



WESTERN AUSTRALIA SPECIFICATION

267

RIGID CONCRETE ROAD SAFETY BARRIER SYSTEMS (Public Domain)

Amendment Record for this Specification Part

This Specification is Council's edition of the AUS-SPEC generic specification part and includes Council's primary amendments.

Details are provided below outlining the clauses amended from the Council edition of this AUS-SPEC Specification Part. The clause numbering and context of each clause are preserved. New clauses are added towards the rear of the specification part as special requirements clauses. Project specific additional script is shown in the specification as italic font.

The amendment code indicated below is 'A' for additional script 'M' for modification to script and 'O' for omission of script. An additional code 'P' is included when the amendment is project specific.

Amendment Sequence No.	Key Topic addressed in amendment	Clause No.	Amendment Code	Author Initials	Amendment Date
<i>EXAMPLE 1</i>	<i>Provision for acceptance of nonconformance with deduction in Payment</i>	<i>XYZ.00</i>	<i>AP</i>	<i>KP</i>	<i>2/6/97</i>

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**SPECIFICATION 267 : RIGID CONCRETE ROAD SAFETY BARRIER SYSTEMS
(Public Domain)**

GENERAL

267.01 SCOPE

1. The work to be executed under this Specification consists of the setting out and construction of concrete safety barriers from precast units, by fixed forms or slipforming in accordance with the requirements for rigid road safety barrier systems in AS/NZS 3845..
2. Safety barriers may be constructed adjacent to or on new or existing pavements.
3. This Specification details the requirements for public domain, Type F and VCB, rigid road safety barrier systems. Where a patented rigid road safety barrier system is specified and shown on the Drawings, all materials shall be in accordance with the manufacturer's specifications and, it shall be constructed strictly in accordance with the manufacturer's instructions.
4. Where a patented crash attenuator is specified and shown on the Drawings, all materials shall be in accordance with the manufacturer's specifications and, it shall be constructed strictly in accordance with the manufacturer's instructions.
5. Non-rigid road safety barrier systems are specified in a separate specification part.

267.02 REFERENCE DOCUMENTS

Documents referenced in this Specification are listed in full below whilst being cited in the text in the abbreviated form or code indicated.

***Documents
Standards
Test Methods***

a) Council Specifications

- | | | |
|-----|---|---|
| 201 | - | Control of Traffic |
| 261 | - | Pavement Markings |
| 262 | - | Signposting |
| 264 | - | Non-Rigid Road Safety Barrier Systems (Public Domain) |
| 271 | - | Minor Concrete Works |

(b) Australian Standards

- | | | |
|---------------|---|--|
| AS 1289.5.4.1 | - | Compaction control test – Dry density ratio, moisture variation and moisture ratio |
| AS 1379 | - | The specification and manufacture of concrete |
| AS 1906.2 | - | Retroreflective devices (non pavement application) |
| AS 3610 | - | Formwork for concrete |
| AS 3799 | - | Liquid membrane - forming curing compounds for concrete |
| AS/NZS 3845 | - | Road safety barrier systems |

MATERIALS

267.03 CONCRETE

- | | |
|--|---|
| 1. Supply and placement of concrete, steel reinforcement, formwork, tolerances, construction joints and protection shall conform to the requirements of the Specification for MINOR CONCRETE WORKS. | Concrete |
| 2. The minimum strength of concrete at 28 days shall be 30 MPa for cast-in-situ formed concrete or precast concrete and 40 MPa for slip formed concrete construction unless shown otherwise on the Drawings. | Strength |
| 3. The maximum nominal size of aggregate shall be 20mm, and the specified slump at the point of placement shall be 25mm for slipforming and 80mm for fixed forms. | Slump |
| 4. If ready-mixed concrete is used, the concrete shall be mixed and delivered in accordance with AS 1379. | Ready Mixed Concrete |
| 5. Concrete shall be sampled and tested by personnel from a NATA registered laboratory and the test results certified by a NATA endorsed signatory. All costs for sampling and testing shall be borne by the Contractor. | Sampling & Testing Contractor's Cost |
| 6. A pair of cylinders shall be provided and tested for compressive strength for every 50m ³ of concrete placed. Strength results shall be submitted to the Superintendent if so requested by the Superintendent. | Testing Frequency |

CONSTRUCTION

267.04 GENERAL

- | | |
|---|--|
| 1. The Contractor shall at all times conform to the requirements of the Specification for CONTROL OF TRAFFIC. | Traffic Control |
| 2. Construction of rigid barrier shall comply with AS/NZS 3845 except where explicit departures are detailed in the Drawings. | |
| 3. Unless otherwise stated on the Drawings, the barrier may be precast, constructed in fixed forms or slip-formed to the dimensions and details as shown on the Drawings. | Types |
| 4. Where a non-rigid road safety barrier is to be connected to a rigid road safety barrier, anchorage assemblies shall be cast into the road safety barrier to the dimensions and details as shown on the Drawings. All other components for non-rigid road safety barriers are specified in a separate specification part. | Connections To Non-Rigid Barriers |
| 5. The set out of the safety barrier shall be presented to the Superintendent for approval before construction commences. This action constitutes a HOLD POINT . The Superintendent's approval to the set out is required prior to the release of the hold point. | Set Out |
- HP**

267.05 PREPARATION OF THE BASE

- | | |
|---|-----------------|
| 1. For safety barriers constructed on new or existing pavements, before placing the | Cleaning |
|---|-----------------|

mortar pad for precast units or placing concrete or slipforming, the base shall be cleaned of all loose materials and dust.

2. Safety barriers constructed on new or existing pavements shall be provided with dowels in cored holes at regular staggered spacings as shown on the Drawings. When precast units are used care must be taken to align and space the core holes accurately.

***Dowels and
Core Holes***

3. For safety barriers constructed adjacent to new or existing pavements, the foundation material shall be shaped and compacted to form a firm base. Other than for barriers constructed on pavement courses, the relative compaction shall be at the 95 per cent level in accordance with AS 1289.5.4.1 for standard compactive effort. Where placed on pavement courses, the foundation shall be compacted to the requirements of the respective pavement course.

***Compaction of
Foundations***

4. For safety barriers containing street lighting standards, the conduit carrying electrical cables must be located in the base rather than in the barrier, as detailed on the Drawings, unless otherwise approved by the Superintendent. For slip-formed barriers the conduit trench forms a key and no dowels are required unless shown otherwise on the Drawings.

***Electrical
Conduits***

267.06 CONCRETE PLACEMENT

1. For fixed form construction, the concrete shall be thoroughly compacted and the surface screeded off. Immediately following compaction and screeding the concrete shall be tested for high or low spots and any necessary corrections shall be made before the concrete has hardened.

***High/Low
Spots***

2. For fixed form construction, the concrete surface shall be finished true and uniform to a class 2 finish in accordance with AS 3610.

***Concrete
Finish***

3. For slip form construction, where hand finishing is required, every effort shall be made to provide a uniform appearance of the barrier.

***Hand
Finishing***

4. Precast units shall be placed on a mortar pad of 10mm minimum thickness.

Precast Units

267.07 ALIGNMENT AND LEVEL

1. The top and face of the barrier shall be true to line and the top surface shall be of uniform width, free from humps, sags and other irregularities.

***Finish and
Appearance***

2. The line and level at any point on the safety barrier shall be within ± 50 mm of the plan location and within ± 20 mm of the design levels as shown on the Drawings.

***Line and Level
Tolerance***

3. When a 3m long straight edge is laid on top of or along any face of the barrier the surface shall not vary more than 5mm from the edge of the straight edge except at grade changes or curves in which case the faces shall transition uniformly.

***Surface
Tolerance***

267.08 JOINTS

1. Where construction is in fixed forms or by slip-forming, contraction joints of minimum 50mm depth shall be formed on all exposed surfaces at 4m spacing.

***Contraction
Joints***

2. Expansion joints of 15mm width for the full depth of the barrier shall be constructed where specified on the Drawings. Expansion joints shall consist of a preformed jointing material of bituminous fibreboard or equivalent approved by the Superintendent.

***Expansion
Joints***

3. Where the barrier is cast on concrete pavement the contraction, isolation, tied or

Pavement

CONCRETE SAFETY BARRIER

expansion joints as they appear in the pavement shall be continued through the barrier.

Joints

4. Where the barrier is cast adjacent to a concrete pavement the contraction joints shall be formed at 4m centres.

Adjacent to Pavement

5. Precast units shall be placed such that all connections are tight, secure and true in line and level.

Precast Units

267.09 CURING

1. For slip-formed barriers either wax emulsion, hydrocarbon resin or water borne curing compounds to the requirements of AS 3799 Class A Type 1, Class B Type 1-D or Class Z Type 1-D respectively shall be used.

Curing Compound

2. The Contractor shall provide a certificate of compliance for the curing compound from a laboratory with appropriate NATA registration.

Compliance

3. The curing compound shall be applied in a fine spray to provide even coverage at a rate of 0.2 l/m² or the rate determined on the test certificate to achieve 95 per cent water retention, whichever is the greater.

Application Rate

4. Equipment and materials for the curing operations shall be kept on site at all times during slip-forming of the barrier.

Equipment on Site

5. Moist curing systems are acceptable when demonstrated as an effective process during manufacture of precast barrier units.

Precast Units

267.10 DELINEATORS

1. Delineators complying with AS 1906.2 shall be fixed with brackets to the concrete safety barrier at locations, and to the details, as shown on the Drawings.

Fixing

2. The delineators shall be so arranged that drivers approaching from either direction will see only red reflectors on their left side and white reflectors on their right.

Arrangement and Colour

267.11 SIGNING AND LINEMARKING AT BARRIER

1. Permanent signing, and longitudinal linemarking adjacent to the concrete safety barrier shall be provided in accordance with the Specifications for SIGNPOSTING and PAVEMENT MARKINGS.

2. Temporary traffic control devices installed for the control of traffic shall not be removed before the concrete safety barrier, permanent signing and longitudinal linemarking have been inspected and approved by the Superintendent. This action constitutes a **HOLD POINT**. The Superintendent's approval of the concrete safety barrier, signing and linemarking is required prior to the release of the hold point.

HP

SPECIAL REQUIREMENTS

267.12 RESERVED

267.13 RESERVED

MEASUREMENT AND PAYMENT

267.14 PAY ITEMS

1. Payment shall be made for all the activities associated with completing the work detailed in this Specification on a schedule of rates basis in accordance with Pay Items 267(a) to 267(b) inclusive.
2. A lump sum price for any of these items shall not be accepted.
3. If any item, for which a quantity of work listed in the Schedule of Rates, has not been priced by the Contractor, it shall be understood that due allowance has been made in the prices of other items for the cost of the activity which has not been priced.
4. Traffic control is measured and paid in accordance with the Specification for CONTROL OF TRAFFIC.
5. Concrete safety barrier is measured and paid in accordance with this Specification and not in the Specification for MINOR CONCRETE WORKS.
6. Linemarking and signing are measured and paid in accordance with the Specifications for PAVEMENT MARKINGS and SIGNPOSTING.

Pay Item 267(a) – ROAD SAFETY BARRIER

- (i) Type F
- (ii) Type VCB

1. The unit of measurement shall be the linear metre measured along the top of the barrier, excluding terminal ends.
2. A separate schedule shall be provided for differing base conditions.
3. The schedule rate shall include all operations and provision of materials as described in this Specification and shown on the Drawings to provide the safety barriers complete in all respects.

Pay Item 267(b) - TERMINAL ENDS

1. The unit of measurement shall be “each” terminal end provided.
2. The schedule rate shall include all operations and provision of materials as described in this Specification and shown on the Drawings to provide the terminal ends complete in all respects.
3. The schedule rate shall also include, where specified and shown on the Drawings, cast in anchorage assemblies for the connection of non-rigid road safety barriers.