



**AUSTRALIAN RAIL TRACK CORPORATION LTD**

*This document has been adopted by the ARTC with the permission of the NSW Government and will continue to apply under the authority of the ARTC General Manager Infrastructure, Strategy & Performance until further notice*

**Discipline**  
**Engineering Standard – NSW**

**Category**  
**Signalling**

**Title**  
**Pole Route**

**Reference Number**  
**SMP 41 – (RIC Standard: SC 00 52 00 41 SI)**

**Document Control**

<b>Status</b>	<b>Date</b>	<b>Prepared</b>	<b>Reviewed</b>	<b>Endorsed</b>	<b>Approved</b>
Issue 1 Revision 2	Mar 05	Standards and Systems	Standards Engineer	GM Infrastructure Strategy & Performance	Safety Committee
		Refer to Reference Number	H Olsen	M Owens	Refer to minutes of meeting 12/08/04

## **Disclaimer**

Australian Rail Track Corporation has used its best endeavors to ensure that the content, layout and text of this document is accurate, complete and suitable for its stated purpose. It makes no warranties, express or implied, that compliance with the contents of this document shall be sufficient to ensure safe systems of work or operation. Australian Rail Track Corporation will not be liable to pay compensation in respect of the content or subsequent use of this document for any other purpose than its stated purpose or for any purpose other than that for which it was prepared except where it can be shown to have acted in bad faith or there has been willful default.

## **Document Approval**

The technical content of this document has been approved by the relevant ARTC engineering authority and has also been endorsed by the ARTC Safety Committee.

## **Document Supply and Control**

The Primary Version of this document is the electronic version that is available and accessible on the Australian Rail Track Corporation Internet and Intranet website.

It is the document user's sole responsibility to ensure that copies are checked for currency against the Primary Version prior to its use.

## **Copyright**

The information in this document is Copyright protected. Apart from the reproduction without alteration of this document for personal use, non-profit purposes or for any fair dealing as permitted under the Copyright Act 1968, no part of this document may be reproduced, altered, stored or transmitted by any person without the prior written consent of ARTC.

## About This Standard

This Standard defines the procedures and practices to be followed when working on signalling and communications pole routes.

# Document History

**Primary Source** – RIC Standard SC 00 52 00 41 SI Version 2.0

## List of Amendments –

<b>ISSUE</b>	<b>DATE</b>	<b>CLAUSE</b>	<b>DESCRIPTION</b>
1.1	01/09/2004		▪ Reformatting to ARTC Standard
1.2	14/03/2005	Disclaimer	Minor editorial change

# Contents

<b>1 GENERAL .....</b>	<b>6</b>
<b>2 PREVENTION OF ACCIDENTS .....</b>	<b>6</b>
2.1 RESPONSIBILITY OF LINESMEN IN CHARGE .....	6
2.2 TESTING POLES BEFORE CLIMBING .....	6
2.3 LADDERS USED IN CLIMBING POLES .....	7
2.4 BODY BELTS .....	7
2.5 LINEWIRES .....	7
2.6 LINE POLES, ERECTION, ALTERATION, REMOVAL .....	7
2.7 TEMPORARY POLES TO BE STAYED .....	8
2.8 DANGEROUS POLES .....	8
2.9 LINESMEN NOT TO CLIMB POLES WITH CONDEMNED MARK (X) .....	8
2.10 ERECTION OF POLES OR WIRES IN VICINITY OF TRANSMISSION LINES .....	8
<b>3 SAFE WORKING INSTRUMENT LINE WIRES .....</b>	<b>9</b>
3.1 PRECAUTIONS TO BE OBSERVED WHEN HANDLING .....	9
3.2 TRANSPOSITIONS .....	9
<b>4 SIGNALLING POWER MAINS ERECTED ON RAC POLES .....</b>	<b>9</b>
<b>5 STAY WIRES .....</b>	<b>9</b>
<b>6 CLEARING GROWTH FROM LINE ROUTES .....</b>	<b>10</b>

---

## 1 GENERAL

Suitably accredited linesmen are responsible for the maintenance of the signalling and communications line pole routes on their respective areas, but the signalling maintainer is responsible for the efficiency of the circuits operating over the linewires, and shall become conversant with the methods of installation and maintenance. Linesmen and signalling maintainers shall co-operate fully during testing and fault finding.

Linesmen are to make regular maintenance inspections as programmed by the Maintenance Engineer and TMP of all pole routes on their sections. In addition to the checking of line wire tension, line wire insulation, stay wires, other fittings, clearance over roadways, growth of trees, etc., each pole should be tested and if considered dangerous must be adequately strengthened until renewal is possible.

Linewires used for signalling, safeworking and communications circuits shall be maintained as free as possible from any type of fault. It is the duty of linesmen and signalling maintainers to observe the linewires whilst travelling their areas and take immediate action to rectify any fault or have potential faults attended to promptly.

All line pole route maintenance, testing and faulting shall also be carried out in accordance with:

Booklet S.R.A. 81-12 Line Route Maintenance and Construction. Question and Answers.

## 2 PREVENTION OF ACCIDENTS

**NOTICE - linesmen are not to ascend any pole in course of erection until it has been properly set in the ground and the whole of the earth filled in and rammed.**

### 2.1 Responsibility of Linesmen in Charge

Linesmen in charge of work are to clearly understand that they will be held responsible for seeing that every possible care is exercised to prevent accidents, that all gear is in good order, that any pole used as a derrick is sound, that the hooks of all pulley blocks are moused and that they alone issues orders during the lifting of the pole.

### 2.2 Testing Poles before Climbing

Before any linesman climbs a pole it is to be tested. When working in parties the responsibility for this test rests with the leading or senior linesman in charge of the gang. An effort should be made to force the pole over by pushing against it across the line of the wires. Though this test is not conclusive in the majority of cases, it will be sufficient to disclose any serious weakness in the pole. If there is still any doubt as to the condition of a pole, additional tests should be made:-

- (i) by opening up the ground for a depth of about 300 to 400 mm, and then hitting the edges at the foot of the pole by means of a bar or with a tomahawk to determine its soundness.

- (ii) by applying a force as near the top of the pole as possible. It could be applied by two linesmen using a long pike giving the pole a swing, or by placing a ladder against the pole and applying a push-over as near the top of the pole as possible.
- (iii) by boring wooden poles with an auger bit to ascertain the amount of sound timber.

## 2.3 Ladders used in Climbing Poles

Before using a ladder it must carefully be examined with a view to ensuring that is in sound condition appropriate to the task, and placed in a safe working position. All ladders used should be non metallic and properly fitted with tie-bolts.

Where ladders are used in climbing poles, care must be taken that the bottom of the ladder is secured from slipping. The distance from the base of the pole to the foot of the ladder should be approximately one quarter of the length of the ladder. The ladder should always be tied to the pole at the top, and in any case where there is a liability of the ladder slipping, owing to the unevenness of the ground or unusual spread, the ladder should be also secured by tying to the pole at or near the foot. Linesmen must not stand on the top of the stiles.

On no account must one ladder be placed against a pole and another then rested on its top, nor should ladders be joined together.

Unless under very exceptional circumstances, more than one linesman shall not stand upon a ladder at one time, and where it is necessary to send up additional tools, etc., this should be done by passing down a rope.

Ladders shall not be placed against crossarms as these may break or shift under weight.

## 2.4 Body Belts

A safety belt or body line must always be used when climbing poles.

## 2.5 Linewires

- (i) When handling a line wire it shall be held near to the end to avoid injury due to the line wire flicking.
- (ii) When line wires are being removed from a line pole which is stayed (as at angle or termination) the strain of the stay-wire shall be counteracted by a temporary strut or stay before the lines are cut.

## 2.6 Line Poles, Erection, Alteration, Removal

The erection, alteration, and removal of poles must only be undertaken with an adequate number of linesmen and, should any difficulty arise, the linesman in charge of the work should at once communicate (by telephone if possible) with the Maintenance Engineer

When erecting a new pole in place of another, upon the erection of the new pole the old one is to be, if possible, be securely lashed to it within a few feet of the top, so that it will not be possible for the old pole to fall when linesman are working on it. If this cannot be done, the old

pole is to be temporarily stayed fore and aft and also side-stayed, so that it will be perfectly safe for linesmen to work on it.

The digging out of an existing pole must not be commenced until the linesmen have completed the removal of the wires and descended to the ground. **Under no conditions shall a pole be even partially dug out before or during the time that the linesmen are dismantling the wires from it.** Where the poles are set in concrete they should be cut off at ground level.

## 2.7 Temporary Poles to be Stayed

When temporary poles are erected in connection with any work, they shall be adequately stayed before linesmen are permitted to work upon them.

## 2.8 Dangerous Poles

Nothing is to stand in the way of renewing or adequately strengthening any dangerous poles, and such work shall always be considered as of primary urgency. Records shall be kept showing the date on which poles were condemned and the dates they are renewed.

## 2.9 Linesmen not to Climb Poles with Condemned Mark (X)

Where wood poles have been condemned as dangerous and unfit to climb, they shall be marked with one cross (X), and all linesmen are forbidden to climb any pole bearing such a mark.

If it is necessary to access hardware or linewires attached to the pole then an Elevated Platform vehicle (EPV) is to be used. Refer to Safety Standard A10-02-N111 for elevated work platforms.

## 2.10 Erection of Poles or Wires in vicinity of Transmission Lines

Where poles or wires are to be erected in the vicinity of transmission lines approval is required from the ARTC General Manager ISP or nominated Signalling representative.

The minimum clearance between transmission lines and signalling and communication linewires and poles shall be in accordance with the following table :

VOLTAGE	NOT EXCEEDING A SPAN LENGTH OF		
	60.0m	100m	120m
Up to 650 Volts	1.20m	1.40m	1.50
Above 650 but not exceeding 22,000 volt	1.80m	2.00m	2.10m
Above 22,000 but not exceeding 33,000 volts	2.00m	2.10m	2.30m
Above 33,000 but not exceeding 66,000 volts	2.10m	2.30m	2.60m
Above 66 000 but not exceeding 132,000 volts	3.80m	4.20m	4.70m
Above 132 000 volts	<b>BY APPROVAL</b>		



### **3.1 Precautions to be observed when handling**

Where line wire returns are in use for safe working instruments, under no circumstances must the leading-in wires or jumper wires used at intermediate points be disconnected and reconnected by the linesman without the signalling maintainer being present. When work involving the disconnection of these wires is necessary, the signalling maintainer and linesman must work in conjunction, and the former will be responsible for seeing that the wires are reconnected correctly and the instruments subsequently tested and certified correct.

### **3.2 Transpositions**

Safeworking instrument line wires must not be transposed. Any transpositions found in safeworking instrument line wires must be brought to the attention of the Maintenance Signal Engineer.

## **4 SIGNALLING POWER MAINS ERECTED ON RAC POLES**

Before carrying out any repairs on aerial conductors, and where those conductors carry 120v circuits, or where there is a risk of coming into contact with circuits that carry 120v, the linesman should arrange with the signalling maintainer for the power supply to be cut off during the time the work is in hand.

Where possible, the work should be carried out during the time the section is unoccupied. Insulating rubber gloves must be used by the linesman.

Attention is drawn to the serious risks involved when staff are working on line wires or poles adjacent to power substations, electric power supply lines or other conductors carrying high voltages and, before any work is undertaken at locations where there is any possibility of contact with 'live' conductors, it will be the personal responsibility of the employee in charge of the work to see that the supply is disconnected.

It should be borne in mind at all times that any power conductor must be regarded as 'alive'. Should any doubt exist in this regard, work must not be allowed to proceed until investigations have been made and action taken accordingly. This would include testing for voltage on the wires to confirm disconnection by use of a meter, testing that equipment is no longer functioning.

## **5 STAY WIRES**

A clearance of not less than 50mm must be maintained between stay wires and line wires.

Stay wires to be renewed shall not be removed before the new wires have been fixed unless temporary stay wires are used.

## **6 CLEARING GROWTH FROM LINE ROUTES**

It is the responsibility of all Maintenance Linesmen to ensure that the line route is free from tree and scrub growth.

During patrols of the line route notes should be taken of areas needing attention, and work programs generated to remove excessive tree and scrub growth.

Overhanging branches should also be removed from above the route. If trees growing outside the ARTC boundary are noted as a concern then every effort must be made to contact the property owner prior to any lopping taking place.