the link on the following basis:

(i) Up to 500 vpd: 7m seal width

(ii) 500 to 2000 vpd: 8.5m seal width if B/C for link >1

or else 7.0m seal width

(iii) 2000 to 4000 vpd: 10m seal width if B/C for link >1

or else 8.5m seal width

(iv) Over to 4000 vpd: 10m seal width

or 11m or 12m seal width if B/C for link above cut-off value

8. Implementation

Compare the recommended widths from the various treatment needs and select the appropriate seal width to meet all requirements. The selected cross-section standard shall be applied to all new works and to pavement smoothing (rehabilitation works) where widening can be achieved above the current funding cut-off and to area wide treatments where seal widening is specifically approved.

By exception, a lesser seal width may be approved where the target seal width cannot be realistically achieved over the full treatment length due to the presence of a significant impediment (e.g. a physical restriction such as an isolated rock bluff) provided the width used will not create a varying driving environment.

System Manager approval is required for the use of any higher-than-existing cross section which is below the standard cross section for the link, except when the improvement to the cross section on a highway is being carried out and funded in conjunction with area wide treatment or pavement smoothing works. In those cases, approval is to be obtained from the Senior Manager, Maintenance and Operations.

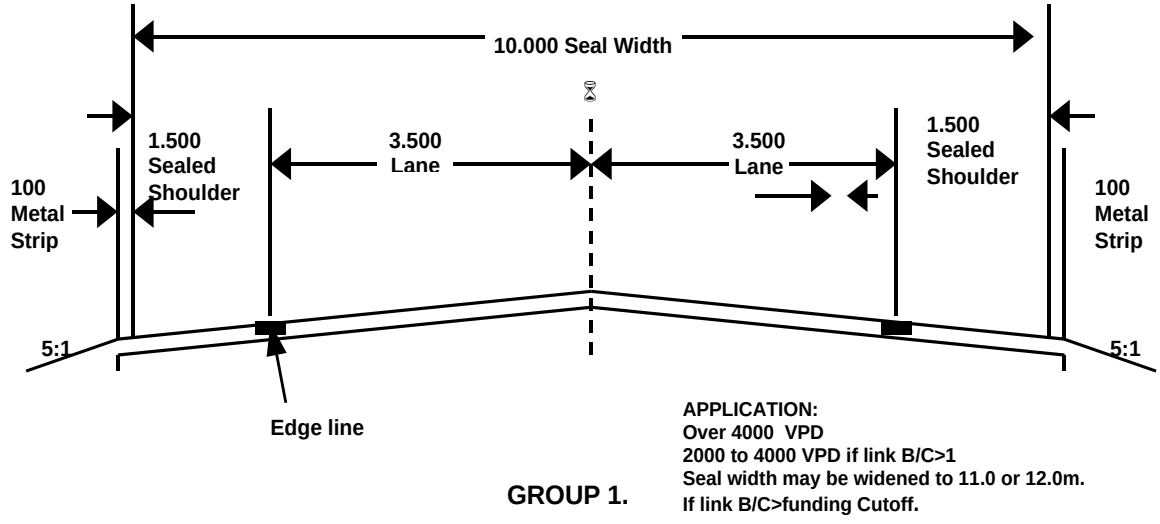
If funding for the new standard cross section cannot be justified for a length of highway, it shall remain at its existing width.

A section of road already above the proposed link standard is not to be narrowed to conform.

NZTA offices will ensure that all rural State highways have undergone a cross-section review as per the methods described in this guideline by 1 July 2020. Further cross-section reviews will then be undertaken at 5-year intervals.

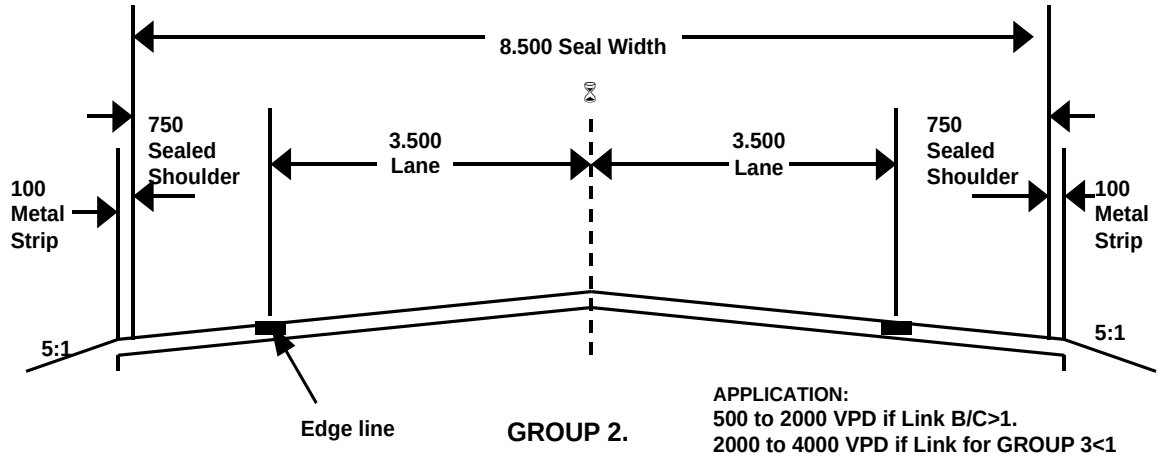
The cross-section review findings, including calculations shall be held by NZTA regional offices for review and update. For quick reference, the selected cross section widths shall be recorded on the highway information sheets.

Figure A3A.1 Cross-section guideline for two-lane rural road



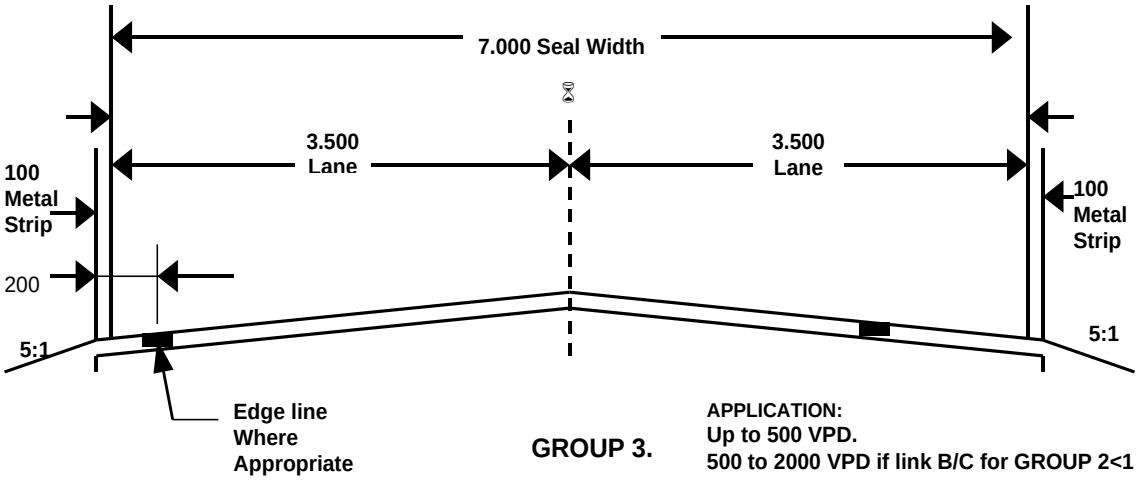
GROUP 1.

APPLICATION:
Over 4000 VPD
2000 to 4000 VPD if link B/C>1
Seal width may be widened to 11.0 or 12.0m.
If link B/C>funding Cutoff.



GROUP 2.

APPLICATION:
500 to 2000 VPD if Link B/C>1.
2000 to 4000 VPD if Link for GROUP 3<1



GROUP 3.

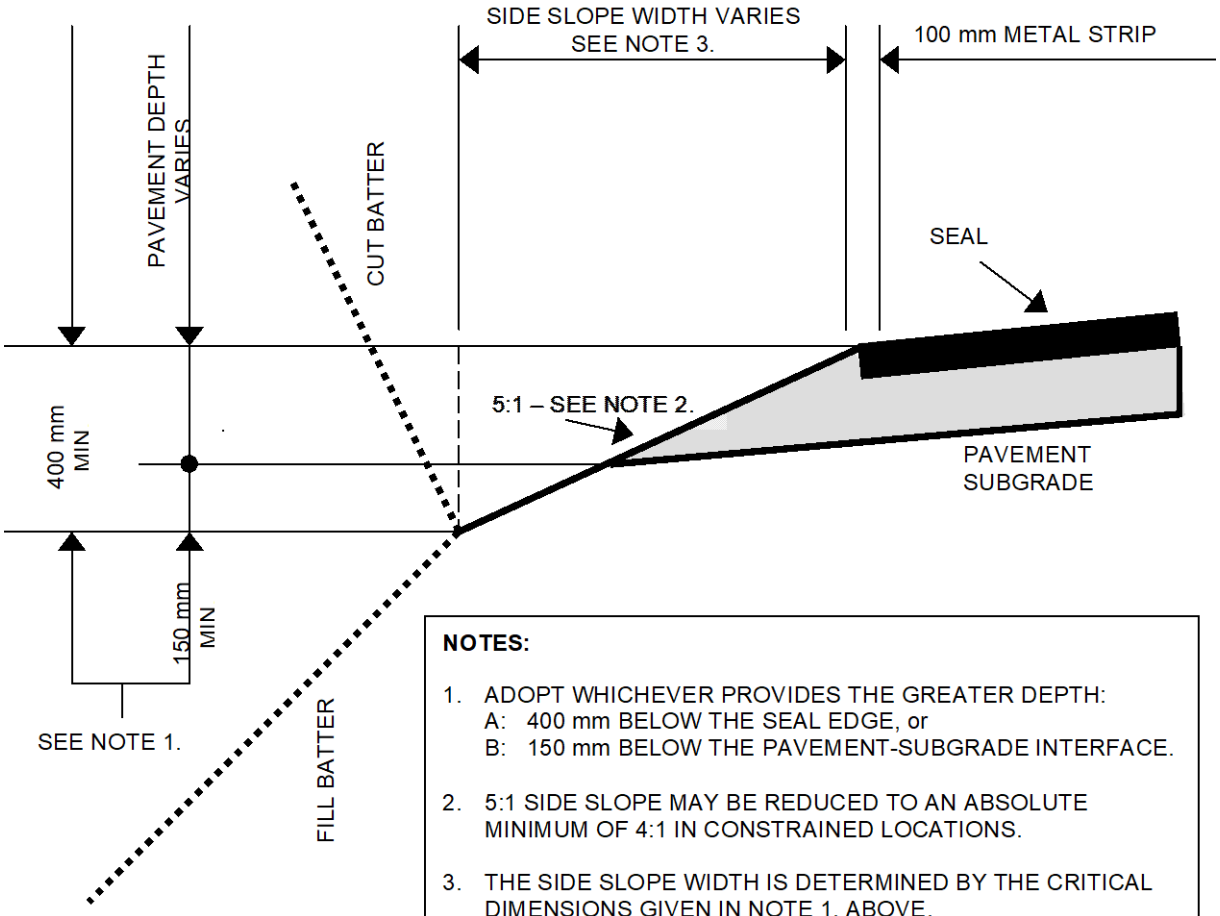
APPLICATION:
Up to 500 VPD.
500 to 2000 VPD if link B/C for GROUP 2<1

NOTE: 5:1 side slopes may be reduced to a minimum of 4:1 in constrained areas.

Table A3A.1 Accident rates for various cross-section configurations (Crashes/km/yr)

Total Shoulder Width	Sealed Shoulder Width	Lane Width (m)				
Total Width	Sealed Width	2.75	3.00	3.25	3.50	3.60
0.00	0.00	29.74	26.83	24.37	22.36	21.91
0.25	0.00	29.16	26.31	23.89	21.92	21.48
	0.25	28.60	25.80	23.44	21.50	21.07
0.50	0.00	28.57	25.78	23.42	21.48	21.05
	0.25	28.02	25.28	22.97	21.07	20.65
	0.50	27.45	24.77	22.50	20.64	20.23
0.75	0.00	27.41	24.73	22.46	20.61	20.19
	0.25	26.88	24.25	22.03	20.21	19.81
	0.50	26.33	23.76	21.58	19.80	19.40
	0.75	26.02	23.48	21.33	19.57	19.55
1.00	0.00	26.53	23.94	21.74	19.95	19.55
	0.25	26.02	23.48	21.33	19.57	19.17
	0.50	25.49	23.00	20.89	19.17	18.78
	0.75	25.19	22.73	20.65	18.94	18.56
	1.00	24.31	21.93	19.92	18.28	17.91
1.50	0.00	24.49	22.10	20.07	18.41	18.05
	0.50	23.53	21.23	19.28	17.69	17.34
	1.00	22.44	20.24	18.39	16.87	16.53
	1.50	20.87	18.83	17.11	15.70	15.38
2.00	0.00	22.45	20.26	18.40	16.88	16.54
	0.50	21.57	19.46	17.68	16.22	15.89
	1.00	20.57	18.56	16.86	15.46	15.15
	1.50	19.13	17.26	15.68	14.39	14.10
	2.00	17.44	15.74	14.30	13.12	12.85

Figure A3A.2 Cross-section guidelines for two-lane rural roads: side slope details



NOTES:

1. ADOPT WHICHEVER PROVIDES THE GREATER DEPTH:
   A: 400 mm BELOW THE SEAL EDGE, or
   B: 150 mm BELOW THE PAVEMENT-SUBGRADE INTERFACE.
2. 5:1 SIDE SLOPE MAY BE REDUCED TO AN ABSOLUTE MINIMUM OF 4:1 IN CONSTRAINED LOCATIONS.
3. THE SIDE SLOPE WIDTH IS DETERMINED BY THE CRITICAL DIMENSIONS GIVEN IN NOTE 1. ABOVE.
4. SEE FIGURE A3A.1 FOR CROSS SECTION WIDTH DETAILS.

Other Statutory Controls

Purpose	Situations often arise where action is required to meet an immediate situation. Provision is made in various regulations for prompt action to be initiated without the need for a bylaw or more formal control measures.
Road construction zones	Managers, System Management are authorised to declare Road Construction Zones on State highways in accordance with regulation 12 of the HMV Regulations 1974. The zone can be applied to construction or maintenance works. The purpose of such a notice is to be able to run special or non-standard vehicles on the whole or part of a section of the highway being reconstructed. It is not intended that it should allow overloading of vehicles beyond the manufacturers' recommended limits as this may be detrimental to vehicle safety. The specific types and particular limits of these vehicles must be stated on the notice. The boundaries of any road construction zone shall not extend beyond the specific section of road under construction but may be of lesser length. The length of the zone should only be that part of the site for which any resultant damage from these vehicles will not be critical in the future management of the highway. The limitations on access within the zone for all or any particular type(s) of vehicles must be stated on the notice. The construction zone will also need to apply when the particular vehicles are being used on any haul road within the road reserve, even if the carriageway itself is not utilised. The Regulations require that a copy of the notice (and any amendment to it) is lodged with the Agency. This requirement is to advise a change in allowed vehicle standards on a road and therefore a copy of any State highway notice must be sent to the appropriate Manager, Road Compliance, Transport Access Delivery Group within the Agency. NZ Police (CVIU) is also to be advised of all construction zones and be sent a signed copy of the notice. The CVIU may also be consulted if there are concerns about the vehicles requested to be included in the notice.

Road Construction and Maintenance Standards

Introduction	NZTA has approved national standard documents specifications with notes to cover a range of construction and maintenance activities on State highways. Current national standard System Design and Delivery (SDD) contract documents are: • State Highway Professional Services Contract Proforma Manual SM030 • Physical Works Proforma Manual SM031 • State Highway Maintenance Contract Proforma Manual SM032 Network Outcomes Contract Management Manual SM034. A schedule of all current specifications can be obtained from the Manager, Procurement Strategy and Methods, Wellington.
Application of Standard Contract Documents	The following guidelines shall apply to the use of standard contract documents: 1. Standard contract documents shall be used for all appropriate contracts unless written dispensation has been received from the Manager, Procurement Strategy and Methods. 2. The standard contract documents shall be maintained by the Manager, Procurement Strategy and Methods, and all requests for documents and recommendations for change shall be forwarded to that officer. Requests for change can be sent to the manual e-mail addresses.
Application of Standard Specifications	The following guidelines shall apply to the use of standard specifications: 1. All construction and maintenance on state highways shall be in accordance with NZTA standard specifications where these exist. 2. Project specifications shall list only those standard specifications relevant to the project. 3. Specification notes shall not be included in contract documents.
Road construction	Construction shall be in accordance with the current NZTA "B", "F", "G", "P", "Q" and "T" series specifications.

Bridge Construction and Maintenance Standards

Introduction	Bridges impose inflexible and durable constraints on State highways. Each bridge is unique. A consequence of this uniqueness is that there are no NZTA standard specifications developed for bridge construction and maintenance.
Bridge construction	Construction of State highway bridges shall comply with the following specifications: 1. Bridge Manual Version 3.3 June 2018. 2. Standards New Zealand (SNZ) Specifications. 3. Manufacturers' specifications where no SNZ specification exists. 4. Site-specific Engineer's specification. 5. Waterway Design: Austroads 1996.

State Highway Proposals Affecting National Parks, Reserves and Conservation Areas

Early engagement	For any work within, through or adjoining a national park, reserve or conservation area (collectively, public conservation lands) early discussion or ongoing consultation and involvement in decision-making is required between NZTA and DOC.
Planning	When planning new State highway works (whether construction, improvement or maintenance), both agencies should work together to ensure statutory objectives are met. The objectives of each agency are outlined in the NZTA/DOC Memorandum of Understanding (see section 5.5.1-5.5.3 of the MOU). To ensure a partnership approach is maintained, there should be early consultation on any proposed works between both parties. This is to ensure the planned State highway development or improvement is consistent with the: • Land Transport Management Act 2003; • Government Roading Powers Act 1989; • National Parks Act 1980: • Conservation Act 1987; • Reserves Act 1977; and • policies and plans [and Standard Operating Procedures] prepared under these Acts by either parties. Both parties will conduct early consultation to seek agreement at the scoping and or scheme assessment stage. This includes consultation required by any public and/or statutory process, for any proposed works, and consultation in respect of State highway provisions within CMS, CMP and NPMP.
Environmental effects	New or upgraded State highways will be planned, designed, constructed and maintained to ensure works and activities avoid, remedy, or mitigate effects on natural character, historic values or landscape features and on public use and recreational facilities (e.g. tracks, structures). This includes but is not limited to: • avoidance of fragmentation of habitats and ecosystems where possible, including culvert replacements allowing unimpeded fish passage; • rehabilitation of surfaces of earthworks; • avoiding pest plant and weed introduction and providing weed control; and • collecting and treating stormwater run-off beyond statutory requirements if deemed necessary by NZTA and DOC staff. Where possible, DOC will also assist NZTA by identifying suitable pest and weed-free sources of road materials in NPMP/CMP/CMS, within public conservation land. Environmental effects of construction or improvement (including maintenance works) of any state highway shall be assessed in line with the

	Agency's environmental and social responsibility standard (see https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/environment-and-social-responsibility/national-standards-guidelines-and-specifications/esr-standard). An Assessment of Environmental Effects (AEE) is required for all projects in line with the Resource Management Act 1991 (RMA) and/or Conservation and National Parks Act (1987 and 1980) requirements. The coverage and detail of the AEE will reflect the scale of the project / works. In addition to the statutory requirements, the AEE should outline any objectives and functions of the state highway. Probable effects shall be assessed and addressed in line with the NZTA's environmental policy and planning documents, guides, standards and specifications (see https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/). Particular focus will be on:- • Ecological quality and processes; • Landscape values; • Cultural and historic values; and • Character and values of national parks, reserves and conservation areas. The AEE should address the statutory purpose for which the land is held and the relevant provisions of any NPMP, CMP or CMS guides and standards provided by DOC on assessing animal and plant conservation values (see https://www.doc.govt.nz/Documents/science-and-technical/sfc327entire.pdf). The NZTA requirements for environmental and social management plans (ESMP's) applies to all projects scaled to the issues (see https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/environment-and-social-responsibility/management-plans/). Where projects are considered high risk and or traverse areas of particularly high natural and cultural values a specific environmental management plan covering controls to be used shall be developed and agreed between that parties.
State highway operation standards	Standards adopted for State highway improvements within or adjoining public conservation lands must be commensurate with the qualities of the park, reserve or area through which the State highway passes and with its transportation function. To maintain adequate transport capacity and safety, the road corridor cross-sections adopted must allow for seal widths to normal standards used elsewhere on rural State highways, except where significant natural, historic, landscape or recreational values need to be preserved. In these cases, a smaller width may be acceptable provided safety is not compromised. To ensure these issues are addressed an assessment of the character of the affected area shall be undertaken to identify any special needs for corridor management that addresses high values (e.g. vegetation or habitats). Controls (non-standard) can include tailored vegetation clearance through the corridor with specific controls for unique plants and habitats, and extra controls in dealing with pest plant / organism issues (e.g. material handling and disposal including equipment cleaning). Controls for historic, landscape or recreational values may include assess management, avoidance of certain activities or implementation of multi modal transport systems. Land to provide shoulder and drainage for the operation of the State highway will be sought as well as additional width on corners for seal widening. Extra

	width may be sought due to the environmental conditions that affect the State highway.
Signage	All signs should be placed to meet safety requirements for road users on the State highway and should not obstruct scenic views. The design, placement and appearance of official signs within the State highway reserve are subject to standards and rules. NZTA is obligated to provide official signs under the Land Transport Rule: Traffic Control Devices and by virtue of its role under the Land Transport Management Act 2003. The NZTA Manual of Traffic Signs And Markings (MOTSAM), the Traffic Control Devices Manual, the Variable Message Signs Guideline and the State Highway Control Manual, all provide guidance on design, size and location of official signs, whilst third party signs, including advertising signs are controlled by the New Zealand Transport Agency (Signs on State Highways) Bylaw 2010 and amendments (https://www.nzta.govt.nz/assets/resources/Bylaws-state-highway/Bylaw-2010-New-Zealand-Transport-Agency-Signs-on-State-Highways-Bylaw-July-2010.pdf). Additional policy and guidance can be found in the Planning Policy Manual (See https://www.nzta.govt.nz/resources/planning-policy-manual/). DOC also has guidance on appropriate signage on public conservation land. Consultation between DOC and NZTA should occur where the following is proposed: · DOC signage is to be placed on public conservation land near to a State highway; · NZTA signage on State highway land, other than for road safety (such as general information signs), to be placed adjacent to public conservation land; · Non-NZTA signage (e.g. fish and game signs) placed on State highway land, and which requires approval by NZTA; or · Third party information or advertising signage, to be placed on public conservation land visible from a State highway. The purpose of this consultation is to avoid conflict between public conservation land values, State highway user safety and visual quality.
Authorisation for use of Public Conservation Land	Where capital projects or maintenance works need to be undertaken on public conservation land, unless specified within agreed management plans, NZTA will need appropriate authorisation from DOC to undertake the work. Examples of some of the types of works which may require authorisation are: Realignments or road widening; Disposal of cut-to-waste material from a seal widening; River bank protection; Clearance and management of accumulated snow and ice; Stockpiling; Erection of snow fences; Culvert extensions; Management of pest organisms; and Geotechnical borehole drilling.

Basic Design Criteria for State Highways through National Parks, Reserves and Conservation Areas

General	In all aspects of planning, design and construction of State highways through public conservation land, NZTA's State Highway Professional Services Contract Proforma Manual (SM030) and State Highway Construction Proforma Manual (SM031) should be complied with. The NZTA's environmental standards, guides and specifications will be used as the basis of management controls.
Pre-Works Project Liaison	The location of the State highway, its alignment and profile, the cross-section design and other related features shall avoid, remedy or mitigate any adverse effects on environmental values, including waterways, and on public use and public conservation land.
Design speed	Special attention must also be given to the impact of the State highway on the natural character and landscape and to the highway's visual appearance. Where possible, multipurpose landscaping should be used, as identified in the NZTA landscape guides and specifications.
Alignment	Where proposed works are to be undertaken on public conservation land, NZTA and its consultant should meet with the appropriate DOC conservancy teams as part of business cases processes and preparation for authorisations when designs are considered and being developed. The purpose of these meetings is to identify any specific constraints (e.g. whether it is a sensitive ecological area) which should be avoided, remedied or mitigated.
Native vegetation	Prior to any construction activities being undertaken, a pre-works on site meeting between DOC, the Contractor, NZTA and/or consultant should take place. The purpose of the meeting is to discuss construction practices and re-affirm specific issues discussed at the design stage that the contractor needs to be aware of in undertaking the work.
Structures	The design speed shall be carefully chosen, as it is the key element that directly fixes standards for the horizontal alignment and profile of the State highway. As a result, this can influence the manner in which the location of the state highway avoids environmental damage, including historic sites so that it blends into the landscape.
Stopping places	The general alignment and profile of the highway must fit the character of the area traversed, to ensure that excavation and embankment will be reduced to a minimum while meeting NZTA's statutory objective. Geometric design should follow a curvilinear horizontal alignment and have a gently rolling profile, which will result in a more pleasing appearance.

Miscellaneous Policies

Official opening ceremonies	Guidelines for opening ceremonies are given on pages 29 and 30 below. All proposals for official opening ceremonies must conform with the criteria specified in the guidelines. Funding should be provided as a provisional sum in the approved contract.
Roadside landscaping and vegetation	Roadside planting shall be in accordance with NZTA's *Landscape Guidelines 1st Edition*. A schedule of landscape areas maintained by NZTA shall be kept by the Network Consultants and regional offices. All specified NZTA maintained landscape areas shall be maintained to a standard appropriate to that situation.

Guidelines for Opening Ceremonies for New Zealand Transport Agency Projects

In this Section	This section contains guidelines for opening ceremonies.

Guidelines for Opening Ceremonies for New Zealand Transport Agency Projects

Appropriate Projects

Opening ceremonies should be considered for all large projects of national significance (e.g. the completion of Grafton Gully, Auckland).

They may be appropriate for some projects of local significance (e.g. completion of the sealing of SH 6).

Small projects which generate high local interest, but have little or no national significance, may also be considered at the discretion of Managers, System Management.

Funding

New Zealand Transport Agency (NZTA) will fund opening ceremonies of significant projects on the grounds that they are NZTA's achievements on behalf of road users. The contractor and/or the local territorial authority may wish to contribute. Where appropriate, NZTA will accept and acknowledge other contributions, but ownership of the ceremony will remain with NZTA.

Joint projects (e.g. NZTA/local authority projects) should be funded in proportion to the funds contributed to the project.

Official openings should preferably be identified during the early planning phase of projects. Funding for an opening ceremony should be written into the professional services contract as a provisional item.

Where the desirability of having an opening ceremony becomes apparent at a later phase of the project, funding must be negotiated as a variation to the professional services contract.

The upper limit on NZTA funding of opening ceremonies is $5,000.00 unless the Chief Executive approves otherwise.

Approval

All opening ceremonies are to be approved by the Chief Executive at least two months before the date of the ceremony. A memo to the Chief Executive outlining the proposal and cost should be copied to the Manager, External Engagement and Communications.

Publicity

The publicity for opening ceremonies will be managed through NZTA's Governance, Stakeholders and Communications Group. The details must be confirmed with the Manager, External Engagement and Communications at least one month prior to the ceremony.

Invitations

Invitations should be issued to all organisations and individuals approached during the consultation phase. This should include the local MP (including the local Maori MP), the local authority Mayor and relevant councillors, Regional Transport Committee members, the Chair of NZTA, the Chief Executive, General Manager, System Design and Delivery, NZTA, or their representatives.

NZTA Board members living in the project region should be invited. Invitations should also be extended to other local dignitaries and interest groups in accordance with the wishes of the community (e.g. iwi where they have an interest) and organisations, which have an interest in the project (e.g. RTA or AA).

The Minister of Transport should be invited to attend only when the project is one of national or very significant local interest. In that case the Minister should be requested to perform a brief ceremonial role (e.g. declaring the highway open/ cutting the ribbon) and to speak on any particular subjects of public interest. The invitation should be extended formally through the Chief Executive.

Small, local ceremonies may involve only the Manager, System Management, a local authority representative and possibly a locally based Board member.

Opening Ceremony Protocols

The Design Portfolio Manager should preside over the ceremony.

The official speakers should be:

- the Chair (or representative) of NZTA
- the contractor
- the Mayor (or representative)
- the local MP
- a representative from Iwi where appropriate
- the Minister of Transport (or Prime Minister) where appropriate
- a blessing / tapu lifting etc. where appropriate

For small local ceremonies the Manager, System Management will represent NZTA if a locally based Board member is not available to attend.

The ceremony may be followed by morning or afternoon tea or appropriate catering.

DRAFT

1 December 2008

Parties

NEW ZEALAND TRANSPORT AGENCY

("*NZTA*")

and

[LOCAL AUTHORITY]

(*the Principal*)

COST SHARING CONTRACT

COST SHARING CONTRACT

TABLE OF CONTENTS

PARTIES

(1) NEW ZEALAND TRANSPORT AGENCY (*NZTA*)

(2) [LOCAL AUTHORITY] (*the Principal*)

1 INTERPRETATION

1.1 Application

This Section shall apply to the Contract Documents unless inconsistent with the context.

1.2 Definitions

Contract Agreement means the written agreement for the fulfilment of the contract signed by the Principal and NZTA.

Contract Documents means the Contract Agreement in the First Schedule and the documents referred to in and forming part of the Contract Agreement.

Contract Price means the sum named in the Contract Documents for the completion of the Contract Works subject to such adjustments as are provided for in the Contract Documents.

Contract Works means the works including Temporary Works to be executed in accordance with the contract.

Cost includes expense or loss and overhead cost whether on or off the Site.

Daywork means work to which 8.4 applies.

Days when used to express a period of time means Working Days.

Drawings means the drawings included in the Contract Documents together with any modification of such drawings.

Due Date for Completion has the meaning assigned to it in the First Schedule.

Materials means any raw or manufactured material, goods or things (other than Plant) required for use in the Contract Works.

Month means a calendar month.

Plant means all appliances, temporary buildings and equipment of whatsoever nature required for the construction, completion or maintenance of the Contract Works but not intended to be incorporated in the Contract Works.

Prime Cost Sum has the meaning assigned to it in 5.6.

Principal means [ ] and includes its successors.

Schedule means the third schedule included in the Contract Documents which shows the prices payable for sections or items of the Contract Works and the proportion of such prices payable by the Principal and may also include quantities, rates, Prime Cost Sums and contingency sums.

Site means the land and other places on or over or under which the Contract Works are to be carried out together with any other places made available to NZTA by the Principal conditionally or unconditionally for the purposes of the Contract.

Special Conditions means the First Schedule and such other documents as are included in the Contract Documents which add to or delete from or modify these General Conditions.

Specifications means documents included in the Contract Documents containing descriptions of Materials and workmanship and other details of the Contract Works together with any additions to or modifications of such documents approved in writing by NZTA and the Principal for the purpose of the Contract.

Subcontractor means any person who contracts with NZTA to carry out or supply part of the Contract Works on behalf of NZTA and includes a nominated subcontractor under 3.4.

Temporary Works means works of any kind, not being part of the Contract Works to be taken over by the Principal, but which are required for the execution of the Contract Works.

Variation means a variation to the Contract Works pursuant to clause 4 and any other matter which is stated to be a Variation by the General Conditions or by the Special Conditions.

Week means a period of seven consecutive calendar days.

Working Day means a calendar day other than any Saturday, Sunday, public holiday or any day falling within the period from 24 December to 5 January both inclusive.

1.3 General

1.3.1 Where the context so requires, words importing the singular shall include the plural and *vice versa*, and words importing the masculine shall include the feminine and the neuter.

1.3.2 Cross-references to other clauses or clause sub-divisions within these General Conditions quote the number only.

1.3.3 The headings to clauses are for convenience only and shall not affect their interpretation.

1.4 Law, currency and language

1.4.1 The contract shall be governed by and construed with reference to the law for the time being in force in New Zealand.

1.4.2 All prices and payments made under the contract shall be in New Zealand currency and payable in New Zealand.

1.4.3 All communications between the Principal and NZTA shall be in the English language.

1.5 Computation of time

1.5.1 Where any period of time from a given day, act or event is prescribed or allowed for any purpose, the time shall, unless a contrary intention appears, be reckoned as exclusive of that day or the day of that act or event.

2 THE CONTRACT

2.1 Type of contract

2.1.1 The contract shall be a cost share contract in the proportions set out in the Schedule of Prices.

2.2 Evidence of contract

2.2.1 Unless and until the Contract Agreement is executed by the parties, the offer and its acceptance between NZTA and the Principal shall, together with the other documents intended to form part of the contract, constitute the contract between them.

2.3 Use of documents

2.3.1 NZTA shall maintain on Site at least one copy of the Drawings and Specifications marked to show where superseded or modified together with at least one copy of all amended Drawings, supplementary Drawings, information or directions as may be issued by the Engineer from time to time during the Contract.

2.3.2 The Contract Documents shall be taken as mutually explanatory and if there are ambiguities or omissions these shall not invalidate the contract.

3 CONTRACTOR'S OBLIGATIONS

3.1 General responsibilities

3.1.1 NZTA shall complete, hand over to the Principal and maintain the Contract Works and arrange to provide all services, labour, Materials, Plant, Temporary works, transport and everything whether of a temporary or permanent nature required so far as the necessity for the same is specified in or to be inferred from the Contract Documents.

3.2 Contractor's representative

3.2.1 NZTA shall arrange to provide all necessary supervision during the contract. It shall have on the Site at all working times a competent representative. All work shall be carried out under the supervision of NZTA's representative.

3.3 Possession of the Site

3.3.1 Where necessary, the Principal shall give NZTA possession of the Site on the date as is provided in the First Schedule.

3.3.2 Should the Principal not give possession of the Site or any portion of the Site, in accordance with the First Schedule, for any reason other than default of NZTA in carrying out his obligations under the contract, NZTA may suspend the commencement of work on the Site or on that portion of the Site by notice in writing.

3.3.3 The Principal shall obtain authority for NZTA to have the reasonable right of entry upon and do any act upon any adjoining property as may be necessary for the commencement or prosecution of the Contract Works. Such access may be limited by the Special Conditions. Any Costs involved in obtaining such right shall be borne by the Principal. NZTA shall respect the rights of the adjoining property owners and shall make good at its own expense with the least possible delay any damage arising out of its operations. NZTA shall procure for itself at its own Cost the use of or inappropriate rights in respect of any other property which it may choose to use for carrying out the Contract Works.

3.4 Separate contractors

3.4.1 NZTA may arrange for work on the Site to be carried out under separate contract by parties other than NZTA and concurrently with the carrying out of the Contract Works. Such parties shall be engaged directly by NZTA and are referred to as "subcontractors".

3.5 Care of the works

3.5.1 NZTA shall be responsible for the care of the Contract Works and all Plant from the time it obtains possession of the Site until the time of completion.

3.5.2 NZTA shall be responsible for the care of all Materials which are in its care or possession awaiting incorporation in the Contract Works.

3.5.3 NZTA shall be responsible for and shall indemnify the Principal against loss or damage to the Contract Works occurring after completion arising out of the execution of NZTA's outstanding obligations under the contract.

3.5.4 Except where loss or damage has the effect of terminating the contract by frustration, should any loss or damage occur to the Contract Works or Materials while NZTA is responsible for their care, NZTA shall repair the loss or damage to the extent needed for completion, handing over and maintenance of the Contract Works. Such repair of damage shall be carried out without additional payment by the Principal unless caused by an excepted risk defined in 3.5.5, in which event the repair (to the extent its necessity arises from an excepted risk) shall be a Variation.

3.5.5 The excepted risks are:

(a) riot (insofar as it is uninsurable), civil commotion or disorder (unless solely restricted to employees of NZTA or his Subcontractors and arising from NZTA's conduct of the Contract Works), war, invasion, act of foreign enemies, hostilities (whether war be declared or not), civil war, rebellion, revolution, insurrection of military or usurped power;

(b) ionising radiations or contamination by radioactivity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel, radioactive toxic explosive, or other hazardous properties of any nuclear explosive, nuclear assembly or nuclear component thereof;

(c) pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds;

(d) the use, occupation or taking over of any portion of the Contract Works including but not limited to any portion in respect of which a certificate of Practical Completion has been issued;

(e) the design of the Contract Works other than by NZTA or by a person acting on his behalf;

(f) any such operation of the forces of nature as an experienced contractor could not foresee or reasonably make provision for or insure against;

(g) any risks specifically excepted in the Special Conditions;

(h) any act or omission of the Principal or of any other person for whose acts or omissions the Principal is as between himself and NZTA responsible.

3.6 Protection of persons and property

3.6.1 So far as the Site and the Contract Works are under NZTA's control, NZTA shall take all reasonable steps to keep them in an orderly state and in such a condition as to avoid danger to persons and property.

3.6.2 NZTA shall provide, erect, maintain and when no longer required, remove all barricades, fencing, temporary roadways and footpaths, signs and lighting necessary for the effective protection of property, for traffic and for the safety of others.

3.6.3 NZTA shall indemnify the Principal against any liability or Cost resulting from extraordinary or excessive traffic on any highway, road or bridge arising from the execution of the Contract Works.

3.6.4 NZTA shall take all reasonable steps to avoid nuisance and prevent damage to property.

3.7 Setting out

3.7.1 NZTA shall be responsible for the setting out of the Contract Works in accordance with the Contract Documents.

3.7.2 NZTA shall preserve and maintain in their true position all survey marks other than marks which are required to be covered or removed by the Contract Works. Should any survey mark be disturbed or obliterated NZTA shall arrange its replacement at his own Cost.

3.7.3 If at any time prior to completion of the contract works any error shall appear in the position, levels or dimensions of any part of the Contract Works set out by NZTA, NZTA shall rectify the error. The Cost of rectification shall be borne by NZTA except and to the extent that any error arises out of incorrect information supplied by the Principal, and which was not known by NZTA to be incorrect at the time of tender.

3.8 Materials, labour and Plant

3.8.1 NZTA shall, except where otherwise specified in the Contract Documents, supply at its own Cost everything necessary for the completion of the Contract Works and the performance of its obligations under the contract including minor items not expressly mentioned in the Contract Documents and of a type not normally detailed but necessary for completion and performance of the Contract Works.

3.8.2 All materials and workmanship shall conform to the provisions of the Contract Documents, with work being carried out in a tradesperson-like manner. Unless otherwise specified, all Materials used other than in Temporary Works shall be new.

3.9 Programme

3.9.1 NZTA shall prepare a construction programme and submit it to the Principal within the nominated time. The programme shall show the proposed order of work and the dates for commencement and completion of the various stages of the Contract Works.

3.9.2 The supply of Materials, services and work to be supplied by the Principal shall be phased to comply with NZTA's programme or as otherwise reasonably requested by NZTA.

3.9.3 If it becomes evident to NZTA that completion of the Contract Works is likely to be delayed, it shall notify the Principal as soon as practicable.

3.9.4 From time to time, the Principal may require NZTA to amend its programme to take account of the actual progress of the Contract Works.

3.9.5 Work requiring inspection by the Principal other than emergency work shall be carried out on Working Days and within normal working hours unless NZTA has given reasonable prior notice to the Principal.

3.10 Compliance with laws

3.10.1 In carrying out the contract the Principal and NZTA shall comply with the provisions of all statutes, regulations and bylaws of government, local and other public authorities that may be applicable to the Contract Works.

3.10.2 Unless the Contract Documents require otherwise, the Principal shall obtain all licences and approvals of public authorities which may be required for the use of the Contract Works when constructed. NZTA shall give all notices and obtain all other necessary permits and approvals as may be required for the construction of the Contract Works and shall pay all proper charges for such permits and approvals. The Principal shall arrange for NZTA to be supplied with copies of any necessary documents and other information in order to comply with this clause.

3.10.3 If the issue of any permit or approval is delayed without fault of NZTA and NZTA thereby suffers delay in the completion of the Contract Works or incurs additional Cost, the effect of the delay in the issue of the permit or approval shall be a Variation.

3.10.4 From time to time at the request of the Principal and in any case before the completion of the Contract Works NZTA shall deliver to the Principal all documents necessary to prove the issue of notices, permits and approvals for which NZTA is responsible under this clause.

4 VARIATIONS

4.1 Variations permitted

4.1.1 The Principal and NZTA may agree to any Variations to the Contract Works.

4.1.2 The Principal and the Contract may agree to direct or change the order in which the work is to be carried out. Any such agreement shall be a Variation.

4.1.3 NZTA shall carry out and comply with any Variation agreed to under this clause.

4.1.4 The value of Variations shall be added to or deducted from the Contract Price.

5 PAYMENTS

5.1 Contractor's claims

5.1.1 NZTA shall submit to the Principal invoices for payment under the contract. Unless otherwise provided in the Contract Documents such invoices shall be submitted in respect of work carried out during periods of not less than one Month.

5.1.2 NZTA's invoices shall show:

(a) the estimated extent and value of the Contract Works, excluding Variations, which have been carried out

(b) the estimated extent and value of all work done or other Cost which is claimed in respect of Variations

(c) the estimated extent and value of Materials delivered to the Site which are intended to be incorporated in the Contract Works but have not yet been so incorporated

(d) any advances for Temporary Works or Plant or for Materials not yet on Site for which payment is provided in the Contract Documents

(e) the estimated value of Cost fluctuations

(f) the proportion of each of the above items to be met by the Principal in accordance with the Schedule of Prices.

5.1.3 Within 8 Working Days after the receipt of NZTA's invoice the Principal shall pay to NZTA the sum invoiced less any deductions which are required by the terms of the contract or by law.

5.2 Final invoice

5.2.1 Not later than two Months after the completion of the Contract Works NZTA shall submit to the Principal a final invoice of all NZTA's claims in relation to the contract. The final invoice shall state the amount or amounts claimed by NZTA in respect of all outstanding invoices and shall show next to each amount what proportion of the amount is due from the Principal. This account shall be endorsed "final invoice" and signed by NZTA.

5.2.2 Submission of the final invoice by NZTA shall be conclusive evidence that NZTA has no outstanding claim against the Principal except as contained therein, and except for any item which has been referred to arbitration under clause 6. The Principal shall not be liable to NZTA for any matter in connection with the contract unless contained within the final invoice but this shall not preclude the later correction of any clerical or accounting error.

5.3 Interest

5.3.1 The Principal shall pay NZTA interest on all monies certified as payable and remaining unpaid after the expiry of the time provided for payment in the invoice or if no time is provided for payment then after 8 working days.

5.3.2 The rate of interest shall be equal to one and a quarter times the average interest rate as certified by a chartered accountant or trading bank manager, which is currently payable or which would be payable by NZTA for overdraft facilities [or 11% per annum accruing daily].

5.3.3 The right to interest shall be additional to any other remedy to which NZTA may be entitled at law.

5.4 Cost fluctuations

5.4.1 If after the date of this Agreement the making of any statute, regulation or bylaw, or the imposition by Government or by a local authority of any royalty, fee or toll increases or decreases the Cost to NZTA of performing the contract, such increase or decrease not being otherwise provided for in the contract, the effect shall be treated as a Variation.

5.4.2 A cost fluctuation adjustment shall be paid in accordance with the provisions of Appendix A unless otherwise provided in the Special Conditions.

5.4.3 Claims for Cost fluctuation adjustments in accordance with this clause may be submitted by NZTA to the Principal each month in writing and a detailed summary of all such claims shall be submitted with the final invoice.

5.5 Prime Cost Sums

5.5.1 Prime Cost Sums may be provided for Materials to be supplied by NZTA or by a Nominated Subcontractor for incorporation into the Contract Works. Such sums shall be expended only on agreement between the Principal and NZTA.

5.5.2 NZTA shall obtain quotations and samples for the Materials covered by the Prime Cost Sums and submit them to the Principal for its approval.

5.5.3 The amount payable to NZTA in respect of a Prime Cost Sum shall be varied by the substitution for the Prime Cost Sum of the following:

(a) the net purchase price payable by NZTA (without deduction of any cash discount for early payment), together with

(b) a reasonable allowance for NZTA's expense and profit on the Materials to which the Prime Cost Sum relates.

5.5.4 The proportion of the Prime Cost Sum payable by the Principal to NZTA shall be that proportion provided in the Schedule of Prices or if no proportion is provided then such proportion shall be agreed between the Principal and NZTA in writing.

5.6 Contingency sums

5.6.1 Contingency sums may be provided for any work which may be executed by NZTA, but the expenditure on which is unknown at the time of entering into this Agreement. Such sums shall be expended only after written agreement between the Principal and NZTA. The proportion of the Contingency sum payable to NZTA by the Principal shall be that proportion provided in the Schedule of Prices or if no proportion is provided then such proportion shall be agreed between the Principal and NZTA in writing.

5.6.2 All work carried out under a contingency sum shall be a Variation.

6 DISPUTES

6.1 General

6.1.1 No decision, valuation or invoice of NZTA shall be questioned or challenged more than three Months after it has been given to the Principal unless notice has been given to NZTA within that time.

6.1.2 Every dispute or difference concerning the contract shall be dealt with under the following provisions of this Section.

6.2 Conciliation and arbitration

6.2.1 If the Principal and NZTA cannot reach agreement on any matter, then either the Principal or NZTA may by notice require that the matter in dispute be referred to arbitration.

6.2.2 A notice requiring arbitration shall be in writing and shall be given by the Principal or NZTA to the other of them within one Month after negotiations between the parties have broken down.

6.2.3 The notice requiring arbitration may include a request for conciliation. If such a request is made and is acceded to by the other party then the Principal and NZTA shall endeavour to agree on a conciliator and shall submit the matter in dispute to him to her. The conciliator shall discuss the matter with the parties and endeavour to resolve it by their agreement. All discussions in conciliation shall be without prejudice, and shall not be referred to in any later proceedings. Failing agreement the conciliator may by written decision himself or herself determine the matter. The conciliator's determination shall be binding on both parties unless within ten Working Days either party notifies the other in writing that it rejects the conciliator's determination. The Principal and NZTA shall bear their own costs in the conciliation, and shall each pay half the costs of the conciliator.

6.2.4 If:

(a) conciliation has not been requested, or if requested has not been agreed upon within ten Working Days of the request; or

(b) the parties have agreed upon conciliation but have been unable within ten Working Days of such agreement to agree upon a conciliator; or

(c) no agreement has been reached in conciliation and no determination has been issued by the conciliator within two Months of the request for conciliation, or within such further time as the parties may agree; or

(d) either party has within the prescribed time rejected the conciliator's determination

then the matter in dispute shall be referred to arbitration.

6.2.5 The dispute shall be referred to a sole arbitrator if the Principal and NZTA agree upon one, and if not then to two arbitrators, one appointed by each party, and their umpire. References in this Section to "the arbitrator" shall include two arbitrators and their umpire.

6.2.6 The arbitrator shall have full power to open up, review and revise any decision, opinion, instruction, direction, or valuation.

6.2.7 Where the matter has been referred to conciliation the conciliator shall not be called by either party as a witness, and no reference shall be made to the determination, if any, issued by the conciliator in respect of the matter in dispute.

6.2.8 The award in the arbitration shall be final and binding on the parties.

6.3 Suspension during dispute

6.3.1 No dispute proceeding shall entitle NZTA to suspend the execution of the Contract Works, except with the agreement the Principal in writing.

6.3.2 No payment due or payable shall be withheld on account of disputes proceedings other than payment of so much of the item as is in dispute.

6.4 Award of interest

6.4.1 The arbitrator may award interest upon any amount due and payable under his or her award from the Principal to NZTA or vice versa at such rate and for such period as he or she considers just, down to the date of the award.

7 FRUSTRATION AND DEFAULT

7.1 Frustration

7.1.1 In the event that either the Principal or NZTA considers that the contract has become impossible of performance or has been otherwise frustrated, it may notify the other that it considers the contract to be terminated. If the other party agrees, or in the event of disagreement if it is so determined under clause 6 by conciliation or arbitration, then 7.1.2 shall apply.

7.1.2 The Principal shall pay NZTA:

(a) the agreed proportion of the value of the work carried out at the date of termination less the amounts previously paid;

(b) the agreed proportion of the Cost of Materials ordered for the Contract Works which have been delivered to NZTA or of which NZTA is legally obliged to accept delivery, and which NZTA delivers to the Principal. These Materials shall become the property of the Principal upon delivery to it;

(c) the agreed proportion of cost fluctuation adjustments due and payable up to the date of termination;

(d) fair compensation to NZTA for any Cost which is included in the First Schedule to the extent that the termination of the contract causes an under-recovery of that Cost;

(e) the agreed proportion of any Cost reasonably incurred by NZTA in the expectation of completing the Contract Works in so far as such Cost is not covered by other payments under this clause;

(f) the Cost of any works necessitated by the removal of Contractor's plant and the carrying out of the Engineer's instructions for the making safe of the Contract Works;

(g) any other Costs resulting from the termination as are reasonable to compensate NZTA for disruption and are not otherwise provided in the Contract Documents.

8 SERVICE OF NOTICES

8.1 General

8.1.1 The Principal or Contractor may require that any notice, instruction or other communication under the contract be given in writing.

8.1.2 Any document which is to be served upon the Principal or NZTA under the contract shall be sufficiently served if it is handed to an employee or to its appointed representative, or delivered to its address as stated in the Contract Documents or as subsequently advised in writing.

8.1.3 Proof that a document has been sent by prepaid post in a correctly addressed envelope shall be *prima facie* evidence of delivery in the ordinary course of post.

FIRST SCHEDULE

SPECIAL CONDITIONS OF CONTRACT

Contract for: _____

1. The Principal is:_____

   of (street address:_____

2. NZTA shall be given possession of the Site on:

   _____

3. NZTA shall complete the Contract Works by _____.

4. The amount of the insurance to be effected in respect of the Contract Works shall be not less than the total of the Contract Price and the following:

   (a) for the Cost of demolition, disposal and preparation for replacement work, the sum of $_____ (or _____% of the Contract Price)

   (b) for professional fees including the cost of clerks of works and inspectors, the sum of $_____ (or _____% of the Contract Price)

   (c) for the value of items incorporated, or to be incorporated, in the Contract works, the cost of which is not included in the Contract Price, the sum of $_____

   (d) for increased construction Costs during the construction period _____% of the Contract Price

   (e) for increased construction Costs due to delay during the reinstatement period _____% of the Contract Price.

5. (a) NZTA shall insure as provided in _____

6. Cost fluctuation adjustments

   (a) shall be paid in accordance with Appendix A

   (b) shall be paid in accordance with _____

   (c) shall not be paid

   (*delete as appropriate*)

7. Prime Cost Sums included in the contract are:

   (a) _____ $_____

   (b) _____ $_____

   (c) _____ $_____

   (d) _____ $_____

8. The contingency sum to be included in the contract is: _____

   $_____

9. For the purpose of service of notices, the postal address of

   (a) the Principal is _____

SECOND SCHEDULE

CONTRACT AGREEMENT

FOR _____

THIS AGREEMENT is made on _____ 19_____

BETWEEN NEW ZEALAND TRANSPORT AGENCY (*NZTA*)

AND _____

of _____ (*the Principal*)

IT IS AGREED as follows:

1. NZTA shall construct, complete, deliver and maintain the works and things described in the Contract Documents.

2. THE Principal shall pay NZTA the proportion of each cost as set out in the attached Schedule of Prices.

3. EACH party shall carry out and fulfil all other obligations imposed on that party by the Contract Documents.

4. THE Contract Documents are this Contract Agreement and the following which form part of this agreement:

   (a) the General Conditions of Contract, NZS 3910:1987

   (b) the Special Conditions of Contract

   (c) the Specification

   (d) the Drawings

   (e) the Third Schedule "Schedule of Prices" (*delete if applicable*)

   (f) *identify any additional documents to be included (for example agreed correspondence*)

   _____

   _____

THIRD SCHEDULE — SCHEDULE OF PRICES

Item	Value	Principals Proportion
1.		
2.		
3.		
4.		

WITNESS to the signature

of NZTA: _____

NZTA

WITNESS to the signature:

of the Principal: _____

Principal

APPENDIX A

COST FLUCTUATION ADJUSTMENT BY INDEXATION

A1

The provisions of this Appendix shall apply unless otherwise specifically provided in the Special Conditions.

A2

The amounts payable by the principal to the Contractor under the contract shall be adjusted up or down by amounts calculated in accordance with the following formula:

$$C = V\left[\frac{0.4(L - L')}{L'} + \frac{0.6(M - M')}{M'}\right]$$

Where C = Cost fluctuation adjustment for the quarter under consideration,

V = Valuation of work certified for payment as having been completed during the quarter under consideration subject to A3, but without deduction of retentions and excluding the Cost fluctuation adjustment,

L = Prevailing Weekly Wage Rates Index; — "part 1 Analysis: Private Sector: Industry 15 — Construction" published by the Department of Statistics applying for the quarter under consideration,

L' = Index as defined under L but applying for the quarter during which tenders close,

M = "Producers Price Index — Construction Inputs" published by the Department of Statistics applying for the quarter under consideration,

M' = Index as defined under M but applying for the quarter during which tenders close.

A3

For the purpose of calculating the Cost fluctuation adjustment, any Daywork, Prime Cost Sums, Variations and other payment items which are based on actual Cost or current prices and any advances shall be excluded from the Engineer's valuation.

A4

No other Cost fluctuation adjustment will be made by reason of any inaccuracy in the proportions of labour and Material Costs assumed in the above formula.

A5

The Contractor shall not be entitled to claim or have deducted any Cost fluctuation adjustment for any further changes in indices which occur after the Due Date for Completion of the contract.

A6

The indices to be used in the calculation of fluctuation shall be those first published by the Department of Statistics for the appropriate quarter.

A7

Where indices for the quarter have not yet been published, interim payments will be made on the basis of the indices for the most recent quarter for which indices are available.

A8

If at any time either of the indices referred to in A2 are no longer published by the Department of Statistics, or if the basis of either index is materially changed, the adjustment shall thereafter be calculated by using such other index, or in such other manner, as will fairly reflect the changes as previously measured by that index.

Sustainability Rating Scheme Policy

Policy

The approved *Sustainability Rating Scheme Policy* requires the following:

- All capital projects and programmes over $15 million capital value shall consider the merits of ISC certification.
- All projects over $100 million are required to complete ISC certification unless:
    - Alignment with the objectives, non-monetised and monetised benefits and a strong value for money case demonstrates that it is not practical; and
    - The sustainability objectives of Waka Kotahi such as: reducing GHG emissions, reducing environmental harm and improving public health can be implemented in an agreed alternative way.
- The assessment of the merits of ISC certification for all capital projects will be evaluated during the early business case stage and at subsequent project stages. This evaluation shall be in the context of broader sustainability outcomes outlined in our relevant policy and strategy documents, including Toitū Te Taiao, the Environmental Social Responsibility Policy and the Resource Efficiency Policy.
- The assessment of the merits for completing ISC certification shall be completed in accordance with requirements and processes outlined in the Environmental and Social Responsibility Standard (Z19) and EPMO - SM011.
- Requirements and processes for contractors completing the ISC certification during tender, design and construction phase are outlined in the *Sustainability Rating Scheme Specification (P49)*.
- Any project not required to complete ISC certification shall be required to implement and demonstrate achievement of the broader sustainability outcomes outlined in our relevant policies and strategic documents, including Toitū Te Taiao, the Environmental Social Responsibility Policy and the Resource Efficiency Policy.
- Projects that are part funded by Waka Kotahi and meet the policy thresholds of $15 million shall also consider the merits of using the ISC - IS rating scheme. At a minimum these projects shall apply the principles outlined in Toitū Te Taiao, the Resource Efficiency Policy and other relevant Government policies driving broader sustainability outcomes.