SM012 State Highway Controls and Operations Manual
Part 3 - Consolidated Bridges and Structures Sections

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1.0 Bridge Construction and Maintenance Standards

1.1 Introduction

Bridges impose inflexible and durable constraints on State highways. Each bridge is unique. A consequence of this uniqueness is that there are no NZTA standard specifications developed for bridge construction and maintenance.

1.2 Bridge Construction

Construction of State highway bridges shall comply with the versions of the following specifications that were current at the time of contract:

1. The NZTA Bridge Manual, the NZTA Highway Structures Design Guide and, where applicable, project-specific engineering specifications.
2. Named Standards New Zealand (SNZ) specifications, joint Standards Australia/Standards New Zealand (SA/SNZ) specifications or recognised international standards.
3. The Austroads "Guide to Bridge Technology, Part 8: Hydraulic Design of Waterway Structures".

1.3 Bridge Maintenance

Bridge maintenance shall be in accordance with the following:

1. S6 Bridge Inspection Policy, NZTA.
2. Bridge Inspection and Maintenance, NZTA.
3. Bridge Overweight Rating and Position Weight Limits Assessment, NZTA.

1.4 Responsibility

System Managers are responsible for inspection and maintenance of all bridges on State highways. This includes delegated State highways where maintenance and/or construction are carried out by a TLA.

1.5 Painting of Bridges

Bridges are only to be painted, surface coated, or texturised if:

A. The coating is necessary for protection purposes; or
B. The coating has been approved as part of the design; or
C. The Lead Advisor Structures' approval has been obtained.

1.6 Railway Bridges

The NZTA has a formal agreements with KiwiRail covering the use and maintenance requirements of joint road/rail bridges and especially such bridges that use the same bridge width as the rail uses for carriageway on State highways. Details of those requirements should be obtained from KiwiRail (note section 83(4) of the Railways Act 2005).

KiwiRail will inspect combined road-rail bridges for railways purposes to identify joint maintenance requirements, but how this is managed still needs to be agreed.

2.0 Bridge and Culvert Design Details

2.1 Introduction

This section gives guidelines for the design of new or replacement bridges, and culverts.

2.2 New and Replacement Bridges and Culverts

The design and strengthening of all bridges, including major culverts as defined in the proceeding referenced standards, shall comply with the NZTA Bridge Manual and the NZTA Highway Structures Design Guide, with reference to the *Austroads Guide to Bridge Technology.*

3.0 Highway Structures Inventory Management System (HSIM)

3.1 Introduction

An electronic inventory system containing descriptions of the functions, materials and operating characteristics is maintained for all bridging structures on State highways.

3.2 Structures Included

The following structures shall be included:

(a) All structures having an opening of 3.4 m^2 or more that passes partly or completely under the road.
(b) All structures passing over State highways carrying road, rail, pedestrians or services.
(c) Other structures if appropriate.

3.3 Description of Inventory

The current inventory system possesses the following features:

A. The system is computer based and records names, dimensions and descriptions of each structure.
B. Each structure is uniquely identified by name of highway and route position, and the Bridge Structure Number (BSN).
C. Data for each structure is divided into four sections:
    - General
    - Structure and Materials
    - Geometrics and Safety
    - Live Load Capacity
D. The data can be integrated and reports in varying formats prepared.
E. Hard copy A4 printouts of each structure's data and descriptive codes are held by Contract Managers and Network Contractors.
F. The descriptive inventory is not linked with the overweight permit system.

3.4 Updating Procedure

The following updating guidelines should be followed:

(a) System Managers will be responsible for ensuring the bridging inventory is updated.
(b) Amendments or deletions are to be clearly marked on the relevant current printout for the bridge obtained from the bridge descriptive inventory (BDI).
(c) New bridge data is to be entered on a blank standard printout form included with the BDI Administration and User Guideline, which is available from the BDI System Administrator at the Wellington office.
(d) Standard bridge inventory forms should be used. Refer to *Bridge Inspection and Maintenance Manual* Appendix 5.5.

Changes to the inventory shall be forwarded to the Principal Engineer Structures at Wellington office for inclusion in the computer-based inventory

4.0 Bridge Restrictions for Legal Loads and Overweight Policy

4.1 Overview and Purpose

Bridges are a vital component of the State highway network. Unlike carriageways in general, bridges can be subject to sudden catastrophic failure if overloaded. This section deals with policy and procedures required to restrict loads on bridges not capable of safely carrying normal highway loadings.

Restrictions must be applied where the legal maximum weight and/or speed limits allowed by the Heavy Motor Vehicle (HMV) Regulations 1974 would exceed the structural capacity of the bridge leading to premature structural deterioration or failure.

4.2 Methods for Applying Restrictions

There are two methods of applying load restrictions:

1. Restrictions applied under the HMV Regulations.
2. Restrictions by NZTA Bylaw.

4.3 Responsibility

The Chief Engineer, or the Lead Advisor Structures, is responsible for the rating, fixing of any weight limit and posting of restrictions for all State highway bridges (including railway overbridges) except combined road-rail bridges for which the responsibility is retained by KiwiRail.

4.4 KiwiRail Controlled Bridges

The list of KiwiRail combined road-rail bridges is given in the table below:

Table 1: Combined Road/Rail Bridges

State Highway	Route Position	Name
2	243/10.82	Pekatahi
6	282/13.80	Inangahua
6	463/0.00	Arahura

4.5 Overweight Permits

Special permits can be issued for specific loadings in excess of the HMV regulations and/or in excess of any legal bridge restriction. Such permits usually impose special conditions so as to limit stresses on critical bridge members.

Examples of possible conditions are:

1. Limit vehicle speed to reduce impact stresses.
2. Position the load on the bridge so as to minimise live load stresses.

The procedures to be followed for issuing overweight permits are specified in Overweight Permit Manual, NZTA.

4.6 Over-dimensional Loads on State highways

Permits for overdimension loads are issued by the Agency's Over-dimension Permit Issuing Agency (OPIA), who may be contacted at OPIA@nzta.govt.nz. Application for a permit can be made on the form that can be downloaded from:

https://www.nzta.govt.nz/assets/Commercial-Driving/Application-for-an-overdimension-permit.pdf.

For motorways, comment must be given by the System Manager.

Broad guidelines for over-dimension permit issuing are contained in Section 1 of the Overweight Permit Manual, NZTA.

5.0 Heavy Motor Vehicle Regulation Restrictions

5.1 Introduction

The HMV Regulations 1974 specify a legal procedure to be followed to restrict a load on a bridge. This is the preferred method of restricting loads on bridges and the alternative method using NZTA Bylaw restrictions should only be used in exceptional cases (see section 7.0 below, *NZTA Bylaw Restrictions for Bridges*).

5.2 Engineer's Certification

Weight and speed limits applied under the provisions of the HMV Regulations require a certificate from an engineer (who is a Chartered Professional Engineer). The certificate shall state that, as a result of a detailed inspection and analysis of the bridge, the engineer is of the opinion that if either of the following conditions pertains, then the loads would so over-strain the bridge as to be likely to cause its ultimate failure.

(a) The use of the bridge by vehicles exceeding in weight the proposed weight limits; or
(b) The use of the bridge by vehicles travelling at a speed exceeding the proposed speed limit.

5.3 Certificate Advice to Chief Executive

The National Manager Portfolio and Standards has delegated authority to impose restrictions, but the Group General Manager and Chief Executive must be advised of the proposed restriction prior to the posting action being taken.

A copy of all weight and speed restriction certificates shall be forwarded to the Chief Executive for reporting to the Board. The certificate must state the actual limits that are posted.

A new certificate must be issued if the limits are changed.

A new certificate is not required if a restriction is imposed without change.

5.4 Legal Requirements

For a bridge restriction applied under the HMV Regulations to become effective it must be:

(a) Published in a newspaper circulating in the district in which the bridge is situated; and
(b) Indicated on signs erected and maintained near each end of the bridge.

5.5 Newspaper Publication

Newspaper publication must be in the format and using the headings given from Form D in the First Schedule of the Regulations. The weight restrictions must be in the same terms as required for the signs. Three newspaper columns should be requested for the notice. The notice shall be issued in the name of the National Manager Portfolio and Standards.

5.6 Bridge Signs

Signs required to be erected at each end of a restricted bridge shall be R5-9 signs as defined in the *Land Transport Rule Traffic Control Devices 2004*. Refer to Schedule 1 of the Traffic Control Devices Rule for sign sizes and the format to be used for the panels.

5.7 Posting Advice

One full page of the newspaper showing the notification shall be forwarded to the Senior Manager Safer Commercial Transport within seven days of the publication together with advice that an Engineer's Certificate has been obtained.

One full page showing the notification shall also be forwarded to the Chief Executive NZTA by minute on a copy of the advice to the Police Commissioner.

6.0 Ongoing Requirements for Restrictions

6.1 Introduction

Existing bridge restrictions may need changing or removal as situations change.

Bridge restrictions imposed under the HMV Regulations are only valid for a period of 12 months and must be reimposed annually if they are to serve for a longer period.

6.2 Changing or Re-imposing a Restriction

The procedure is exactly the same as for the original restriction.

6.3 Standardised Removal Date

NZTA requires that all State highway bridge restrictions be revised and renewed by 1 October each year. A schedule of renewed bridge restrictions shall be forwarded to the National Manager Programme and Standards by 30 June each year for reporting to the Chief Executive. All bridge restrictions shall be reimposed by the beginning of October even though they may have been in operation for only a few months.

6.4 Removal of Restrictions

Restrictions that are no longer required for whatever reason shall be removed by taking both of the following two actions:

(a) Publishing notification of the removal in some newspaper circulating in the district in which the bridge is situated; and
(b) Removing the signs at the bridge.

Existing restrictions may be removed at any time. See the HMV Regulations s11(10) for explanation of the requirements.

One full page of the newspaper notice shall be forwarded to the Senior Manager Safer Commercial Transport and the National Manager Programme and Standards as required for the imposition of restrictions.

7.0 NZTA Bylaw Restrictions for Bridges

7.1 When to Use

A bylaw under section 61(3) of the Government Roading Powers Act 1989 (reference section 22AB sub-section (1)(zh) Land Transport Act 1998) can be used where the HMV Regulation procedure causes undue restriction to certain types of axle configurations.

7.2 Justification

Information as to the form of weight restrictions proposed and the benefit to be gained in comparison to the HMV Regulation procedure is to be supplied to the General Manager Transport Services to seek approval to proceed.

7.3 Bylaw Procedures

The power to make such a bylaw has been delegated to the General Manager Transport Services.

The consultation processes set out in section 22AD of the Land Transport Act 1998 shall be followed in order for the bylaw to be made.

Once a bylaw is approved and gazetted, appropriate signs must be erected and maintained near each end of the bridge.

The bylaw shall be published in a newspaper circulating in the district in which the bridge is situated.

7.4 Expiry Date

Bridge restrictions applied by means of a bylaw do not need to be reimposed each year. They must however be reassessed each year prior to 1 October and the assessment of ongoing need advised to the National Manager Portfolio and Standards.

7.5 Revocation of Bylaw

Any bylaw made for the purpose of applying weight restrictions that no longer apply must be formally revoked using the same process under which the bylaw was established. The bylaw will not be properly revoked until the revocation notice has been gazetted and the 28-day objection period has been completed.

8.0 Building Act Application to Bridges and Structures

8.1 Introduction

NZTA is required to comply with the provisions of the Building Act 2004 and the Building regulations 1992.

The Act controls the construction, alteration and demolition of 'buildings' and includes requirements for the management of some 'buildings' once constructed.

NZTA is an "owner" under the Act and a number of roading structures are defined as "buildings", for example bridges, tunnels, culverts, retaining walls greater than 1.5 metres high or with a surcharge.

8.2 Application

The Act applies to demolition, alteration, design, construction, installation and for some buildings, to ongoing inspection and maintenance procedures. Where required, these procedures are specified in "compliance schedules" for the building concerned.

The Act does not affect:

- planning matters which are controlled by resource management legislation;
- people's activities within buildings;
- requirements that certain tasks may be undertaken by people who have certain qualifications.

8.3 Exemptions

Exemptions from the Act include

- scaffolding and falsework in construction
- dangerous goods containers and explosives magazines
- standalone machinery systems, cableways

8.4 Compliance with Building Code

All building work must comply with the Building Code. The Building Code is performance based. It lays down the functional requirements for a building and sets out the performance criteria with which buildings must comply.

Territorial local authorities have power to waive or modify most provisions of the Building Code. Territorial authorities' decisions under the Act can be referred to the Building Industry Authority (BIA) for determination. Every waiver or modification of the Building Code needs to be notified to the BIA.

Building consent means consent to carry out building work. It is granted by a territorial local authority.

9.0 Use of Bailey Bridging

9.1 Introduction

NZTA's Bailey bridge stocks are administered by the Transport Services Group. Those stocks are available on a hire basis for the use of road controlling authorities including government agencies and private sector users.

9.2 Responsibility

Within Transport Services, the Principal Structures Engineer manages the stocks and is the person to whom inquiries should be addressed concerning potential hires. In the absence of the Principal Structures Engineer, inquiries should be referred to the Lead Advisor Structures at the NZTA Auckland Office, or Opus International Consultants in Christchurch.

9.3 Bailey Bridge Service Provided

NZTA's Bailey bridges are provided through two contractors, one in each of the North and South Islands. Those contractors provide a full Bailey bridge service which includes transportation to and from the site, superstructure design and erection, in-service inspection and maintenance, and dismantling when the hire terminates. The contracts do not include the determination of the bridge location, alignment, span arrangements or the design and construction of foundations, substructures or road approaches. Those matters are the responsibility of hirers.

In emergency situations after hours only, inquiries can be directed to the following:

- **In the first instance – call the Bailey Bridge Project Manager on 021 243 0192.**

Then:

- **in the North Island ¾ contact John Patten of Downer EDI Works Ltd Hastings, A/H (06) 835-5789 or 027-447-0221, and**
- **in the South Island ¾ contact Downer EDI Works Ltd Christchurch, A/H (03) 359-0710 or 027-273-6870.**

9.4 Costs

The costs of the service provided in 9.3 are in three components as follows:

- the hire of components which will be on a tonnage basis for the period that the Bailey bridge is available for traffic. Included in the hire charge are on-site inspections and routine maintenance of the structure. Hirers will be billed three monthly in advance unless otherwise agreed;
- transportation of components to site, design and erection. These costs will be separately invoiced when the bridge is erected and in service; and
- dismantling and return transportation of components. These costs will be separately invoiced at the end of the hire.

The Principal Structures Engineer will provide the hire charges to prospective hirers on request and an assessment given of the erection and dismantling costs. The Bailey bridge services contractor will provide a detailed estimate of the erection and dismantling costs when the hire proceeds.

9.5 Agreement

Hirers will be required to sign a standard *Bailey Bridge Hire Agreement* with NZTA with the exception of hires for works on State highways where hirers are expected to adhere to the general intent of that standard hire agreement. The current version of the standard agreement may be obtained by contacting structures@nzta.govt.nz.

10.0 Swing Fences Attached to State Highway Bridges

10.1 Introduction

Attaching swing fences to a bridge creates the potential for the bridge to sustain damage in a flood or storm.

A swing fence may be attached to a State highway bridge only if NZTA has given approval.

10.2 NZTA's Powers

Section 51(2) of the GRP Act empowers NZTA to require the removal of a swing fence which has been attached to a State highway bridge without approval.

Section 51(5) of the GRP Act empowers NZTA to give approval subject to condition.

10.3 Obtaining Approval

Any person wishing to attach a swing fence to a State highway bridge should make application to the appropriate NZTA regional office.

The applicant must produce written evidence, from a suitably qualified engineer, that neither the fence nor the method of attachment is likely to increase the risk of the bridge or any of its component parts being damaged by flood or storm.

10.4 Unauthorised Swing Fences

The owner of any swing fence which has not been approved by NZTA is required to apply for approval or to remove the fence.

10.5 Removal of Swing Fences

The procedure to be followed when removing or requiring the removal of a swing fence is:

1.	The land owner is advised - either verbally or in writing - that the fence poses a risk to the bridge.
2.	Where appropriate, the land owner is advised of the right to make application for approval of the fence.
3.	If approval is unlikely to be granted or is not sought, the land owner is given a date - one month from the date of written advice - by which the fence is to be removed.
4.	The land owner is informed that s353 of the LGA and s5(1) of the Animal Law Reform Act 1989 require that land owners fence their land and that they are liable if they negligently allow stock to wander on to a road.

5.	The land owner is to be informed that failure to comply with the removal order may result in NZTA laying a complaint or information under s51(4) of the GRP Act and the fence may be removed at the land user's expense.

10.6 Formal Notification

The suggested format for formal notification requiring removal of a swing fence is given in section 11.0 below.

11.0 Notification on Requiring Removal of a Swing Fence Attached to a State Highway Bridge

11.1 In this Section

This section contains the suggested format and wording for the letter to be sent to a landowner required to remove a swing fence from a State highway bridge.

11.2 Notification of the Requirement to Remove a Swing Fence Attached to a State Highway Bridge

Name of Land Owner

Address of Land Owner

Dear *Mr/ Mrs/ Ms/ Miss .....*

State Highway No. *<Number>* : Swing Fence Attached to *<Name of Bridge>*

A swing fence has been attached to ..... Bridge on State Highway No ..... at *Route Position or location.* The fence appears to be an extension of your boundary fence and therefore your responsibility. If this is not the case please contact me *contact details*.

The swing fence has been erected without the approval of the road controlling authority, the New Zealand Transport Agency (NZTA), thereby contravening Section 51 (2) of the Government Roading Powers Act (GRP Act) 1989.

In a storm or flood the swing fence will drag water and trap debris, thereby creating the potential for damage to the bridge. You are, therefore, required to remove the swing fence from the bridge by *one month from the date of the letter to be specified.* Failure to comply with this requirement may result in:

NZTA laying an information or complaint against you under Section 54 (4) of the GRP Act - This could result in the Courts imposing a fine on you, as well as a financial penalty for each day you continue to offend - and;

NZTA removing the fence and claiming the cost of doing so from you under Section 51 (3) of the GRP Act.

Insert where appropriate:

Should you wish to apply for approval to retain the swing fence; you will be required to provide a written report from a suitably qualified engineer stating that the neither the fence nor its method of attachment is likely to increase the risk of the bridge or any of its components being damaged in a storm or flood.

If you wish to apply for approval to retain the fence please contact me immediately to discuss the procedure.

Under Section 353 of the Local Government Act 1974, landowners who graze stock are required to fence their land to prevent the stock from wandering on to a road. Further, Section 5 (1) of the Animal Law Reform Act 1989 requires that land containing stock be fenced and holds the land owner liable if the stock wanders on to a road due to negligence of the land owner. These provisions also apply to State highways.

Your co-operation in either removing the swing fence, or having its retention approved before ..... *(date specified for removal)* is sought.

If you have any enquiries, please contact me.

Yours sincerely

(*If not written by NZTA; specify authority e.g. Network Consultant, Wairarapa)*