



AUSTRALIAN RAIL TRACK CORPORATION LTD

Discipline: Engineering (Track & Civil)

Category: Standard

Specification – Signals, Track Warning ETD-00-02

Applicability

New South Wales	✓	CRIA (NSW CRN)	
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Primary Source

ARTC NSW Standard BOS 03

Document Status

Version	Date Reviewed	Prepared by	Reviewed by	Endorsed	Approved
1.1	18 Jun 10	Standards	Manager Standards	Exec Manager SS&P 21/06/2010	CEO

Amendment Record

Version	Date Reviewed	Clause	Description of Amendment
1.0	01 Dec 09		Implementation draft. Supersedes NSW Standard BOS 03 v1.1
1.1	18 Jun 10		Banner added regarding mandatory requirements in other documents and alternative interpretations.

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Mandatory requirements also exist in other documents.

Where alternative interpretations occur, the Manager Standards shall be informed so the ambiguity can be removed. Pending removal of the ambiguity the interpretation with the safest outcome shall be adopted.

1 General

This specification covers the requirements for track warning signals (colloquially known as detonators) to act as an audible warning device when attached to railway tracks and when run over by an approaching train. These signals have, traditionally, been explosive devices activated by friction. Non explosive signals may be utilized when approved by ARTC.

The contents of this specification are mandatory and the minimum standard required.

2 Reference Documents

Australian Standard: AS 1259.1 "Sound Level Meters" applies to the provision of these signals.

3 Description and Marking

The signals supplied shall be constructed, marked and coloured in a manner similar to the explosive signals already tested and approved. (Refer to 'Testing' Clause 6)

The signals shall be designed to be positively attached (i.e. clipped) to the head of the rail with sufficient force so as to prevent slippage in all weather and track conditions when being run over by a train and to prevent removal by birds.

4 Authorisation

The Contractor shall receive authorisation for the storage, transport and use of the signals from the WorkCover Authority of New South Wales.

The Classification Code so authorised shall be 1.4S.

Documentation relating to the authorisation and in particular the signal description and packaging description shall be made available if requested.

5 Labelling

Each inner container for packaging the explosive signals shall be labelled with the following information:

- 'Signals, Track, Warning'.
- Actual number of explosive signals.
- 'UN No.o193'
- 'Class 1.4S'
- 'Not liable to explode in bulk'
- Contractor's name
- Month and year of manufacture
- Expiry date Batch or Lot Number of the explosive signals
- 'Ensure Box is empty before discarding' or other equivalent wording
- Any other wording as required by the WorkCover Authority of New South Wales.

Each outer container for packaging the inner containers of signals shall be labeled with the following information:

- 'Signals, Track, Warning'
- Actual number of inner containers packed into the outer container
- Actual number of explosive signals
- 'UN No. 0193'
- 'Class 1.4S'
- 'Not liable to explode in bulk' Contractor's name
- Month and year of manufacture
- Expiry date
- Any other wording as required by the WorkCover Authority of New South Wales.

6 Testing

6.1 Type Testing

The signals, if not of the type of design previously approved for use, shall be subjected to the following safety, reliability and noise level tests.

The Contractor shall submit test certificates and results for these tests.

6.1.1 Number of Signals for Type Testing

Sufficient number of signals, that would have been manufactured in a normal production run, shall be type tested by the Contractor to enable the Contractor to establish an acceptable quality level (AQL) for each test. As such, large scale testing over a number of production batches would normally be required to establish the validity of the AQLs selected. Care should be taken by the Contractor in establishing AQLs, as they would become integral to batch production sampling, its cost effectiveness and the level of reliability offered to the user. The method of establishing AQLs shall be stated in the annexed schedule.

6.1.2 Safety Test

No signals when tested as under shall activate.

The signal shall be fixed, in the normal manner, to a section of rail. A steel weight of 11.3 kg, having a hemispherical striking surface of 75mm radius of curvature, shall be dropped centrally on the signal from 100mm height.

6.1.3 Reliability Test

Every signal when tested as under shall activate.

The signal shall be tested by the method of clause 6.1.2 with the exception that the weight shall be dropped from a height of 400mm.

6.1.4 Noise Level Test

Every signal when tested as under shall register a noise level of not less than 150 dB Linear Peak Hold.

The signal shall be treated by the reliability test method as in clause 6.1.3 and the noise level measurements may be performed during the reliability test.

The noise level test shall be performed in a free field environment and the activating apparatus shall be located at a distance not less than 50 metres from any acoustically reflecting surface.

The microphone of the sound level meter shall be located 6 metres from the test signal at a distance of 1.2m to 1.5m above the ground, with the microphone pointed in the direction of the test signal.

The velocity of the wind, if any, during this tests shall not exceed 8 m/sec.

6.1.4.1 Measurement Equipment

The Sound Level Meter shall comply with the Australian Standard AS 1259.1, 'Sound Level Meters' - Type 2.

The Sound Level Meter shall be able to measure the noise level of the detonated test signal in terms of dB linear peak hold (re 2 x 20 exponent-5Pa).

The Sound Level Meter shall be calibrated prior to and immediately after each test program with an appropriate acoustic calibrator or equivalent device.

6.2 Service Trials

The signals which comply with the requirements of Clause 6.1 will be subjected to a 'Running' test as follows:

6.2.1 Running Test

This involves a variety of trains, speeds and rail conditions. Typical conditions include:

Trains Passenger and freight

Speeds Low (below 20 kph, medium (60-90 kph), high (up to 115 kph)

Rail Dry, wet, straight or curved track

All signals shall activate. All signals shall be clearly audible to the train crew involved and to personnel observing the tests alongside the track.

Fragmentation, if any, should be minimal.