Master Specification
Part RD-BF-C3

Construction of Concrete Safety Barrier Systems

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Government of South Australia
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Contents

RD-BF-C3 Construction of Concrete Safety Barrier Systems

1 General

a) This Master Specification Part specifies the requirements for the construction of concrete safety barrier systems (including both precast and cast in situ barriers), including:

i) the documentation requirements, as set out in section 2;

ii) the construction of concrete safety barrier systems, as set out in section 3; and

iii) the Witness Point requirements, as set out in section 4.

b) Concrete safety barrier systems must comply with the Reference Documents, including:

i) AS 3610 Formwork for concrete;

ii) AS/NZS 3845 Road safety barrier systems and devices;

iii) Department Standard Drawings (available from: https://dit.sa.gov.au/standards/standards_and_guidelines); and

iv) GD 300 Accepted Safety Barrier Products (available from: https://dit.sa.gov.au/standards/standards_and_guidelines).

2 Documentation

2.1 Construction Documentation

In addition to the requirements of PC-CN3 “Construction Management”, the Construction Documentation must include detailed procedures for:

a) achieving the specified concrete compaction, finishing, curing and dimensional tolerances (for cast in situ barriers) required by this Master Specification Part; and

b) placement of units and method of grouting (for precast units).

2.2 Quality Management Records

In addition to the requirements of PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable), the Quality Management Records must include evidence that:

a) the concrete safety barrier system has been constructed or installed in accordance with the Contract Documents, including the Construction Documentation, Design Drawings (if applicable) and the Department Standard Drawings;

b) set-out is compliant; and

c) all clear distances behind barriers, minimum offsets from the roadway, and deflection of end terminals are compliant.

3 Construction of concrete safety barrier systems

3.1 General

a) Barriers on bridge deck medians and sealed surfaces must be placed such that they are retained by a minimum depth of 30 mm of asphalt on both sides.

b) Barriers placed on subbase must be restrained prior to placing base material against them so that there is no visible movement during placement of the base.

3.2 Precast barrier units

The following requirements apply to the construction of precast barrier units forming part of concrete safety barrier systems:

a) a spreader bar must be used during lifting to ensure that slings remain vertical;

b) hemispherical recesses must be filled with mastic after installation of the precast barrier units;

c) the precast barrier units must be set up on packer blocks to provide sufficient gap under the unit to enable the grout to be placed under the entire unit;

d) a **Witness Point** applies prior to grouting the precast barrier units in place. Grouting of the precast barrier units in place must not occur until the Contractor has proceeded past the Witness Point;

e) grout must:

   i) be Grade S32 and consist of cement, sand, water and an approved admixture;

   ii) have a water-cement ratio as low as practicable consistent with adequate workability and not greater than 0.45 by mass; and

   iii) be used within 30 minutes of mixing; and

f) grouting must:

   i) be carried out in such a manner that the shear key and the area under the precast barrier units are completely filled with dense and uniform grout placed in one continuous operation; and

   ii) not be carried out when the temperature of the grout is less than 10°C or greater than 30°C.

3.3 Cast in situ barriers

The following requirements apply to the construction of cast in situ barriers forming part of concrete safety barrier systems:

a) concrete must be placed:

   i) in an operation which proceeds continuously between the ends of concrete safety barrier systems;

   ii) between construction joints; and

   iii) within a precast barrier segment;

b) fresh concrete must not be placed against concrete that has taken its initial set, except at properly formed construction joints;

c) unformed surfaces must be tamped to bring a layer of fines to the surface and screeded to the specified level;

d) immediately following tamping and screeding as specified in section 3.3c), unformed surfaces must be tested for high or low spots and any necessary corrections made;

e) the Contractor must control cracking by sawing or forming movement joints, and must ensure that:

   i) movement joints are:

      A. straight and square to the line of the barrier;

      B. 50 mm deep; and

      C. spaced at intervals of not more than 4.5 m along the barrier; and

   ii) where sawing is used to control cracks, it is carried out:

A. before uncontrolled cracking begins; and

B. within 12 hours after placing the concrete; and

f) expansion joints must be:

i) straight and square to the line of the barrier;

ii) 6 mm wide; and

iii) filled with a preformed joint filler.

3.4 Tolerances

The Contractor must ensure that the concrete safety barrier systems comply with the following tolerances:

a) subject to section 3.4b), tolerances must be in accordance with AS/NZS 3845.1 Road safety barrier systems and devices, Part 1: Road safety barrier systems;

b) the tolerances for item “(i) deviation in finished level from the barrier design” as set out in AS/NZS 3845.1 Road safety barrier systems and devices, Part 1: Road safety barrier systems must be replaced with the following tolerances:

i) slip formed: -0 mm, +20 mm;

ii) fixed form in situ: -0 mm, +10 mm; and

iii) precast: -0 mm, +10 mm.

4 Witness Points

Table RD-BF-C3 4-1 details the review period or notification period, and type (documentation or construction quality) for each Witness Point referred to in this Master Specification Part.

Table RD-BF-C3 4-1 - Witness Points

Section reference	Witness Point	Documentation or construction quality	Review period or notification period
3.2d)	Prior to grouting the precast barrier units in place	Construction quality	24 hours notification