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Signalling maintenance

Reference documentation

GE/RT8000	Rule Book
NR/L2/OHS/00110	First Aid at Work
NR/L3/MTC/RCS0216/GH04	Working at Height

Contents

1 Purpose

This module is designed to give guidance to Signalling maintenance staff when considering the type of equipment to use to work at height. It provides a hierarchy for the selection of equipment and techniques to work at height safely.

2 Scope

This document applies to all activities within the Signalling maintenance function performed at height.

~~3~~3 Definitions

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Refer to index.

4 Planning for work at height : Signalling Maintenance

4.1 General

All activities requiring work at height shall be planned, assessed, and where reasonably practical, performed from ground level.

4.2 Pre requisites to planning considerations

4.2.1 Electrical isolation and train working arrangements

When planning work at height adjacent to live electrical equipment arrangements should be in place for isolations or suitable safety clearances are maintained throughout the duration of the work e.g. no person or equipment to come within 2.75 metres of any live 25kV overhead line equipment. These arrangements shall comply with NR/SP/ELP/29987 Working on or about 25kV A.C Electrified lines and NR/WI/ELP/3091 DC electrified lines working instruction as appropriate.

All work on or near the line shall only be undertaken when line are blocked with additional protection as detailed in the RSSB rule book

4.2.2 Temporary Lighting

During periods of darkness, in low-light conditions or during inclement weather, temporary lighting shall be used. An assessment shall be undertaken to establish the most effective lighting from a selection such as self contained lighting on MEWP's, generators with associated tripod/floodlights, personal issue lights/torches, and cap lamps, taking account of the activities to be carried out..

4.3 Planning considerations

4.3.1 General

The first priority shall always be to identify alternatives to carrying out work at height e.g. use of equipment where work can be performed from ground level thus eliminating the risks associated with work at height. However, where there is no alternative and the activity requires working at height the following hierarchy shall be rigidly followed:-

a) MEWP

b) Scaffold

c) Fixed ladders

d) Temporary ladders/Step ladder.

When moving down the hierarchy decisions shall be based on the most appropriate method which can take into account the circumstances e.g. MEWP not being available, duration and nature of task. The person planning the work shall not move down the hierarchy without taking cognizance of all equipment and techniques available.

The information in appendix E identifies the main activities that are required to be carried out at height on Signalling assets and suggests alternative means of access in accordance with the hierarchy. Considerations that shall be addressed when selecting the specific types of equipment are given in clauses 5, 6 and 7

4.3.2 Work at Height Planning Tool

To aid the process a work at height planning tool is attached as Appendix B which can be used if required.

NOTE This tool can be used by those planning working at height so that the level of exposure of risks to staff is minimised

When planning to use scaffolds or ladders the distance from the access point to site of work shall be considered as part of the risk assessment process and kept to a minimum to avoid introducing additional risks into the work process.

5 Working at height equipment

5.1 Mobile Elevated Working Platform (MEWP)

Where MEWP's are planned to be used Personnel shall be trained and competent in the operation of the specific item of equipment and for the task to be undertaken. The operator shall check the certification/inspection records and satisfy themselves that the equipment is within its inspection/service date and there are no obvious defects/damage to the equipment. In the event of a defect or damage being found which has the potential to cause failure it shall not be used. The local manager shall be informed and it shall be quarantined immediately.

Where the MEWP is designed and planned for use on rail all relevant standards shall be complied with.

When in a MEWP harnesses shall be worn at all times and attached via a lanyard to designated anchor points.

MEWP's shall not be used above the maximum windspeed shown on the engineering acceptance certificate or as per training as appropriate.

5.2 Temporary scaffold arrangements

NOTE There are a number of different types of scaffolding including pre fabricated towers, standard tube and clip scaffolding and cantilevered structures etc. Each one has a specific purpose. Aluminium pre fabricated towers are light in weight and severe loading or excessive forces applied to the top of the tower can easily cause them to overturn.

Mobile tower scaffolds shall only be erected and inspected by personnel who are suitably trained and competent. Where the scaffold is to be mounted onto a rail trolley all relevant standards shall be complied with.

Where standard access tube and clip scaffolding is required it shall only be erected by competent contractors. The contractors shall also be responsible for the statutory inspections in accordance with legislation.

Scaffolding, including Mobile tower scaffolds, shall be inspected immediately following erection, every 7 days and after any adverse weather likely to affect the stability e.g. high winds.

Under no circumstances shall anyone working on the platform of a temporary scaffold arrangement work outside the confines of the handrails or attempt to modify the structure.

5.3 Ladder working

5.3.1 Fixed Ladders

Whenever using fixed ladder the climber shall make a visual inspection of the structure and if there are any defects (that affect safety whilst climbing) the proposed use of ladders shall be abandoned and other means of executing the work explored. The climber shall consult with their manager/on call manager as applicable.

Persons climbing all types of ladders shall wear a body harness.

Where ladders are fitted with an integral rail lock system and the climber is competent iin its use this shall be used as a method of permanent attachment.

For structures below 4.5 metres the wearer can climb without attaching themesleves. However, once the working area is reached they shall attach themselves using a work positioning belt and restraint lanyard to prevent falls

For structures over 4.5 metres in height the climber shall be attached at all times via a suitable lanyard to the structure.

Three points of contact shall be maintained at all times whilst ascending / descending. A tool belt or similar device which allows hands to be free to hold ladder rungs shall be used.

Ladders shall not be used by persons working alone.

5.3.2 Portable/Temporary Ladders

5.3.2.1 General

When considering the use of temporary ladders/step ladders for work on Signalling assets, work activities Shall be limited to tasks of a minor nature with a total duration of 30 minutes.. Examples of other tasks of a similar nature may be carried out as required providing the safety criteria detailed in appendix E has been met.

The loading of ladders shall not exceed the following;

- Class 1 (Industrial) Maximum static load – 175kg (27.5 stone)
- EN131 (European Standard) Maximum static load – 150kg (23.5 stone)

Ladders shall be inspected prior to use in accordance with the guidance in appendix A

No items of equipment shall be carried by the user which prevents him maintaining 3 points of contact. A tool belt or similar device which allows hands to be free to hold ladder rungs shall be used.

Domestic and aluminium ladders shall not be used on infrastructure with 25kV or 1500dc overhead line or 650/750 dc 3rd /4th rail systems unless special arrangements have approved by the relevant E&PME.

5.3.2.2 Requirements for erection of a portable/temporary Ladder.

The following applies when erecting ladders:

a) A minimum of 2 persons shall carry the ladder horizontally below waist height (at a comfortable height for the persons carrying).

b) The ladder should only be erected when arrangements have been made for any line blockage or area accessible by the general public cordoned off

c) When erecting the ladder a suitable temporay anchor point shall be identified at the bottom to attach a rachet/strap. Where no anchor option exists at low level, the ladder shall be footed temporarily whilst the ladder is made secure at its head..

d) The ladder shall be extended one metre (3 rungs) above the landing point, and angled at 75 degrees to the vertical.

NOTE If the ladder does not have the clearance above the landing point a longer ladder Shall be required.

e) Ladders should not be used in strong winds. An assessment shall be made on arrival on site. If the wind conditions are excessive taking into account gusts, ladders shall not be used.

NOTE: site conditions Shall dictate windspeed e.g. whilst prevailing winds can be high, if the site is in a cutting with low wind speed then ladder work can be considered. Where appropriate a hand held anemometer shall be used for this purpose. The beaufort scale, shown in appendix D, gives an indication in terms of movement of trees etc at certain windspeeds.

f) Where ladder have been erected ladders shall not be left unattended.

5.3.3 Working from Step Ladders

The following requirements apply when using step ladders.

a) Class 1 (Industrial) or EN131 compliant step ladders or combination units shall be utilised for access needs.

b) BS7377 compliant kik steps may be utilised for low level Work at Height activities.

c) Tubular metal steps on castors with a built in platform shall have at least one side handrail to platform. Such assets are used in equipment rooms and in Store Locations. They shall be capable of remaining in place when a persons load is applied.

5.4 Safety Harnesses

5.4.1 General

Harnesses should generally be issued on a personal basis to trained and competent Signal Maintenance personnel working at height. Harnesses and associated equipment shall be uniquely identified and examined in accordance with legislative requirements. Records shall be maintained locally to demonstrate in date compliance. Lanyards and rescue equipment Shall be issued by Section Managerslocally to demonstrate in date compliance.

5.4.2 Inspection and Examination Certificates

Safety harnesses shall be inspected by the user prior to use and by a competent person every six months. A record of inspections shall be maintained. When checking the harness these three key elements shall be observed:

- Webbing - Check webbing for cuts, abrasions and exposure to chemicals.
- Stitching - Check stitching for cuts and abrasions. Pull at any seams to expose threads for inspection.
- Hardware - Check the hardware or metal parts for breaks and corrosion. Make sure all parts are functioning well and are in good order.

Defective harnesses shall be withdrawn from service immediately and destroyed in such a way to prevent unintentional reintroduction into the workplace.

If used for emergency purposes i.e. a fall occurs, the harness and any lanyard or other attaching equipment shall be immediately taken out of service and remain so until inspected by an approved examiner.

6 Rescue arrangements

Before commencing work the team leader shall check that the rescue arrangements as detailed in Appendix C have been provided for and briefed to staff on site.

Any staff required to use fall arrest equipment for working at height shall also be suitably trained and competent in the use of rescue equipment which shall be taken to site and available for use at all times.

Any staff trapped within a MEWP through plant failure whilst at height,Shall be recovered by competent person working within the group utilising emergency release facility.

7 Welfare and First Aid

Welfare arrangements shall be in place and agreed locally.

First aid arrangements shall be in compliance with the Network Rail Infrastructure Maintenance first aid risk assessments.

Appendix A
Ladder Inspection Prior To Use

Before using a ladder the following shall be taken into account:

- Does the ladder have an approved identification tag and is within the inspection date?
- Are the rungs intact?
- Are the stiles intact (no visible splits or cracks)?
- Are the ladder guides in place (or extending section)?
- Are the catch clips on an extending ladder intact?
- Is the rope attached, in good condition and runs through the two pulleys at the bottom?
- All under wires are present and secure?
- There are no splinters likely to cause injury?
- The extension operates freely?
- In the event of any defects being found the ladder shall be taken out of service immediately and quarantined, a '*do not use*' label shall be attached until such time as the ladder can be fully inspected. Defective ladders shall be destroyed in such a way that prevents unintentional reintroduction into the workplace.

If used for emergency purposes i.e. a fall occurs, the harness and any lanyard or other attaching equipment shall be immediately taken out of service and remain so until inspected by an approved examiner.

Whenever using temporary/mobile ladders the following precautions **shall** be observed:-

1. As the climber you shall make a visual inspection of the location where the head of the ladder Shall be placed. If there are any defects the proposed use of ladders shall be abandoned and other means of executing the work explored consulting your manager/on call manager as applicable.
2. The user shall not carry any item in his her hand as both hands shall be used for climbing/ascending the ladder. Three points of contact at all times whilst ascending/descending. Small hand tools can be carried on tool belts.

Any activity on a step ladder is to be deemed inspection or short term duration activity, ie not to exceed 30 minutes.

Appendix B
Work at Height Planning Tool

Name of person planning work:	**Position:**	**Location:**	**Date:**
Date of Work:	**Location of Work:**		
List work to be carried out:			

Work at Height Control Hierarchy – please select the appropriate control measure;

Control	✓ if selected	Justification for selection – give details of why a control higher up the hierarchy has not been selected.
Avoidance – i.e. can the work be lowered to the ground?		
Fall prevention - through using existing fixed safe structures.		
Fall prevention – by use of equipment such as MEWP's, scaffolds.		
Fall prevention – by use of work equipment that that protects the individual, e.g. work restraint harness.		
Fall prevention – If harness cannot be used carry out and record risk assessment.		
Mitigate falls by using work equipment to minimise distance/consequences i.e. nets or soft landing systems.		
Mitigate falls by using work equipment to minimise distance/consequences i.e. personal fall arrest system.		
Mitigate falls by using work equipment to minimise distance/consequences through training, instruction, inspection of equipment etc.		

Lighting on site shall be suitable and sufficient so that personnel are able to view all aspects of the tasks being carried out.

Where ladders are to be used, please indicate the following;

How Shall the ladder be secured?.....

Harness anchor points……

Site specific Rescue Plan;

The generic rescue arrangements are detailed in appendix C of this procedure. Where addition requirements are identified these shall be listed below;

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Rescue equipment be on site ? Yes/No ……………….. **Where located ?** ……………………………

Rescue equipment type ?... (i.e. Arbil/belay system etc.)

Has everyone involved in the work been trained/assessed on the use of this rescue equipment ?
Yes/No ……………………….. If 'No' work at height shall not proceed.

Signed……………………………………………….. **Print name**……………………………………………

Designation…………………………………………. **Date**…………………………………………………

Appendix C
Basic Rescue Plan

This plan details the arrangements for the rescue or recovery of a person suspended from Fall Arrest equipment when working from a ladder. The plan outlines the principles required, highlighting tools or equipment necessary for implementation and acts as a guide to rescue or recovery but is not exhaustive. This plan shall be amended to reflect other location specific hazards that may be present.

The principles adopted consider the requirements of Health & Safety legislation and shall be subject to review and update as necessary.

It would be very difficult to provide detailed actions for every conceivable situation, for that reason and for the purposes of simplifying the documentation of the plan, a number of scenarios have been included to display the requirements. Where appropriate site specific information should be added to this rescue plan within the Work at Height Planning Tool (Appendix B).

Emergency Situation	**Actions**
1) Member of staff working at height has fallen from the ladder and is suspended from their safety harness, unhurt.	The member of staff concerned remounts the ladder, descends to ground level and is checked by the first aider for injury/shock. If either the individual who has fallen or the first aider is concerned with regard to any injury, then professional medical attention shall be sought immediately. The Team Leader re-assesses the method of work and report the incident to Control/Line Manager.
2) Member of staff working at height has fallen from the ladder, is unhurt, but is suspended from their safety harness and cannot return to the ladder by their own actions.	Ground staff should immediately attempt to assist the member of staff using resources available on site e.g.Ladder, MEWP. If this is not possible or successful, the rescue equipment on site shall be used If either the individual who has fallen or the first aider is concerned with regard to any injury, then professional medical attention shall be sought immediately. The Team Leader re-assesses the method of work and report the incident to Control/Line Manager.
3) If the member of staff has fallen from the ladder and sustained some injuries.	Ground staff Shall be required to make a decision, relative to those injuries, to call the Emergency Services and then carry on with the rescue / recovery process; the rescue equipment on site should be utilised, in remote mode if necessary, to lower them to the ground. Work should stop, the casualty dealt with in a manner appropriate to the seriousness of their injuries. If either the individual who has fallen or the first aider is concerned with regard to any injury, then professional medical attention shall be sought immediately. The Team Leader shall report the incident to Control/Line Manager.

Appendix D
Beaufort Wind Scale

Force	Mile/hour	Description	Specification for use on land
0	0-1	Calm	Calm; smoke rises vertically.
1	1-3	Light air	Direction of wind shown by smoke drift, but not by wind vanes.
2	4-7	Light breeze	Wind felt on face; leaves rustle; ordinary vanes moved by wind.
3	8-12	Gentle breeze	Leaves and small twigs in constant motion; wind extends light flag.
4	13-18	Moderate breeze	Raises dust and loose paper; Small branches are moved.
5	19-24	Fresh breeze	Small trees in leaf begin to sway; crested wavelets form on inland waters.
6	25-31	Strong breeze	Large branches in motion; Whistling heard in telegraph wires; umbrellas used with difficulty.
7	32-38	Near gale	Whole trees in motion; Inconvenience felt when walking against the wind.
8	39-46	Gale	Breaks twigs off trees; Generally impedes progress.
9	47-54	Severe gale	Slight structural damage occurs (chimney-pots and slates Removed).
10	55-63	Storm	Storm Seldom experienced inland; trees uprooted; Considerable structural damage occurs.
11	64-72	Violent storm	Very rarely experienced; accompanied by wide-spread Damage.
12	73-83	Hurricane	"

Appendix E
Hierarchy for the selection of the appropriate plant and equipment for working at height within the Signalling maintenance function

The actual activity detail and work content shall be taken into consideration when selecting the plant and equipment.

Activity	First Preference for Working	Second Preference	Third Preference	Specific Do's / Dont's
Colour Light Signal Maintenance	Fixed Ladder*	MEWP	Scaffold	Do use the appropriate fall arrest equipment for the preference chosen.
Semaphore Signals	Fixed Ladder*	MEWP	Scaffold	Do use the appropriate fall arrest equipment for the preference chosen
Banner Repeater Signals (Inc: Theatre Signals / RA and OFF Indicators)	Fixed Ladder*	MEWP	Scaffold	Do use the appropriate fall arrest equipment for the preference chosen
Route Indicators	Fixed Ladder*	MEWP	Scaffold	Do use the appropriate fall arrest equipment for the preference chosen
Trackside Apparatus Case (Where at Height)	Fixed Ladder*			Do use the appropriate fall arrest equipment for the preference chosen
Road Lights, Road Signs & Audible Warnings	Work from Ground	Ladder*	Scaffold	Do use the appropriate fall arrest equipment for the preference chosen
Lever Frames and associated Locks and Circuit Controllers	Step Ladder (For below Signalbox floor level, and with harness and lanyard from above)			Do use the appropriate fall arrest equipment for the preference chosen

Activity	**First Preference for Working**	**Second Preference**	**Third Preference**	**Specific Do's / Dont's**
Swing Bridges (Refer to TRCS GA022)	Harness / Lanyard Restraint	Scaffold		Do create an exclusion Zone at each end of the bridge. Do use the rail as the clipping on point. Do use a restraining lanyard if working at the end of the open ends. If working on the outside of the structure, use a work positioning lanyard with a second person and rope controlling the lowering. User sgall be secured to an authorised clipping on point.