INFORMATION PACK

INFORMATION RE INSTALLATION OF STOCK UNDERPASSES

GUIDELINES FOR THE INSTALLATION OF STOCK UNDERPASSES	**QS-K401**
Timeline for the Installation of a Stock Underpass	QS-K401-AA
Data Sheet Accompanying Design Documents	QS-K401-AB
First and Second Schedules NZS 3910-2003	QS-K401-AC

REFERENCE INFORMATION

Waimakariri District Council

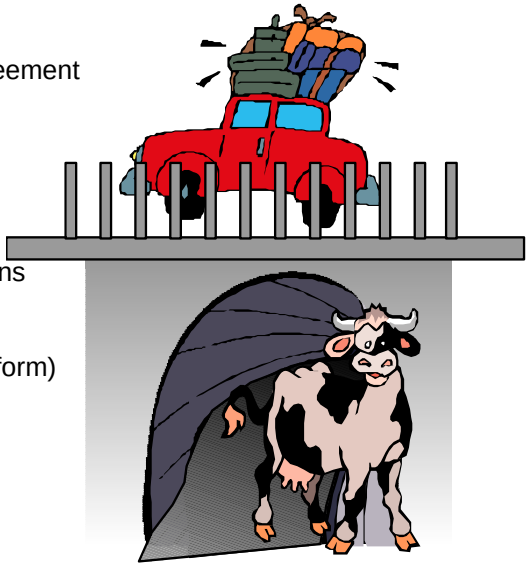
Council Policy S-CP 4582 Council Policy Stock Underpasses

QS-K402 Stock Underpasses

QS-K402-AA Stock Underpass Construction Agreement

QS-K402-AB Stock Underpass Use and Subsoil Lease Agreement

QS-E205-AA	Building Consent / PIM Application
QP-C288-AA	Traffic Management Plan template
QP-C288-AB	Application for Temporary Speed Restrictions
QP-C843	Road Openings
QP-C843-AA	Preliminary Notification of Road Opening (form)
QP-C843-AB	Road Opening Notice (form)
QP-C843-AC	Works Completion Notice (form)
QP-C843-AD	Works Maintenance Notice (form)



Standard Drawings

Roadside Soakhole (WDC S.D. 600-390)

Underpass Sightrail Typical Detail (WDC S.D. 1529)

Stock Underpass Carriageway Reinstatement (WDC S.D. 1530)

NZ Transport Agency

NZTA M-23 Specification for Road Safety Barrier Systems - 2009

NZTA M-23-Appendix A Approved Road Safety Barrier Systems – February 2010

NZTA M-23-Notes on the Specification for Road Safety Barrier Systems - 2009

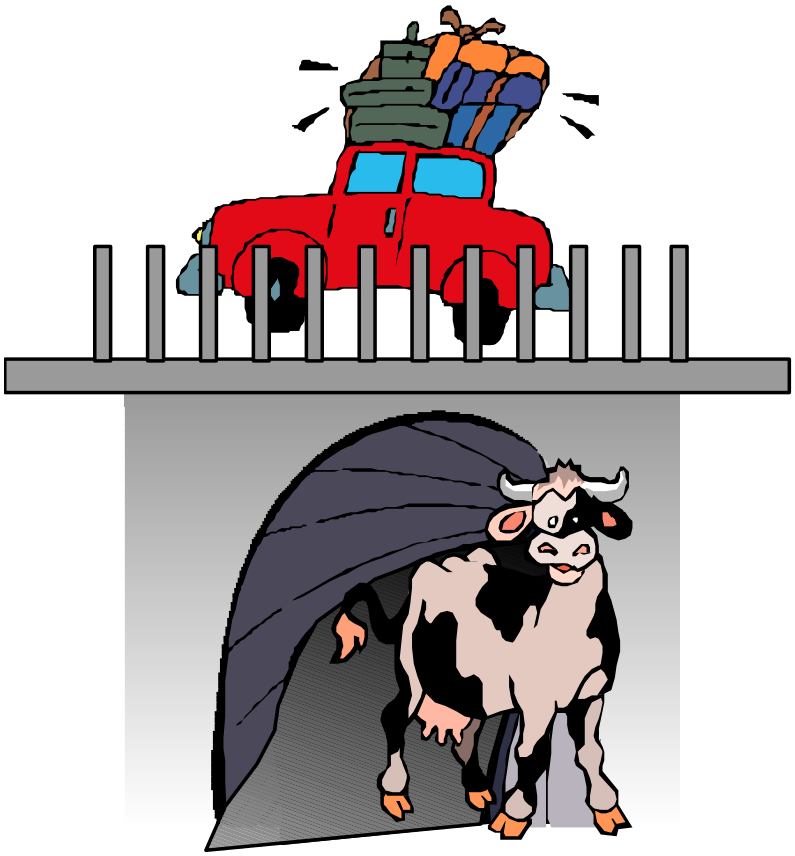
Reference documentation not issued with guidelines

Waimakariri District Council Engineering Code of Practice – available via Waimakariri District Council website www.waimakariri.govt.nz

NZTA Bridge Manual – available from website www.nzta.govt.nz

NZTA Code of Practice for Temporary Traffic Management – available from website www.nzta.govt.nz

GUIDELINES FOR THE INSTALLATION OF STOCK UNDERPASSES



November 2007

QS-K401

TABLE OF CONTENTS

ESSENTIAL APPLICATION and REFERENCE DOCUMENTS
(To be issued with Guidelines)

Council Policy	S-CP 4582 Council Policy Stock Underpasses
Application Building Consent	QS-E205-AA – Application Form
Application Road Opening	QP-C813-AE Road Openings QP-C813-AE-1 Preliminary Notification of Road Opening QP-C813-AE-2 Road Opening Notice (application) QP-C813-AE-3 Works Completion Notice QP-C813-AE-4 Works Maintenance Notice (For further information see NZS HB 2002:2003 "Code of Practice for Working in the Road)
Traffic Management	QP-C288-AA – Traffic Management Plan template QP-C288-AB –Application for Temporary Speed Restrictions
Road Safety Barrier Systems	TNZ M-23 Specification for Road Safety Barrier Systems - October 2006 TNZ M-23-Appendix A Approved Road Safety Barrier Systems - 2007 TNZ M-23-Notes on the Specification for Road Safety Barrier Systems - October 2006
Standard Drawings	Roadside Soakhole (WDC S.D. 600-390) Underpass Sightrail Typical Detail (WDC S.D. 1529) Stock Underpass Carriageway Reinstatement (WDC S.D. 1530)

<u>Reference documentation not issued with guidelines</u>

Waimakariri District Council Engineering Code of Practice – available via Waimakariri District Council website www.waimakariri.govt.nz

Transit NZ Bridge Manual – available from website www.transit.govt.nz

Transit NZ Code of Practice for Temporary Traffic Management – available from website www.transit.govt.nz

1 POLICY GUIDELINES

1.1 Council Policy

A copy of the Council's Policy on Stock Underpasses is included with attached reference documents.

The purpose of these notes is to explain the Policy and set out guidelines for an Applicant intending to install a stock underpass that crosses under one of the Council's roads. If any part of the Policy is not understood, the Applicant should seek clarification at an early stage.

1.2 Initial Site Inspection

After familiarising themselves with these guidelines, Applicants are advised to contact the Waimakariri District Council, P O Box 1005, Rangiora, telephone (03)313 6136. Arranging an inspection of the likely site can provide an early indication of the Council's requirements; this will assist in applying for permission to install a stock underpass.

There is no cost implication to the Applicant for the initial site inspection, or processing of the application to obtain initial approval (approval in principle).

1.3 Procedure

1.3.1 Summary

The procedure, in brief, for installing an underpass is as follows:

- Produce initial concept in consultation with the Council.
- Apply to the Council for permission in principle to install an underpass.
- Prepare design and contract documents, apply for all necessary consents, and commission a contractor.
- Apply to the Council for final permission to proceed with construction of the underpass.
- Construct the underpass after the period, required by the Council, to process the application and advertise any necessary road closure.
- Maintain the underpass for a 6-month defects liability period before hand-over to the Council.

1.3.2 Detailed Procedure

The list below expands the summary above and includes the main steps required in the installation of a stock underpass. They explain, and place in context, the requirements of sections 4, 5 and 6 of the Stock Underpass Construction Agreement. Most of the tasks are to be carried out by the Applicant, the Applicant's Consultant or the Applicant's Contractor, however where someone else is to carry out the task, they are highlighted in **bold**.

1. Obtain and read Stock Underpass Guidelines.

2. Contact the Council to arrange a visit of the likely site to determine the Council's requirements and gain any needed clarification of the Policy or Guidelines.

3. Make written application, for approval to install a stock underpass, to the Manager: Utilities and Roading, Waimakariri District Council, P O Box 1005, Rangiora.

4. The **Council** approves the installation "in principle" (subject to all conditions being met). "Approval in Principle" is given in writing. This should normally take about two weeks.

5. Where the **Council** agrees to make a financial contribution (Cost Share), an indication of the amount will be given at this stage. It will be based on the formula "0.05 x AADT" (where AADT = Annual Average Daily Traffic) up to a maximum of 25% of the total cost of the work.

6. Engage appropriate engineering consultants, acceptable to the Council, to obtain the necessary consents and to produce the design, cost estimate, tender documentation and evaluation, contract administration and construction supervision.

There are two acceptable approaches:

   A) Commission a consultant to design the underpass and to let and administer a contract to build it (Design then Build).

   B) Commission a consultant to let and administer a contract to design and build the underpass (Design/Build).

   The following procedure is suitable for Approach A, or it can be adapted for Approach B.

7. The designer should make contact with all service authorities and obtain location plans for survey marks, telephone, electricity and other under/above ground services and overhead plant to ensure all conflicts with the work are identified. (During the course of all works within the road reserve the Applicant is responsible for all damage and all costs of subsequent reinstatement of services.)

8. Prepare Initial Design, and Consent Application(s). (Allow 1 month)

9. Apply for any required Resource Consent(s). These may be discharge consent for effluent from Environment Canterbury and/or land use consent from the Council.

10. When the design and specification is complete apply for a Property Information Memorandum (PIM) and Building Consent. The application forms for these are listed in the reference documents.

11. Complete the contract documents.

12. Resource Consent is granted by **Consent Control Authority(s)**. (This can take up to six weeks.)

13. When the contract documents are complete, commission a contractor to build the underpass.

The Policy requires that the construction contract contains the standard conditions of, and complies with NZS3910:2003 “Conditions of Contract for Building and Civil Engineering Construction” (QS-K401-AC contains a copy of the First and Second Schedules of NZS 3910:2003, with the options required by the Council pre-selected). A Registered Engineer shall be appointed as Engineer to the contract.

Where the Council agrees to “Cost Sharing” the Policy requires compliance with Land Transport NZ Competitive Pricing Procedures Manual. Land Transport NZ Competitive Pricing Policy states that contracts to an amount greater than $100,000 shall be put out to tender. For contracts less than $100,000 shall either be put out to tender or, where practicable, three quotations will be sought. The Council reserves the right to confirm final acceptance of any tender.

These apply to both the “Design then Build” and “Design/Build” approaches.

14. Building Consent is granted by the Waimakariri District Council contracted agent Prime Building Compliance. (This normally takes up to four weeks.)

15. Submit final documents, together with the accompanying Data Sheet QS-K401-AB to the Council to obtain formal approval for construction to proceed. These shall include the following:

    -Unsigned Schedules from (NZS3910: 2003) Conditions of Contract [see note below]
    - Specification
    - Design Drawings
    - Building Consent and PIM
    - Resource Consent(s)
    - Designers Producer Statement
    - Signed Construction Agreement
    - Signed Use & Subsoil Lease Agreement
    - Proof of Contractor’s Insurance
    - Contractor’s Health and Safety Plan
    - Road Opening Notification Application (A copy is in reference documents)
    - Traffic Management Plan (A standard form is in reference documents)
    - Bond (if required)
    - Any further conditions the Council may apply (at the time of initial approval)

    Note: by this stage a preferred contractor should have been selected and the contract ready for signing. However it should not be signed until the Council has given final approval for the underpass. This is to avoid contractual obligations in case approval is not given or is delayed. Only the First and Second Schedules of the Contract need to be submitted to the Council.

16. Formal approval from the **Council** to proceed with construction will be given in writing. (The Applicant now becomes the Grantee). This will include details of the Councils financial support of the underpass. (This will normally take two weeks)

    The **Council** will issue a Road Opening Notification with the approval for the underpass. This is a separate permit required in all cases where an excavation takes place in one of the Council’s roads. The Applicant will be responsible for the

costs associated with any repair work as a result of settlement during a 12-month period of maintenance.

17. The **Council** will advertise the road closure, required for construction. (Six weeks notice is required)

18. Construction of the stock underpass can commence.

19. The Contractor will, as necessary liaise with service authorities to determine services locations and any necessary relocation.

20. The **Council** carries out its auditing role during the construction as per the Council's Road Opening Permit Conditions.

21. When construction is complete (Practical Completion), the defects liability period starts. This is where the Grantee maintains and repairs any defects until hand-over to the Council. (6 months for underpass, 12 months for Road Opening Notification).

    The applicant is advised that a defects liability period is a contractual procedure and that the applicant should specify this requirement in the contract for the work.

22. The Grantee can apply for the Council's Cost Share after Practical Completion provided that all the following documents are supplied:

    - All notices to the Installation Contractor
    - Payment certificates
    - Inspection records
    - Building Code Compliance Certificate
    - Producer Statement from Installation Contractor
    - As-built drawings
    - Proof of compliance with clause 3.1.9 of the Use & Subsoil Lease Agreement
    - An appropriate Invoice to the Council for the agreed amount

23. Prior to expiration of the Defects Liability Period the Council will undertake a site inspection and advise any remedial works required at the Grantee's expense, before the Council grants final acceptance.

24. Once acceptance by the Council is granted, the structure will be included in the Council's Asset Register. However the Grantee shall still be responsible for repairs and reinstatement of structural defects detected by the Council in periodic inspections of the underpass. The responsibilities of the Grantee and the Council for maintenance of the underpass are detailed in sections 3 and 4 of the Stock Underpass Use Agreement and Subsoil Lease Agreement.

25. Requirements for the removal of the underpass are detailed in sections 5 and 6 of the Stock Underpass Use Agreement and Subsoil Lease Agreement.

1.4 Timeline

Generally 6 months should be allowed for between the initial request for permission to build an underpass from the Council and the start of construction. QS-K401-AA contains a timeline that shows the duration of the critical tasks outlined in Section 1.3.

2 DESIGN CRITERIA

2.1 General

This section is a guide for the designer to meet the Council's requirements. If it is desired to depart from these criteria, consult the Council and alternatives may be considered.

2.2 Layout

2.2.1 Location

The Council may require Land Use Consent in terms of Rule 31.16 and 31.17 of the Council's District Plan. This rule addresses reverse sensitivity issues between dwelling houses and the location of structures/places where effluent is stored or accumulates (The underpass could be considered to be such a structure/place). In short the minimum separation distances that avoid the requirement for consent are:

- 20m for houses on the same property
- 150m for houses on other properties

2.2.2 Cover

The road shall cross the new underpass on essentially the same profile and cross-section that existed before the construction.

If an asphalt fillet is used to re-establish the road cross-section and running surface over the underpass, the minimum cover at the edge of seal shall be 20mm. The underpass outside the edge of seal lines can remain uncovered; however there shall be no step between the underpass and the metal surface in the road shoulders or grass berms.

If the road cross-section and running surface is to be re-established with metal basecourse and chip seal the minimum cover at the edge of seal shall be 100mm and the minimum cover anywhere shall be 80mm.

WDC Standard Drawing 1530 in reference documents 3 shows typical cross sections for stock underpass carriageway reinstatement.

2.2.3 Grade

The Underpass shall be laid at a grade between 0.25% and 1% across the road to enable passive drainage of storm water and effluent from inside the culvert. This will also allow a single collection point for pumping storm water or if site conditions permit, passive drainage for the whole underpass.

2.2.4 Length

- At least a 3-metre clearance shall be maintained between the nominal edge of the carriageway and the end of the underpass.

- In the case of a sealed road the edge of the carriageway shall be the edge of the seal, and where the road is unsealed or sealed and less than 6-metres wide, the nominal carriageway width shall be taken as 6 metres.

- If an underpass does not run perpendicular to the road centreline the minimum length shall be increased to gain the full 3-metre clearance from the nearest parts of the carriageway.

- On some roads future carriageway widening is likely; in these cases additional length will be required.

- The final length of the structure shall be as approved by the Council.

2.3 Underpass Structure

2.3.1 Culvert Type and Dimensions

The underpass shall be constructed with materials approved by the Council. The use of reinforced concrete box culverts or marine grade aluminium is both acceptable.

No underpass shall have clear internal dimensions less than 1.5m wide and 2m high.

The design loading shall be HN-HO-72 for a depth of fill over the culvert of 0.0 to 2.0 metres. Or at sites (as advised by the Council), where raising the level of the carriageway is a possibility in the future, the design loading shall be HN-HO-72 for a depth of fill over the culvert of the actual design cover plus 0.0 to 2.0 metres.

The Design Life of the box culvert shall be not less than 100 years. Where reinforced concrete is used the cover to steel and maximum crack widths shall be designed to provide this.

2.3.2 Wingwalls and Headwalls

The soil embankments at the ends of the culvert shall be retained by appropriately designed retaining walls.

The design life of the retaining structures shall be not less than 50 years.

2.3.3 Concrete

Concrete material and construction shall comply with NZS 3109:1997 and amendments. All concrete shall be either High or Special Grade with a maximum aggregate size of 20mm.

The concrete surface finish for each section of the work shall be as follows:

Section	Surface Finish	
Precast Wingwalls Headwalls and Box Units	Unformed surfaces	U3
	Exposed to view and inside of box units	F3
	Exposed/Trafficked face of Culvert floor	U5
	Permanently covered	F1
Concrete Infills	Exposed to view	F3
	Covered	F1

The above surface finish designations are fully defined in NZS 3114 however, a summary is provided here for convenience.

Finish F1: A formed finish for covered work with no limitation on surface unevenness or colour variation.

Finish F3: Surface variation shall be no greater than 6 mm abrupt variation or 6 mm gradual variation. Precautions shall be taken to eliminate grout loss leading to honey-combing and to avoid the incidence of scouring. The concrete surface of the formwork shall be plywood, tempered hardboard or steel.

Finish U3: Surface variation shall be no greater than 3 mm abrupt variation or 3 mm gradual variation. The smooth finish is obtained by steel trowelling. Precautions shall be taken to restrict the uncontrolled formation of shrinkage cracks.

Finish U5: Surface variation shall be no greater than 3 mm abrupt variation or 3 mm gradual variation. This shallow textured finish is obtained by passing a hard bristled broom over an initially wood and/or bull floated surface. Precautions shall be taken to restrict the uncontrolled formation of shrinkage cracks.

2.3.4 Specification

A full design specification for the underpass box units and retaining walls shall be submitted with accompanying Producer Statement from the designer that the design is adequate to withstand applied traffic loads and other normal applied loads.

The specification shall cover the following:

- Design
- Materials
- Construction and workmanship
- Handling, storage and Transport
- Installation
- Foundation
- Backfilling
- Plans
- Any other topics required for correct and safe manufacture and installation

Supply and installation shall be carried out as per designer's specification and plans.

2.4 Drainage

2.4.1 Requirements

The underpass shall be adequately drained.

The underpass and any sump or pumping chamber structures shall be designed to not float in the advent of a high water table.

Any drainpipes installed in the road shall have sufficient strength to withstand loads from traffic and backfill. Subsoil drainage shall be in accordance with WDC Engineering Code of Practice.

The structures installed shall take into account the likely scouring of fill batters, and shall provide protective work (e.g. wingwalls) to prevent or minimise the effects of the scouring and subsequent damage to the road.

Where pumping is required to drain the underpass, storm water from roadside drains or swales shall be prevented from entering the underpass. A Roadside Soak Hole may be constructed according to WDC Standard Drawing 600-390 of the Waimakariri District Council Engineering Code of Practice. Otherwise the underpass shall be installed at sufficient depth to either continue a swale across the culvert or to pipe the storm water across.

The discharge outlet of pumped storm water effluent shall comply with any standards set by Environment Canterbury. Resource Consent may be required.

2.4.2 Suggestions

Where possible locate the underpass so that the invert is above the ground water table especially in soils with a high permeability. Excessive ground water flows can cause drainage problems and high pumping costs. A thorough site investigation should be carried out to determine the soil and groundwater conditions.

2.5 Roadside Barrier Rails

2.5.1 Guardrails

The Applicant shall, at the time of construction, install Armco “or similar” guardrails to reduce the possibility of vehicles leaving the road and dropping into the openings adjacent to the road. All materials shall be supplied and installed in accordance with TNZ M/23 Specification for Road Safety Barrier Systems, TNZ M/23 Appendix A Approved Road Safety Barrier Systems – 2007 and the Transit NZ Bridge Manual.

The guardrail barriers will nominally have 2 x 1.92m straight sections across the span of the underpass with 3 to 6 x 1.92m sections of 64m-radius flare either side. The length of flare is dependant on the distance between the end of the culvert and the road boundary as set out below:

Distance Between Culvert and Road Boundary	Number of 1.92m sections in flares	Number of B.C.T. Anchors	Nominal Length of one Guard Rail Including Crashworthy Terminals
3m to 4m	6	3	27.5m
2m to 3m	5	3	23.6m
1m to 2m	4	3	19.8m
0m to 1m	3	2	15.9m
0m			Guardrail not required

2.5.2 Bridge End & Hazard Markers

The stock underpass shall be marked with bridge end markers approved by the Council. These shall generally be supplied and installed in accordance with the Manual of Traffic Signs and Markings, published by LTSA and Transit New Zealand and any amendments

Hazard markers shall be affixed to the crash-worthy terminals at the ends of the guardrails.

2.5.3 Sightrails

Where there is a gap between the ends of the guardrails and the road boundary, sightrails shall be constructed across the gap.

Where the underpass culvert extends across the full width of the road and guardrail is not required, a sightrail shall be placed along the boundary at the ends of the culvert and extend two metres past the ends of the adjacent cut batters.

Sightrails shall be constructed according to the requirements of WDC Standard Drawing 1529 (Underpass Sightrail Typical Details) in reference documents.

2.5.4 Stock Fencing

Adequate fencing and gates should be supplied by the Applicant to control stock movement when entering and leaving the underpass and shall be installed to prevent the escape of stock onto the roadside.

All costs associated with the maintenance of this fencing within the road reserve shall lie with the Applicant and work shall be done to ensure stock control is maintained to the satisfaction of the Council at all times.

2.5.5 Layout

The final layout shall be determined by the Council at or after the initial site meeting and will take into account roading hierarchy, traffic loading, length of underpass and any site-specific risk.

2.6 Access Ramps

2.6.1 Requirements

The sides of the access ramps shall be battered to at least the stable slope for the site soil conditions. Within the road reserve however, the batters shall not exceed a maximum slope of 1 to 1.

2.6.2 Suggestions

The access ramps should be formed to a grade suitable for their purpose. A grade around 1:15 is suggested.

It is recommended that a 3m section of the access ramps at the ends of the box culvert remain nominally flat (1:100 slope) before grading to ground level. This should improve the function of the underpass with respect to stock acceptance and use by vehicles.

Cows hooves bruise easily therefore it is recommended that the granular fill used to provide a basecourse following excavation have a maximum particle size of 75mm to 100mm. A wearing course of soft material like crushed limestone could also be considered.

3 CONSTRUCTION REQUIREMENTS

3.1 General

3.1.1 Standard Specifications

The following is a list of the specifications referred to in this Guide.

TNZ M/23	Specification for Road Safety Barrier Systems - October 2006
TNZ M/23 Appendix A	Approved Road Safety Barrier Systems - 2007
NZS 3109	"Specification for Concrete Construction"
NZS 3114	"Specification for Concrete Surface Finishes"
NZS HB 2002:2003	“Code of Practice for Working in the Road”
TNZ P/3	First Coat Sealing
TNZ M/1	Roading Bitumens
TNZ M/6	Sealing Chip
TNZ M/13	Adhesion Agents
TNZ B/2	Construction of Unbound Granular Pavement Layers
TNZ P/12	Pavement Marking
WDC QP-C813-AE	“Road Openings” and related appendices QP-C813-AE-1,-2,-3,-4”.

WDC QP-C800 – QP-C820 series of documents that make up the Council’s Engineering Code of Practice

3.1.2 Traffic Management and Construction Programme

The Council will consider temporary road closure for one day if warranted. Road closure will be permitted between 9.00 am, and open 3.00 pm week days only. A limited road width over the new underpass shall be useable by traffic after 3:00pm on the day of closure.

All costs associated with temporary road closure including detour signing to The Council’s approval will be the Applicant's responsibility.

Alternative methods of construction allowing for the passage of traffic throughout the construction period should be provided if applicable.

A public notice advertising road closure is required 6 weeks in advance. The Contractor/Applicant shall submit a Traffic Management Plan and Construction Programme, detailing the planning, scheduling and control with respect to time of the whole project, to the Council for approval, 8 weeks prior to work commencing.

If permission for road closure is granted, the road may not be closed until all traffic control and safety signs are in position and excavation of the site is ready to begin.

The site shall be signed and barricaded as per the Transit NZ Code of Practice for Temporary Traffic Management, until all works on the road have been completed.

3.1.3 Working areas and Site Access

The Contractor shall confine the operations to the areas immediately alongside the works to be constructed. The operations shall be controlled in a manner that ensures no unnecessary damage is caused to the Council’s road.

Before any plant or equipment is moved onto the site the Contractor shall arrange to meet the Council's representative on site so that the specific boundaries of site working areas can be clearly defined and agreed upon.

The Contractor should be required to make arrangements for water, power and telephone supply and sewage disposal. The Contractor should provide sanitary conveniences for the workers on the site and shall maintain these in a clean condition to the approval of the local Inspector of Health and Labour Department Inspector.

3.1.4 Health and Safety

All aspects of work carried out by the Contractor shall conform to the Health and Safety in Employment Act, the Construction Contracts Regulations and any subsequent amendments.

3.1.5 Inspection of Works

The Engineer to the Contract or his representative will monitor the works. However as part of the Road Opening Notification process, the Council shall appoint someone to audit certain parts of the construction as detailed in shall be in accordance with the WDC QP-C813-AE "Road Openings" and related appendices QP-C813-AE-1,-2,-3,-4; the NZS HB 2002:2003 Code of Practice for Working in the Road; or as modified at the time of granting the Road Opening Notification.

Council's inspections are as follows:

(a) After setting out and prior to commencement of work
(b) Inspections of excavated material
(c) Any unexpected subsoil conditions and obstructions
(d) Base of trench to be inspected
(e) Bedding prior to commencement of granular filling
(f) Granular layer completion
(g) Sub-basecourse layer completion
(h) Basecourse layer completion
(i) Temporary surfacing
(j) Preparation for application of final surfacing
(k) Completion of final surfacing.
(l) Inspection of finished lid levels on surface boxes, markings and reinstatement etc.

To enable audit inspections to be carried out the Grantee, or their Contractor, shall notify Council at least one working day prior to commencing various stages of the works.

The Council will meet the cost of the above inspections.

3.1.6 Temporary Fencing and Roadside Stock Control

Temporary fencing shall be erected and maintained by the Contractor until permanent fencing is constructed or until the end of the contract, at locations indicated in the documents and where existing fencing is dismantled.

The temporary fencing shall have a stock holding capacity similar to that of adjacent existing fences.

3.1.7 Clean up on Completion of Works

The site is to be left in a clean and tidy condition after the works are completed, with all surplus spoil removed and excavated road shoulder areas re-grassed. No stockpiles of material are to be left within the road reserve.

The period of defects liability for the underpass (ie the “maintenance period”) shall normally be 6 months. Prior to expiration of this period the Council will undertake a site inspection and advise any remedial works required at the Grantee’s expense, before the Council grants final acceptance.

Once acceptance by The Council is granted, the structure will be included in The Council's Asset Register, but the Grantee shall still be responsible for repairs and reinstatement of structural defects detected by the Council in periodic inspections of the underpass (Clause 3.1.3 of the Stock Underpass Use and Subsoil Lease Agreement).

The Road Opening Permit has a Defects Liability Period of 12 months so there will be a further 6-month period where the Grantee shall be liable to meet the conditions set by the Permit.

These periods of Defects Liability should be reflected in the Construction Contract.

3.2 Excavation

The excavation shall generally comply with the requirements of QP-C813-AE Road Openings and related appendices (NZS 2002:2003) and the Council’s Engineering Code of Practice.

The limits of excavation shall be kept to a minimum and the Contractor shall be responsible for any statutory notifications to the Department of Labour (Occupational Health and Safety) and timbering or shielding as required to contain the sides of the excavated area.

Excavation can be carried out in the wet, however the ground water level shall be below the invert level of the structure at all times during construction. The Contractor shall be responsible for dewatering the excavation.

3.3 Installation

3.3.1 General

The excavation and installation of the underpass shall be carried out by a competent and experienced Contractor familiar with Transit New Zealand specifications, safety procedures and the Health and Safety Act, which shall all be adhered to.

3.3.2 Box Culvert, Retaining Walls and Drainage.

The culvert units, retaining structure, and drainage components shall be placed to the levels and dimensions shown on the drawings and in accordance with the designer’s specifications.

3.3.3 Barriers

All fences and barriers shall constructed in the positions and dimensions shown on the drawings and in accordance with the designer's specifications.

Armco guardrail shall be installed in accordance with TNZ M/23 and TNZ M/23 Appendix A.

The Contractor shall comply with the inspection requirements of Section 3.1.5 and on completion of all works shall provide a producer statement confirming that installation complies with all conditions laid down in the plan and specifications.

3.4 Backfilling

Backfill shall be in accordance with WDC Engineering Code of Practice and any additional requirements of the Box Culvert and Retaining-Wall Specification.

The granular backfill shall be the same AP65 material specified for the Subbase in WDC Engineering Code of Practice.

3.5 Carriageway Reinstatement

3.5.1 Chip Seal Reinstatement

This specification is for where the carriageway is to be sealed using a two wet coat seal of Grade 6 chip over Grade 4 chip seal.

The surface to be sealed shall conform to the shape in the cross section shown in WDC Standard Drawing 1530 in reference documents and merge to the shape of the adjacent sealed carriageway off the structure.

The Bitumen, Sealing Chip and any approved adhesion agents shall comply with TNZ Standards M/1, M/6 and M/13.

The preparation of the surface for sealing shall be in accordance with TNZ B/2.

The first coat seal shall be applied, upon the finished surface, in accordance with TNZ P/3.

The Contractor shall sweep and remove surplus chip from the entire site within 72 hours of sealing. The Contractor shall ensure that the site is kept safe and free from surplus chip throughout the duration of the maintenance period. The Contractor shall allow for one further sweeping during the maintenance period.

3.5.2 Asphalt Reinstatement

This specification is for the laying of a wedge of asphaltic concrete on a single Grade 6 seal coat for reinstating the shape of the driving surface over concrete box culverts with minimum cover of 20mm at edge of seal.

A strip of approved geotextile shall be laid across the joint between the concrete culvert and adjacent granular material.

Before laying, the concrete surface shall be swept free of loose fines and saw cut edges shall be thoroughly cleaned.

The Grade 6 seal coat shall consist of approved asphaltic bitumen complying with TNZ M/1.

The seal coat shall be uniformly applied to the laying surface. Bitumen shall be applied by brush to cleaned saw-cut edges. A grade 6 chip shall be lightly spread, with a coverage of 80 to 90%. Over-chipping shall be prevented.

The asphaltic concrete shall be AC10 conforming to TNZ M/10. The grading shall meet the requirements of TNZ M/10 Table 1 Mix 10.

Construction of the asphaltic concrete paving shall be in accordance with the requirements of TNZ P/9. Compaction shall be by the use of suitable rollers to achieve the density requirements of TNZ M/10. The compacted material shall conform to the shape in the cross section shown in WDC Standard Drawing 1530 in reference documents and merge to the shape of the adjacent sealed carriageway off the structure.

3.5.3 Unsealed Road

Where a stock underpass is installed in an unsealed road the approaches shall be sealed either side of the underpass to the extent required by The Council and the above requirements applied.

3.5.4 Records

The contractor shall provide records of application rates, of bitumen and chip, on completion of the sealing.

3.5.5 Pavement Marking

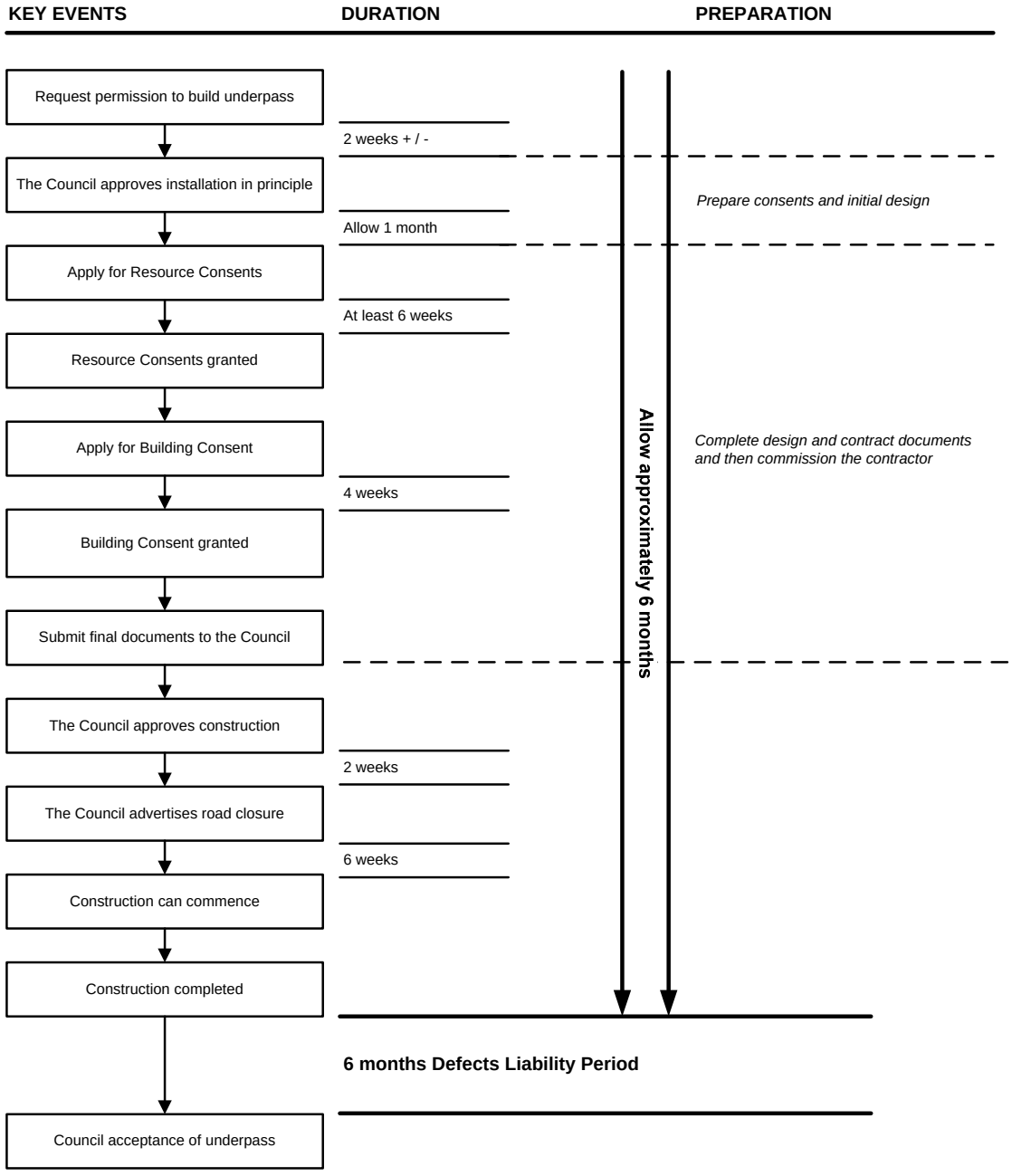
Pavement marking shall be carried out to replace all existing painted lines lost through this contract and add edge lines as shown on plans. The markings shall comply with TNZ P/12 and shall be completed within two weeks of the roadway being sealed.

3.5.6 Repairs And Maintenance Of The New Surfacing

The standard of maintenance shall be such that the "take" of chip shall continue to comply with the requirements of TNZ P3. The Council will inspect the surface immediately before the temporary speed restriction signs are removed, after any necessary sweeping is completed. Provided that all other requirements of this specification have been complied with, and the sealing binder is adhering strongly to the sealing chip, the Contractor's period of maintenance will be set at 6 months from that point of time.

Sealed areas damaged by the operation outside the working area shall be repaired to the satisfaction of the Council.

TIMELINE FOR THE INSTALLATION OF A TYPICAL STOCK UNDERPASS



STOCK UNDERPASS
DATA SHEET ACCOMPANYING DESIGN DOCUMENTS

I wish to carry out the work described in the plans and specifications deposited herewith:

Landowner: _____, of _____ (address)

_____

Underpass installation Contractor _____

_____

Culvert manufacturer _____

_____

Site Location _____

Estimated start date _____ (allow eight weeks notice)

Contact person _____ Telephone _____

Services Contacted :	Telephone	___ (Please Tick)
	Power	___
	Water	___
	Sewer	___
	LINZ	___

Documents Enclosed:	Unsigned Schedules from Conditions of Contract (NZS 3910: 2003)	___
	Specification	___
	Design Drawings	___
	Building Consent and PIM	___
	Resource Consent(s)	___
	Designers Producer Statement	___
	Signed Construction Agreements	___
	Signed Use & Subsoil Lease Agreement	___
	Proof of Contractor's Insurance	___
	Contractor's Health and Safety Plan	___
	Road Opening Notice (RON) Application	___
	Traffic Management Plan	___
	Bond (if required)	___
	Any further conditions the Council may apply	___

Signature: _____

For Office Use Only

Stock Underpass Construction Agreement
& Use and Subsoil Lease Agreement Signed _____ (initials) ____/____/____ (date)

Road Reinstated and inspected _____ (initials) ___/___/___ (date)

Maintenance Inspection Completed _____ (initials) ___/___/___ (date)

FIRST SCHEDULE

SPECIAL CONDITIONS OF CONTRACT
(Clause numbers refer to General Conditions)

PART A – SPECIFIC CONDITIONS OF CONTRACT

1.2
The Principal is

of

(a) There are Separable Portions as set out in the following parts of the Contract Documents;

~~(b) There are no Separable Portions in this contract.~~
(Delete provision which does not apply.)

2.1.1
This contract is a:

(a) Lump sum contract;

~~(b) Measure and value contract;~~

~~(c) Cost reimbursement contract.~~
(Delete provisions which do not apply.)

2.5
This contract is:

(a) A construction contract in public roads;

~~(b) A term maintenance contract (including a road maintenance contract);~~

~~(c) Neither a construction contract in public roads nor a term maintenance contract.~~
(Delete provisions which do not apply.)

2.6.1
This contract is:
(a) A local authority contract;

~~(b) Not a local authority contract.~~
(Delete provision which does not apply.)

2.6.3
Clauses B1 and B2 of Appendix B:

(a) Shall apply to this contract;

~~(b) Shall not apply to this contract.~~
(Delete provision which does not apply)

NOTE – This provision should only be incorporated in local authority contracts where the Site is in a public roadway or where the public has access to the Site similar to its access to a public roadway.

2.6.4(a)
A safety plan for the Site:

(a) Is required, as set out in the following parts of the Contract Documents;

~~(b) Is not required.~~
(Delete provision which does not apply.)

2.6.4(b)
A traffic management plan:

(a) Is required, as set out in the following parts of the Contract Documents;

~~(b) Is not required.~~
(Delete provision which does not apply.)

2.8.1
- sets of Contract Documents shall be supplied free of charge to the Contractor upon the acceptance of tender in addition to tender, consent, and Contract Agreement sets.

2.9.2
- sets of Contract Documents shall be supplied free of charge to the Engineer upon the acceptance of tender in addition to tender, consent, and Contract Agreement sets.

3.1.1
A Contractor's bond:

(a) Is required;

~~(b) Is not required.~~
(Delete provision which does not apply.)

3.1.2
The Contractor's bond shall be for the sum of $

3.2.1
A Principal's bond:

(a) Is not required;

~~(b) Is required and the surety shall be~~
(Delete provision which does not apply.)

3.2.2
The Principal's bond shall be for the sum of $

5.4.1
The Contractor shall be given possession of the Site on:

(a) 10 Working Days after the Date of Acceptance of Tender;

~~(b)~~
(Delete provision which does not apply.)

5.6.6
(g) Risks specifically excepted are

5.11.1

(a) The Contractor is to be responsible, for and on behalf of the Principal, for obtaining project information memoranda, building consents and code compliance certificates under the Building Act 1991 for the carrying out of the following parts of the Contract Works to which Appendix D applies.

(i)

~~(b) There are no parts of the Contract Works to which Appendix D applies.~~
(Delete provision which does not apply.)

5.17.1

Quality management systems:

(a) Are required and details shall be submitted by

~~(b) Are not required.~~
(Delete provision which does not apply.)

5.18.1 (a)

(a) As-built drawings, are required, as set out in the following parts of the Contract Documents:

(i)

~~(b) As-built drawings are not required.~~
(Delete provision which does not apply.)

5.18.1 (b)

(a) Operation and maintenance manuals are required as set out in the following parts of the Contract Documents:

(i)

~~(b) Operation and maintenance manuals are not required.~~
(Delete provision which does not apply.)

6.1.2

The Engineer is whose professional qualification is .

8.1 and **8.6**

(a) The Contractor shall insure as provided in 8.1;

~~(b) The Principal shall insure as provided in 8.6.~~
(Delete provision which does not apply.)

8.1.2 or **8.6.1**

(To be completed irrespective of whether the Principal or the Contractor is insuring.)

The amount of the insurance to be effected in respect of the Contract Works and Materials shall be for not less than the sum of the following:

(a) The Contract Price, after the acceptance of the tender or other offer, excluding any additions or deductions which may be required to be made during the course of the contract;

(b) For the Cost of demolition, disposal and preparation for replacement work, the sum of :

(i) 5 % of the Contract Price as described in (a) above; or
~~(ii) % of the Contract Price as described in (a) above; or~~
~~(iii) $~~
(Delete provisions which do not apply.)

(c) For professional fees including the Cost of clerks of works and inspectors, the sum of:

(i) 5 % of the Contract Price as described in (a) above; or
~~(ii) % of the Contract Price as described in (a) above; or~~
~~(iii) $~~
(Delete provisions which do not apply.)

(d) 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 $

(e) For increased construction Costs not already provided for in the Contract Price during the period from the acceptance of the tender or other offer until the issue of the Defects Liability Certificate for the Contract Works, the sum of:

(i) 5 % of the Contract Price as described in (a) above; or
~~(ii) % of the Contract Price as described in (a) above; or~~
~~(iii) $~~
(Delete provisions which do not apply.)

The insurance shall make provision for automatic change of cover for items (a) and (e) above, to provide insurance for any additions to or deductions from the Contract Price which occur after acceptance of the tender or other offer.

8.2.1
Contractor's Plant insurance is required for each item of construction machinery on the Site owned by the Contractor that has a market value of more than:

$50,000; or
~~$~~
(Delete provision which does not apply.)

8.3 and **8.7**
(a) The Contractor shall insure as provided in 8.3;

~~(b) The Principal shall insure as provided in 8.7.~~
(Delete provision which does not apply.)

8.3.1 or **8.7.1**
(To be completed irrespective of whether the Principal or the Contractor is insuring.)
Public liability insurance shall be effected for an amount not less than $

8.3.2
Motor vehicle third party liability insurance shall be effected for an amount not less than $

8.4.1
(a) Professional indemnity insurance for design by the Contractor shall be effected for an amount not less than $

~~(b) Professional indemnity insurance for design by the Contractor is not required.~~
(Delete provision which does not apply.)

8.6.2
The existing structures are:

(i)

8.6
For the insurance policies required under the following clauses:

The insurers are:

8.6.2 (a)
8.6.2 (b)

The deductibles are:

8.6.2 (a)
8.6.2 (b)

The exclusions and other limitations, if any, are:

8.6.2 (a)
8.6.2 (b)

8.7
For the insurance policy required under clause 8.7:

The insurers are:
The deductibles are:
The exclusions and other limitations, if any, are:

Amount of liability insurance cover under clause 8.7 for any one claim or series of claims arising out of the same occurrence $

10.2.1
The periods to be used for calculating the Due Date for Completion are:

(a) In respect of the Contract Works Weeks;

(b) In respect of Separable Portions

(i) : Weeks,
(ii) : Weeks,
(iii) . : Weeks.

10.3.1 (as amended by **B3**)
(Only applicable to construction contracts in public roads as defined in 2.5.)
Allowance for inclement weather Working Days.

10.4.5
Prior to the issue of the certificate of Practical Completion:

(a) A producer statement in the form of the Sixth Schedule is required;

~~(b) Producer statements are required as set out in the following parts of the Contract Documents;~~

(i)

~~(c) A producer statement is not required.~~
(Delete provisions which do not apply.)

10.5.1
Liquidated damages shall be applied as follows:

(a) In respect of the Contract Works $ per Week;

(b) In respect of Separable Portions

(i) : $ per Week,
(ii) : $ per Week,
(iii) : $ per Week.

NOTE – Where liquidated damages are provided for, the amount must be a genuine pre-estimate of the likely loss that would result from delay of completion. Where liquidated damages are provided for Separable Portions it may be necessary to provide different rates for each Separable Portion.

Where liquidated damages are not provided, the Principal can recover and the Contractor will be liable only for such actual loss as the Principal can prove has resulted from the late completion, being loss of a kind reasonably foreseeable to the parties at the time the contract was made as being likely to result.

10.6.1
A bonus shall be paid as follows:

(a) In respect of the Contract Works $ per Week;

(b) In respect of Separable Portions:

(i) : $ per Week,
(ii) : $ per Week,
(iii) : $ per Week.s

(Delete if not applicable.)

11.1.1
The Period of Defects Liability shall be:

(a) In respect of the Contract Works Weeks;

(b) In respect of Separable Portions

(i) : Weeks,
(ii) : Weeks,
(iii) : Weeks.

(To be completed if period is other than three Months.)

11.3.2
Prior to the issue of the Defects Liability Certificate:

(a) A producer statement in the form of the Sixth Schedule is required**;**

~~(b) Producer statements are required as set out in the following parts of the Contract Documents:~~

(i)

~~(c) A producer statement is not required.~~

(Delete provisions which do not apply.)

11.5.1
The Contractor shall provide guarantees as set out below:

~~No guarantees are required.~~
(Delete provision which does not apply.)

11.5.2
The form of guarantee shall be in the form annexed as the Schedule.

12.1.2(b)(iv)
(a) Advances for Temporary Works, Plant, or Materials not yet on Site shall be made to the Contractor in accordance with:

(i) The following conditions

~~(ii) The conditions attached in~~

~~(b) Advances for Temporary Works, Plant or Materials not yet on Site shall not be made to the Contractor.~~
(Delete provisions which do not apply.)

12.3.1
The percentage to be retained from each progress payment and the limit of the total sums retained shall be:

(a) In respect of the Contract Works:
Total retention
10 % of the first $200,000, plus
5 % of the next $800,000, plus
1.75 % of any amount in excess of $1,000,000
with a maximum of $200,000 when aggregated

Defects liability retention
50 % of total retention

~~(b) In respect of the Contract Works:~~
~~Total retention~~
~~% of first $ plus~~
~~% of next $ plus~~
~~% of amount in excess of $~~
~~with a maximum of $ when aggregated~~

~~Defects liability retention~~
~~50 % of total retention~~
(Delete either (a) or (b).)

(c) Where there are Separable Portions, the amount to be retained in respect of the Contract Works in accordance with (a) or (b) of this clause shall be reduced upon the completion of each Separable Portion by the following percentages:

(i) In respect of by %
(ii) In respect of by %
(iii) In respect of by %

12.8.2
Cost fluctuation adjustments:

(a) Shall not be paid;

~~(b) Shall be paid in accordance with Appendix A;~~

~~(c) Shall be paid as set out in the Schedule.~~
(Delete provisions which do not apply.)

12.9.1
(a) Provisional Sums are included in the schedule of quantities;

~~(b) There is no schedule of quantities and the Provisional Sums included in the contract are:~~

(i) : $
(ii) : $
(iii) : $
(iv) : $

~~(c) There are no Provisional Sums.~~
(Delete provisions which do not apply.)

12.10.1
(a) Prime Cost Sums are included in the schedule of quantities;

~~(b) There is no schedule of quantities and the Prime Cost Sums included in the contract are:~~

(i) : $
(ii) : $
(iii) : $
(iv) : $

~~(c) There are no Prime Cost Sums.~~
(Delete provisions which do not apply.)

12.11.1
The contingency sum to be included in the contract is $

15.1.2
For the purpose of service of payment claims or notices, the postal address of:

(a) The Principal is

For the attention of:
Fax No.

(b) The Engineer is

For the attention of
Fax No.

(c) The Contractor is

For the Attention of

Fax No.

NOTE - The General Conditions of Contract provide in the following clauses for matters which may be dealt with by further specific conditions of contract:

2.4.1 Cost reimbursement contract details
2.7.2 Execution of Contract Agreement
2.8.3 Variation or modification of General Conditions
5.4.3 Access to adjoining properties
5.5 Separate contractors
5.9.1 Exceptions to Contractor's obligation to supply
5.9.3 Advances for Plant or Materials
5.10.1 Programme
7.1.2 (d) Risks specifically excepted
8.8.1 (d) Risk, loss or damage not covered by Principal's insurance
9.4.2 Variations carried out on Daywork basis
12.1.1 Frequency of payment claims
12.3.3 Contractor's bond in lieu of retentions
12.12.2 Goods and services tax

PART B – OTHER CONDITIONS OF CONTRACT

(Include here other Special Conditions that modify the General Conditions)

SECOND SCHEDULE

CONTRACT AGREEMENT

Contract for

THIS AGREEMENT is made on

BETWEEN
("the Contractor")

AND
("the Principal").

IT IS AGREED as follows:

1. **THE** Contractor shall carry out the obligations imposed on the Contractor by the Contract Documents.

2. **THE** Principal shall pay the Contractor the sum of $ or such greater or less sum as shall become payable under the Contract Documents together with Goods and Services Tax at the times and in the manner provided in the Contract Documents.

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 Conditions of Tendering;

(b) Notices to tenderers (give details with dates);

(c) The Contractor's tender;

(d) The notification of acceptance of tender;

(e) The General Conditions of Contract, NZS 3910:2003;

(f) The Special Conditions of Contract;

(g) Specifications issued prior to the Date of Acceptance of Tender;

(h) Drawings issued prior to the Date of Acceptance of Tender;

(i) The Schedule of Prices; *(Delete if not applicable)*

(j) The following additional documents: (Identify any additional documents to be included for example agreed correspondence.)

WITNESS to the signature
of the Contractor:

.....
Contractor

WITNESS to the signature
of the Principal:

.....
Principal

POLICY

Roads and Streets

STOCK UNDERPASSES

1. The Council will, on request, consider requests for permission to construct a stock underpass under any of the roads under its control.

2. Permission to construct a stock underpass will normally be granted by the Manager Utilities and Roading who is hereby delegated that authority.

3. Where the Manager Utilities and Roading considers that the request should not be approved, and the matter cannot be resolved through negotiation with the applicant, only the Utilities and Roading Committee may refuse such permission.

4. In granting permission for construction of an underpass the Manager Utilities and Roading shall ensure that the following conditions are imposed:

   a) The applicant completes a Stock Underpass Construction Agreement.

   b) The applicant completes a Stock Underpass Use Agreement and Subsoil Lease Agreement.

   c) The Council will financially support the construction of each stock underpass only to the extent that the work meets the Transfund NZ formula for financial support detailed in Section 7.4.20 of the Transfund NZ Programme and Funding Manual, as it may be amended from time to time.

      - The maximum contribution available is 25% of the total cost of the work.

      - The Transfund NZ policy requires that the funding be from the Minor Safety Improvements Programme. In the event that such funding is not available in the current financial year the Council will make provision for that expenditure in its annual estimates for the next financial year. In this event, should the applicant wish to proceed with the construction earlier than the Council can provide the financial assistance, the applicant shall carry the full cost and invoice the Council for its share after the commencement of the year in which programme provision is made. Deferment of the Council's contribution shall not alter the requirement for the grantee to comply with the Competitive Pricing Procedures requirements of the Construction Agreement.

   (d) The Manager Utilities and Roading shall report to the Utilities and Roading Committee each grant of a Stock Underpass Construction Agreement that attracts Council financial support.

   (e) Removal of a stock underpass, in accordance with the conditions contained in the Stock Underpass Use Agreement, may be authorised by the Manager Utilities and Roading when requested to do so by the grantee. Alternatively, should the Manager Utilities and Roading recommend the closure of an underpass against the wishes of the grantee, such approval is reserved to the Utilities and Roading Committee.

WAIMAKARIRI DISTRICT COUNCIL

215 High Street
Private Bag 1005
RANGIORA 7440
New Zealand

Phone: (03) 311 8900
or: (03) 327 6834
Fax: (03) 313 4432
www.waimakariri.govt.nz

STOCK UNDERPASS CONSTRUCTION AGREEMENT

BETWEEN The WAIMAKARIRI DISTRICT COUNCIL
The "Council"

AND _____
("the GRANTEE")

Dated _____

WAIMAKARIRI DISTRICT COUNCIL

215 High Street
Private Bag 1005
RANGIORA 7440
New Zealand

Phone: (03) 311 8900
or: (03) 327 6834
Fax: (03) 313 4432
www.waimakariri.govt.nz

STOCK UNDERPASS CONSTRUCTION AGREEMENT

This agreement is made on the …….. day of ……..20……..

BETWEEN

1. **The Waimakariri District Council**, a statutory authority established under the Local Government Act 1974 (herein after referred to as "the Council")

AND

2) ……. of ……..

……. (herein after referred to as "the Grantee")

BACKGROUND

A. The Council having the statutory responsibility and control of all matters in relation to the road network in the Waimakariri District has authority to agree to the construction of a stock underpass.

B. Ownership of the stock underpass will be vested in the Council.

C. The Council and the Grantee have agreed to the construction of a stock underpass on ……. Road at or near route position …… and as shown on Plan No. ……..

D. The parties agree that the stock underpass shall meet the requirements of relevant the Council policies, design criteria and construction specifications.

E. Cost Sharing – the parties agree, as applicable and as set out herein, to cost sharing in relation to the construction of the stock underpass. The Council undertakes to make a maximum payment of …….. $……. to the …….
(words) (figures)

Grantee on meeting the conditions of this agreement herein.

F. The parties have agreed to enter into a separate agreement in conjunction with this agreement, for the stock underpass use and the lease of subsoil, to formalise the rights of the parties concerning the ongoing use of the stock underpass.

Now therefore in consideration of the above the parties wish to record the terms and conditions relating to the agreement as follows:

WAIMAKARIRI DISTRICT COUNCIL

215 High Street
Private Bag 1005
RANGIORA 7440
New Zealand

Phone: (03) 311 8900
or: (03) 327 6834
Fax: (03) 313 4432
www.waimakariri.govt.nz

STOCK UNDERPASS CONSTRUCTION AGREEMENT

1. Defined Terms

1.1 In this agreement, unless the context requires otherwise:

Stock underpass means a stock access structure together with associated fencing, drainage and safety facilities, over or under a State highway, connecting two parts of a property or properties.

Grantee means the property owner, whose property or properties is/are bisected by the State highway, or whose property is afforded access across the State highway, at the position where the stock underpass is proposed or is constructed, who is party to this agreement or any other document.

Parties means the Waimakariri District Council and the Grantee, their personal representatives/successors and permitted assigns.

Cost Sharing means that, subject to the terms of this agreement, the Council will share with the Grantee the cost of construction of the stock underpass by making a financial contribution to the Grantee in accordance with the provisions of the Council's published policy on this matter and the current Transfund Programme and Funding Manual.

AADT means the current annual average daily traffic passing the stock underpass site as ascertained by the Council.

Words of the singular are deemed to include the plural and vice-versa.

Words in the masculine gender are deemed to include the feminine and vice-versa.

2. Title

2.1 Ownership of the stock underpass shall be vested in the Council.

3. The parties mutually

3.1 Confirm the contents of BACKGROUND.

3.2 Agree that they shall each carry out and fulfil all their respective obligations set out in this document.

4. Terms of Agreement

The parties agree and confirm that::

4.1 The Grantee shall engage appropriate engineering consultants acceptable to the Council for the necessary design, estimating, tender documentation and evaluation, contract administration and construction supervision. Where the Council agrees to cost sharing, the requirements of the Transfund Competitive Pricing Procedures Manual and the Council's Tendering Policy (or their replacement publications) shall be observed, and all tender documentation and specifications shall conform to the Council requirements.

WAIMAKARIRI DISTRICT COUNCIL

215 High Street
Private Bag 1005
RANGIORA 7440
New Zealand

Phone: (03) 311 8900
or: (03) 327 6834
Fax: (03) 313 4432
www.waimakariri.govt.nz

4.2 The Council will consult with the Grantee but reserves the right to determine the location of the stock underpass, the consultants and contractors engaged, and the suitability of design and construction standards. Where the Council agrees to cost sharing, the Council reserves the right to confirm final acceptance of any tender without obligation to approve the lowest or any particular tender.

4.3 Where cost sharing applies, following the Council's approval of the tender, the Grantee shall accept the same.

4.4 The Council's financial contribution, as determined under "Cost Sharing", shall be payable to the Grantee upon the Council's receipt of the Building Code Compliance Certificate and appropriate invoice together with certified copies of all payments.

4.5 In the event of any subsequent variation to the tendered sum and/or the associated engineering fees, the Grantee shall be responsible for the cost of such variations.

4.6 In particular in the construction of the stock underpass the Grantee shall satisfy the Council of the following:

4.6.1 Liaison with service authorities to determine services locations and relocation.

4.6.2 Compliance with the Building Act 2004 and the Building Regulations 1992.

4.6.3 Safe Safety Plan, including the provisions of the Health and Safety in Employment Act 1993.

4.6.4 Temporary traffic control to be approved by the Council.

4.6.5 Provision of road detours shall require the Council's consent together with appropriate public notification noting that temporary closure of a road normally requires at least six weeks notice.

4.6.6 Compliance with the Council's construction standards.

4.6.7 The Council's Road Opening Notice conditions.

4.6.8 The construction contract contains the standard conditions of, and complies with, NZS3910:2003 Conditions of Contract for Building and Civil Engineering Construction.

4.6.9 Public liability insurance with a limit of indemnity to $2,000,000.00, or such lessor sum as the Council may approve, for the period of construction. The Council shall approve both the insurer and the terms and conditions of the policy.

4.6.10 A six-month Period of Defects Liability commencing from the date of Practical Completion of the Contract Works.

4.7 The Grantee shall rearrange the farm layout and farm management to eliminate any existing stock crossing immediately on practical completion of the stock underpass.

4.8 The Grantee shall if required by the Council, provide a bond, with sureties acceptable to the Council, that will become null and void, on fulfilment of all obligations under this agreement, satisfactory and timely completion of the stock underpass construction and, rectification of any defects within the Period of Defects Liability. The form and amount of bond shall be as determined by the Council.

WAIMAKARIRI DISTRICT COUNCIL

215 High Street
Private Bag 1005
RANGIORA 7440
New Zealand

Phone: (03) 311 8900
or: (03) 327 6834
Fax: (03) 313 4432
www.waimakariri.govt.nz

STOCK UNDERPASS CONSTRUCTION AGREEMENT

5. Documentation

5.1 Copies of documentation including all notices, plans, specifications, building and resource consents, payment certificates, inspection reports and compliance certificates and as-built drawings shall be sent to the Council as they become available. Provided that all documents shall be supplied before the Council makes any payment owning to the Grantee.

6. Design and Installation Certificate

6.1 The design and construction of the stock underpass shall be executed in accordance with all relevant building codes, resource consents and the Council's standards. The Council shall receive a copy of an Engineer's certifying statement and a copy of the Building Code Compliance Certificate to this effect on completion.

7. Agreement Conditional

7.1 This agreement is conditional upon the parties entering into an agreement for the Stock Underpass Use.

WAIMAKARIRI DISTRICT COUNCIL

215 High Street
Private Bag 1005
RANGIORA 7440
New Zealand

Phone: (03) 311 8900
or: (03) 327 6834
Fax: (03) 313 4432
www.waimakariri.govt.nz

STOCK UNDERPASS CONSTRUCTION AGREEMENT

SIGNED for and on behalf of the Waimakariri District Council

…… } ……

…… } ……

In the presence of:

Witness' Signature ……..
Name ……..
Occupation ……..
Address ……..
……..
……..

SIGNED by the Grantee

…… } ……

…… } ……

In the presence of:
Witness' Signature ……..
Name ……..
Occupation ……..
Address ……..
……..
……..

The Common seal of

……..

was hereto affixed in the presence of:

……

WAIMAKARIRI DISTRICT COUNCIL

215 High Street
Private Bag 1005
RANGIORA 7440
New Zealand

Phone: (03) 311 8900
or: (03) 327 6834
Fax: (03) 313 4432
www.waimakariri.govt.nz

STOCK UNDERPASS USE AND SUBSOIL LEASE AGREEMENT

BETWEEN WAIMAKARIRI DISTRICT COUNCIL
("THE COUNCIL")

AND _____
("the GRANTEE")

Dated _____

WAIMAKARIRI DISTRICT COUNCIL

215 High Street
Private Bag 1005
RANGIORA 7440
New Zealand

Phone: (03) 311 8900
or: (03) 327 6834
Fax: (03) 313 4432
www.waimakariri.govt.nz

STOCK UNDERPASS USE AND SUBSOIL LEASE AGREEMENT

STOCK UNDERPASS USE AGREEMENT AND SUBSOIL LEASE AGREEMENT

This agreement is made on the …….. day of ……..20……..

BETWEEN

1) **The Waimakariri District Council**, a statutory authority under the Local Government Act 1974 (herein after referred to as "the Council")

AND

2) …… of ……..

…… (herein after referred to as "the Grantee")

BACKGROUND

A. The Council having the statutory responsibility and control of all maters in relation to the road network in the Waimakariri District has authority to agree to the use of a stock underpass.

B. Ownership of the stock underpass will be vested in the Council.

C. The Council and the Grantee have agreed to the construction of a stock underpass on ……. Road at or near route position …… and as shown on Plan No. ……..

D. The parties have agreed to enter a separate agreement in conjunction with this agreement for the stock underpass construction and cost sharing (if any) in relation to the construction, to formalise the rights of the parties concerning the stock underpass construction.

Now therefore in consideration of the above the parties wish to record the terms and conditions relating to the agreement as follows:

1. Defined Terms

1.1 In this agreement, unless the context requires otherwise:

Stock underpass means a stock access structure together with associated fencing, drainage and safety facilities, over or under a public road under the Council's control, connecting two parts of a property or properties.

Grantee means the property owner, whose property or properties is/are bisected by the State highway, or whose property is afforded access across the State highway, at the position where the stock underpass is proposed or is constructed, who is party to this agreement or any other document.

Parties means Waimakariri District Council and the Grantee, their personal representatives/successors and permitted assigns.

Words of the singular are deemed to include the plural and vice versa.

Words in the masculine gender are deemed to include the feminine and vice-versa

WAIMAKARIRI DISTRICT COUNCIL

215 High Street
Private Bag 1005
RANGIORA 7440
New Zealand

Phone: (03) 311 8900
or: (03) 327 6834
Fax: (03) 313 4432
www.waimakariri.govt.nz

STOCK UNDERPASS USE AND SUBSOIL LEASE AGREEMENT

2. The parties mutually

2.1 Confirm the contents of BACKGROUND.

2.2 Agree that they shall each carry out and fulfil all their respective obligations set out in this document.

3. The Grantee

3.1 The Grantee agrees and confirms that:

3.1.1 The Grantee shall have the right to us the stock underpass in consideration of the payment to the Council of an annual fee of one dollar ($1.00) if demanded.

3.1.2 The Grantee shall not do anything or allow anything to be done that will affect the structural integrity of the stock underpass.

3.1.3 The Grantee shall maintain, at the Grantee's cost, the stock underpass, including associated fencing, drainage and safety facilities, in good order and condition at all times, and immediately make safe and repair damage to the stock underpass caused through direct for indirect use or activity, and in any event shall carry out such maintenance or repair as may be reasonably be required, in writing, by the Council.

3.1.4 The Grantee shall advise the Council when any maintenance or repair, other than that of a routine nature, is required. The Grantee shall effect such maintenance or repair in accordance with the instructions of and to the satisfaction of the Council.

3.1.5 The Grantee shall be responsible for the cost of maintenance of the access through or over the structure.

3.1.6 The Grantee shall obtain the consent of the Council before entering onto the State highway to effect maintenance or repairs to the stock underpass.

3.1.7 The Grantee shall immediately made good any damage caused by the Grantee, his servants, agents or visitors, to the carriageway or legal road reserve.

3.1.8 On receipt of advice under Clause 4.1.4, or as determined through its own inspection, the Council may elect to carry out all or part of any maintenance or repairs at the Grantee's cost or otherwise. The Council will, in such case, notify the Grantee accordingly within 14 days of receipt of advice or inspection.

3.1.9 The Grantee shall indemnify the Council against all costs, actions, demands, suits, damages and proceedings of any kind for any loss or damage that might result to any property of any person or any agency of the Crown directly or indirectly by reason of the exercise of the rights under this agreement.

4. The Council

4.1 Notwithstanding the provisions of Clause 3.0, the Council shall meet the cost of repairs of any structural defect in the stock bypass where the Council is satisfied such defect is not directly or indirectly attributable to the use of the stock underpass by the Grantee.

WAIMAKARIRI DISTRICT COUNCIL

215 High Street
Private Bag 1005
RANGIORA 7440
New Zealand

Phone: (03) 311 8900
or: (03) 327 6834
Fax: (03) 313 4432
www.waimakariri.govt.nz

STOCK UNDERPASS USE AND SUBSOIL LEASE AGREEMENT

5. Removal of Stock Underpass

5.1 The Grantee shall have the right to have the stock underpass removed at any time subject to the following conditions:

5.1.1 Two months written notice to the Council of the Grantee's exercise of right.

5.1.2 The Council shall undertake removal of the stock underpass and reinstate the road to its satisfaction. The Council will ensure that its consultants and contractors take all reasonable care in removal of the stock underpass but the Council will be responsible for any damage that may occur to the stock underpass as a result of its removal.

5.1.3 The Grantee shall reimburse the Council for the costs of such removal and reinstatement. Upon receipt of notice under Clause 6.1.1, the Council will provide the Grantee with an estimate of cost of such removal. The estimated amount shall be paid to the Council, pending completion of the removal and reinstatement, and then applied to the cost of removal and reinstatement.

5.1.4 Ownership of the stock underpass structure shall pass to the Grantee upon removal and reinstatement.

5.1.5 Consent may not be given to the grantee, upon removal of the stock underpass, to allow access to and stock to traverse the road at or near the stock underpass location.

6. Termination

6.1 The Council may terminate this agreement and may remove the stock underpass:

6.1.1 at the expiration of three months written notice of intention to terminate if the land under which the stock underpass is constructed ceases to form part of Waimakariri District Road Network or is otherwise removed from the Council control; or

6.1.2 without notice if the Grantee fails, within twenty eight (28) days of receiving notice requiring the Grantee to remedy any default on the Grantee's part under this agreement; or

6.1.3 Immediately without notice if any default on the Grantee's part under the terms of this agreement in the opinion of the Council interferes or may interfere with the safe and/or efficient operation of the road.

6.1.4 The Grantee shall not be liable for any compensation on termination of this agreement.

7. Assignment

7.1 The rights of the Grantee shall not be assigned under this agreement without prior written consent of the Council, which shall not unreasonably be withheld.

WAIMAKARIRI DISTRICT COUNCIL

215 High Street
Private Bag 1005
RANGIORA 7440
New Zealand

Phone: (03) 311 8900
or: (03) 327 6834
Fax: (03) 313 4432
www.waimakariri.govt.nz

STOCK UNDERPASS USE AND SUBSOIL LEASE AGREEMENT

8. Notices

8.1 All notices under this agreement shall be sent to the following addresses by hand, post or facsimile or to such other addresses as are from time to time nominated in writing by the parties:-

The Council:-

The Chief Executive Officer
Waimakariri District Council
Private Bag 1005
Rangiora

Facsimile: 03 313 4432

Phone: 03 313 6136

Grantee:-

……

……

……

Facsimile: ……

Phone: ……..

8.2 It will be sufficient in cases where notice is to be given by the Council that some person acting under the Council's express or implied authority sign such notice.

WAIMAKARIRI DISTRICT COUNCIL

215 High Street
Private Bag 1005
RANGIORA 7440
New Zealand

Phone: (03) 311 8900
or: (03) 327 6834
Fax: (03) 313 4432
www.waimakariri.govt.nz

STOCK UNDERPASS USE AND SUBSOIL LEASE AGREEMENT

SIGNED for and on behalf of the Waimakariri District Council

…… } ……

…… } ……

In the presence of:

Witness' Signature ……..
Name ……..
Occupation ……..
Address ……..
……..
……..

SIGNED by the Grantee

…… } ……

…… } ……

In the presence of:
Witness' Signature ……..
Name ……..
Occupation ……..
Address ……..
……..
……..

The Common seal of

……..

was hereto affixed in the presence of:

……

WAIMAKARIRI DISTRICT COUNCIL

BUILDING CONSENT / PIM APPLICATION

UNDER THE BUILDING ACT 2004
NON COMMERCIAL

Private Bag 1005, Rangiora 7440 | Ph (03) 311 8900, (03) 327 6834 | Fax (03) 313 4432 | www.waimakariri.govt.nz

THE BUILDING

(refer to your Rates Account for details)

1. Site Address: _____

_____

(Street /Road /Township)

Rapid Number: _____

(Applies to Rural Properties Only)

2. Legal description:

LOT: _____ DP/RS: _____

Valuation Roll Number: _____

Note: Only complete items here that are applicable to your project.

3. Building Name: _____

(eg: where buildings have Official Names)

4. Location of Building within Site: _____

(Only applicable to multi-development sites)

5. Number of Levels: _____ 6. Level/Unit No: _____

7. Floor Area – Existing:_____ New:_____ Total:_____

8. Current Lawfully Established Use: (eg: Use on any previous consent for the existing building)

_____

9. Year Building First Constructed: _____

(Only applicable to existing buildings, approximate date is acceptable, e.g. 1920s or 1960-1970)

THE APPLICANT / OWNER

10. Owner's Name: _____

(Company or organisational name)

11. Contact Person:_____

(If Owner is not an Individual)

12. Mailing Address: _____

_____

13. Street Address / Registered Office: _____

_____

14. Phone Numbers: Mobile: _____
Daytime: _____ After Hours: _____

15. Fax: _____

16. Email: _____

17. Website: _____

18. The following evidence of ownership is attached to this application, eg:

❒ Certificate of Title and / or
❒ Sale and Purchase Agreement

AGENT / CONTACT

Contact Details MUST be in New Zealand)

19. Name of Agent: _____

20. Contact Person: _____

21. Mailing/Billing Address: _____

_____

22. Street Address / Registered Office: _____

_____

23. Phone Numbers: Mobile: _____
Daytime: _____ After Hours: _____

24. Fax: _____

25. Email: _____

26. Website: _____

27. ❒ Authorisation from Agent Attached.

(Authorisation from the owner confirming authority)

28. **Note: The "Agent/Contact" will be the first point of contact for communications with the Council / Building Consent Authority regarding this Application / Building Work and will receive all correspondence including all invoices.**

APPLICATION

29. I request that a:
(select one)

❒ Project Information Memorandum Only (PIM)

❒ Building Consent for PIM No: _____

❒ Building Consent (including Project Information Memorandum)

❒ Building Consent without PIM

be issued for the Building Work Described in this Application.

For Office Use Only

Deposit paid

$_____

Receipt _____

Date _____

THE PROJECT

30. Type of Building Work: (eg: dwelling, dwelling relocation, commercial, farm shed, garage, demolition, etc., or combination of)

_____

_____

31. Specify the intended use of the building:
(eg: domestic use, shop, implement shed, garage to bedroom)

_____

32. Will the building work result in a change of use of the building: ❒ Yes ❒ No

Will Hazardous Substances be stored in the building?

_____

33. Intended life of the building:
❒ Indefinite but not less than 50 years
❒ Or specified as _____ years

34. List Building Consents previously issued for **this building** (if any) (ie: is this project being constructed in stages? Is this consent for a relocated or transportable building?)

_____

_____

_____

35. **Estimated Value (inc GST) $**_____
(ie: the estimated aggregate of the values of all goods and services to be supplied for the building work and includes GST).

PROJECT INFORMATION MEMORANDUM

This section must be completed if you are applying for a PIM.
DO NOT complete this section if a PIM has already been issued.

The following documents are attached to this application:
❒ Site plan, Floor plans, Elevations for proposed building, Certificate of Title and or Sales and Purchase Agreement
Two copies of all information required. (All plans to be dimensioned, scaled and accurate.) *One set of plans must be A3 or A4 size.*
❒ Application Fee (per Council Fees and Charges Schedule)

BUILDING CONSENT

(DO NOT complete this section if the Application is for a Project Information Memorandum only)

36. **The following documents are attached to this application:**
❒ **3 copies** – building plans (site plans, floor plans, elevation plans) *(one set of plans only must be A3 or A4 size)*
❒ **3 copies** of each –specifications, producer statements, truss details *(refer below)*
❒ **2 copies** – Certificate of Title and/or Sale and Purchase Agreement. Current C/T required (all transactions up to date)
All plans to be dimensioned, scaled and accurate
❒ Project Information Memorandum
❒ Development Contribution Notice (if applicable)
❒ Certificate attached to Project Information Memorandum (Resource Management Act)
❒ Key personnel – see page 8.

37. ❒ See page 9 for a Schedule confirming the Building Work will comply with the Building Code.

NB: Where a buildable truss design certificate is used for the granting of a building consent, an “as built” truss design must be provided to us for assessment ten days prior to the structure and pre-roof inspection. A set fee will be charged at the time of granting of the consent to cover the assessment of the as built truss design information.

Where a building consent has been granted using an “as built” truss design certificate no further information will be required unless the design/layout of the roof has changed from what was consented.

NOTES BY APPLICANT

Other notes or comments which you as the applicant may wish to add, eg Resource Consents

APPLICATION INFORMATION

(a) Project Information Memorandum (PIM)

A PIM will be issued within 20 working days provided all the required information is supplied with the application. Insufficient information could mean the application is returned. It is not mandatory to apply for a PIM. Applicants can choose not to apply for a PIM when they consider that the information would not be relevant for their building project. Note that where information is found to be necessary for processing the consent application, consent processing will be placed on hold until that information is provided and the cost will be charged as part of the consent processing fee.

A fee is required to accompany your PIM application. (Per Council's Fees and Charges Schedule.)

(b) Building Consent (BC)

A Building Consent will be processed within a maximum allowable time of 20 working days provided all the information required has been supplied. Processing time is stopped whenever further information is required and starts again when the information is received.

Once the building consent has been processed, you will receive notification, which will include an invoice for the fees payable.

Once the fees are paid in full your Building Consent will be granted.

(c) Combined Project Information Memorandum & Building Consent Applications

Applications for a combined PIM / BC will only be accepted when sufficient information is provided to permit the Building Consent to be processed. If insufficient information is provided then further information will be requested, or your application may be returned to you.

INSPECTIONS

Phone the Building Unit on (03) 311 8900 for booking inspections.

A minimum of 48 hours notice of commencement of the building work is required to be given to the Building Consent Authority.

During the process of construction, inspections will be necessary to confirm all work complies with your approved Building Consent documentation. The Building Consent Authority requires a minimum of 24 hours notice prior to the Building Consent Authority's Building Officials visit, however this will not guarantee an inspection in 24 hours if inspection bookings are full for that day.

The inspections required will be set out in the Building Consent documentation issued by the Building Consent Authority. Failure to have a prescribed inspection carried out and to be provided with confirmation that the work has been approved by the Inspecting Authority will put the issue of the Code Compliance Certificate for the work at risk.

RESOURCE CONSENTS

Your application will be assessed by the Planning Unit of the Council to determine whether your project complies with the relevant District Plan requirements.

If your application does not comply with District Plan requirements you will need to either amend your proposal to comply or apply for a Resource Consent. A Certificate will be attached to your Project Information Memorandum to notify that a resource consent is required prior to building work commencing. It is recommended that you contact the Planning Unit to determine the process from there.

CODE COMPLIANCE

A building consent is not completed until it has been issued with a Code Compliance Certificate. The Owner is required to complete a separate application form to apply for a Code Compliance Certificate as soon as practicable after the building work is completed but in any event no later than **2 years** after the granting of the Building Consent. A Code Compliance Certificate will be issued within a maximum allowable time of 20 working days provided all the information required has been supplied.

In the event that no application for Code Compliance is made, the Building Consent Authority may visit the site to determine if a CCC can be issued.

Private Bag 1005, Rangiora 7440 | Ph (03) 311 8900, (03) 327 6834 | Fax (03) 313 4432 | www.waimakariri.govt.nz

If you are unsure about the terminology or whether your project requires a particular detail, your builder or designer will be able to assist you.

PROVIDE THE FOLLOWING WITH EVERY APPLICATION

Applications may not be accepted or returned unprocessed if the application is not fully drawn and specified and accompanied by supporting documentation.

Applicants must mark all items provided with ✓ or mark **X** if not applicable.

Is this work associated with damage sustained in the earthquake/aftershocks? ☐ Y ☐ N

		For office use only – these have arrived
APPLICATION FORM (one copy required)		
☐	Fully complete all sections.	☐
☐	Means of Compliance with NZBC – Designer to complete.	☐
☐	Provide the correct legal description. Council can help with this.	☐
☐	Provide two copies of the current Certificate of Title or Sales and Purchase Agreement.	☐
☐	Give name and contact numbers of contact person (if not the owner).	☐
☐	State the project location (street address or location details as near as possible if no address).	☐
☐	Sign and date the form.	☐
☐	Agent Authorisation.	☐
DESIGN BASIS – To be completed by the Designer		
Please list the following basis for the building design:		
☐	Wind zone ……	
☐	Earthquake zone ……	
☐	Snow Zone/Altitude ……	
☐	Corrosion zone – If Applicable ……	
☐	Building is specifically engineer designed.	
☐	Complies with NZS 3604: 1999.	
☐	Both Specific Design and NZS 3604.	
DESIGN DOCUMENTS (Three copies required)		
☐	Weather Tightness Risk Matrix.	☐
☐	Truss design layout and Producer Statement	☐
☐	Bracing Calculations/Plan.	☐
☐	H1 Energy efficiency calculations.	☐
SITE PLAN – Three copies		☐
☐	Overview of site showing legal boundaries as per current Title.	
☐	Showing proposed and existing structures (including swimming pools).	
☐	Dimensions to boundaries.	
☐	Proposed and existing site levels.	
☐	North Point.	
☐	Utility infrastructure (sewer, water pipelines, septic tanks etc.) where applicable.	
☐	Water races, drains, topographic features.	

DRAINAGE LAYOUT ☐

Three copies to scale usually 1:100 or 1:50

- ☐ Foul Water – Showing waste pipes, sizes, grades, venting.
- ☐ Foul Water to discharge point.
- ☐ Storm Water – Pipe sizes, grades, down pipe locations.
- ☐ Storm Water drain to discharge point.

FOUNDATION LAYOUT ☐

Three copies to scale usually 1:100 or 1:50

- ☐ Full foundation layout plan.
- ☐ For timber floors show all pile layout, pile types and bracing location.
- ☐ Slab thickenings, shrinkage control joints and reinforcing rebates.

FLOOR PLANS ☐

Three copies to scale usually 1:100 or 1:50

- ☐ Layout of all floors fully dimensioned. For alterations and/or additions provide both new and existing floor plans.
- ☐ Doors and window positions and sizes.
- ☐ Layout of amenity areas (laundry etc.).
- ☐ Main structural beams that are not shown elsewhere.
- ☐ Lintel sizes.
- ☐ HWC Location.
- ☐ Roof Space Access.
- ☐ Gas Cylinder Location.
- ☐ Room names.
- ☐ Location of smoke alarms.
- ☐ Location of heating unit (if applicable).

EXTERIOR ELEVATIONS ☐

Three copies to scale usually 1:200 or 1:50

- ☐ Elevations of all external walls showing claddings.
- ☐ Doors and windows showing opening sections.
- ☐ Show location of Solar Panels.
- ☐ Accurate ground levels existing and proposed.
- ☐ Subfloor ventilation for timber floors.
- ☐ Show roof bracing on elevations if not shown elsewhere.

CROSS SECTION AND CONSTRUCTION DETAILS ☐

Three copies to scale usually 1:50 or 1:20 for sections and 1:10 for details (minimum scale).

- ☐ Roof lines, overhangs, floor levels, ground levels.
- ☐ Major vertical dimensions.
- ☐ Foundation, wall and roof structure and materials.
- ☐ Upper level decks or balconies over lower level room must be fully detailed including the storm water disposal and overflow precautions.
- ☐ Stairs, handrails and balustrade showing pitch and head clearances.
- ☐ Structural connections, posts to footings, beams to posts, trusses or beams to walls.
- ☐ Component fixing information is to be provided for all structural and framing components.
- ☐ Foundation and footing details and reinforcing. Show height from finished floor to ground level.
- ☐ Pile details for timber floors.
- ☐ Floor bracing details.
- ☐ Timber grade and treatment.
- ☐ Damp proof membranes and building papers.
- ☐ Insulation systems and materials.
- ☐ Flashing details and documents.
- ☐ Roof penetrations.
- ☐ Shower floor details and wall to shower base junction detail.
- ☐ Sealing to wet area fixtures.
- ☐ Water splash prevention
- ☐ All other building components that are not otherwise detailed or are unusual in any way.

SPECIFICATION – Three copies ☐

The specification must be for the project. We will not accept standard specifications unless they relate directly to the building and they cover the project accurately and fully. Multi-choice specifications will not be accepted. A brief accurate specification is usually best.

- ☐ Provide a written specification to cover all of the trades involved in the project. All materials used in the project are fully specified including fixings of all materials and components.
- ☐ The specification can be written on the drawings as long as all materials are fully covered.

SPECIFIC DESIGNS – Three copies ☐

For all components that require specific design provide the following:

- ☐ The Chartered Professional Engineer's. Producer Statement.
- ☐ The engineer's monitoring schedule if the engineer chooses to do site monitoring.
- ☐ All structural calculations.
- ☐ Structural details showing connections and details of the components.
- ☐ Solar technical details and plumbing schematic.
- ☐ Log fire and flue installation instructions.
- ☐ Current Potable Water Test.
- ☐ Effluent disposal design & ECan's copy of the submitted application form or approval.
- ☐ Wastewater system designs when required to be done by a Chartered Professional Engineer such as in a hazard zone.

CODE COMPLIANCE

Complete as far as possible in all cases

(Give names, addresses, and telephone numbers. Give relevant registration numbers if known)

BUILDER

Name: ..... Reg. N^{o}: .....

Address: .....

Phone N^{o}: ..... Fax N^{o}: ..... Email: .....

DESIGNER(S)

Name: ..... Reg. N^{o}: .....

Address: .....

Phone N^{o}: ..... Fax N^{o}: ..... Email: .....

REGISTERED DRAINLAYER

Name: ..... Reg. N^{o}: .....

Address: .....

Phone N^{o}: ..... Fax N^{o}: ..... Email: .....

CRAFTSMAN PLUMBER

Name: ..... Reg. N^{o}: .....

Address: .....

Phone N^{o}: ..... Fax N^{o}: ..... Email: .....

CRAFTSMAN GASFITTER

Name: ..... Reg. N^{o}: .....

Address: .....

Phone N^{o}: ..... Fax N^{o}: ..... Email: .....

REGISTERED ELECTRICIAN

Name: ..... Reg. N^{o}: .....

Address: .....

Phone N^{o}: ..... Fax N^{o}: ..... Email: .....

STRUCTURAL ENGINEER

Name: ..... Reg. N^{o}: .....

Address: .....

Phone N^{o}: ..... Fax N^{o}: ..... Email: .....

OTHER CONTRACTOR – TYPE: .....

Name: ..... Reg. N^{o}: .....

Address: .....

Phone N^{o}: ..... Fax N^{o}: ..... Email: .....

Application for project information memorandum and/or building consent

The building work will comply with the building code as follows:

[if you're not sure which clauses are applicable, consult with your builder, designer or architect.]

Clause [tick relevant clause numbers of building code]	**Means of compliance** [refer to the relevant compliance document(s) or detail of alternative solution in the plans and specifications; if not applicable put n/a]	**Waiver / modification required** [state nature of waiver or modification of building code required; if not applicable, put n/a]
☐ **B1** Structure		
☐ **B2** Durability		
☐ **C1** Outbreak of fire		
☐ **C2** Means of escape		
☐ **C3** Spread of fire		
☐ **C4** Structural stability during fire		
☐ **D1** Access routes		
☐ **D2** Mechanical installations for access		
☐ **E1** Surface water		
☐ **E2** External moisture		
☐ **E3** Internal moisture		
☐ **F1** Hazardous agents on site		
☐ **F2** Hazardous building materials		
☐ **F3** Hazardous substances and processes		
☐ **F4** Safety from falling		
☐ **F5** Construction and demolition hazards		
☐ **F6** Lighting for emergency		
☐ **F7** Warning systems		
☐ **F8** Signs		
☐ **G1** Personal hygiene		
☐ **G2** Laundering		
☐ **G3** Food preparation and prevention of contamination		
☐ **G4** Ventilation		
☐ **G5** Interior environment		
☐ **G6** Airborne and impact sound		
☐ **G7** Natural light		
☐ **G8** Artificial light		
☐ **G9** Electricity		
☐ **G10** Piped services		
☐ **G11** Gas as an energy source		
☐ **G12** Water supplies		
☐ **G13** Foul water		
☐ **G14** Industrial liquid waste		
☐ **G15** Solid waste		
☐ **H1** Energy efficiency		

All the relevant information on this form is required to be provided under the Building Act and Resource Management Act for the Environmental Services Unit to process your application. Under these Acts this information has to be made available to members of the public. The information contained in this application may be made available to other units of the Council. You have the right to access the personal information held about you by the Council which can be readily retrieved. You can also request that the Council correct any personal information it holds about you.

APPLICANT'S SIGNATURE

Signed by or for and on behalf of the Applicant _____

❒ Owner ❒ or Agent Date: _____

Note: if acting "for and on behalf", please read the following declaration before signing:- "I hereby declare that I am authorised to act as Agent of the Applicant" and enclose a letter of authorisation from the owner.

WAIMAKARIRI
DISTRICT COUNCIL

215 High Street
Private Bag 1005
RANGIORA 7440
New Zealand

Phone: (03) 313 6136
or: (03) 327 6834
Fax: (03) 313 4432

Website: www.waimakariri.govt.nz

Completion Notes

1. A Traffic Management Plan (TMP) is to be submitted to the Council at least two working days prior to commencing any work that may interfere with the flow of traffic on roadways for comment or amendment, unless there is a requirement for public notification. Then, the Traffic Management Plan must be submitted five days before any advertisement is to be placed.
2. **Traffic Management Plans can only be completed by a current Site Traffic Management Supervisor (STMS).**
3. For signs and site layouts please refer to Transit New Zealand's Code of Practice for Temporary Traffic Management.
4. **Please delete any provision/s that do not apply.**

WDC VC Permit N^{o} or Contract N^{o}: _____

TRAFFIC MANAGEMENT PLAN

<table>
<tr><td>Traffic Management Plan Reference</td><td colspan="4"></td></tr>
<tr><td></td><td colspan="4">For Office Use Only</td></tr>
<tr><td>Organisation</td><td>Contractor</td><td colspan="3">Client</td></tr>
<tr><td>Contract Name/Number</td><td></td><td colspan="3">RCA Consent Reference</td></tr>
<tr><td rowspan="2">Location</td><td rowspan="2">Road Name(s)</td><td rowspan="2">Road Level (LV, 1, 2, 3)</td><td rowspan="2">Speed Limit</td><td>From RP</td></tr>
<tr><td>To RP</td></tr>
<tr><td>Description of Activity</td><td colspan="4"></td></tr>
<tr><td>Work Programme</td><td colspan="4">Commencement date:
Completion date:
Contract Period:</td></tr>
<tr><td>Proposed/ Restricted Work Hours</td><td colspan="4">Monday to Thursday:
Friday:
Saturday:
Sunday: No work</td></tr>
<tr><td>Traffic Details (Main Route)</td><td>AADT</td><td colspan="3">Peak Hour Flow</td></tr>
</table>

Proposed Traffic Management Method	Active:
	Unattended:
	Night:
Proposed Speed Restrictions	
Positive Traffic Management Measures	
Contingency Plans	
Public Notification	
Personal Safety	

On-Site Monitoring	Attended: Unattended: Overnight: Other times:	
Other Information *(eg. delay calcs, EED issues, temporary speed issues, etc)*		
Layout Diagrams	Attached ☐	
EED Applicable?	Y/N	Attached Y/N
Traffic Controllers	Name (STMS) Cert No:	Phone (24 hours)
	Name (TC) Cert No:	Phone (24 hours)
TMP prepared accurately to represent site conditions and submitted by	Contractor/Applicant Cert No:	Date
Requires Amendment	Engineer Cert No:	Date

This TMP is Approved on the Following Basis

1. To the best of the approving Engineer's judgment this TMP conforms to the requirements of Transit New Zealand's Code of Practice for Temporary Traffic Management.

2. This plan is approved on the basis that the activity, the location and the road environment have been correctly represented by the applicant. Any inaccuracy in the portrayal of this information is the responsibility of the applicant. The STMS for the activity is reminded that it is the STMS's duty to "Postpone, cancel or modify operations due to the adverse traffic, weather or other conditions that affect the safety of this site" (reference A4.5).

Approving Engineer: .....
(Name and Certificate Number)

.....
(Signature)

WAIMAKARIRI
DISTRICT COUNCIL

215 High Street
Private Bag 1005
RANGIORA 7440
New Zealand

Phone: (03) 313 6136
or: (03) 327 6834
Fax: (03) 313 4432

Website: www.waimakariri.govt.nz

APPLICATION FOR TEMPORARY SPEED RESTRICTIONS

Pursuant to Section 23(1) of the Traffic Regulations, a temporary maximum speed limit of **.....** kilometres per hour are hereby fixed for motor vehicles travelling over the length of:

Sought by (Contractor): _____

For (Client): _____

Contract No. (if appropriate): _____

Road Name / State Highway: _____

Situated at: _____

From Route Position: RP _____ / _____

To Route Position: RP _____ / _____

From the Date of: _____

To the Date of: _____

Between the Hours of: _____ am _____ pm

Approval Granted by: Name: _____

Position: _____

Signature: _____

Date: _____

Special Conditions to Apply: _____

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:_____

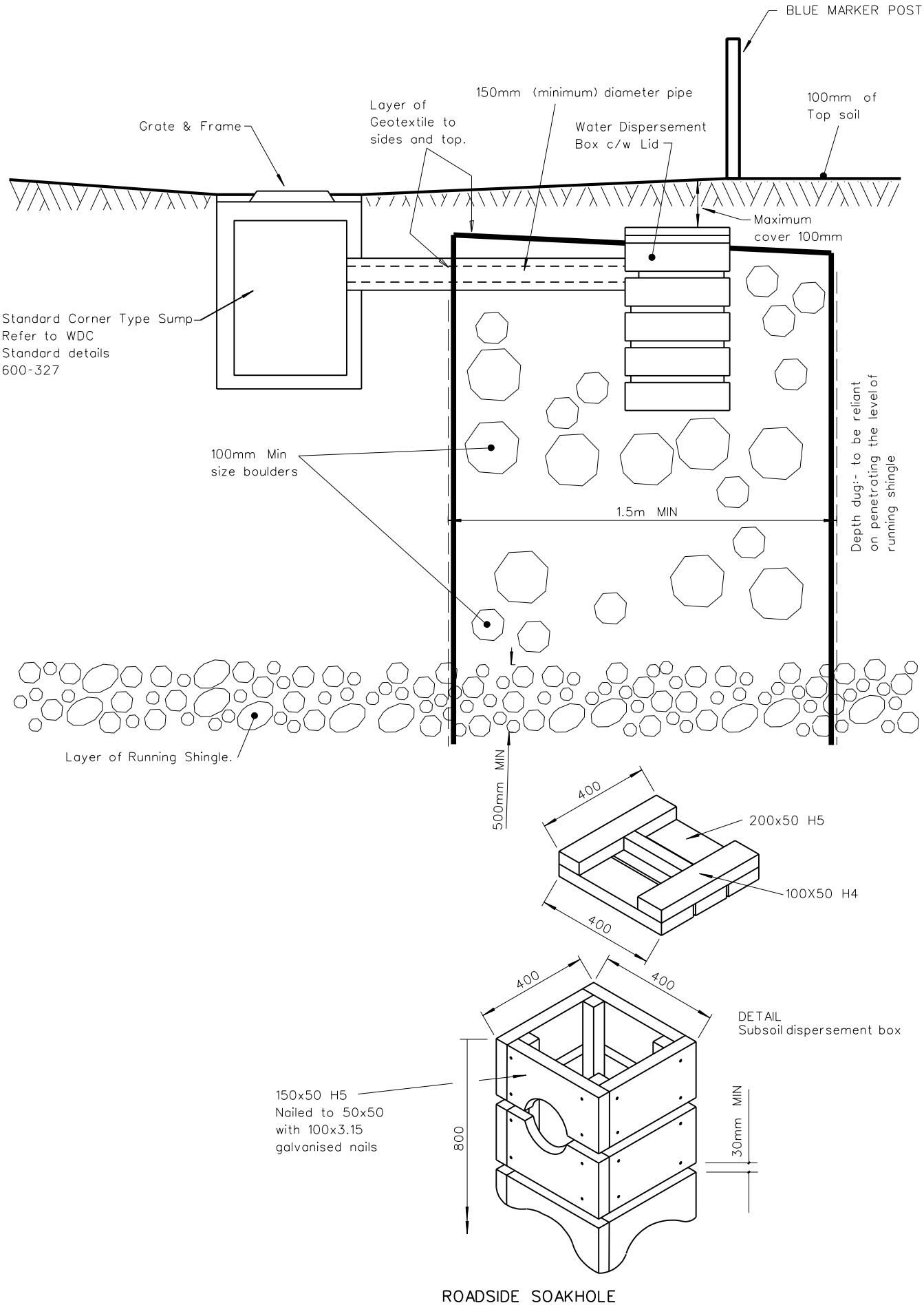
Accepted by the Waimakariri District Council Date:_____ Print Name:_____

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

Notice copied to_____Maintenance Contractor

_____

_____

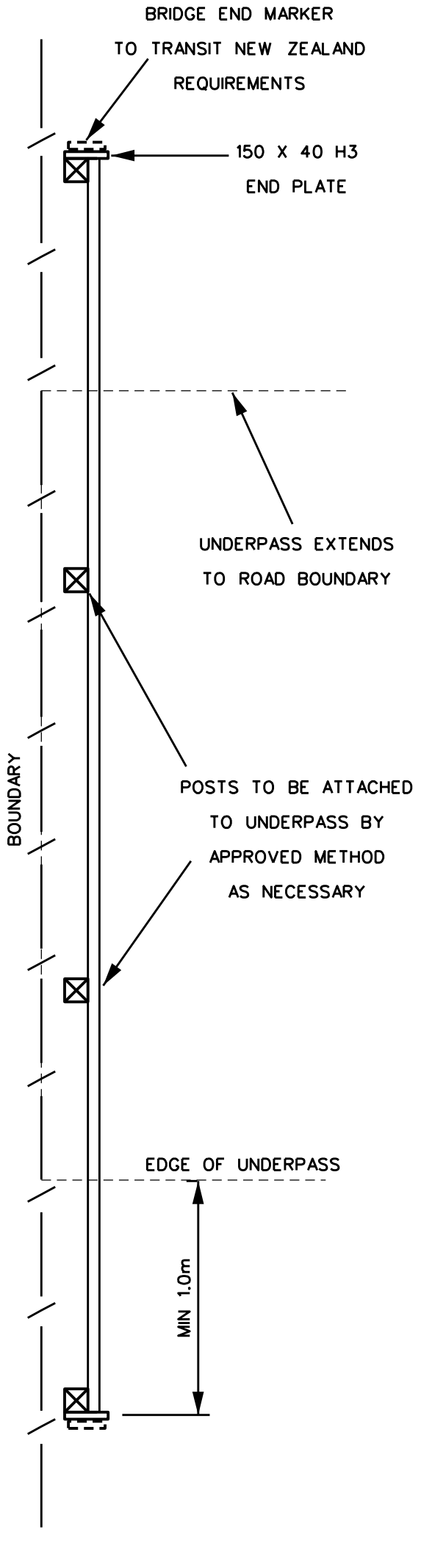


ROADSIDE SOAKHOLE

WAIMAKARIRI DISTRICT COUNCIL
technical services

NOT TO SCALE	SHEET TITLE	PROJECT TITLE	SHEET
	ROADSIDE SOAKHOLE	STANDARD DRAWINGS	390

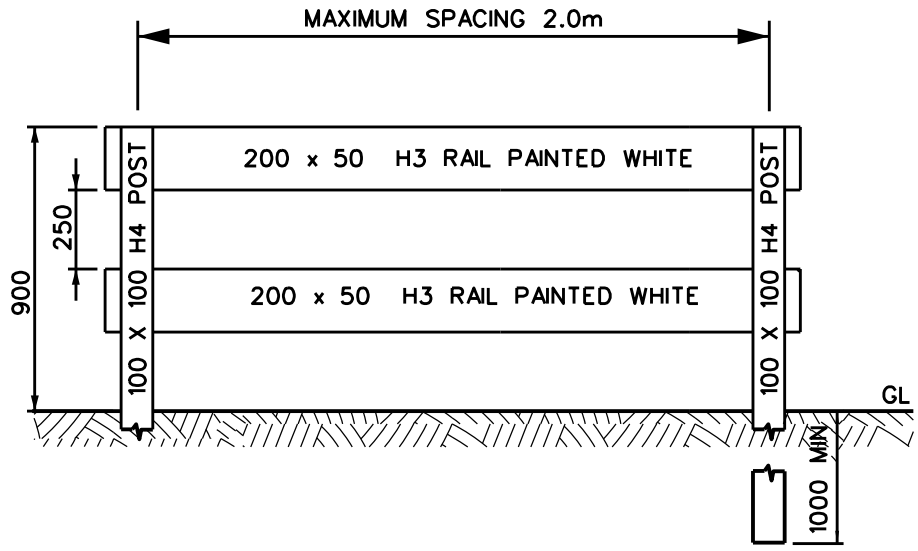
ISSUE	PLAN No.
F	600



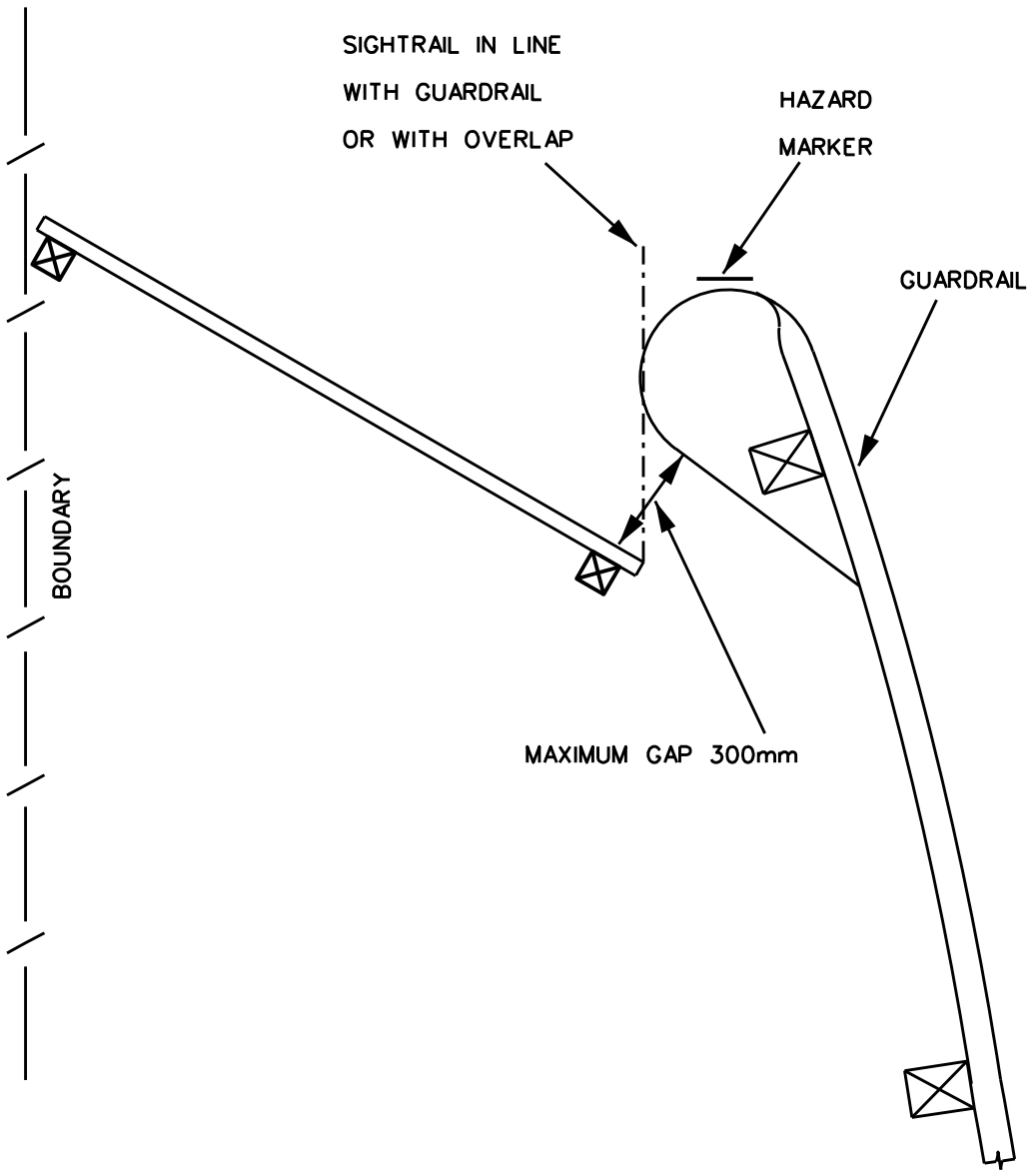
PLAN OF SIGHTRAIL
WHERE GUARDRAIL
IS NOT REQUIRED

NOTES:

- POSTS & RAILS SHALL BE CLEAR GRADE
- ANY CUT ENDS ON POSTS SHALL BE PLACED AT THE TOP AND PAINTED WITH APPROVED PRESERVATIVE
- RAILS MAY BE REMOVABLE TO ALLOW MAINTENANCE ACCESS



SIGHTRAIL ELEVATION

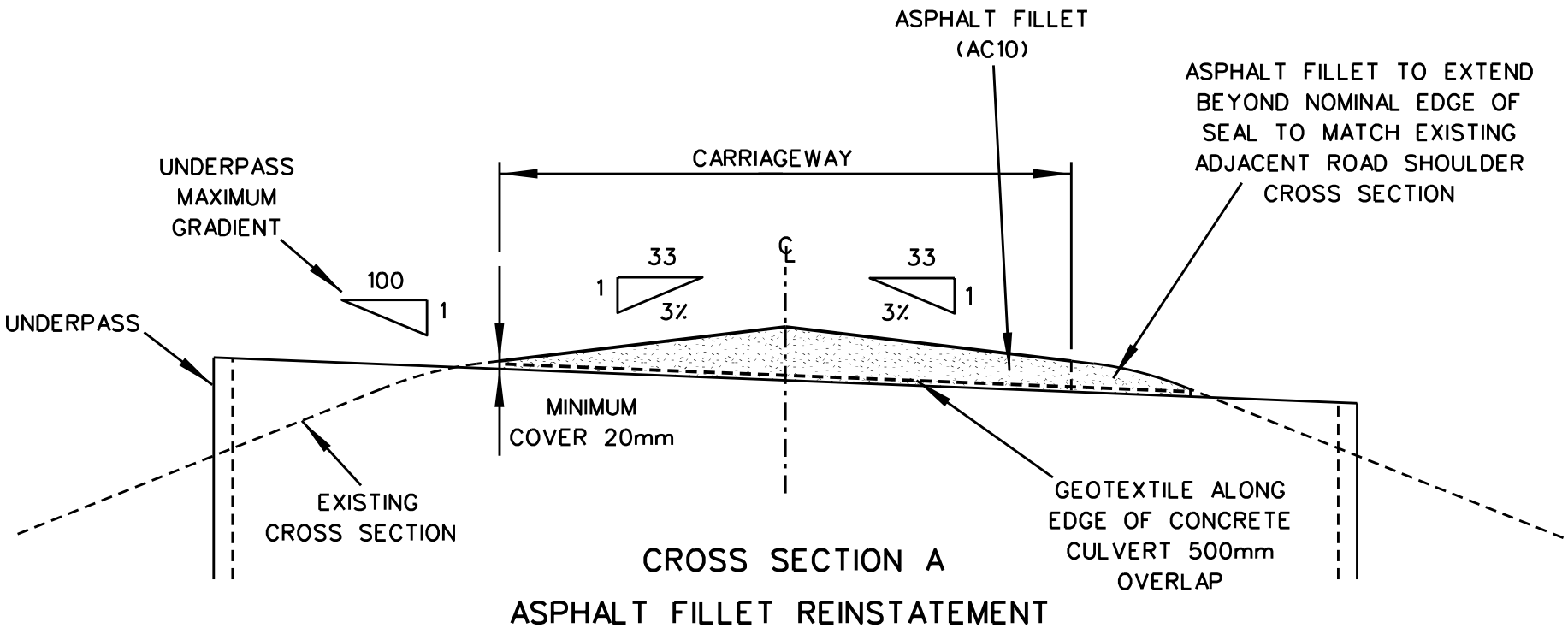


PLAN OF SIGHTRAIL
AT ENDS OF GUARDRAILS

WAIMAKARIRI
DISTRICT COUNCIL
TECHNICAL SERVICES
215 HIGH STREET
PRIVATE BAG 1005
RANGIORA

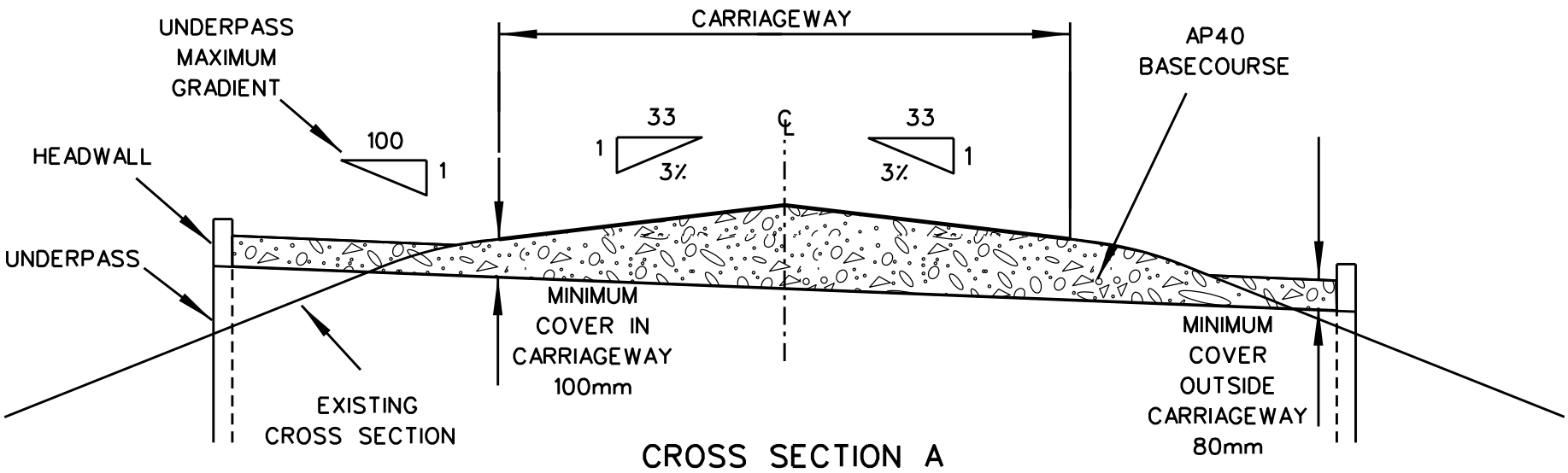
SCALE ~ NTS	SHEET TITLE	PROJECT TITLE	PLAN No.
	Underpass Sightrail Typical Detail	Standard Drawings	1529

ISSUE	SHEET
A	1



CROSS SECTION A

ASPHALT FILLET REINSTATEMENT

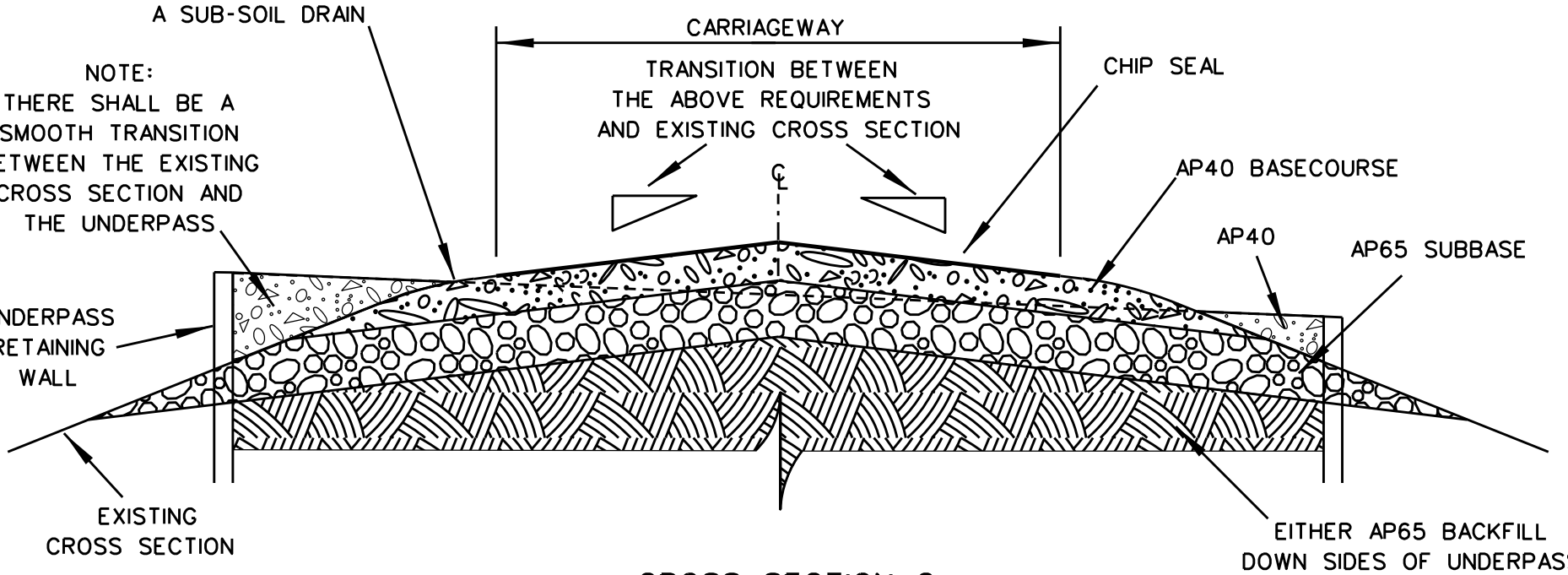


CROSS SECTION A

CHIP SEAL REINSTATEMENT

ENSURE DRAINAGE AT THE EDGE OF SEAL OVER THE UNDERPASS BY SHAPING THE SHOULDER OR IF THIS IS NOT POSSIBLE, BY PROVIDING A SUB-SOIL DRAIN

NOTE:
THERE SHALL BE A SMOOTH TRANSITION BETWEEN THE EXISTING CROSS SECTION AND THE UNDERPASS



CROSS SECTION C

REINSTATEMENT ADJACENT TO UNDERPASS

WAIMAKARIRI DISTRICT COUNCIL
TECHNICAL SERVICES
215 HIGH STREET
PRIVATE BAG 1005
RANGIORA

SCALE 1:NTS (A4)
VERTICAL = 4x HORIZONTAL

SHEET TITLE
Typical Cross section
Stock Underpass
Carriageway
Reinstatement

PROJECT TITLE
Standard Drawings

PLAN No.
1530

ISSUE
A

SHEET
1

SPECIFICATION FOR ROAD SAFETY BARRIER SYSTEMS

1. SCOPE

This specification sets out the approval, performance, design, layout and installation requirements for permanent road safety barrier systems on state highways.

For the purpose of this specification, a road safety barrier system comprises one or a combination of the following components:

- Roadside and/or Median Barriers,
- Bridge Barriers,
- Crash Cushions and/or End Terminals, and
- Barrier Transitions.

2. APPLICATION

This specification applies to the installation of all road safety barrier systems on roads and bridges on the state highway network.

3. APPROVED ROAD SAFETY BARRIER SYSTEMS

Only those road safety barrier systems listed in NZTA M23: Appendix A are approved for use on state highway roads.

Other products that have met NCHRP 350 requirements, may be approved for use on state highways, on application to the New Zealand Transport Agency Traffic and Safety Manager.

Road safety barrier systems used on bridges must conform to the requirements of Transit New Zealand's Bridge Manual.

The approval of NZTA Traffic and Safety Manager is required for a road safety barrier system to be listed in NZTA M23 Appendix A. The primary criterion for the approval of a barrier system is that it must have been successfully crash tested and the results evaluated in accordance with the National Cooperative Highway Research Program Report 350: *Recommended Procedures for the Safety Performance of Highway Features* (NCHRP Report 350). In addition, consideration will also be given to the following:

- **In-service Performance:** In the case of a product with no demonstrable in-service history an in-service trial is required, at the manufacturer/supplier's cost or otherwise agreed with NZTA.

- **Availability of Spares for Maintenance:** The manufacturer/supplier will need to demonstrate that spare parts are available within an agreed timeframe.

If a road safety barrier system has not been crash tested in accordance with NCHRP Report 350, and its use on state highways is likely to be cost effective, then an alternative crash test regime will be considered, providing:

- the testing has been undertaken by a reputable crash test organisation, and
- the results certified as complying with an equivalent NCHRP Report 350 test level.

4. PERFORMANCE

The minimum performance level for road safety barrier systems installed on state highways is NCHRP Report 350 Test Level 3 (TL 3). The performance level of the road safety barrier systems approved for use on state highway roads is given in NZTA M23: Appendix A.

The minimum performance level required for road safety barriers on state highway bridges shall be determined by the method given in Appendix B, Section B3 of Transit New Zealand's Bridge Manual.

5. DESIGN, LAYOUT, INSTALLATION AND MAINTENANCE OF ROAD SAFETY BARRIER SYSTEMS

5.1 Design

The design of all road safety barrier systems shall be compliant with the crash tested design or the barrier system configuration given approval under Section 3: Approval of Road Safety Barrier Systems. Changes to the crash-tested/approved design/configuration will deem the barrier system non-compliant with this specification.

5.2 Layout

The layout of all road safety barrier systems should comply with the relevant guidelines:

(a) **Roadside Safety Barriers**

The layout of all roadside barriers shall be in accordance with the requirements of Section 7.3 of the SHGDM: Longitudinal Road Safety Barriers.

(b) **Median Safety Barriers**

The layout of all median barriers shall be in accordance with the requirements of Section 7.3.12 of the SHGDM: Median Barriers.

(c) **Bridge Barriers**

The layout of all bridge barriers, i.e. the barriers physically on the bridge deck, shall be in accordance with the requirements of the Bridge Manual.
Barriers on the approaches to bridges shall be in accordance with Section 7.3 of the SHGDM: Longitudinal Road Safety Barriers.

5.3 Installation

All road safety barrier systems must be installed in accordance with the manufacturer's instructions.

5.4 Maintenance

All road safety barrier systems must be maintained in accordance with the manufacturer's instructions and should be maintained at a level necessary to preserve its crash worthiness.

NZ TRANSPORT AGENCY
WAKA KOTAHI

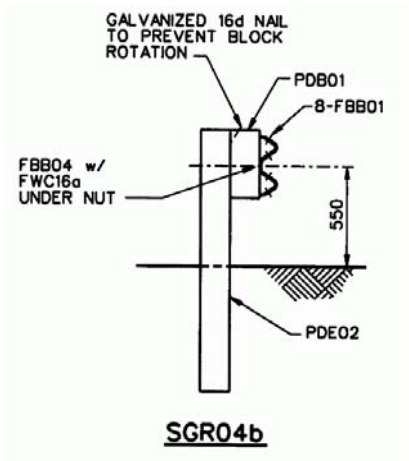
SPECIFICATION FOR ROAD SAFETY BARRIER SYSTEMS

APPENDIX A: APPROVED ROAD SAFETY BARRIER SYSTEMS

1 NON-PROPRIETARY ROAD SAFETY BARRIER SYSTEMS

1.1 Semi-Rigid Roadside and Median Barriers

Semi-rigid barrier systems approved for use on state highways are shown in Figure 1 and 2: Semi-Rigid Roadside Barriers. These systems are described and detailed in the AASHTO-AGC-ARTBA Joint Committee. Subcommittee on New Highway Materials, Task Force 13 Report: *A Guide to Standardized Highway Barrier Hardware – May 1995* (Task Force 13 Report).

Task Force 13 Report Reference	**NCHRP Report 350 Test Level**	**Type**	**Post Spacing (mm)**	**Deflection** (under highest impact severity) **(mm)**
SGR04b (W-Beam)	**TL-3**		**1905**	**800**
Figure 1: Semi-Rigid Roadside Barriers				

(continued on next page)

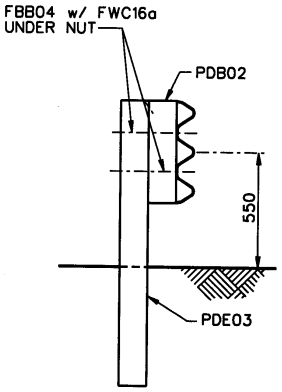
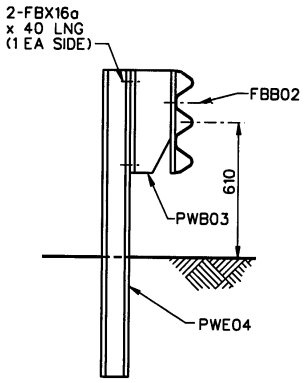
Task Force 13 Report Reference	**NCHRP Report 350 Test Level**	**Type**	**Post Spacing (mm)**	**Deflection** (under highest impact severity) **(mm)**
SGR09c (Thrie-beam)	**TL-3**	 SGR09c	**2000**	**680**
SG09b (Thrie-beam, with modified blockout)	**TL-4**	 SGR09b	**2000**	**600** (2000 kg pick-up) **900** (school bus)

Figure 1 *(continued)*: Semi-Rigid Roadside Barriers

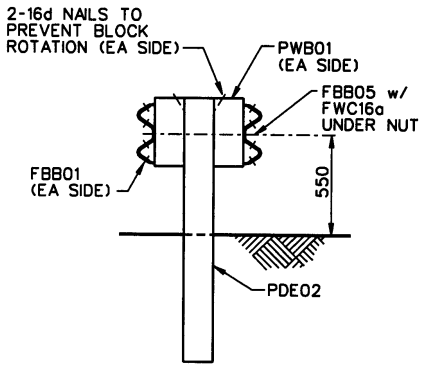
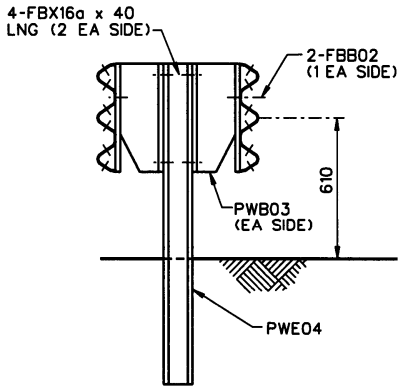
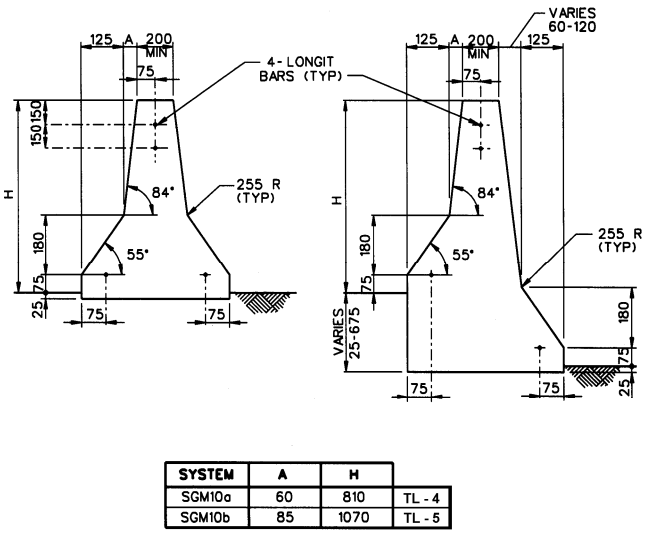
Task Force 13 Report Reference	**NCHRP Report 350 Test Level**	**Type**	**Post Spacing (mm)**	**Deflection** (under highest impact severity) **(mm)**
SGM04b (W-Beam)	**TL-3**	 SGM04b	**1905**	**600 to 1200**
SG09b (Thrie-beam, with modified blockout)	**TL-4**	 SGM09b	**2000**	**300 to 900**

Figure 2: Semi-Rigid Median Barriers

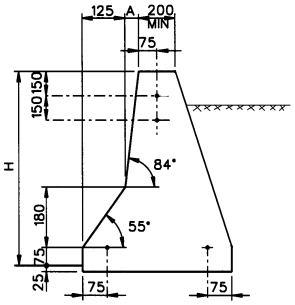
1.2 Rigid Roadside and Median Barriers

(a) F-Shape Concrete Barrier



SYSTEM	A	H	
SGM10a	60	810	TL - 4
SGM10b	85	1070	TL - 5

Task Force 13 Report Reference: SGM10a-b



Median/Roadside Barrier **NOTE: When used as a roadside barrier overall mass and dimensions must not be reduced. For ease of construction roadside barriers may use the optional constant rear slope cross-section.**	**Roadside Barrier** **(Optional Constant Rear Slope Cross-Section)**

Figure 3: F-Shape Concrete Median and Roadside Barriers

The F-shape concrete barrier system is shown in Figure 3 above. It is also described and detailed in the AASHTO-AGC-ARTBA Joint Committee, Subcommittee on New Highway Materials, Task Force 13 Report: *A Guide to Standardized Highway Barrier Hardware – May 1995: System Drawing SGM10a-b.*

For New Zealand state highway use the *"INTENDED USE"* and *"COMPONENTS"* paragraphs on Sheet 2 of SCM10a-b shall be replaced with the following:

"INTENDED USE

The F-shape median barrier is similar to the more common New Jersey shape but the breakpoint is 80mm lower. The barrier has been successfully crash tested according to NCHRP Report 230 and has performed well in the field. Four reinforcement bars are shown but other sizes, numbers and arrangements of reinforcement have been used by state road controlling authorities in the US. The upper longitudinal reinforcement does not provide flexural strength, since it lies on the neutral axis, and it is only intended to prevent large pieces of the barrier breaking off and falling into the traffic lanes in the event of an impact. Additional flexural reinforcement will increase the strength of the barrier in severe impact situations.

A 3m long 250mm deep reinforced anchor footing must be provided at both ends, to properly secure the barrier. Other common methods of supporting the barrier include setting the barrier in a continuous keyed foundation or dowelling the barrier to a foundation.

A top-width of 200mm is usually adequate but some state road controlling authorities in the US have used a top-width of 240mm, to accommodate sign and luminaire supports.

The barrier may be cast-in-place, slip formed or pre cast. Cast-in-place and slip formed barrier will normally be a continuous pour without transverse contraction joints. Cast-in-place segments less than 12m in length must be joined to adjacent sections by at least three 25mm diameter steel dowels, or an equivalent joining method approved by Transit New Zealand.

COMPONENTS

Concrete used in the construction shall comply with the requirements of NZS 3109 and shall be manufactured in accordance with NZS 3104. The minimum concrete cover depth is 40mm. The 28 day compressive strength and concrete binder type shall be in accordance with the durability requirements of NZS 3101 for the relevant exposure classification but in all cases shall be a minimum of 30 MPa.

Reinforcing steel shall be grade 500E or 500N conforming with AS/NZS 4671 and increased from 15 mm to 16 mm."

1.3 Pre cast Concrete Barriers

(a) The minimum length of a pre cast barrier unit for use in a permanent barrier installation shall be 6.0m.

(b) Concrete shall comply with the requirements of NZS 3109 and shall be manufactured in accordance with NZS 3104. The minimum concrete cover depth is 40mm. The 28 day compressive strength and concrete binder type shall be in accordance with the durability requirements of NZS 3101 for the relevant exposure classification but in all cases shall be a minimum of 30 MPa.

Reinforcing steel shall be grade 500E or 500N conforming with AS/NZS 4671.

(c) Pre cast barrier units must be joined by an approved method capable of transferring operational stresses from one unit to another, i.e. steel dowels, tongue and groove locating system, shear key, etc.

(d) Each end unit in a permanent barrier installation must have a 3m long 250mm deep reinforced anchor footing, to properly secure the barrier.

(e) Upper longitudinal reinforcement similar to that used for cast-in-place and slip-formed barriers must be provided, to prevent large pieces of

barrier breaking off and falling into the traffic lanes in the event of an impact. Extra reinforcement will be needed to accommodate:

- the transfer of operational stresses from one unit to another by the joining system, and
- barrier unit handling stresses.

(f) To ensure uniform bearing a sand-cement grout, or another approved method, must be used to bed pre cast units.

2. PROPRIETARY ROADSIDE AND MEDIAN BARRIERS

2.1 Flexible Barrier Systems

Any installation of post spacings not included in the following tables, requires the approval of the NZTA National Traffic and Safety Manager.

(a) Brifen

The following configuration is approved:

(i) The four rope system as specified on the Brifen website (www.brifen.com). The system must comply with drawings LB/01, 04, 07B, 11, 12, 13, 126, 127 and 128, which are available on the Brifen website.

(ii) In addition to the end terminal shown in these drawings, the terminal detail on the FHWA website, reference CC-86 is also permitted.

(iii) NCHRP350 crash tested post spacing and associated deflections are:

Test level	Post Spacing* (m)	Deflection (m)
3	1.0	1.25
3	2.4	1.65
3	3.2	1.8
4	3.2	1.7
***** *Post spacing may be reduced, within the guidelines of the manufacturer/supplier, to allow the system to be installed on curves*		

(b) Safence

(i) NCHRP350 crash tested spacing and associated deflections are:

Test level	Post Spacing* (m)	Deflection (m)
3	2.0	1.9
3	3.0	2.5
4	4.0	2.1
***** *Post spacing may be reduced, within the guidelines of the manufacturer/supplier, to allow the system to be installed on curves*		

(ii) To be used with the Safefence 350 end terminal.

(c) Armorwire

(i) NCHRP350 crash tested spacing and associated deflections are:

Test level	Post Spacing * (m)	Deflection (m)
3	3.0	1.5
4	3.0	1.1
***** *Post spacing may be reduced, within the guidelines of the manufacturer/supplier, to allow the system to be installed on curves*		

(ii) To be used with the Armorwire Terminal End (ATE).

2.2 Semi-Rigid Systems

The following is approved:

(a) NuGuard

The NuGuard system using NuCor posts as shown in the FHWA acceptance letter dated 27 June 2008 (ref HSSD/B-162B, NCHRP350).

Test level	Deflection (m)
4	1.2

3. END TERMINALS, CRASH CUSHIONS AND TRANSITIONS

3.1 Propriety End Terminals

(a) Propriety end terminals approved for use on state highways are listed in Table 1 below.

Terminal	Comments
ET-2000	Use the manufactures installation instructions/checklist. ***NOTE:*** The rail ***must not*** be bolted to the posts at post numbers 1, 3, 5 and 7.
FLEAT 350	Use the manufactures installation instructions/checklist. ***NOTE:*** The rail ***must not*** be bolted to the posts at post numbers 1 and 3.
SKT 350	Use the manufactures installation instructions/checklist. ***NOTE:*** The rail ***must not*** be bolted to post number 1.
X-350	Use the manufactures installation instructions/checklist.
FLEAT MT	Use the manufactures installation instructions/checklist.
Brakemaster & FastBrake	Use the manufactures installation instructions/checklist.

Table 1: Propriety End Terminals

(b) Other End Terminals

(i) Buried-in-Backslope Anchor

The anchorage of the system must be able to develop the full tensile strength of the W-beam.

(ii) Trailing Terminal – AS/NZS 3845:1999, Figure F10

This terminal can only be used where it cannot be hit head-on by vehicles, ie. on one-way roads and median barrier separated divided carriageway roads.

NOTE: Figure F10

- Steel posts can be replaced with wooden posts at a spacing of 1905mm
- The end post may be attached to a soil plate or slotted into a soil foundation tube.

3.3 Propriety Crash Cushions

Propriety crash cushions approved for use on state highways are listed in Table 2 below.

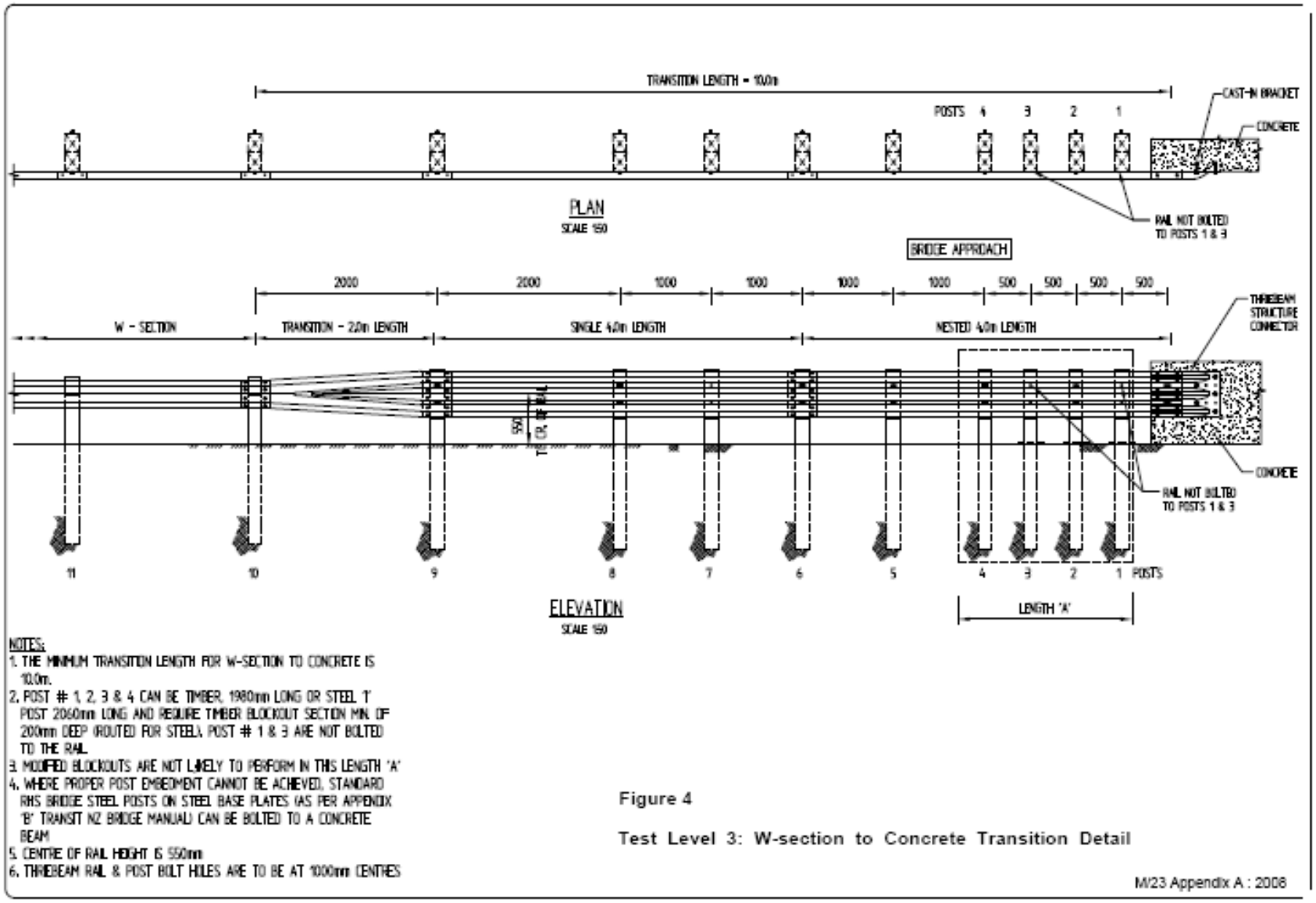
Cushion	Comments
TRACC	Use the manufactures installation instructions/checklist.
TAU II	Use the manufactures installation instructions/checklist.
QuadGuard	Use the manufactures installation instructions/checklist.
CAT 350	Use the manufactures installation instructions/checklist.

Table 2: Propriety Crash Cushions

3.4 Transitions

(a) AS/NZS 3845:1999, Figures F5 and F6
NOTE: the 780mm taper (Detail A) on the base of the F-shape barrier should begin at the end of the recess.

(b) W-section to concrete transition detail using Thriebeam rail: figure 4 below shows the TL3 (wooden post) version and figure 5 below shows the TL4 (steel post) version.

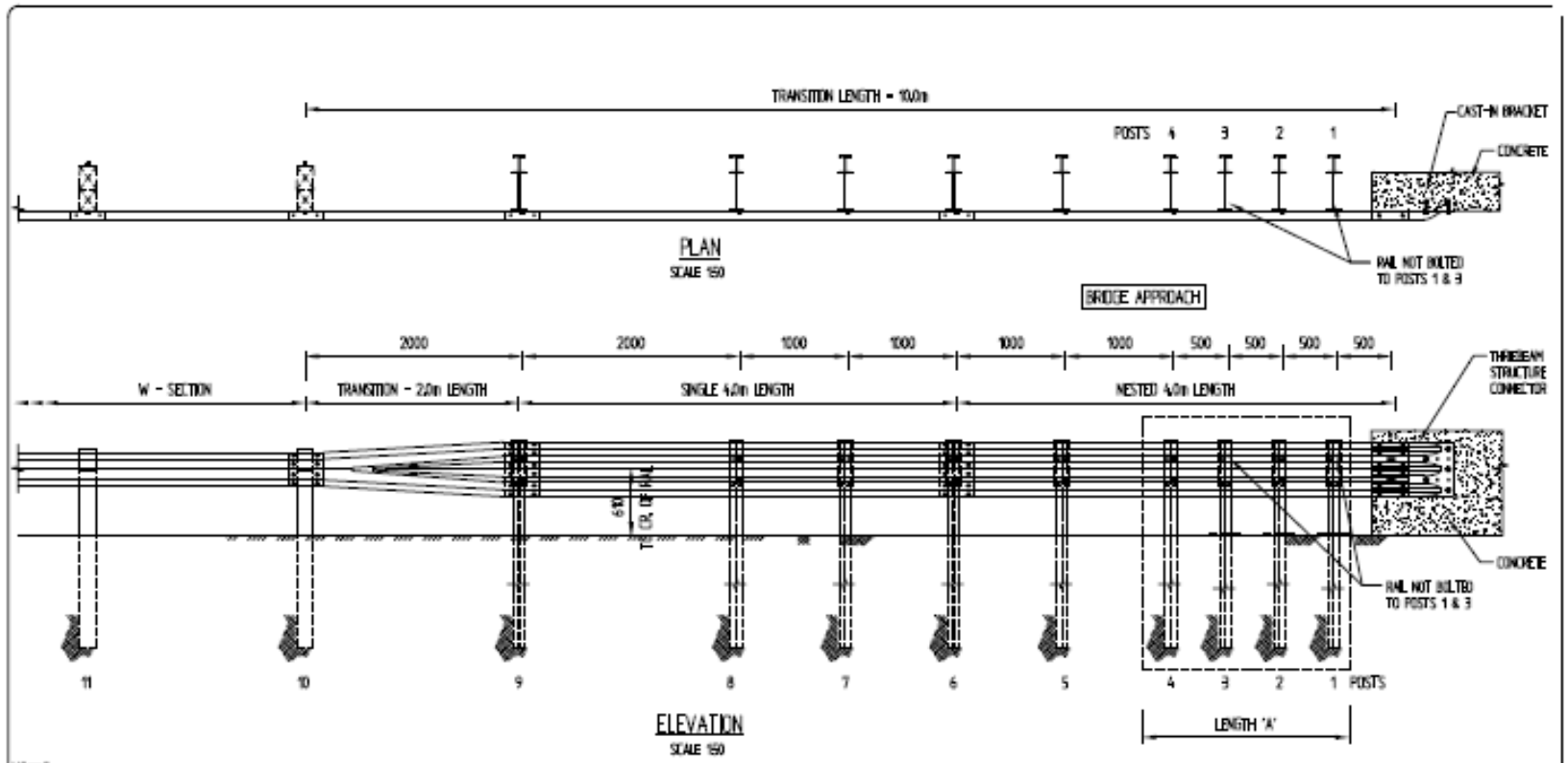


NOTES:
1. THE MINIMUM TRANSITION LENGTH FOR W-SECTION TO CONCRETE IS 10.0m.
2. POST # 1, 2, 3 & 4 CAN BE TIMBER, 1980mm LONG OR STEEL 'I' POST 2060mm LONG AND REQUIRE TIMBER BLOCKOUT SECTION MIN. OF 200mm DEEP (ROUTED FOR STEEL). POST # 1 & 3 ARE NOT BOLTED TO THE RAIL.
3. MODIFIED BLOCKOUTS ARE NOT LIKELY TO PERFORM IN THIS LENGTH 'A'
4. WHERE PROPER POST EMBEDMENT CANNOT BE ACHIEVED, STANDARD RHS BRIDGE STEEL POSTS ON STEEL BASE PLATES (AS PER APPENDIX 'B' TRANSIT NZ BRIDGE MANUAL) CAN BE BOLTED TO A CONCRETE BEAM
5. CENTRE OF RAIL HEIGHT IS 550mm
6. THRIEBEAM RAIL & POST BOLT HOLES ARE TO BE AT 1000mm CENTRES

Figure 4

Test Level 3: W-section to Concrete Transition Detail

M/23 Appendix A : 2008



NOTES:

1. THE MINIMUM TRANSITION LENGTH FOR W-SECTION TO CONCRETE IS 10.0m.
2. POST # 1, 2, 3 & 4 CAN BE TIMBER, 1980mm LONG OR STEEL 'I' POST 2060mm LONG AND REQUIRE TIMBER BLOCKOUT SECTION MIN. OF 200mm DEEP (BOLTED) FOR STEEL. POST # 1 & 3 ARE NOT BOLTED TO THE RAIL.
3. MODIFIED BLOCKOUTS ARE NOT LIKELY TO PERFORM IN THIS LENGTH 'A'
4. WHERE PROPER POST EMBEDMENT CANNOT BE ACHIEVED, STANDARD 'I' BEAM BRIDGE STEEL POSTS ON STEEL BASE PLATES (AS PER APPENDIX 'B' TRANSIT NZ BRIDGE MANUAL) CAN BE BOLTED TO A CONCRETE BEAM
5. CENTRE OF RAIL HEIGHT IS 610
6. THRIEBEAM RAIL & POST BOLT HOLES ARE TO BE AT 1000mm CENTRES

Figure 5

Test Level 4: W-section to Concrete Transition Detail

M/23 Appendix A : 2008

NZ TRANSPORT AGENCY
WAKA KOTAHI

NOTES ON THE SPECIFICATION FOR ROAD SAFETY BARRIER SYSTEMS

1. INTRODUCTION

A road safety barrier is considered to be a hazard and should only be used when the consequences of hitting it are less than the hazard/object which it is shielding. The use of a road safety barrier should only be considered as a last resort following an assessment of whether or not the mitigation of the hazard or object can be achieved through the application of the principles of clear zoning.

A clear zone is a recovery zone in which a driver may regain the control of an errant vehicle. The clear zone must be free from hazards or objects and traversable by a vehicle. Refer to SHGDM, Section 6.6: Clear Zone for more details on clear zone principles and requirements.

2. NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 350 (NCHRP 350)

NCHRP 350 provides standardised procedures for the crash testing and evaluation of both permanent and temporary road safety features, including barriers, sign supports, etc.

The objective of the testing is to determine the manner in which a road safety feature performs during a vehicle crash, for typical site and traffic conditions. There are six test levels, each being defined by impact conditions, i.e. vehicle type, speed, mass, and angle of approach. A summary of the NCHRP 350 test matrix for longitudinal roadside/bridge barriers, and barrier transitions, is given in Table 1 on the next page.

NOTE: While different types of barriers have road safety features that meet a given test level, they generally have different performance characteristics.

Test Level	Test Vehicle	Impact Speed (km/h)	Impact Angle (deg.)
1	700/820 kg car 2000 kg Pick-up	50 50	20 25
2	700/820 kg car 2000 kg Pick-up	50 70	20 25
3	2000 kg Pick-up	100	25
4	2000 kg Pick-up 8000 kg Single unit truck	100 80	25 15
5	2000 kg Pick-up 36,000kg Semi-trailer (Van)	100 80	25 15
6	2000 kg Pick-up 36,000 kg Semi-trailer (Tanker)	100 80	25 15

Table 1: NCHRP Test Matrix Summary

3. SELECTION OF ROAD SAFETY BARRIER SYSTEMS

3.1 Minimum Performance Standard

The minimum performance level for a state highway road safety barrier system is NCHRP 350 Test Level 3 (TL-3). However, in many circumstances, barriers complying with higher test levels will be necessary because factors such as traffic conditions, traffic volume and composition and the cost effectiveness of various safety alternatives must all be considered in the design of road safety barrier systems.

Designers should determine the performance level required for a roadside/median barrier on a case by case basis after due consideration of all factors involved. For example:

(a) The standard roadside protection is a TL-3 barrier but some features, such as a school playground located close to the toe of fill embankment on the outside of a high speed horizontal curve, warrant the provision of a higher performance roadside barrier.

(b) High proportions of heavy and/or dangerous goods vehicles in the traffic stream will usually require TL-4 barriers as a minimum.

(c) Even higher performance barriers, ie. a TL-5 barrier that will contain 36,000 kg truck or a TL-6 barrier that will contain a 36,000 kg tanker, should be used at locations where there are high proportions of heavy

and/or dangerous goods vehicles in the traffic stream, and there would be serious consequences if such a vehicle penetrated, or rolled over, the barrier.

(d) The standard bridge edge protection is a TL-3 barrier but the Transit New Zealand Bridge Manual (Bridge Manual) edge protection criteria will often require the provision of a TL 4 barrier, which will contain an 8,000 kg truck, in most cases.

The Bridge Manual contains a method for determining the appropriate barrier test level for any given situation and it must be complied with when dealing with barriers on bridges. The method is also equally relevant for determining the appropriate test level for roadside and median barriers.

4. TYPES OF ROAD SAFETY BARRIER SYSTEMS

4.1 Roadside and Median Barriers

(a) Flexible Systems

Flexible barrier systems, e.g. wire rope barriers, are generally more forgiving than other types because most of the impact energy is dissipated by deflection of the barrier and lower impact forces are imposed on the vehicle and its occupants.

All wire rope barriers approved for use on state highways have different deflection characteristics for a given NCHRP 350 test level.

(b) Semi-rigid Systems

Semi-rigid barrier systems, e.g. W-Beam and Thrie-Beam barriers, are the most common type of road safety barrier used in New Zealand. This type of system redirects vehicles mainly by the beam action of the relatively strong steel rails transferring impact loads to closely spaced posts, which in turn transfer the loads to the ground.
Semi-rigid barrier systems have much less lateral deflection than flexible systems.
Examples of semi rigid road safety barrier systems available in New Zealand are:

- Strong Post W-Beam - TL-3
- Strong Post Modified Thrie-Beam - TL-4.

(c) Rigid Systems

Rigid barrier systems, e.g. concrete barriers, work by transferring vehicle impact loads directly into the ground, resisting impacts through the inertial resistance of the barrier mass and its sliding resistance across the ground. The face of these barriers is designed to

absorb impact energy by partly lifting the vehicle and controlling the behaviour of the vehicle after impact.

Rigid barriers have no lateral deflection.

4.2 Bridge Barriers

Although road safety barriers on bridges tend to appear similar in design to roadside barriers they are unique in their design.

The design of bridge barriers must comply with the requirements of the Bridge Manual.

Guidelines for the retrofitting of guardrails to existing bridges are in preparation.

4.3 Crash Cushions and End Terminals

The end of a barrier is a point of major concern. A crashworthy end treatment, conforming to NCHRP 350 TL-3, must be provided when the end of a barrier is vulnerable to head-on impacts.

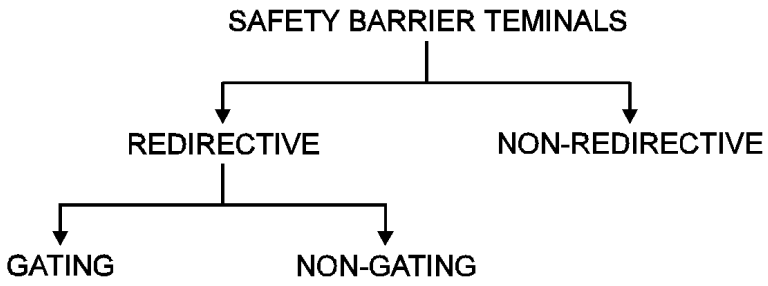
4.4 Transitions

A non-rigid barrier should be gradually stiffened on the approach to a connection with a more rigid object such as a bridge barrier, a retaining wall, an abutment wall, or another structural support. The transition design should result in barrier that will permit an impacting vehicle to be smoothly redirected without pocketing or snagging of the barrier.

5. TERMINALS & CRASH CUSHIONS

5.1 Terminals

The diagram below shows the three terminal behaviour types described in NCHRP 350 and how they are related to each other.



(a) Redirective Gating Terminal

Redirective gating terminals provide:

- controlled penetration of the barrier when a vehicle impacts at, or near, the nose of the device; and
- smooth redirection of a vehicle when it impacts the barrier downstream of the nose section.

Part of the length of a redirective gating terminal is usually able to be included in the length of standard barrier needed to shield a hazard, but this varies from system to system.

(b) **Redirective Non-gating Terminal**

Redirective non-gating terminals will smoothly redirect a vehicle, without pocketing or penetration of the barrier, when a vehicle impacts the barrier:

- at, or near, the nose of the device; or
- downstream of the nose.

Most of the length of a redirective terminal will usually be able to be included in the length of standard barrier needed to shield a hazard.

(c) **Non-redirective Terminal**

Non-redirective terminals absorb an impacting vehicle's kinetic energy when they are hit head-on by an errant vehicle. However, they will not control vehicles that impact at an angle and pocketing, or penetration, of the terminal may result. All non-redirective terminals are gating.

5.2 Crash Cushions

Site conditions will usually dictate the type of crash cushion needed, e.g. fixed objects such as barrier ends which are less than one metre wide should be shielded by a narrow crash cushion. Wide obstacles, e.g. those greater than 5m, are best shielded by sand barrel arrays, custom designed attenuator systems or metal-beam "bullnose" attenuators.

Kerbs and slopes can cause an impacting vehicle to become airborne and reach undesirable roll and pitch angles before impacting the crash cushion. The surface on which a crash cushion is installed should be smooth, flat, and compacted. All of the energy absorbing systems must be placed on a hard, smooth pad or surface (usually concrete) to enable the unit to be compressed uniformly during an impact. In the case of inertial crash cushions, a paved surface provides uniform support for the sand barrels and, perhaps more importantly, provides a surface on which the pattern of the array and the required masses of the modules can be permanently marked for maintenance purposes.

If a crash cushion is installed on a structure, the location of expansion joints may dictate the type of device to use, or require some modifications to the standard design, e.g. non-anchored units such as sand barrels, may be susceptible to vibration-induced movement.

Climatic conditions in a particular area should also be considered because some crash cushions are affected by above or below average temperatures and may also be more susceptible to inadvertent damage caused by operations such as snow removal.

5.3 Aesthetic and Environmental Considerations

While aesthetics are a consideration, they are not normally controlling factors in the selection of a side protection barrier, except in the environmentally sensitive locations such as recreational areas or parks. In such cases, it is important that the systems used be crashworthy as well as visually acceptable to the road controlling authority.

It is also important to consider environmental factors in the selection process. For example:

- Barriers with considerable frontage area may contribute to a build up of drifting sand or snow in some areas.
- Metal railing barriers may deteriorate rapidly in highly corrosive urban/industrial environments.

In some cases, solid barriers may restrict sight distances of drivers entering from a side road or intersection, or may block a driver's view of a particularly scenic panorama.

6. ROADSIDE BARRIER SYSTEM MAINTENANCE

The future maintenance costs of alternate systems should be considered in the barrier selection process. Normally, the initial cost of a system increases as its strength increases, but maintenance costs decrease. Conversely, a system having a relatively low installation cost usually requires significantly more maintenance following impacts. Maintenance factors can be grouped into three categories:

6.1 Routine maintenance

Routine maintenance costs are similar for all operational roadside barrier systems. Some cleaning and painting is occasionally done, but the use of preservative-treated wood posts and galvanized steel components has nearly eliminated the need for this work. Periodic re-tensioning of cable barrier systems may be required. Graffiti on concrete barriers can present an ongoing maintenance cost. Some systems may interfere more with roadside mowing and vegetation control.

6.2 Collision maintenance

The amount and cost of repairs after an impact by a vehicle can play an important role in the system selection. The number of impacts that are likely to occur along a particular section of barrier depends on a number of factors, primarily traffic speed and volume, road alignment and the distance between the edge of the traffic lane and the face of the barrier. The extent of barrier damage for any specific impact depends upon the strength of the system.

Collision maintenance costs may become an overriding consideration in areas where traffic volumes are extremely high, and barrier impacts are frequent, such as on urban expressways and motorways where barrier repair is difficult to accomplish without interfering with road users. For this reason, rigid concrete barriers (e.g. "F-type" profile), are often preferred at such locations, particularly in median applications.

A further consideration in collision maintenance for post and rail systems is the ability of the rail element and possibly the posts to be re-used after a hit. Savings may be possible if the rail can be straightened. In some cases, of course, the rail will be damaged beyond repair, in which case the salvage/scrap value may be a consideration.

6.3 Material and Storage Requirements

Before selecting a barrier system, the future availability of the repair materials and their storage requirements should be considered. The need for stocking spare parts increases as the number of parts required increases. Thus, there are obvious advantages of using only a few barrier systems whose component parts are standardized, easy to stockpile and readily available.

7. KEY REFERENCE DOCUMENTS

New Zealand Transport Agency	**State Highway Geometric Design Manual** (SHGDM) **Bridge Manual**
Joint Australian/New Zealand Standard	**AS/NZS 3845: 1999 - Road Safety Barrier Systems**
National Cooperative Highway Research Program (NCHRP)	**NCHRP Report 350: Recommended Procedures for the Safety Performance Evaluation of Highway Features**
American Association of State Highway and Transportation Officials (AASHTO)	**Roadside Design Guide** (AASHTO RDG) The recommended comprehensive reference for the design and installation of road safety

	barrier systems on New Zealand state highways.