



CODE OF PRACTICE - VOLUME THREE - TRAM SYSTEM [CP3] TRANSADELAIDE INFRASTRUCTURE SERVICES		
PART 12: GUARD/CHECK RAILS AND BUFFER STOPS		DOC. NO. CP-TS-982
Issue: 1	Date: 22/10/07	Page: 1 of 9

TRACK AND CIVIL INFRASTRUCTURE

CODE OF PRACTICE

VOLUME THREE - TRAM SYSTEM [CP3]

GUARD/CHECK RAILS AND BUFFER STOPS



**CODE OF PRACTICE - VOLUME THREE - TRAM SYSTEM [CP3]
TRANSADELAIDE INFRASTRUCTURE SERVICES**

PART 12: GUARD/CHECK RAILS AND BUFFER STOPS	DOC. NO. CP-TS-982
Issue: 1	Date: 22/10/07
	Page: 2 of 9

TABLE OF CONTENTS

	<i>Page No.</i>
1.0 PURPOSE AND SCOPE	3
1.1 Purpose	3
1.2 Principles	3
1.3 Scope	3
1.4 Definitions	3
1.5 References	3
2.0 DESIGN AND RATING OF GUARD RAILS	5
2.1 Application of guard rails	5
2.2 Configuration	5
2.3 Weight of rail	6
2.4 Installation	6
2.5 Plain track or points and crossings	6
3.0 DESIGN AND RATING OF CHECK RAILS	7
3.1 Application of check rails	7
3.2 Configuration	7
3.3 Types of check rail	7
3.4 Plain track or points and crossings	7
4.0 MONITORING AND MAINTENANCE OF GUARD/CHECK RAILS	8
4.1 Inspection, assessment and maintenance actions	8
5.0 BUFFER STOPS	9
5.1 <i>To be developed</i>	9
6.0 DOCUMENTATION	10
6.1 Guard rail record	10
6.2 Check rail record	10
6.3 Inspection reports	10

**CODE OF PRACTICE - VOLUME THREE - TRAM SYSTEM [CP3]
TRANSADELAIDE INFRASTRUCTURE SERVICES****PART 12: GUARD/CHECK RAILS AND BUFFER STOPS** **DOC. NO. CP-TS-982****Issue: 1****Date: 22/10/07****Page: 3 of 9****1.0 PURPOSE AND SCOPE****1.1 PURPOSE**

The purpose of this part is to set standards to ensure that guard rails, check rails and buffer stops are safe and fit for purpose.

1.2 PRINCIPLES

This part complies with the principles set out in the "Code of Practice for the Defined Interstate Rail Network", volume 4, part 2, section 1.

1.3 SCOPE

This part specifies general procedures for the design/rating, maintenance and monitoring of guard rails, check rails and buffer stops.

1.4 DEFINITIONS**1.4.1 Guard rail**

Guard rails are defined in the "Code of Practice for the Defined Interstate Rail Network, Glossary, Volume 2, sub-section 4.1 (Track and Civil Infrastructure Terminology) General.

1.4.2 Check rails

Check rails are defined in the "Code of Practice for the Defined Interstate Rail Network, Glossary, Volume 2, sub-section 4.1 (Track and Civil Infrastructure Terminology) General. In this Code of Practice:

- a) when laid on the track in close contact with the running rails, check rails shall be used to prevent a vehicle from derailing or, when used in conjunction with rerailers, to re-rail a derailed vehicle where it would be in danger of striking a structure with consequential personal injury or property damage; or
- b) to prevent a vehicle from derailing or to re-rail a derailed vehicle where it was in danger of toppling over the side of an overbridge; or
- c) they may also be used on the low leg of sharp curves to minimize wear of the running rails.

Note that in this part of the Code of Practice, the usage of the term shall distinguish them from check rails used in points and crossings.

1.5 REFERENCES**1.5.1 Industry codes of practice**

- a) Code of Practice for the Defined Interstate Rail Network, Glossary, Volume 2, section 4.0 Track and Civil Infrastructure Terminology, sub-section 4.1 General.
- b) Code of Practice for the Defined Interstate Rail Network, volume 4 (Track, Civil and Electrical Infrastructure), part 2 (Infrastructure Principles), section 1: Rail.

1.5.2 TransAdelaide documents

Motorperson Training Programme



CODE OF PRACTICE - VOLUME THREE - TRAM SYSTEM [CP3]		
TRANSADELAIDE INFRASTRUCTURE SERVICES		
PART 12: GUARD/CHECK RAILS AND BUFFER STOPS		DOC. NO. CP-TS-982
Issue: 1	Date: 22/10/07	Page: 4 of 9

1.5.3 TransAdelaide documents

a) CP2

CP-TS-981: Part 11, Rails and rail joints

CPRD/PRC/046 Records Management

b) Quality and Railway Safety Procedure Manual

QP-IS-501: Document and Data Control

1.5.4 TransAdelaide drawings

318-A1-84-1793: Overway bridges - Check rail details

xxx-xx-xx-xxx: Victoria Square type buffer stop

CODE OF PRACTICE - VOLUME THREE - TRAM SYSTEM [CP3] TRANSADELAIDE INFRASTRUCTURE SERVICES		
PART 12: GUARD/CHECK RAILS AND BUFFER STOPS		DOC. NO. CP-TS-982
Issue: 1	Date: 22/10/07	Page: 5 of 9

2.0 DESIGN AND RATING OF GUARD RAILS

2.1 APPLICATION OF GUARD RAILS

Guard rails shall be installed:

- a) where the nearer running rail is closer than 3.5m from the unprotected support of an overhead or adjacent structure;
- b) on all open deck bridges (i.e. unballasted) with a span in excess of 6m; and
- c) at any other location, where, in the event of a derailment, it is necessary to restrain derailed vehicles from deviating from the general track alignment.

2.2 CONFIGURATION

2.2.1 Single or double guard rails

Guard rails shall be installed in accordance with drawing number 318-A1-84-1793 and shall consist of one of the following configurations:

- a) where there is a structure at risk on both sides of the line - two rails laid between the running rails, laid for the length required to protect the structure at risk, then angled to meet in the centre of the track;
- b) where there is a structure at risk on one side of the line only - one rail laid on the opposite side of the track centreline to the structure at risk, laid for the length required, then angled across to the centre line of the track.
- c) on the Goodwood Overpass - as a special case, one rail shall be laid half way between the two running rails for the full length of the concrete deck.

2.2.2 Basic dimensions of guard rails

The basic dimensions of all guard rails are shown in figures 2.1 and 2.2.

Figure 2.1: Plan view of guard rails

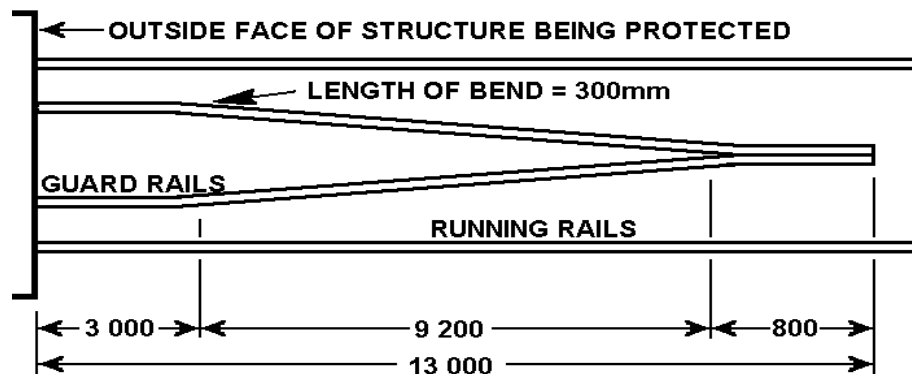
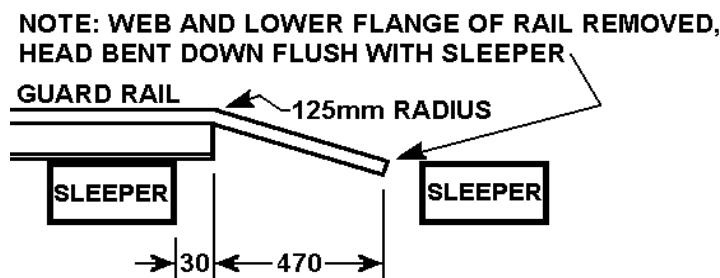


Figure 2.2: Ends of guard rails



2.3 WEIGHT OF RAIL



CODE OF PRACTICE - VOLUME THREE - TRAM SYSTEM [CP3] TRANSADELAIDE INFRASTRUCTURE SERVICES		
PART 12: GUARD/CHECK RAILS AND BUFFER STOPS		DOC. NO. CP-TS-982
Issue: 1	Date: 22/10/07	Page: 6 of 9

Guard rails shall preferably be made with 82AS or AS 41kg rail but in all cases shall be of a weight not less than 40kg/metre.

2.4 INSTALLATION

- a) Guard rails shall be installed at a distance from the running rail (or rails) so that a derailed vehicle with derailed wheels bearing hard against the guard rail, shall clear the structure being protected by not less than 125mm.
- b) Guard rails shall not be placed closer to the running rails than 100mm or further away than track centre.
- c) If this is insufficient to ensure a clearance of 125mm between a derailed vehicle and the structure at risk, then check rails shall be fitted in accordance with section 3.
- d) Where guard rails are installed on an open deck bridge, the guard rails shall be installed at a distance from the running rail (or rails) so that on a derailed vehicle with derailed wheels bearing hard against the guard rail, the opposite wheels will still ride on the bridge timbers. If this requires guard rails to be installed closer to a running rail than 100mm, then check rails shall be fitted in accordance with section 3.
- e) The top of the guard rail shall be at the level of the adjacent running rail surface, or below it by no more than 50mm.
- f) Guard rails shall be fastened preferably every sleeper or every fastening interval on slab track, but shall be fastened at least every alternative sleeper or fastening interval.
- g) Joints in guard rails shall be made in accordance with the requirements for running rails in CP-TS-981 (Rails and rail joints)

2.5 PLAIN TRACK OR POINTS AND CROSSINGS

Guard rails as prescribed in this section shall be used on plain track. Where points and crossings are present, consideration shall be given to an alternative means of protection or to the susceptibility of risk.



CODE OF PRACTICE - VOLUME THREE - TRAM SYSTEM [CP3] TRANSADELAIDE INFRASTRUCTURE SERVICES		
PART 12: GUARD/CHECK RAILS AND BUFFER STOPS		DOC. NO. CP-TS-982
Issue: 1	Date: 22/10/07	Page: 7 of 9

3.0 DESIGN AND RATING OF CHECK RAILS

3.1 APPLICATION OF CHECK RAILS

Check rails shall be used where, because of proximity of adjacent structures, guard rails do not provide adequate protection to structures e.g. through girder bridges, truss bridges, etc. They may also be used on the low leg of sharp curves to minimize wear of the running rails.

3.2 CONFIGURATION

Check rails shall have the following characteristics:

- a) Check rails used to protect structures:
 - 1) shall always be laid in pairs with the ends of the check rails square across the track.
 - 2) may be fitted with permanent rerailers at the leading end on unidirectional track or both ends on bi-directional track and derailed wheels shall be led into the rerailers with rails or steel angles laid on the approach.
- b) The check rails on curves shall be laid on the low leg only.
- c) The flangeway of the check rails shall be not less than 30mm or greater than 50mm wide.
- d) Check rails shall always be flared on both ends.
- e) Check rails shall be fitted with the top of the check rails level with a plane across the top of the running rails (± 5 mm).
- f) Check rails shall be fastened preferably every sleeper, but shall be fastened at least every alternative sleeper.
- g) Joints in check rails shall be made in accordance with the requirements for running rails in CP-TS-981 (Rails and rail joints)

3.3 TYPES OF CHECK RAIL

- a) Check rails shall preferably be made with steel rails of the same weight of rail as the running rail but in all cases shall be of a weight not less than 40kg/metre.
- b) Check rails may also be made of other rolled steel sections e.g. angles or flat vertical plates if used in accordance with the provisions of this part.

3.4 PLAIN TRACK OR POINTS AND CROSSINGS

Check rails as prescribed in this section shall be used on plain track. Where points and crossings are present, consideration shall be given to an alternative means of protection or to the susceptibility of risk.



CODE OF PRACTICE - VOLUME THREE - TRAM SYSTEM [CP3] TRANSADELAIDE INFRASTRUCTURE SERVICES		
PART 12: GUARD/CHECK RAILS AND BUFFER STOPS		DOC. NO. CP-TS-982
Issue: 1	Date: 22/10/07	Page: 8 of 9

4.0 MONITORING AND MAINTENANCE OF GUARD/CHECK RAILS

4.1 INSPECTION, ASSESSMENT AND MAINTENANCE ACTIONS

Inspection, assessment and maintenance actions of guard rails and check rails shall comply with the requirements of CP-TS-981 (Rails and rail joints) and include the specific conditions shown in table 4.1:

Table 4.1: Guard rail and check rail inspection, assessment and maintenance actions

Type of inspection	Specific conditions or actions to observe
Scheduled inspections	
Walking inspections	a) Identify visually, and report, visible guard rail and check rail defects and conditions (i.e. indicators of a defect) that may affect the integrity or function of the guard rail including the following: <ol style="list-style-type: none"> 1) missing or ineffective rail/sleeper continuity; 2) lack of guard rail continuity; 3) obvious damage to components. b) Intervals between walking inspections shall not exceed 31 days.
Unscheduled inspections	To be undertaken following the report of defective guard rails and check rails.
Assessment and method of assessment	The integrity of guard rails and check rails shall be assessed to verify their capacity to safely perform their required function.
Maintenance actions and response	a) Damaged components including ineffective rail joints, which may render the guard rail or check rail ineffective in the event of a derailment shall be replaced or restored within 30 days or less. b) Missing or ineffective sleeper fastenings shall be dealt with as follows: <ol style="list-style-type: none"> 1) If less than 25% sleeper fastenings are missing or ineffective; no action. 2) If 25% or greater are missing or ineffective; replace or restore to specification within 30 days. 3) If a guard rail is missing or ineffective, a "Notch 1" or 20km/hr maximum speed limit shall be applied until the guard rail is replaced or made effective. 4) For splay rails or the ends of guard rails, three or more are missing or ineffective on consecutive sleepers, replace or restore to specification within 30 days. c) Where check rails are fitted the responses shall be as shown in table 4.2.

Table 4.2: Response criteria to check rail flangeways

Flangeway		
Width, variation from design width	< ±6mm	No action
	±6 to ±10mm	Impose a "Notch 1" or 20km/hr speed limit or repair
	> ±10mm	Pilot or repair
Depth, variation from design depth	≤ ±10mm	No action
	> ±10mm	Impose a "Notch 1" or 20km/hr speed limit or repair



CODE OF PRACTICE - VOLUME THREE - TRAM SYSTEM [CP3] TRANSADELAIDE INFRASTRUCTURE SERVICES		
PART 12: GUARD/CHECK RAILS AND BUFFER STOPS		DOC. NO. CP-TS-982
Issue: 1	Date: 22/10/07	Page: 9 of 9

5.0 BUFFER STOPS

5.1 *To be developed*

6.0 DOCUMENTATION

6.1 GUARD RAIL RECORD

A record shall be maintained of all guard rails in accordance with QP-IS-501 (Document and Data Control).

RECORD TO BE PREPARED

6.2 CHECK RAIL RECORD

A record shall be maintained of all check rails in accordance with QP-IS-501 (Document and Data Control).

RECORD TO BE PREPARED

6.3 INSPECTION REPORTS

All inspection reports shall be maintained in accordance with CPRD/PRC/046 Records Management.