



AUSTRALIAN RAIL TRACK CORPORATION LTD

Discipline: Engineering (Track & Civil)

Category: Code of Practice

Electrical Infrastructure

Section 14

Applicability

ARTC Network wide	✓	CRIA (NSW CRN)	
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Primary Source

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Document Status

Version	Date Reviewed	Prepared by	Reviewed by	Endorsed	Approved
2.2	08 Nov 11	Standards	Standards & Procedures Administrator	Track Standards Engineer	Manager Standards

Amendment Record

Version	Date Reviewed	Clause	Description of Amendment
2.0	31 Jul 09		Implementation draft of network wide document which is an amalgamation of the CoP for SA/WA & Vic and NSW requirements.
2.1	18 Jun 10		Banner added regarding mandatory requirements in other documents and alternative interpretations.
2.2	08 Nov 11		Banner added regarding mandatory elements of RISSB National CoP being incorporated

This ARTC CoP has drawn on the Rail Industry Safety and Standards Board (RISSB) National Code of Practice Volume 4, Track and Civil Infrastructure, but is not identical. The ARTC CoP has been subject to Risk Assessment as required by the various State Rail Safety Regulators. The results of these risk assessments have made it necessary to deviate from the RISSB CoP in some areas. ARTC maintains traceability of the differences.

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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.

14 Section 14: Electrical Infrastructure

14.1 Scope

The electrical infrastructure elements considered in this section are based on the topics set out in AS 4292.2 insofar as the operation of non-electric trains in electrified areas and work on or about the electrified area is concerned.

14.2 Operational Signage

Electrification warning signs should be provided as follows:

- a) At track entry from non-electrified to electrified areas.
- b) At road and pedestrian entry and crossing points at station yards, level crossings and general access points to the electrified railway.
- c) On rollingstock, construction/maintenance plant, cranes, structures or other places where workers, passengers or the public could readily approach live equipment.

14.3 Electrical Infrastructure Clearances

Clearances between live electrical equipment and other infrastructure, rolling stock or other equipment should not be less than those defined in Table 14.1 under all design ambient conditions.

Table 14.1 – Electrical Infrastructure Clearances

CLEARANCE CONDITION	1500V DC SYSTEMS	
	Static	Passing
Normal	150 mm	200 mm
Reduced	120 mm	150 mm

Better than normal clearances should be achieved where practical.

Reduced clearances should only be used in cases of extreme difficulty and should be specifically recorded and notified to all relevant railway owners and operators.

Beneath major bridge and building structures a minimum clearance, under all design conditions, of 500mm between live equipment and the structure should be achieved.

14.4 Operation and Control of the Electrical System

Electric control centres should be provided to:

- control and monitor the incoming supplies, load circuits, switching, sectioning arrangements and protection systems for the complete electric system;
- coordinate field activities of electrical workers;
- maintain effective communication continuously with adjacent electric control centres, relevant rail traffic control centres and electric network service control centres.

14.5 Separation Distances from Electrical Equipment

Minimum separation distances are defined in Table 14.2.

Table 14.2 – Minimum Separation Distances

	1500V DC SYSTEMS
General approach safety distance	1.2m
*Minimum approach distance (see note below)	500 mm

**Note: Access within the minimum approach distance should only be carried out by specially accredited and equipped workers or with isolation of the electrical equipment concerned.*

Workers should ensure that they and any equipment or materials they are using do not encroach deliberately or accidentally within the safety distance at any time.

All workers in electrified areas should have appropriate electrification awareness training and accreditation.

Access within the general approach safety distance should only be allowed with the provision of special barriers, procedures and/or competency accreditation.

Exposed metal structures and equipment should be earthed or bonded to the traction earth system or track in locations where accidental contact with live electric traction equipment could occur under normal or fault conditions, so as to limit the step and touch potential under electric traction fault conditions to a safe level.

Where equipment has to be connected to a different earthing system from the traction earth, precautions should be taken to prevent hazard arising from people touching both systems simultaneously (especially under fault conditions) and from the transfer of fault potentials and currents between systems.

The track of non-electrified lines, sidings etc should either be properly electrically isolated from electrified track or be properly electrically integrated with it.

Contact wire heights as detailed in Table 14.3 should be provided.

Table 14.3 – Contact Wire Heights (mm)

	1500V DC SYSTEMS	
	NSW	Victoria
Normal Minimum	4750	5200
Reduced Minimum	4570	4420
Level Crossings	5400	5700
Loading/Unloading areas	4750	5700
Maximum	5800	5700

Reduced minimum heights may be utilised at major over-track structures where it is uneconomic to provide normal heights.

Wire heights should provide for minimum electrical clearances to structures and rollingstock outlined in Clause 14.2.

Wire heights should be recorded and made available to relevant railway owners and operators to ensure interface compatibility.