

# 17 Barrier Repairs

## 17.1 Scope

This Section sets out the requirements for repairing the following:

- a) **road safety barriers**, meeting the specification requirements of TNZ M/23, of various types and materials and includes that part of the **barrier** covering the Length of Need (**LON**), (as defined in the State Highway Geometric Design Manual (**SHGDM**)), and the end terminals, and
- b) **barriers**, handrails and rails for the containment of pedestrians and cyclists.

The work required by this Section does not include:

- a) repairing timber sight rails.

## 17.2 Definitions

Terms defined in Table 3.2, Definitions appear in **bold**.

## 17.3 Cyclic Inspections

All equipment failures due to crash **damage** or vandalism shall be identified, made safe and reported as specified in Section 9.

The Contractor shall inspect all **barriers** within the Contract area at least at the frequency listed in Table 17.1 and shall repair **barriers** within the response times listed in sections 17.4.1 and 17.4.2.

Class	Inspection Frequency
M	Daily
U and R1	Every 2 Days
R2	Every 3 Days
R3	Weekly
R4	Weekly

The purpose of cyclic inspections is to identify any **damaged barriers** or **barrier** systems. Any **damage** identified must be reported to the Engineer.

## 17.4 Response Times

### 17.4.1. Temporary Repairs

All temporary repairs must be completed within 24 hours of **notification**.

### 17.4.2. Permanent Repairs

The Contractor shall submit a priced repair proposal to the Engineer, and install all replacement materials and components within the response times listed in table 17.2 and in accordance with the

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manufacturers instructions and/or specifications (where these are available), and best industry practice.

Activity	Response Time
Submit priced proposal for Repair of <b>Damage</b> to <b>Barrier</b>	Within 3 days from <b>notification</b>
Completion of <b>Barrier</b> Repair	Within 2 weeks of Engineer's Approval

### 17.5 Specific Requirements

#### 17.5.1. Stockholding and Barrier Inventory

The Contractor shall provide updates to the **inventory** of all **barriers** in the contract area and make this available to the Engineer when requested. The Engineer shall provide the Contractor with the necessary information to initiate the **barrier inventory** within one month of the commencement of the Contract.

Updates to the **barrier inventory** shall record:

- the location of the **barrier**, (SH route position, and side of the road or median)
- length of **barrier**, and general shape of railing (curve, bend and straight)
- type of **barrier**, and indicate if painted
- type of end terminal, includes start type and end type
- type of defect (if present) and action determined to remedy the defect
- a log of any maintenance work completed and the date of completion
- installation date.

Appendix 17.1 lists the minimum stockholding that must be maintained for each **barrier** system.

#### 17.5.2. Temporary Works prior to completing Permanent Works on Barrier

Where temporary works on guardrails or terminal ends are required, they shall be designed such that road users must be protected from the risks arising from **damaged** or missing sections of **barriers**. Notwithstanding the requirements, the Contractor shall ensure that appropriate **urgent work**, e.g. temporary repairs, are carried out to any **damaged barrier** or **barrier** terminal, and if necessary the site secured by implementation of effective Positive Traffic Management in accordance with COPTTM to ensure the affect on the safety of road users is minimised until permanent repairs are completed.

#### 17.5.3. Damage to Barrier Terminal

Any **damage** to a **barrier** terminal shall be reported and assessed for appropriate **treatment** prior to completing permanent repairs. Repairs are to comply with TNZ M/23. **Damaged barrier** terminals that do not comply with TNZ M/23 shall be replaced with an appropriate compliant **barrier** terminal or impact attenuator. If the **barrier** system requires modification to comply with

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TNZ M/23, and the **SHGDM** including the **LON**, the Engineer may direct the Contractor to complete the appropriate permanent remedial works.

## 17.5.4. Major Damage to Barrier

**Barriers** subjected to major **damage** shall be reported and assessed for appropriate **treatment** prior to completing permanent repairs. If the **barrier** system requires modification to comply with TNZ M/23, and the **SHGDM** including the **LON**, the Engineer may direct the Contractor to complete the appropriate remedial works.

## 17.5.5. Minor Damage to Barrier

Minor **damage** to a **barrier** of up to three sections of rail or equivalent concrete **barrier** (excluding the **barrier** terminal section), shall be reported and assessed for appropriate **treatment** prior to completing permanent repairs. As a minimum, this would normally require the Contractor to reinstate all **damaged barrier** elements to the lines and levels that existed prior to the **damage** occurring. **Damaged barriers**, which were incorrectly installed, shall be repaired to the correct standard, determined by the Engineer, in accordance with the manufacturer's specification. If the **barrier** system requires modification to comply with TNZ M/23, and the **SHGDM** including the **LON**, the Engineer may direct the Contractor to complete the appropriate remedial works. If **barriers** are on a bridge and the bridge structure has been **damaged** then the contractor shall report the **damage** immediately to the consultant so that bridge can be appraised by a suitably qualified engineer.

## 17.5.6. Permanent Repairs

### a) Road Safety Barriers

The Contractor shall report any **barrier damage** to the Engineer prior to making permanent repairs. Permanent repairs shall be undertaken after an assessment of the **barrier** system compliance with TNZ M/23, the **SHGDM** including a determination of the **LON** by the Engineer who shall direct the Contractor on the work to be performed.

**Barriers** incorrectly installed shall be repaired to the correct standard, as and when directed/determined by the Engineer, and in accordance with the manufacturer's specification.

Where a **damaged barrier** does not comply with TNZ M/23 any replacement parts shall be compliant with TNZ M/23, and be in accordance with the manufacturer's specification.

### b) Barriers, handrails and rails for the containment of pedestrians and cyclists.

The Contractor shall report any **barrier damage** to the Engineer prior to making permanent repairs. Permanent repairs shall be undertaken after an assessment of the **barrier** system by the Engineer who shall direct the Contractor on the work to be performed.

**Barriers** incorrectly installed shall be repaired to the correct standard, as and when directed/determined by the Engineer, and in accordance with the manufacturer's specification.

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**Damaged barriers** shall be repaired to a standard not less than that existing before the **damage** occurred, or if they were incorrectly installed, they shall be repaired to the correct standard, in compliance with the standard determined by the Engineer, and be in accordance with the manufacturer's specification.

### c) Repairs to Bridge **Barriers**.

The Contractor shall obtain the agreement of the Engineer to the Contract for repairs to bridge **barriers**. This includes repairs to **road safety barriers** and **barriers** for the containment of pedestrians and cyclists.

#### 17.5.7. Barrier Serviceability

All **barriers** in the contract area shall be maintained by the Contractor to be in a condition fit for purpose. The Engineer may direct the Contractor to maintain, repair, and replace **barrier** parts or the whole **barrier** if it is not fit for purpose. The Contractor shall complete the work in accordance with the manufacturer's specification.

All **barrier** terminals fitted with an anchor cable shall be maintained fit for purpose by the Contractor. The Contractor shall ensure that cables are taut and not loose or draped below the W-Beam. The Contractor shall replace Breakaway Cable Terminals (BCT's) that are deemed to be not fit for purpose and require major repair with terminals and associated **barrier** in compliance with TNZ M/23 and the **SHGDM** including satisfying the **LON**, at the direction of the Engineer.

The Engineer may direct the Contractor to replace lengths of **barrier** comprising W-Sections or steel rails which are not fit for purpose with W-Beam or other **barrier** in compliance with TNZ M/23.

### 17.6 Materials

**Road Safety Barriers** shall comply with TNZ M/23 for general road application, and for bridge side protection Transit's Bridge Manual, and TNZ M/17P "W"-Section Bridge Guardrails, where applicable. Layout and configuration shall be in accordance with the **SHGDM**.

### 17.7 Performance Criteria

The performance of the Contractor will be measured by the following criteria:

- a) that all guard rails and **barriers** are maintained in accordance with this Specification by the date shown on the agreed **programme**, and defective guardrails and **barriers** are repaired within the response times stated.
- b) inspections are completed on time and inspection records are available when requested by the engineer.
- c) that all repairs, installed guardrails and **barriers** are in accordance with the manufacturers instructions and/or specifications (where these are available) and best industry practice.