Transport for London
London Underground

Access

Protecting Workers on the Track Traffic Hours and Depots

Learning information booklet

Issue 2

Effective 1st March 2015

MAYOR OF LONDON

Contents

1 Introduction

This learning information booklet has been produced for individuals accessing the track and providing protection for themselves and others during Traffic Hours and within depots and stabling sidings. It contains information for Protecting Workers on the Track - Traffic Hours (PWT-TH) and Protecting Workers on the Track - Depots (PWT-D).

There are different levels of PWT, you will need to be trained and suitably certificated to work as a PWT in:

- Engineering Hours
- Traffic Hours
- depots
- a possession worksite
- Specified Areas (SA)
- Engineers Current Areas (ECA).

This learning information booklet only covers the activities of the PWT-TH and PWT-D. The following activities are separate modules and are not covered as part of this training:

- securing and unsecuring of points
- defining SA's/protection of possessions
- placing and removing short circuiting devices
- controlling the movement of engineer's trains and mechanised vehicles.

1.1 On successful completion of the training

On successful completion of this training you must arrange an appointment with the Access team and obtain a temporary Internal Verification (IV) number, valid for six months.

The temporary IV number enables the holder to carry out the duties of a lookout or handsignaller (engineering); if the individual is being mentored they can undertake the full duties of a PWT-TH.

Once you have been observed successfully carrying out the protection process on two separate occasions, by an approved assessor, you will obtain a full IV number.

2 Roles and responsibilities

There are different levels of PWT:

Protecting Workers on the Track – Traffic Hours - a person certificated by London Underground (LU) to safely manage worksites and provide protection for themselves and others in Traffic Hours.

Protecting Workers on the Track – Depots - a person certificated by LU to safely manage worksites and provide protection for themselves and others in depots and stabling sidings.

Protecting Workers on the Track – Engineering Hours - a person certificated by LU to safely manage worksites and provide protection for themselves and others in Engineering Hours.

The PWT can be identified with a 'PWT' armband worn on the right arm above the elbow.

2.1 Protecting Workers on the Track – Train Movements

A person certificated by LU to safely manage worksites and to supervise and control the movement of an engineer's train or mechanised vehicle within a SA or an ECA.

A PWT-TM can be identified with a 'Train Movement' armband worn on the left arm above the elbow.

2.2 Protecting Workers on the Track – Possession Worksite

A person certificated by LU to safely manage a possession worksite and supervise and control the movement of engineer's trains or mechanised vehicles.

A PWT-PW can be identified with a 'Possession Worksite' armband worn on the left arm above the elbow.

As a PWT you may have to work with the following individuals:

2.3 Lookout

A person certificated by LU to warn staff who might be exposed to danger from moving trains or vehicles.

A lookout can be identified with a 'lookout' armband worn on the left arm above the elbow.

2.4 Handsignaller (engineering)

A person certificated by LU to control the speed of trains by handsignal, flag or hand lamp, if required for engineering work.

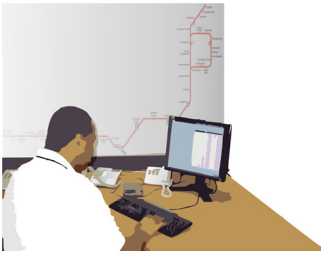
A handsignaller (engineering) can be identified with a 'handsignaller' armband worn on the left arm above the elbow.

2.5 Possession Master

A person certificated by LU to take control of a possession.

A Possession Master (POM) can be identified with a 'Possession Master' armband worn on the left arm above the elbow.

2.6 Controller



A suitably competent person, in overall control of the train service on a line, normally acting from the line's control room.

2.7 Duty Depot Manager / Maintenance Manager Operations

Controls and manages the day to day running of the depot.

3 Appointing a PWT

A PWT must be appointed when staff are working in a group on the operational railway, carrying out or preparing to carry out maintenance/ repair or renewal work, or undertaking inspections or examinations prior to work.

When working alone and part of your activity involves storing material, planned general inspections (PGI), safety surveys or safety tours you will need to be a PWT.

The following work can be carried out without a PWT:

- station cleaning
- vending machine servicing
- bill posting on station platforms
- work on trains by technical personnel or cleaning contractors.

Routine work on stations or trains by uniformed operations personnel does not require a PWT.

3.1 Responsibilities of the PWT

It must be considered at the planning stage if one PWT can take on the activities of both managing the worksite and providing protection or whether to use a separate PWT dedicated to provide the protection. A PWT can be a working member of the work group, as long as this does not interfere with their ability to carry out the protection duties.

As a PWT you will be responsible for the:

- protection arrangements
- work in progress
- discipline
- programme of work
- tools, plant and materials
- first aid and emergency procedures
- general health and safety of the work group.

3.2 'Lead' PWT

There may be scenarios involving single tasks, multi-jobs and multi-tasks; including tasks where a 'Lead' PWT is accountable for the whole worksite and designated PWT's accountable for specific tasks.

On completion of the work the designated PWT must:

- report back to the 'Lead' PWT with the overall accountability for the worksite
- confirm the specific task area is safe for people walking and to a standard required for trains to run.

As the 'lead' PWT with the overall accountability for a worksite, you must make sure that:

- satisfactory protection arrangements are provided when necessary
- the person providing the protection gives a full safety briefing, detailing the protection arrangements
- communications with the person providing the protection are maintained if necessary, by appointing designated PWT's in a multi-task worksite
- the overall worksite is left safe for people walking and to a standard required for trains to run.

4 Planning the work

When planning the work, you must consider the:

- type and location of work
- Site Access Booking for Railway Engineering (SABRE) number
- documentation
- tools, plant and materials
- toolbox briefing and communication
- environmental aspects
- safe isolations
- protection arrangements.

5 Type and location of the work

5.1 Track

You are on or near the track, if you are:

- within two metres of any rail
- on the permanent way
- on a platform ramp.

You are not on or near the track, if you are:

- on a station platform
- in an area guarded by a physical barrier.Physical barriers

The following are approved physical barriers on LU:

- cable run
- chestnut fencing
- netlon fencing
- hoarding
- vortok fencing.

The level part of a platform which is separated from the public area by a barrier, despite not being for public use, is part of the platform and not part of the track.

5.2 Line Clear tunnel sections and Line Safe open sections

The LU system has three different sections:

5.3 Line Clear tunnel sections

Line Clear tunnel sections cover all LU track in the following locations:

- sub-surface tunnels
- tube tunnels
- short sections of track that are either adjacent to, or between two tunnel sections, and are treated as a tunnel section
- sidings in tunnel sections where traction current is switched off in Engineering Hours.

Work in these locations must be carried out during Engineering Hours.

Some open sections can be in the Line Clear tunnel sections.

5.4 Line Safe open sections

Line Safe open sections cover all LU track in the following locations:

- tracks where passenger trains run, that are not classed as tunnel sections or other sections
- stabling sidings in open sections where traction current is switched off in Engineering Hours.

5.5 Other sections

Other sections cover the rest of the track not included in Line Clear tunnel sections or Line Safe open sections, these include:

- non-electrified LU track
- Network Rail (NR) lines, or LU tracks where the approach signalling is under the control of NR
- depots and stabling sidings where traction current remains switched on continuously.

5.6 Station platforms

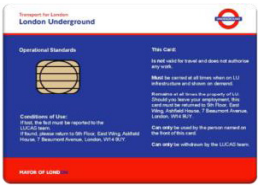
A site and task specific risk assessment must be carried out before working on a station platform. It must be considered that trains are running and traction current is 'on' at all times, unless otherwise confirmed through appropriate protection procedures.

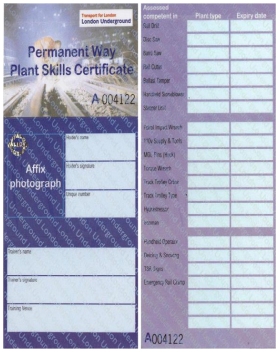
There will be occasions when protection will be required when working on station platforms, this will be covered in section 37.

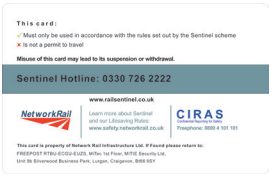
5.7 Type of certification required

As the PWT it is your responsibility to make sure that all personnel in the work group have the appropriate certification for tools, equipment and when on the track.

Different versions of the Access, Health, Safety & Environmental (AHS&E) and track skills certification are presently in circulation.







5.8 Network Rail

Some LU trains may run on or near tracks or stations owned by NR. There may be additional hazards that affect the safety of personnel on the track. Personnel must be certificated and competent to NR standards before accessing any area of the operational railway which is designated as being under NR rules.

The areas where NR certification is needed are:

- Richmond to West of Turnham Green (owned by NR)
- Harrow and Wealdstone to North of Queen's Park (owned by NR but LU certification is valid within Stonebridge Park depot)
- Wimbledon to West of Putney Bridge (owned by LU but NR rules apply due to NR signalling system).

LU certification is not valid for work on either the tracks or the platforms in these areas. If you need to enter these areas, you must have NR certification.

5.9 Lines running close to Network Rail lines

The areas where LU and NR property boundaries run close together are on the:

District line between:

- Upminster to Campbell Road Junction Westbound
- around Kensington (Olympia).

Central line between:

- West Ruislip to North Acton Eastbound
- West Acton to Ealing Broadway Westbound.

Metropolitan and Circle line between:

- Kings Cross to Farringdon Inner Rail
- Harrow on the Hill to Finchley Road Northbound Metropolitan and Northbound Metropolitan Fast.

Hammersmith and City line between:

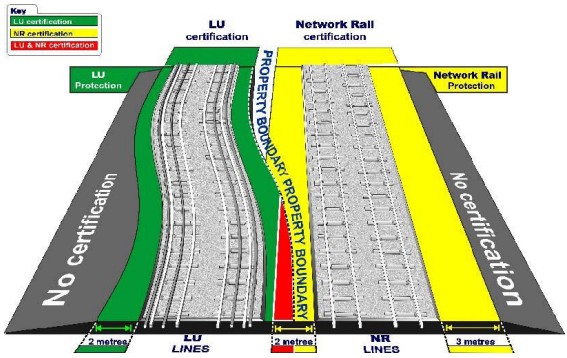
- Paddington to Westbourne Park
- Barking Sidings to Campbell Road Junction Westbound.

Victoria line at:

- Northumberland Park depot road 48.

If you are working in these areas, LU certification and protection applies if you:

- remain on LU property
- do not get closer than 2 metres laterally to the nearest NR running rail.



NR certification and protection is needed if, at any time on:

- LU property, personnel are working within 2 metres laterally from the nearest NR running rail
- NR property, personnel are working within 3 metres laterally from the nearest NR running rail.

NR certification is also needed when you require access through or across NR areas to get to LU assets and come within 3 metres of the nearest NR running rail.

When working close to the through running boundary with NR the appropriate NR protection will be required.

If you are not sure your work group's safety on the track certification is valid at a particular location, you should seek advice from your manager.

5.10 Stations where Network Rail certification is needed

When working on stations belonging to other operators, whether or not LU certification and protection are valid will depend on the location of the worksite.

Other operators' stations are on the:

- District line at Barking, Upminster and Kensington (Olympia) stations
- Central line at Stratford
- Bakerloo line at Queen's Park.

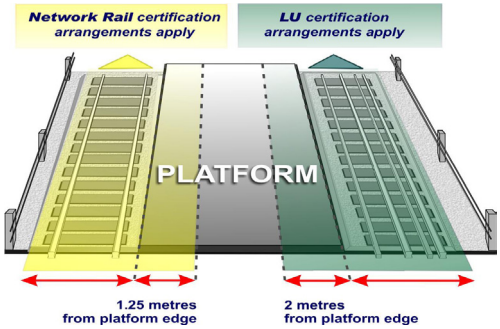
Stations owned by LU where other companies operate are on:

- Metropolitan and Circle lines between Barbican and Farringdon
- Victoria line between Highbury and Islington.

At these stations, LU certification and protection arrangements apply on LU:

- track
- equipment on platforms - unless the work is within 1.25 metres of the NR platform edge.

Platform work within 1.25 metres of the NR platform edge, NR certification and protection arrangements apply.



5.11 Overhead Line Equipment

When on a section of line which is adjacent to or passes over NR lines electrified by 25kv (A.C.) Overhead Line Equipment (OLE) system, always:

- consider the overhead lines and attachments to be ‘live’ at all times
- make sure clothing and any articles being carried are at least 2.75 metres away from anything attached to or hanging down from the OLE equipment
- carry long articles horizontally
- keep paint, water and other liquids well away from where they might be thrown, fall or splash onto OLE equipment
- keep tools and equipment, including ropes, wires, tapes and surveying equipment, well clear of OLE equipment
- take extra care not to come within 2.75 metres from the OLE equipment when on a structure of any kind.

In an emergency involving OLE the following procedure must be followed:

- contact LU controller
- give location and structure number
- nature of emergency
- await further instructions.

When a worksite is near NR lines the following must be considered during planning, whether:

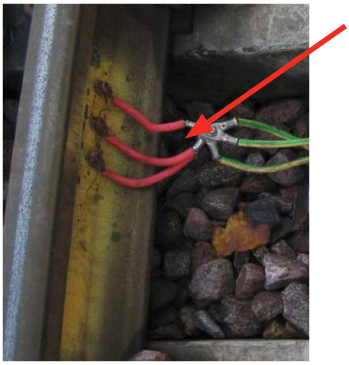
- NR possession or protection is required
- there are any adjacent OLE and if an isolation is required
- the walking routes to and from the worksite are close to NR tracks
- the work group require NR certification
- there are any other relevant factors to consider.

Before allowing personnel to work or walk near NR lines the PWT must make sure that they are briefed on the hazards specific to the area and any additional protection is in place.

5.12 Heathrow Express and London Overground

Heathrow Express and London Overground have been equipped by NR with 25kv OLE for traction supply purposes.

Where LU's infrastructure is in close proximity of these two lines, measures have been taken to immunise LU's infrastructure against any electrical hazards that could possibly emanate from the OLE, and these take the form of red, green and yellow bonds.



Immunisation bonds are found on LU lines that run adjacent to certain NR lines.

Warning signs indicate the 'immunised' areas. In these areas bonds are attached to many lines and structures; you must:

- be briefed by your manager or supervisor on the safety procedures to follow in these areas
- make sure you are familiar with the area before working there
- not remove, cut, connect or disconnect any of the bonds unless authorised to do so.

These areas are on the:

Hammersmith and City lines:

- at Westbourne Park to Paddington (Suburban) on both roads.

Central line:

- between Ealing Broadway to Bridge D29 on both roads
- at the NR bridge which crosses over LU lines at North Acton.

District line:

- at Ealing Broadway, all roads from the platform buffer stop end to the ends of Nos. 24 and 25 siding roads east of the station
- between West end of Earl's Court station to Kensington (Olympia)
- between Turnham Green to Gunnersbury on both roads.

District and Piccadilly lines:

- at Bridge D29 at Hanger Lane Junction

Metropolitan and Jubilee lines:

- at Bridge MR10 and MR10A between West Hampstead and Kilburn

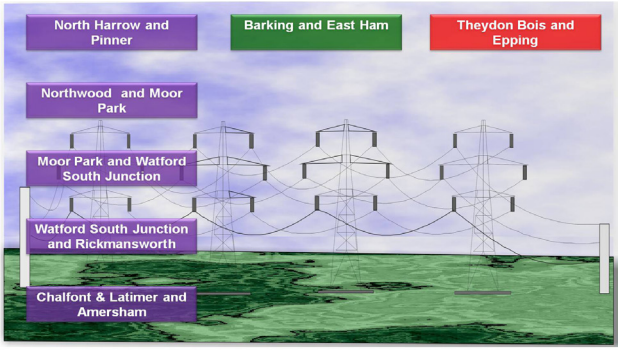
Bakerloo line:

- at Queen's Park.

If you discover a damaged or disconnected bond, you must:

- not touch the bond
- not get closer than 2.75 metres
- tell the LU controller
- warn others working in the area.

5.13 High voltage power lines (National Grid)



If you or anyone in the work group see a line obstructed by fallen wires, you must:

- immediately stop any train from approaching
- keep a minimum safe distance (18m) from the lines at all times
- contact and inform the LU controller.

5.14 Amersham and Harrow-on-the-Hill

Special arrangements apply at Amersham, south of the maintenance boundary on the Up Line and at Harrow-on-the-Hill, north of the boundary on the Northbound Main Line.

At both of these locations the PWT must also be certificated by NR as a Controller of Site Safety (COSS).

For further information refer to leaflet OS No LF09 available on the Network Improvement website.

6 Site Access Booking for Railway Engineering

When accessing the LU infrastructure an approved SABRE number is required for the work being carried out. SABRE numbers are produced from the booking system to control access to the LU infrastructure.

As the PWT you will be given a valid SABRE number by the company you work for.

Urgent work requiring access to the infrastructure must be booked via the Fault Reporting Centre (FRC) or Duty Operations Manager Engineering (DOME) / Duty Operations Engineer (DOE). If granted; an FRC number will be issued.

7 Documentation

As a PWT you will need the following documentation:

- method statement
- risk assessments
- permits and licences required for the work
- relevant Health, Safety and Environment alerts and bulletins
- emergency plans
- relevant drawings
- lifting plan for lifting operations
- Traffic Circular
- Engineering Notice
- scheduled train frequency tables
- line supplement.

7.1 Method statement and work instructions

The following information must be included in a method statement:

- what is to be done
- location – where the work will be carried out
- access and egress
- sequence of the works
- method – how the work will be completed
- commencement date.

The purpose of a method statement is to ensure that the work is carried out correctly, safely and to the required standard.

The following must be included as part of the method statement:

7.2 Resources

The following must be considered:

- PWT
- number of personnel and competence
- plant and equipment
- materials.

7.3 Risk assessments

Risk assessments will be undertaken for the following:

- worksite specific
- job specific
- working at height
- manual handling
- noise
- Control of Substances Hazardous to Health (COSHH)
- environmental issues.

7.4 Control measures

The following control measures maybe required:

- permit to work
- permit to dig
- hot work permits (except depots)
- storage licence
- physical barriers
- signage.

7.5 Personal Protective Equipment

The PWT must be aware of the Personal Protective Equipment (PPE) requirements for the worksite.

7.6 Emergency requirements

The following must be included with the emergency plans:

- emergency evacuation
- first aid
- nearest accident and emergency hospital.

7.7 Monitoring and compliance

The PWT will monitor and enforce the following:

- monitoring the work in progress
- site discipline.

The method statement should include the name and address of the department or company carrying out the works.

8 Risk assessments

A risk assessment is simply a careful examination of what, in your work, could cause harm to people, so that you can decide whether you have taken enough precautions or should do more to prevent harm. The 5 steps to risk assessment are:

- identify the hazards
- decide who might be harmed and how
- evaluate the risk and decide on precautions
- record your findings and implement them
- review the risk assessment.

8.1 Dynamic risk assessment

Before commencing any work, you should spend between ten and twenty seconds looking around, to make sure that you are aware of any hazards that may have been overlooked.

8.2 Specific risk assessments

Specific risk assessments regarding the following must be included in the method statement. It must include information about:

- manual handling
- all chemicals/substances which must have a completed COSHH datasheet prior to use
- hazardous materials e.g. Asbestos, Lead, Silicates (Steadfast), Anthrax, Polychlorinated Biphenyl (PCB), and Mercury.

9 Permits and licences required for the work

9.1 Permit to work

In general you always need a 'permit to work' for work on LU premises. The purpose of the 'permit to work' is to make sure work can be undertaken safely and that everyone can be accounted for in any emergency evacuation.

The 'permit to work' procedure must be used when working at height on roofs or in areas that have confined spaces such as platform inverts.

The only exceptions are:

- emergency work arranged with the FRC
- work shown on a possession, business unit or station works plan.

The PWT's main responsibilities concerning the 'permit to work' are to:

- fill in the 'permit to work' form before arriving at the location of work
- be in possession of the appropriate licences to carry out the work
- make sure all safety or physical isolations have been carried out
- supervise all personnel covered by the 'permit to work' form
- make sure the worksite is cleared after the work is completed
- make sure the area is safe and clear.

9.2 Permit for hot works

Any work involving cutting, grinding, welding or burning is not allowed in any station (whether surface or underground) or in any other sub-surface location without a permit for hot works:

- the permit is submitted by the project manager, and authorised by the accountable manager
- the project manager must submit permit applications at least one week prior to the work
- the single location must be sufficiently compact to be observable by the fire watchperson at all times
- the permit has a unique identifying number, and is valid for one calendar month
- isolation of fire protection equipment details must be indicated on the permit
- the authorised permit top copy must be clearly displayed at the worksite.

Isolations of fire detection equipment may only be carried out by qualified personnel.

The permit requires a trained Fire Watchperson equipped with appropriate fire fighting apparatus, to be in attendance at all times whilst hot works is in progress.

9.3 Fire Watchperson

Before work starts, the Fire Watchperson must:

- book in separately with the station supervisor
- be aware of others working in the area
- carry a hand held radio
- advise the adjacent station(s) when hot works are carried out in tunnels
- carry out safety checks

- have at least 2 x 9 litre AFFF, 1 x 2kg Co2 extinguishers and 1 fire blanket
- make sure the worksite is sufficiently compact to be observed
- have access to the rear of the walls and partitions in order to monitor and control the effects of hot works
- flammable materials must be at least 15 metres from the worksite
- fire extinguishers must be placed in a prominent position on exit route.

The Fire Watchperson must:

- carry their training certificate at all times whilst on duty
- be present throughout the duration of the work, hot works should cease immediately if they have to leave
- not become distracted
- remain at the worksite for at least one hour after the hot working is complete, or until the fire detection equipment has been re-instated, whichever is the later
- make sure that the site is left clean and tidy, as well as safe
- book out with the station supervisor.

If hot working in a tunnel and the Fire Watchperson is required to remain on site for a minimum of one hour and protection is required to be removed, the PWT must ensure the Fire Watchperson is briefed that they must remain on the platform once protection has been removed. If a fire is discovered or suspected, the Fire Watchperson must inform the station supervisor immediately. This only applies in Engineering Hours or in a possession, not for Traffic Hours.

9.4 Storage licence

The reason for storage licensing is to exercise control over the types of materials and the duration of storage at a location, for legal and safety reasons. There are very strict constraints and penalties in place on unauthorised storage at all LU property, therefore:

- all storage must be in accordance with the current procedures
- to store any item on station premises you must first obtain a storage licence issued by the landlord or manager of the premises, and it is only valid for a set period of time
- storage licences must show items allowed to be stored and must be clearly displayed at the location.

9.5 Stores for hazardous materials

The three storage areas allowed are:

9.6 Permanent store

Is a storage area that is designed to contain a fire and to prevent an external fire penetrating it. It must be fitted with automatic suppression system and be compartmentalised. The design and construction must meet the specific requirements of the Fire Precautions (Sub-surface Railway Stations) (England) Regulations.

9.7 Temporary store

A temporary storage area that has similar fire resisting capabilities to a permanent store but might not fully meet legislative requirements in all respects, in which case, an exemption must be sought.

9.8 Portable store

A container designed for the storage of flammable materials. It must meet all of the fire resisting requirements of a permanent store but will have no fire protection or automatic suppression system fitted within it.

Storage of flammable materials:

- should be kept to a minimum and restricted to essential supplies
- can be stored loose in a permanent or temporary store
- can be stored in a portable storage bin provided it does not also contain flammable liquids.

9.9 Storage of flammable liquids

- Flashpoint above 55°C (except diesel) - unlimited storage in metal screw-topped containers.
- Flashpoint between 55 and 21°C (including diesel) - maximum of 75 litres, in 3 x 25 litre red, metal screw-topped containers.
- Flashpoint between 21 and 0°C - maximum 1 litre, in 2 x ½ litre red metal screw-topped containers.

Flashpoint below 0°C - No storage or use below ground.

9.10 Hazards associated with Liquefied Petroleum Gas

Liquefied Petroleum Gas (LPG) is:

- heavier than air and can sink into pits, platform inverts and sump rooms
- extremely flammable.

9.11 Using Liquefied Petroleum Gas

The use of disposable cartridges on blow lamps is permitted, subject to the following conditions:

- the blow lamp must be of a design approved by the engineering client responsible for the work
- one cartridge plus a spare may be taken below ground and all, including empty ones, must be removed after use
- blow lamps must never be left unattended
- 4.5kg sized rechargeable cylinder is permitted, but only one can be used, no spare.

9.12 Gas cylinders

Gas cylinders may be used below ground, but only in Engineering Hours and with a permit for hot works.

Under no circumstances may gas cylinders be stored below ground.

These requirements are set out in the contract QUENSH conditions.

9.13 Fire legislation

Premises within LU are covered by one of the following legislation:

- The Regulatory Reform (Fire Safety) Order
- The Fire Precautions (Sub-surface Railway Stations) (England) Regulations.

The Fire Precautions (Sub-surface Railway Stations) (England) Regulations covers sub-surface railway stations.

To ensure the highest standards, training is a priority. Anyone who is employed to work on stations other than a member of the station personnel must be given instructions in the fire precautions to be observed in the course of their work, and action to be taken by them in case of fire alert and evacuation of the premises.

9.14 Emergency routes and exits

The Regulatory Reform (Fire Safety) Order, Regulation 14 states:

(1) Where necessary in order to safeguard the safety of relevant persons, the responsible person must ensure that routes to emergency exits from premises and the exits themselves are kept clear at all times.

(2) The following requirements must be complied with in respect of premises where necessary (whether due to the features of the premises, the activity carried on there, any hazard present or any other relevant circumstances) in order to safeguard the safety of relevant persons:

- emergency routes and exits must lead as directly as possible to a place of safety
- in the event of danger, it must be possible for persons to evacuate the premises as quickly and as safely as possible
- the number, distribution and dimensions of emergency routes and exits must be adequate having regard to the use, equipment and dimensions of the premises and the maximum number of persons who may be present there at any one time

- emergency doors must open in the direction of escape
- sliding or revolving doors must not be used for exits specifically intended as emergency exits
- emergency doors must not be locked or fastened that they cannot be easily and immediately opened by any person who may require to use them in an emergency
- emergency routes and exits must be indicated by signs; and emergency routes and exits requiring illumination must be provided with emergency lighting of adequate intensity in the case of failure of their normal lighting.

9.15 Combustible matter

The Fire Precautions (Sub-surface Railway Stations) (England) Regulations, Regulation 7 states:

- all parts of station premises must be kept clear of any accumulation of combustible refuse or other combustible matter
- any area set aside for storing combustible refuse in station premises pending disposal must be separated from other parts of the premises by fire-resisting construction.

9.16 Materials used in internal construction of premises

The Fire Precautions (Sub-surface Railway Stations) (England) Regulations, Regulation 8 states any material which is used in the construction of an internal wall or ceiling in any public area must be of limited combustibility.

To inhibit the spread of fire within the premises, any material which is applied to the surface of an internal wall or ceiling in any public area must:

- adequately resist the spread of flame over the surface
- have, if ignited, either a rate of heat release or a rate of fire growth, which is reasonable in the circumstances.

9.17 Compartmentation

Compartmentation means the fabric of each room or area must meet a one-hour fire resisting standard. This includes the walls, floors, ceiling and doors, ventilation and cable access points and should be able to confine a fire in that space for at least one hour period. Regulation 7 (2) requires:

- fire resisting construction
- resistance of heat/fire of no less than one hour
- separate fire risk areas from public access
- that doors must be fitted with self closing devices
- 'Fire Door Keep Shut' is shown on each face of the door
- the construction follows station compliance fire plans.

Any breach of the fire compartmentation must be reported to the station supervisor immediately.

9.18 Contraventions

The enforcing authority, the London Fire and Emergency Planning Authority (LFEPA) have appointed the London Fire Brigade (LFB) to be responsible for inspecting LU stations. They may visit at any time either announced or unannounced, to check that the regulations are being complied with. This includes:

- rubbish being allowed to accumulate
- the means of escape is obstructed
- evidence of smoking
- smoke detector being covered
- fire alarm notice missing or defaced
- holes knocked into compartmented walls and not filled with fire resistant material
- door closers disconnected or faulty
- 'fire door' notice missing.

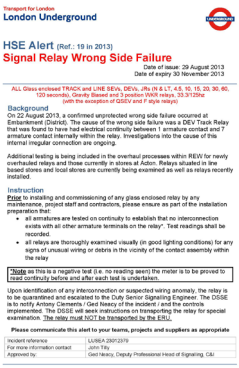
9.19 Movement of materials licence

Materials used in worksites at stations can damage lifts and escalators if not transported correctly. This damage may not be immediately apparent. It is a requirement of LU that you obtain a Movement of Materials (MoM) licence, if you need to move materials by lifts or on escalators.

10 Health, Safety and Environment alerts and bulletins

HSE alerts are for major faults that could result in serious or fatal injury and where immediate remedial action is required.

HSE bulletins will alert you to safety issues related to health and safety in the workplace.



Transport for London
London Underground

HSE Alert (Ref.: 19 in 2013)
Signal Relay Wrong Side Failure

Date of issue: 29 August 2013
Date of expiry 30 November 2013

ALL Glass-enclosed TRACK and LINE SEVs, DEVs, JRs (N & LT, 4.5, 10, 15, 20, 30, 60, 120 seconds), Gravity Biased and 3 position VWR relays, 33/3125hz
(with the exception of QSEV and F style relays)

Background
On 22 August 2013, a confirmed unprotected wrong side failure occurred at Embankment (District). The cause of the wrong side failure was a DEV Track Relay that was found to have had electrical continuity between 1 armature contact and 7 armature contact internally within the relay. Investigations into the cause of this internal irregular connection are ongoing.

Additional testing is being included in the overhaul processes within REW for newly overhauled relays and those currently in stores at Acton. Relays situated in line based stores and local stores are currently being examined as well as relays recently installed.

Instruction
Prior to installing and commissioning of any glass enclosed relay by any maintenance, project staff and contractors, please ensure as part of the installation preparation that:

- all armatures are tested on continuity to establish that no interconnection exists with all other armature terminals on the relay*. Test readings shall be recorded.
- all relays are thoroughly examined visually (in good lighting conditions) for any signs of unusual wiring or debris in the vicinity of the contact assembly within the relay

*Note as this is a negative test (i.e. no reading seen) the meter is to be proved to read continuity before and after each test is undertaken.

Upon identification of any interconnection or suspected wiring anomaly, the relay is to be quarantined and escalated to the Duty Senior Signalling Engineer. The DSSE is to notify Antony Clements / Ged Neacy of the incident / and the controls implemented. The DSSE will seek instructions on transporting the relay for special examination. The relay must NOT be transported to the ERL.

Please communicate this alert to your teams, projects and suppliers as appropriate

Incident reference	LU/BSA 2501279
For more information contact	John Tilly
Approved by:	Ged Neacy, Deputy Professional Head of Signaling, C&I

Transport for London
London Underground

HSE Bulletin (Ref.:21 in 2013)
Injury from Broken Conductor Rail Pot

Date of issue: 16 September 2013
Date of expiry: 03 March 2014

Background

An Engineer working on the Upminster Depot Upgrade recently sustained an injury to his right wrist with six tendons severed and had to be rushed to A&E. The injury occurred when his wrist came into contact with a broken ceramic conductor rail pot on a loaded pallet which the Engineer was attempting to move in order to reach a drainage cover beneath.

Instruction

Persons working on or about the track should be mindful of the potential for injury from broken ceramic conductor rail pots while manual handling or working in close proximity to them.

Pre-work checks of track locations must include a check for the presence of broken ceramic pots. Where broken or damaged ceramic rail pots are found on site, arrangements are to be made for the immediate safe storage, temporary quarantine and / or disposal. Appropriate hand protection must be worn during handling. Do not walk by!

Please communicate this alert to your teams, projects and suppliers as appropriate

Incident reference	ERF 49753
For more information contact	Maria Creole (020) 7918 3784
Approved by (HSE Snr Manager)	James Terry

F0055 A4 August 2013

MAYOR OF LONDON

11 Emergency plans

The following information applies to everyone working in the Line Clear area or requiring access through it to reach locations outside the Line Clear area.

11.1 If you discover a fire

As the PWT you should make sure the work group is briefed on the actions to take if any member of the work group causes or discovers a fire, they must raise the alarm immediately.

As the PWT you must:

- tell the controller a fire has broken out, giving the exact location and nearest entry point and request the attendance of the fire brigade
- follow the evacuation procedure.

11.2 Evacuating the Line Clear / Line Safe area

When evacuating a site you must:

- alert all members of the work group and proceed to the 'Staff Assembly Point' (SAP) by the quickest and safest route
- tell other persons met, for example, mobile personnel to evacuate to the nearest SAP
- use the nearest alternative safe exit, if the evacuation route is blocked
- make sure that everyone is accounted for.

11.3 Work party becomes separated

You must brief the work group on the actions to take if they become separated during the evacuation. The group without the PWT must appoint a person to supervise the evacuation and this person must:

- make sure that everyone in this group leave the site in an orderly manner by the nearest safe route to the SAP
- tell the controller
- contact the station supervisor during Traffic Hours when all members of the separated work group are accounted for.

11.4 Members of the work group are unaccounted for

If any member(s) of the work group are missing you must:

- establish who is missing
- make sure the fire brigade have full details of any missing personnel
- inform the TAC (in Engineering Hours) the details of any missing personnel
- inform the station supervisor (in Traffic Hours) the details of any missing personnel
- inform the DDM/MMO in a depot.

If the Rendezvous Point (RVP) is located at a staffed station, a member of the station personnel will meet the fire brigade. If this is not possible, or it is an unstaffed station, or not a station, the PWT may have to nominate a member of the work group to meet the fire brigade at the RVP.

11.5 After the incident

The PWT should review the situation and decide on any further action with the incident officer if one has been appointed. The PWT should consider:

- any assistance that might be required immediately at the SAP, including first aid
- the need to make sure that any missing persons are accounted for

- any unsafe condition on the track, or damage to equipment that might have occurred, or been left as a result of the evacuation
- the location of tools, plant and equipment that had to be left when the site was evacuated
- the need to continue with the work on the advice of the emergency services
- the requirement to provide a full report of the incident to the manager of the persons involved.

The PWT must follow the incident reporting procedure and provide an incident report as necessary.

For other serious incidents (for example flooding, gas leak, toxic chemical spillage, or tunnel collapse) the requirements of this section must be followed.

11.6 First aiders

The PWT must make sure that first aid provisions are available for the worksite.

11.7 Spill kits

The purpose of spill kits is to soak up all spills, drips or leaks and to prevent pollution of the environment. Spill kit(s):

- required will depend on the material to be used
- should be provided near storage areas and filling points
- come in different size containers or bags and contain the instructions and an assortment of absorbent materials. These containers are not for the purpose of disposing the waste spillage and are only for storing clean spill kits.

If a spillage or leak occurs, you must:

- identify the material and select the correct spill kit
- wear appropriate PPE
- protect any drains with an absorbent sock or boom
- soak up the spillage with absorbent mats or granules
- when the spill has been absorbed, the used spill kit should be temporarily disposed of in the waste bags provided ready to be stored in an approved store awaiting collection
- report the spill and complete an Electronic Incident Report Form (EIRF)
- ensure a new spill kit is ordered.

11.8 Fire fighting equipment and isolations

Fire extinguishers used on LU premises are:

- water
- AFFF
- CO2
- wet chemical
- fire blanket
- powder in depots and vehicles only.

Fire extinguishers are red in colour and have colour coded labels.

11.9 Incident management and reporting

As a PWT if a hazard is brought to your attention you must:

- investigate and make an assessment of the situation
- arrange remedial action as required
- avoid argument if at all possible, but if necessary, insist on safety and report the incident to your manager
- complete your company's incident reporting process.

The following accidents and incidents must be reported:

- all injuries
- near hits
- all hazards
- crime
- fires
- structural failures
- environmental.

There is a legal duty to report all incidents immediately and the PWT must make sure that the personnel, who witness the incident stay at the site until the responsible manager or British Transport Police (BTP) tell them they can leave.

That the only exceptions to this are if:

- the area is unsafe
- the area has to be evacuated
- personnel need medical attention.

As a PWT you must make sure that all incidents are reported as instructed by their company incident reporting procedure.

If you see anything unsafe or see anyone in danger, take immediate corrective action to put it right as the observer always sees more.

11.10 Emergency arrangements

When planning the work, the following emergency arrangements must be considered:

- who will be the designated person to handle an emergency
- what this person must do (i.e. contact the controller, arrange for first aid, meet the emergency services)
- how the controller is to be contacted
- how the DDM/MMO will be informed in a depot
- making arrangements to make sure the track is safe.

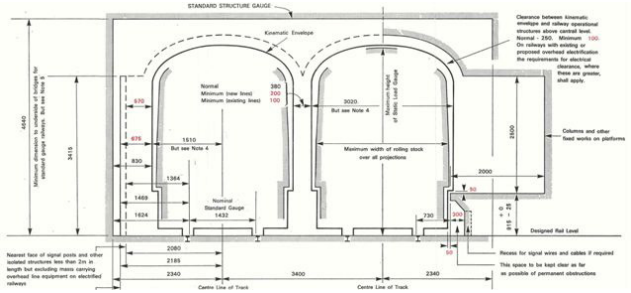
When you contact the controller, they will want to know:

- your name
- contact number
- location
- the nature of the emergency.

In the depot the DDM/MMO must be informed at the earliest opportunity once the controller has been informed.

12 Details of the work

12.1 Drawings



The PWT must study and understand all clearance approval and project drawings. Drawings and other maintenance instructions must be kept up to date and made available to personnel.

12.2 Lifting plans for lifting operations

Heavy lifts involving cranes and other complex lifts using chain blocks will require:

- lifting plans,
- competent person,
- qualified banksman or slinger.

A banksman or slinger is defined as a competent person capable of:

- selecting and attaching/detaching lifting tackle to/from the load
- directing the movement of loads by crane power within the safe system of work.

The banksman or slinger must be suitably certificated.

13 Tools, equipment and materials

13.1 Track trolleys

All track trolleys must be approved by LU before use.

When track trolleys are being used, including motorised, ironmen and railcycle track trolleys, you must:

- set up a safe system of work covering the movement of the track trolleys
- at the start of the shift, tell the appropriate signaller the requirement to secure points
- make sure that a certificated track trolley operator accompanies each track trolley
- inform the track trolley operator(s) about track cant, curvature and gradient
- make sure that the operator(s) takes responsibility for placing the track trolley(s) on the track and removing them after use
- control the movement of track trolley(s) being used in close proximity to each other to make sure safety is maintained
- brief everyone on how and where the track trolley(s) are to be used
- make sure no one rides on a track trolley unless it is a requirement detailed in the method statement
- on completion of the work, confirm to the appropriate signaller that all points have been unsecured and the points are to be tested.

If a railcycle track trolley is being used, the operator must be certificated to protection level.

13.2 Carrying scaffolding or towers

When track trolleys are used to transport scaffolding or towers, a safety plan must be provided. The information within the safety plan must include:

- the number of track trolleys to be used
- stability factors of the scaffolding or tower when being used and when being moved, taking into account track gradient, cant and curvature
- clearances from overhead structures or cables
- the competence of those erecting and dismantling the scaffolding or tower
- the safety of all personnel involved in the task.

Using the above pieces of equipment will have an adverse effect on the signal integrity.

13.3 Storage of track trolleys

The PWT is responsible for ensuring that when stored near the track, the track trolley is secured and that if the trolley is capable of being dismantled, each component must be secured. In addition to this a valid storage licence will also be required.

13.4 Toolbox briefing and communication

The work group must be briefed on all aspects of the work and understand the safe system of work.

The PWT must make sure that all persons in the work group are:

- fit for work and compliant with the LU drugs and alcohol policy
- wearing the correct PPE
- suitably certificated
- aware of the agreed communications.

If a member of the work group is suspected of being under the influence of drugs or alcohol the PWT is responsible for informing:

- their manager
- station supervisor
- BTP.

13.5 Personal Protective Equipment

PPE must be worn in accordance with the method statement and it is the responsibility of the PWT to make sure that:

- LU approved high visibility clothing is worn and fastened correctly at all times when on the LU infrastructure
- no loose clothing that could get snagged on a passing train
- no long coats that can drag across the traction current rails
- suitable work clothing is provided and worn correctly
- the work group wear sturdy footwear suitable for the task
- hard hats are worn in designated areas
- gloves, eye, ear protection and dust masks are provided and worn as instructed.

13.6 Leptospiral Jaundice

Leptospiral Jaundice (Weil's disease) is transmitted by rats and other vermin. If untreated it can be fatal, you should:

- cover all cuts and abrasions with waterproof plasters prior to working
- wear suitable protective clothing
- never touch your face with unwashed hands or gloves
- if scratched whilst working, wash and report to doctor
- wash your hands before eating, drinking or smoking
- wash hands thoroughly in clean water when work is finished.

13.7 Agreed communications

There is a variety of methods of communication used on LU, they include:

- connect radios
- hand signals
- mobile phones
- landline phones
- LU automatic telephone.

14 Environmental aspects

14.1 Waste management

Waste management is controlled by law and as the PWT you must make sure that you comply with the law by:

- disposing of waste in the correct segregated bins
- storing materials carefully so it does not get spoiled
- ensuring that waste is removed by licensed contractors and is accompanied by waste transfer documentation
- ensuring home waste is not brought onto the LU infrastructure
- ensuring waste is removed from the worksite at the end of the shift
- reporting illegal fly tipping to your manager.

14.2 Noise

Noise can result in poor community relations and possibly noise abatements which could result in work being stopped. Where reasonably practicable:

- keep shouting to a minimum
- turn engines off when vehicles and machinery are not in use
- keep noisy plant and activities away from residential properties where possible
- consider local businesses and residents when you park
- report all complaints to your manager.

14.3 Hazardous materials

Hazardous materials must be stored in containers appropriate for the material according to current regulations. As a minimum the stored material must:

- be segregated and secure
- be labelled as hazardous to indicate contents
- not be to able to escape, leak, produce foul odours or attract pests
- be stored or decanted at least 10 metres away from sensitive receptors such as drains and surface water.

14.4 Pollution prevention

Polluting water courses is illegal; even small amounts of some materials can cause serious pollution.

As the PWT you must be made aware that:

- many of our drains go directly to rivers or streams
- drains are not a disposal route for wastes
- oil, fuel, antifreeze, silt and weed killer are just some of the polluting materials used on LU.

You must:

- store materials in the correct areas
- report spillage incidents to your manager.

14.5 Wild life and habitat

LU is home to many legally protected species and as the PWT you must make sure the work being carried out does not:

- disturb nesting birds
- disturb protected species, such as bats and slow worms
- spread Japanese Knotweed.

Any accidental disturbance must be reported to your manager.

14.6 Weedkilling

The weedkilling train can create another type of hazard, and special precautions may be necessary to protect the work group if entering a treated area within 24 hours of application.

A programme setting out the operation of the weedkilling train is published in the Traffic Circular on a fortnightly basis. If a work group is just passing through a treated area, within 24 hours of application, without carrying out work, then they do not require special precautions.

If working in a treated area within 24 hours of application, you must:

- make sure that approved disposable overalls and gloves are worn
- make sure contaminated disposable clothing is sealed into plastic bags and disposed of in the correct bin
- make sure the work group wash their boots
- tell the work group to wash their hands before eating or smoking.

15 Signing in at the station

All staff or visitors who are working at or visiting a station other than their normal place of work must sign in with the station supervisor on arrival, and sign out on departure. On arrival you must:

- give your name and show your identification
- explain the purpose of the visit
- give all relevant details as necessary.

When working on a station you must have either a valid:

- SABRE number and be listed on the station works plan or generic access plan, or
- FRC number.

The following are not required to sign in with the station supervisor:

- emergency services personnel
- LU operational personnel or the Emergency Response Unit (ERU), attending an incident, unless they remain on the station after the incident
- signal and train technicians attending a fault or incident, unless they remain on the station after the incident
- police officers on patrol duties
- revenue control inspectors or HM Revenue and Customs personnel in plain clothes
- staff employed or booking on at engineering depots, for example a track cabin, that are an integral part of a station.

Staff walking through a station at track level are not required to report to the station supervisor of that station. Such staff must report to the station supervisors at the stations where they start and finish their track walks.

15.1 Signing in with the station supervisor

The Person in Charge Evacuation Register (PiCER) is the station access process and is completed by the PWT. It is available electronically as well as in booklet format. The PiCER is applicable to a work party attending a station for work on the LU infrastructure.

When all members of the work group have signed the PiCER form, the PWT must:

- sign in and record the number of personnel in the work group in the visitor's book
- collect the appropriate number of visitors passes
- record the pass numbers in the visitor's book.

The PWT is responsible for confirming the validity of the LU AHS&E briefing cards.

The PWT must make sure that visitor's passes are clearly displayed at all times when at the station.

15.2 Accessing unstaffed stations

Where access to a closed or an unstaffed station is required you must:

- make arrangements beforehand
- agree where to sign in and collect any keys if required.

When signing in at any station the station supervisor must give you details of:

- the emergency evacuation procedure and assembly points
- the fire alarm procedure
- the availability of first aid equipment (if none provided under the safe system of work)
- any operational safety restrictions on the station
- any additional hazards.

You must repeat the briefing to everyone in the work group.

15.3 When personnel arrive late

When personnel arrive after the work group has signed in, the station supervisor must contact the PWT and ask them to attend the office to assist with the signing in of the additional member(s) of the work group. The PWT can appoint a competent deputy to assist with this.

15.4 When personnel wish to leave early

The PWT must make sure the work group is aware that they must sign out with the station supervisor if they wish to leave before the PWT.

15.5 Denied access

If the station supervisor has concerns which cannot be resolved with the PWT, they must not deny access. The station supervisor must inform the DOME/DOE via the FRC. Denied access can only be implemented when authorised to do so.

The station supervisor must:

- inform the PWT that access has been denied
- complete a denied access form detailing the reason for the denied access and issue it to the PWT
- ask the PWT to sign the denied access form.

16 Principles for protecting work groups in Traffic Hours

Protection is defined as:

"Procedures to ensure personnel on or near the track are not endangered by moving trains or mechanised vehicles."

The principles of protecting a work group in Traffic Hours to minimise the risk of them being struck by a moving train or vehicle is controlled by the principles of:

- keeping out of the way of trains
- stopping trains.

16.1 Principle of keeping out of the way of trains

In order to make sure that the work group are kept out of the way of trains, a safe system of work must be set up. This must include a process to alert the work group to the presence of an approaching train, making sure that there is sufficient time for the work group to go to a place of safety before the train reaches the worksite.

The work group will have at least 25 seconds sighting time of an approaching train. The PWT-TH will set up the safe system of work to provide protection for the work group and will use one of the following options:

- provide protection without using a separate lookout
- provide protection using a separate lookout
- slowing trains with handsignaller(s) (engineering) where the sighting time cannot be achieved under normal train operations.

On a warning of an approaching train, personnel must:

- immediately move to a place of safety
- acknowledge the train operators warnings by raising one arm above their head

- remain in the place of safety until they are told that it is safe to leave
- walk facing on coming traffic where possible
- remain visible to train operators
- be aware of changing conditions.

When you are providing protection without lookouts then you cannot carry out any physical activities that will distract you from looking out for trains.

16.2 Principle of stopping trains

This method of protection relies on stopping a train on the track that the work group intends to work on or about. This removes the risk of the train affecting the worksite whilst the work group is working.

A stopped train can be used to transport the work group to the worksite. It can also be secured at the worksite to provide protection by creating a safe haven for the work group. This method is used for emergency work only. The procedure for using trains is authorised by the controller who also designates the train for the activity.

17 PWT-TH responsibilities

When you are undertaking protection activities you must:

- be briefed on the proposed work by your supervisor or works controller
- be familiar with the area where you will be providing protection, including site visits for complex areas
- pass on safety critical messages using the correct format
- check that all the required protection and communications equipment are in good working order before going on the track
- be in possession of the required 'safety on the track' certificate
- wear a PWT armband on your right arm above the elbow
- arrange and agree the protection arrangements required to provide sufficient warning time for the work group
- inform the controller and your manager that you are accessing the track.

As a PWT-TH you must also:

- position lookouts if you are unable to provide protection on your own
- tell the person responsible for the work that work on the track must stop if protection cannot be maintained
- give the required safety briefings
- make sure all staff are adequately certificated and are wearing the required PPE
- make sure all staff are aware of the protection arrangements
- remain in the post until protection is no longer required or you are relieved.

18 Planning protection during Traffic Hours

To be able to go on the track and provide protection during Traffic Hours the you must:

- be certificated PWT-TH as a minimum
- be in possession of the required protection and communications equipment
- be familiar with local conditions
- have read the relevant documentation
- pass on safety critical messages using the correct format
- always have a place of safety
- have at least 25 seconds continuous sighting time
- complete the Traffic Hours log book, every time protection activities are carried out.

18.1 PWT-TH equipment

The PWT-TH must be in possession of a:

- 'PWT' armband
- Traffic Hours log book and pen
- working time piece.

You will require flags (red, yellow and green), horn or whistle and detonators when you are providing protection without lookouts.

18.2 Site familiar

When providing protection on any section of track you must be familiar with the area.

If you are not familiar then you should refer to the site familiar information document on the LU Network Improvement site.

18.3 Basic areas

Areas are defined as single or double tracks with some points and crossings but no major junctions or restrictive features such as a long viaduct or fly under.

As a PWT-TH certificated person you can make yourself familiar with a basic area by:

- taking a cab ride in a train
- studying the controllers' diagrams
- utilising other sources of available information
- walking the site.

Platform grounds are treated as basic areas except where there is:

- multi-track
- locations with other restrictive features.

18.4 Complex areas

These areas are defined as multi-track sites, major junctions and locations with restrictive features. The risks are greater due to the physical conditions on the ground. Staff providing protection who are not familiar with areas that are classified as complex, must make a site familiarisation visit accompanied by protection staff who are familiar with the area, prior to any work taking place. It could take a number of visits before the person becomes fully familiar with a complex area.

18.5 Being familiar with local conditions

Before a PWT-TH provides protection they must be familiar with the following:

- approved points of access to the track
- direction from which trains might approach
- location of any restricted access
- limited sighting conditions of trains
- train or line speed
- train frequencies
- the layout of the area, and the planned route to and from a place of work
- environmental conditions
- limited clearance areas and other obstructions
- poor underfoot conditions
- depots and sidings.

19 Additional documentation

19.1 Method statement and protection plan

As a PWT-TH you must make sure that before starting work there is a method statement detailing the:

- safe system of work for managing the work on site, which will determine if one PWT-TH can safely undertake both protection and worksite safety activities
- protection plan, which will show if you can undertake the lookout duties or if a lookout(s) and handsignaller(s) (engineering) are required.

19.2 Scheduled train frequency tables

From	To	04:00 - 05:00	05:00 - 06:00	06:00 - 07:00	07:00 - 08:00	08:00 - 09:00	09:00 - 10:00	10:00 - 11:00	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 24:00	24:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00
Campbell Rd sub	Bromley	0	3	16	13	13	25	23	18	18	18	18	18	25	25	24	25	21	18	18	16	16	0	0	0
Bromley	West Ham	0	2	14	22	24	25	23	18	18	18	18	18	24	23	24	25	22	18	18	17	17	1	0	0
West Ham	Plaistow	0	2	13	22	24	25	24	18	18	18	18	18	23	24	24	25	23	18	18	17	17	1		
Plaistow	East Ham	0	2	13	21	24	25	24	18	18	18	18	18	24	23	24	25	22	18	18	16	17	2	0	0
East Ham	Barking	0	2	11	22	24	24	24	18	18	18	18	18	23	24	24	25	22	18	18	18	16	3	0	0
Barking	Upney	0	1	6	15	15	17	18	13	12	12	12	11	15	15	14	18	15	12	6	10	10	2	0	0
Upney	Dagenham East	0	1	5	16	14	17	19	12	12	12	12	12	15	15	14	18	15	12	6	10	10	2	0	0
Dagenham East	Hornchurch	0	1	4	11	13	15	19	13	12	12	12	12	14	12	13	17	17	12	7	9	10	3	0	0
Hornchurch	Upminster	0	1	4	10	12	16	18	14	12	12	12	12	14	12	13	16	17	13	8	9	11	3	0	0

Includes Hammersmith & City Line trains between Campbell Road and Barking and Piccadilly Line trains between Acton Town and Hanger Lane Jctn.

You must be aware of train frequencies when accessing the track.

Green - normal work can be undertaken when there are train frequencies of 11 trains or less and adequate protection arrangements are in place.

Amber - if you wish to carry out work where there are train frequencies between 12 and 15 trains per hour, and you cannot remain continuously in a place of safety, you must arrange for a job specific and location specific risk assessment to be undertaken.

Red - work must not be carried out where there are train frequencies of 16 trains per hour or more and you cannot remain continuously in a place of safety.

Inspections can be carried out irrespective of train frequencies.

Train frequency tables are available from the Network Improvement site. Any changes to the information will be published in the Traffic Circular.

Service disruptions might mean that trains do not run at the intervals shown in the train frequency tables, as a consequence, a section shown in the table as green, might become amber or red.

19.3 Line supplement

Train speeds can be found in section three of the line supplement to the Rule Book on the Network Improvement site.

19.4 Traffic Circular

The Traffic Circular contains detailed information about operational changes and is published fortnightly.

You must:

- read the Traffic Circular to see if there is anything affecting the proposed work
- always make sure you have the latest publication.

19.5 Engineering Notice

The Engineering Notice is a publication produced and circulated within LU detailing the nightly engineering work and similar activities.

20 Passing on safety critical messages

20.1 Communications – Phonetic alphabet

A	Alpha	K	Kilo	Q	Quebec
B	Bravo	L	Lima	R	Romeo
C	Charlie	M	Mike	S	Sierra
D	Delta	N	November	T	Tango
E	Echo	O	Oscar	U	Uniform
F	Foxtrot	P	Papa	V	Victor
G	Golf			W	Whiskey
H	Hotel			X	X-ray
I	India			Y	Yankee
J	Juliet			Z	Zulu

The following rules must be carried out when giving or receiving messages.

Make sure:

- you are talking to the right person and that person knows who you are
- your message is clear, accurate, and to the point
- you understand the information and any action that is required
- that you know how to make contact again (if required)
- you record details in the logbook or your notebook (where applicable).

The message must start by:

- stating who you are
- asking who you are talking to
- stating where you are
- stating why you are calling.

20.2 Using numbers

If you are using numbers 10 and over in your message, you must say them one at a time. For example, 'Train 123' must be spoken as 'Train one two three' not 'Train one hundred and twenty three'. You must also say the number '0' as 'zero'.

When signals, points, train descriptions or locations have similar names or numbers (for example, signals A 114 and A 314 on adjacent lines), you must take great care not to cause confusion.

You do not need to quote numbers separately when you refer to time, for example, the time 13:17 hours should be stated as 'thirteen seventeen'.

20.3 Trackside communication

When on the track the principle method of communication is 'Connect' radio. The PWT must use the 'Connect' radio system where available; if this is not possible alternative means of communications must be used.

With the implementation of 'Connect' radio, signal post telephones have now been removed from the LU network.

20.4 Mobile phones

Mobile phones and radio equipment should only be used:

- if it is necessary as part of your duties
- in an emergency
- in a place of safety.

Hands free mobile phones must not be used in the track environment, or in any other area where it is necessary to immediately receive an audible message.

21 Places of safety

The principle of keeping out of the way of trains as a form of protection involves setting up a safe system of work that alerts the work group to the presence of an approaching train, making sure that there is sufficient time for the work group to go to a place of safety before the train reaches the worksite.

A place of safety is a location beside the permanent way where a person can stand safely when trains pass.

A place of safety must meet the minimum distance requirements as shown in Rule Book support information `places of safety`.

A place of safety must:

- have a reasonably good surface to walk on
- not be liable to cause slips and trips
- allow you to walk facing approaching trains
- be wide enough to stand whilst trains pass.

The place of safety could be the cess or the ten foot depending on the minimum safe distance from the nearest running rail.

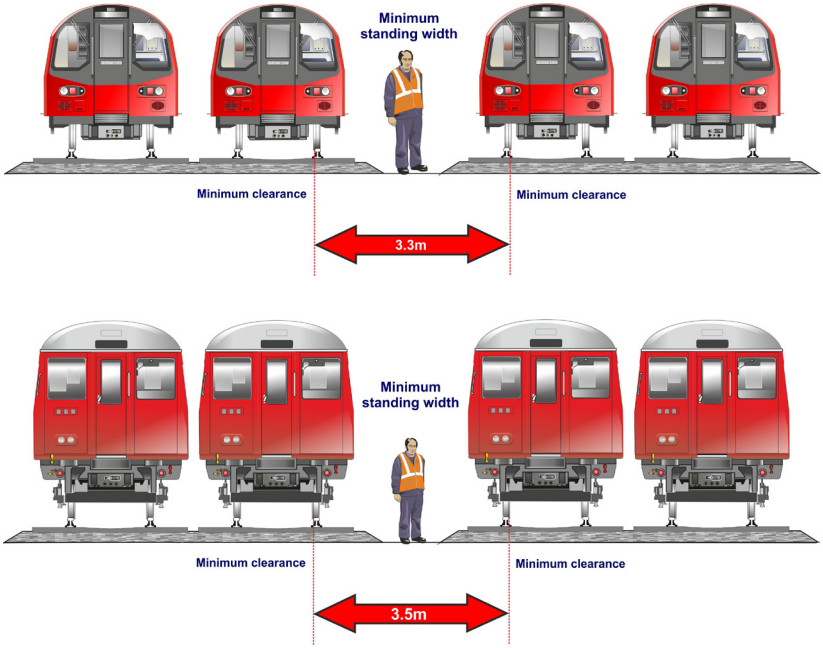
A place of safety can be provided where a physical barrier separates a location from the track.

21.1 The cess to be a place of safety

The cess can be used as a place of safety on:

- straight track
- curved track
- curved track with a check rail.

21.2 The ten foot to be a place of safety



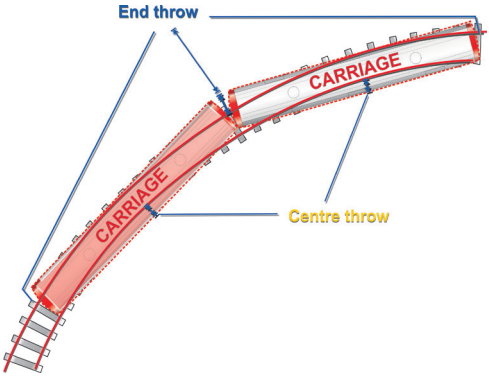
The ten foot can be used as a place of safety on:

- straight track
- curved track
- curved track with a check rail.

21.3 Making allowances for curves

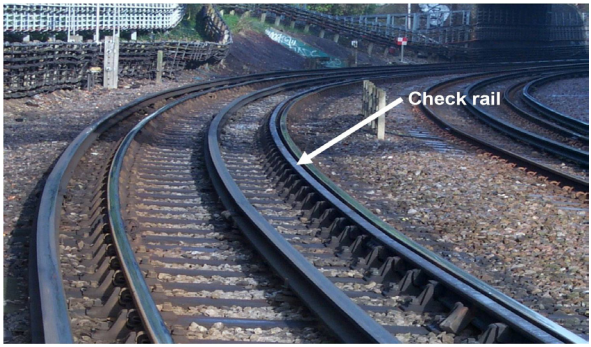
Curved track would affect your safety in the cess or ten foot as:

- curved track makes car bodies lean closer on the inside of the curve
- curved track makes the cars hang out over the rails anywhere except at the bogies (end throw and centre throw).



On curves, you must allow extra clearances for a place of safety, as the end throw and centre throw will be greater.

A check rail is an additional rail fixed in the four foot close to the running rail on the inside of the curve, which restricts lateral movement of the wheels of a train.



22 Sighting time

The sighting time is the time from when you first sight an approaching train to when it reaches the work group in a place of safety. As a minimum you must have at least 25 seconds continuous sighting time to warn the work group and reach a place of safety.

22.1 Calculating sighting time

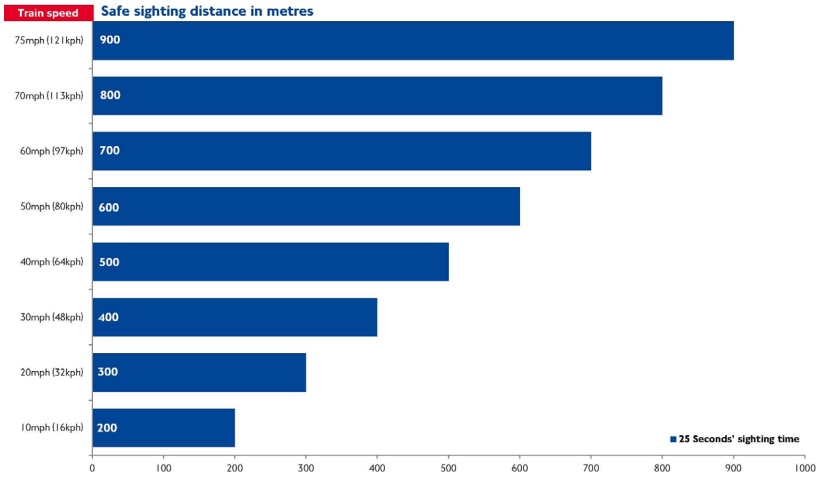
To calculate sighting time at a particular location, you must:

- stand in the place of safety
- time a train from first sighting it, to the moment it reaches the work group at the place of safety.

More than one train should be timed to make sure that the minimum sighting time for the location is calculated.

22.2 Sighting distance

If you cannot measure the sighting time by timing trains, the safe sighting distance method must be used.



To do this you must know the maximum train speeds on that section of track and look up the safe sighting distance.

Train speeds can be found in section three of the line supplement to the Rule Book on the Network Improvement site.

To estimate the distance on the track, use:

- the Location Coding System (LCS) plates which are spaced 100 metres apart
- the kilometre posts which are spaced 200 metres apart.

The PWT-TH must consider a number of factors when determining whether the sighting time needs to be increased:

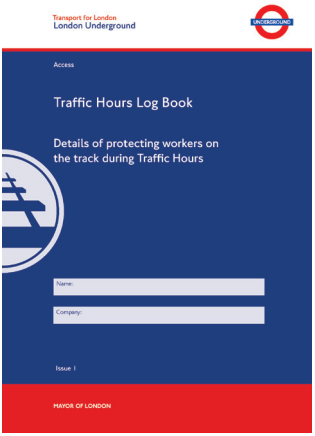
- type of work
- tools and equipment
- number of staff
- level of certification and experience of the work group
- location of the places of safety
- limited clearances
- train speeds
- noise, smoke, fumes or emissions created by the work
- other noise in the area
- weather conditions and visibility
- underfoot conditions.

Once the required sighting time is achieved the PWT-TH must monitor the time to ensure that it remains safe.

23 Traffic Hours log book

As a PWT-TH you must:

- have your own log book
- complete the log book every time you undertake the protection activity.



24 PWT-TH providing protection alone

If you are carrying out protection without using a lookout must:

- be capable of undertaking both protection and lookout activities
- not do any other work
- not be distracted from looking out for trains
- remain at the worksite
- give a safety briefing(s) to the work group
- have adequate continuous sighting time
- provide the work group with the minimum warning time
- remain within verbal contact range of the work group
- make sure the work group remains visible
- be visible to train operators
- stand in a place of safety
- have a separate PWT in charge of the work.

A PWT-TH must appoint lookouts if they are unable to provide the work group with the minimum required sighting time by looking out for trains alone.

25 Positioning or acting as a lookout

When you are positioning or acting as a lookout, you must:

- check that the lookout has all the required certification and equipment
- agree the route to the worksite
- agree the method of warning to be used
- agree the warning codes
- agree the place of safety
- agree the required sighting time
- agree who will indicate to the work group that it is safe for them to continue walking or working after the passage of a train.

Where additional lookouts are used the PWT-TH must time the passage of a train from when the lookout closest to the work group gives the warning.

25.1 Responsibility of a lookout

As a lookout you must:

- be suitably certificated
- check and test your equipment
- attend all planning and safety briefings given by the PWT-TH
- warn the work group of approaching trains.

As a lookout you must not:

- carry out any other work or be distracted
- leave your position until relieved by another lookout or until the work has been completed.

25.2 Lookout equipment

A lookout's equipment consists of:

- 'lookout' armband, worn on the left arm, above the elbow
- red and green flags
- multi-aspect lamp (if required)
- horn or whistle
- detonators (minimum of six).

25.3 When using flags and multi aspect lamps

The lookout must:

- carry the flags unrolled
- hold the red or green flag/multi aspect lamp steady, so that it is visible to train operators
- wave the red flag or multi aspect lamp if the train has to be stopped in an emergency.

Red flag held steady
'stop at me'

Red flag waved
'stop immediately'

Yellow flag steady
'slow down'

Green flag held steady
'proceed'

The yellow flag is used by a handsignaller (engineering).

If a lookout has to stop a train in an emergency, they must record the:

- train number
- train operator's name
- time the train was stopped.

This information must be given to the PWT-TH.

25.4 Warning codes

A lookout will use the following warning codes to warn staff of an approaching train.

The warning code is either one blast or two blasts depending on the direction trains are approaching.

In an area with more than two tracks where there is a fast/main and local service, the lookout will also point and shout to the line on which the train is approaching.

When the lookout gives the warning of an approaching train, the work group must:

- move to the place of safety
- raise one hand above the head to acknowledge.

If the work group fail to acknowledge the lookouts warning, the lookout must repeat the warning. If the work group still fail to acknowledge the warning, the lookout must stop the train.

The horn or whistle should not be used where it might be confused with background noises, such as car horns or whistles from a sports field. In these conditions the lookout can be positioned at the worksite to warn each member of staff by using the touch method.

25.5 Detonators

Detonators used on LU:

- are a day glow yellow disc approximately two inches in diameter
- are embossed with the date of manufacture
- have a life expectancy of five years, after which they must be withdrawn and returned to the stores.

25.6 Pre-use checks

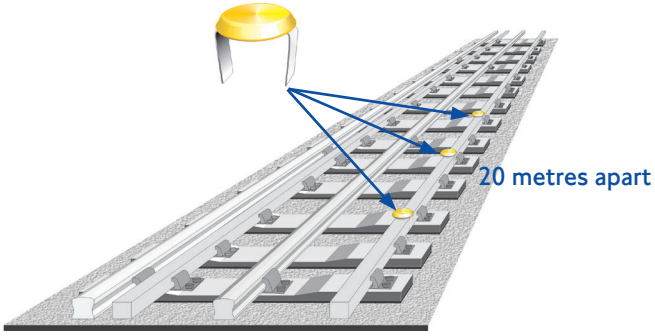
You must inspect the detonators for visible signs of damage or defect.

A detonator must not be used if:

- it is past its expiry date
- the lead strap is broken
- the body is rusty
- it is leaking
- it is damaged.

Any detonators found to be defective must be reported to the PWT-TH.

25.7 Placing a detonator



When placing a detonator, it must be:

- placed on the running rail furthest from the positive conductor rail
- secured by bending the straps around the crown of the running rail
- away from points and crossings
- away from components such as insulated block joints.

When placing detonators you must make sure that detonators are positioned at a sufficient distance and in a position to prevent injury to other person(s) in the area.

In an emergency, you must try to place three detonators on the running rail 20 metres apart, and towards the direction of traffic to warn train operators that something has occurred on the track ahead of the train. If this is not possible, you must try to place as many detonators as you can or use any other means available (e.g. hand signals).

25.8 Storage and control of detonators

Detonators should be stored:

- in a sealed metal container and labelled with the explosive symbol
- in a secure, dry place, away from any chemicals, flammable materials or sources of heat
- with no more than 24 at a site (other than the main stores).

25.9 Transportation of detonators

Detonators must be transported:

- in a sealed metal container marked explosives
- no more than 20 at a time (in two containers)
- secured so they cannot move during transit
- by distribution services if more than 20 need to be carried.

26 Protection arrangements briefing

Lookout(s) and handsignallers (engineering), if applicable, must attend the protection arrangements briefing with the PWT-TH.

The PWT-TH must agree with the lookout(s) and handsignaller(s) (engineering) at the protection arrangements briefing:

- the route to the worksite
- how many lookouts are required and their positions
- who will indicate to staff that it is safe for them to continue after a train has passed and how this will be done.

On the running line this will be the person appointed at the briefings, where as in a depot this will be the lookout.

If during the course of the work the requirements for protection change the:

- work group must be assembled in a place of safety
- lookout(s) and handsignallers (engineering) must be briefed on the new protection arrangements.

27 Briefing the lookout

The lookout(s) will be briefed by the PWT-TH on:

- the route to be taken
- the position of the lookout(s)
- the warning codes to be used
- who will indicate it is safe to continue after the passage of a train and how
- the method of communication.

27.1 Positioning a lookout

The PWT-TH is responsible for deciding where to position the lookout(s) and to make sure they are positioned in a place of safety.

The factors the PWT-TH will need to consider when positioning lookout(s) are:

- sighting times
- nature of work
- number of staff and their experience
- communications
- weather
- speed of trains
- underfoot conditions
- visibility
- curves and gradients
- limited clearance areas
- noise.

If the lookout's line of sight becomes obstructed they must give the warning of an approaching train or stop the train.

When lookouts cannot adequately provide the required sighting time, the PWT-TH must obtain permission from the controller to appoint handsignallers (engineering) to slow approaching trains.

28 Slowing trains down to give sufficient sighting time

If the PWT-TH cannot achieve the required sighting time for the work group using lookouts, then handsignallers (engineering) must be positioned to slow trains down. This procedure must not be used:

- if you are providing protection without using a lookout
- where NR trains operate on LU tracks
- where trains are operating in automatic mode.

The functions of the handsignallers (engineering) is to:

- slow trains approaching the worksite
- give the all clear if it is safe to continue at line speed.

The lookout will be positioned in relation to the handsignaller (engineering) with the yellow flag, to achieve sighting time.

28.1 Positioning handsignallers (engineering)

As the PWT-TH you must:

- have permission from the controller to use handsignallers (engineering)
- make sure that handsignallers (engineering) are positioned correctly to control the speed of trains
- check that the sighting time is sufficient.

When requesting permission from the controller, you must give:

- your name, department and contact number
- the location and details of the work
- the distance of the restriction
- the estimated time when the restriction will be removed.

section 28 Slowing trains down to give sufficient sighting time

You must make sure that handsignallers (engineering) are positioned:

- at the approach side (or sides) of the worksite to show a hand signal displaying a yellow aspect to all train operators approaching the worksite
- at the end of the worksite to show a hand signal displaying a green aspect to all train operators
- in a place of safety where the train operator of an approaching train can clearly see the hand signal.

When the restriction is no longer required you must:

- withdraw the handsignaller (engineering) and inform the controller
- record the time and details in the log book.

If permission is refused by the controller you must record the details in your Traffic Hours log book and NOT continue.

29 Responsibilities of the handsignaller (engineering)

The basic function of a handsignaller (engineering) is to control the speed of trains using flags or a multi-aspect lamp.

The PWT-TH decides if a handsignaller (engineering) is required to slow trains as part of the safe system of work, but the controller must always give permission.

A handsignaller (engineering) must:

- be suitably certificated
- check and test their equipment
- attend all planning and safety briefings given by the PWT-TH
- control the speed of trains as instructed
- attract the attention of the PWT-TH, using their horn or whistle to give the warning of an approaching train, if their duties are affected for any reason.

The handsignaller (engineering) must not:

- carry out any other work or be distracted
- leave their position until relieved by another handsignaller (engineering) or until the work has been completed.

29.1 The handsignaller (engineering)'s equipment

The handsignaller (engineering)'s equipment consists of:

- 'handsignaller' armband, worn on the left arm above the elbow
- red, yellow and green flags
- multi-aspect lamp (if required)
- horn or whistle
- detonators (if required).

29.2 Using the flags or lamp

See section 25.3 of this learning information booklet.

Positioning a handsignaller (engineering)

There will be a minimum of two handsignallers (engineering) positioned for protection purposes. One will be positioned ahead of the lookout and the other at the worksite.

A handsignaller (engineering) must be positioned:

- by the PWT-TH
- by an engineer track for emergency speed restrictions (ESR)
- at the approach side(s) of the worksite/ESR to show a hand signal displaying a yellow aspect to all train operators approaching the worksite/ESR
- at the end of the worksite/ESR to show a hand signal displaying a green aspect to all train operators
- in places of safety where the train operator of an approaching train can clearly see the hand signal.

This procedure cannot be used when trains operate in automatic train protection/automatic train operation modes.

30 Emergency speed restrictions

30.1 Emergency speed restriction in the Line Safe open sections

In the Line Safe open sections an engineer (track) must normally position three handsignallers (engineering) one at:

- least 400 metres from the start of the restriction on the approach side, to display a yellow handsignal
- the start of the restriction , to display yellow handsignal
- the end of the restriction, to display a green handsignal, if the section ahead is clear.

30.2 Emergency speed restriction in the Line Clear tunnel sections

An engineer (track) would position a handsignaller (engineering) for an ESR in a Line Clear tunnel sections at the station(s):

- on the approach side of the restriction, to show a yellow handsignal, if the section ahead is clear
- beyond the restriction, to show a green handsignal, if the section ahead is clear.

30.3 Emergency speed restriction in a Line Safe open section involving tunnels

For ESRs in a Line Safe open section involving tunnels, a handsignaller (engineering) must be positioned:

- at least 400 metres from the start of the restriction on the approach side, to display a yellow handsignal
- one at the start of the restriction, to display yellow handsignal. If they cannot be positioned at the tunnel mouth they must be positioned at the station starting signal at the station(s) on the approach side of the restriction

- one at least 20 metres beyond the tunnel mouth after the speed restriction, or at the station(s) beyond the restriction displaying a green handsignal, if the section ahead is clear.

30.4 Emergency speed restriction over a short distance

For an ESR over a very short distance, one handsignaller (engineering) must be positioned:

- at the start of the speed restriction and display a yellow handsignal, when the train has slowed the handsignaller (engineering) must then show a green hand signal.

30.5 Emergency speed restriction on the Metropolitan Line between Harrow-on-the-Hill and Amersham

If the ESR is on Metropolitan Line between Harrow-on-the-Hill and Amersham, the engineer (track) will normally position four handsignallers (engineering):

- one at least 1,500 metres from the start of the restriction on the approaching side waving a yellow handsignal and placing one detonator (for each train)
- one at least 400 metres from the start of the restriction at the approaching side, displaying a yellow handsignal
- one at the start of the restriction, displaying a yellow handsignal
- one at the end of the restriction, displaying a green handsignal, if the section ahead is clear.

30.6 A lookout within a Specified Area

When staff are acting as a lookout within a specified area they must be positioned by the PWT-TH or PWT-TM and follow their instructions.

You must not carry out the duties of a lookout within an engineer's current area.

31 Limited clearances

A limited clearance sign indicates places where the cess or ten foot is not a place of safety, because there is not enough room for you to stand safely between a passing train and the infrastructure.

31.1 How to calculate walking time

The PWT-TH must estimate the length of the limited clearance area in metres and allow one second per metre plus 50% to ensure enough time is available to walk through the limited clearance, or move from refuge to refuge.

31.2 Limited Clearances with refuges

Where limited clearances have refuges, you must calculate the walking time to the first refuge and then to subsequent refuges.

It is safe to proceed only if you can get through the limited clearance or to a refuge in less than the sighting time of an approaching train reaching the place of safety at the far end of the limited clearance.

31.3 Walking through areas of limited clearance

When walking through areas of limited clearance, you must:

- have sufficient sighting time to get the work group through the limited clearance area or from one refuge to the next within the limited clearance area
- make sure the work group proceed through the limited clearance area in sub-groups no larger than the smallest refuge
- lead the work group or sub-groups in the direction of which trains can approach
- make sure that all sub-groups remain in visual and verbal contact at all times.

31.4 What to do if it is not safe

If the sighting time is not sufficient, you must not walk through the limited clearance.

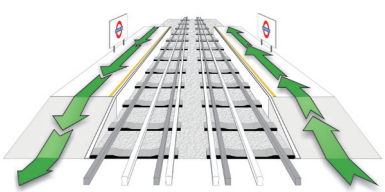
However, you may be able to:

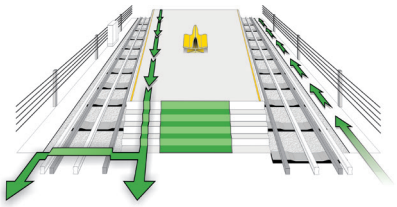
- use a safe route along another track
- take a train through the limited clearance to the next station and walk back.

31.5 Station grounds

To walk through station grounds at track level you must:

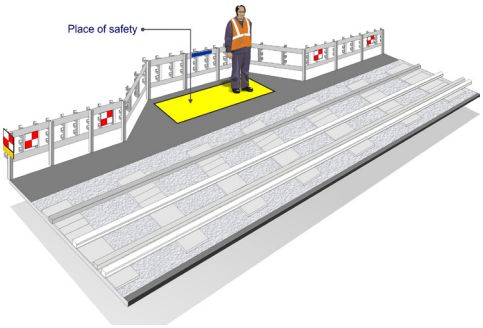
- have a continuous place of safety throughout the length of the platform
- have continuous 25 seconds' sighting time
- walk so as to face the oncoming traffic.

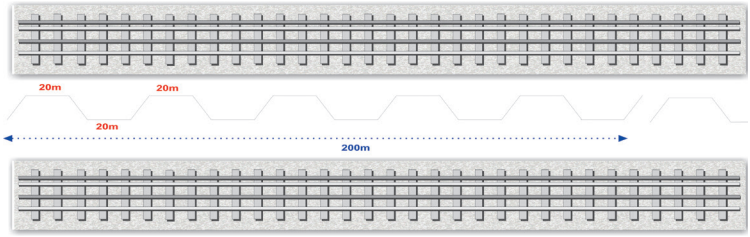




31.6 Staggered cable run

Between Finchley Road and Preston Road, and from Finchley Road to Stanmore, the cable run in the ten foot includes places of safety on alternate sides.





In these areas:

- signs are found at the base of limited clearance signs indicating there is a place of safety within the cable run
- places of safety are a maximum of 20 metres apart, alternately on each side of the cable run
- a blue mandatory sign stating “do not store tools or materials in this place of safety” are found fixed to the cable run
- always walk facing oncoming traffic even if it means going past the point you want to get to and walking back
- the gaps where you can cross to the other side are spaced 200 metres apart.

31.7 Unauthorised areas

You must not go into the following areas without the appropriate protection:

- Line Clear tunnel sections
- an area under possession (without the permission of the POM)
- long limited clearance areas without refuges
- areas where access is restricted by train frequency
- Waterloo and City line
- areas where LU certification is not valid.

Personnel must not go onto the track in any of these situations, even in an emergency, unless protection has been arranged.

32 The journey to site safety briefing

You must hold a safety briefing with the work group before going onto the track. You must tell the work group:

- the details of the protection arrangements
- place(s) of safety to be used
- of the warning code(s) that will be used
- to acknowledge all warnings
- about any other work which could affect them
- who will indicate that it is safe for them to continue walking after a train has passed, and how this will be done
- direction(s) from which trains might approach
- obstructions they are likely to come across
- slip and trip hazards
- about adjacent NR infrastructure (if applicable)
- type of work
- location of the worksite
- any other relevant information.

You should ask the work group questions to make sure that the safety briefing was understood by the work group.

In some circumstances where protection is not required to gain access to the worksite, the PWT-TH will not have to give the journey to site briefing. The PWT-TH must therefore ensure that all relevant information is included in the pre-work safety briefing.

section 32 The journey to site safety briefing

32.1 Informing the controller

Before accessing the track you must inform the controller and provide the following information:

- confirmation of name and employer
- location of work
- nature of work
- estimated time
- number of personnel
- contact number.

32.2 Journey to site

During the journey to the worksite the PWT-TH providing the protection must lead the work group. If an additional PWT is required then they should walk behind the work group to make sure all personnel remain together.

The PWT-TH providing the protection must make sure that all personnel remain together and ensure that:

- the work group is in a place of safety
- a minimum of 25 seconds warning time is maintained
- warnings are acknowledged
- the work group does not move after the passage of a train until instructed
- all tools and equipment are carried in a safe manner.

You must make sure that work group do not carry anything which could stop them from reaching a place of safety, or put them in danger from passing trains.

32.3 Arrival at the worksite

On arrival at the worksite you must make sure the work group is in a place of safety.

33 Implementing the worksite protection

Once at the worksite you must give a protection arrangements briefing to the lookout(s)/handsignallers (engineering) which must include:

- any changes to the details given at the previous safety briefing
- location and extent of the worksite
- number of lookouts and their location.

Once the lookout(s)/handsignallers (engineering) have been positioned you must:

- test the protection arrangements
- adjust the protection arrangements if necessary
- give a pre-work safety briefing to the work group once the protection arrangements have been implemented.

34 Pre-work safety briefing

Before work commences you must conduct a pre-work safety briefing detailing any changes from the journey to the site briefing. The pre-work safety briefing will include:

- the extent of the worksite
- any changes to the details given in the previous safety briefing
- any other relevant information.

You should ask the work group questions to ensure that the safety briefing was understood.

34.1 Additional staff who join the work group

If additional staff join the work group or arrive late at the worksite you must:

- check that they are wearing LU approved high visibility clothing and approved footwear
- check that they are in possession of a valid track safety certificate
- give a full safety briefing.

35 Monitoring worksite protection arrangements

As the PWT-TH you must monitor and control the worksite protection arrangements and make sure that:

- the work group stay within the protected area
- lookout(s) remain in position
- the work group move to the place of safety and acknowledge the warnings
- the work group remain in the place of safety until instructed that its safe to continue working.

35.1 Changing conditions

Changing conditions including obstructions on the track may increase the risk associated with going on the track. These could include:

- deteriorating visibility from smoke, fog, rain or snow
- increased noise levels
- trees in winter/summer
- stored/discarded track components.

35.2 Providing protection in adverse conditions

Whilst the work is in progress, if a condition which affects visibility, or the ability of the warning codes to be heard is unexpectedly encountered, you must:

- stop the work and move the work group to the place of safety
- revise the protection to achieve the required sighting time, and to ensure that the warning codes can be heard before allowing work to start
- contact the controller for permission, if the operation of the train service is affected.

If the minimum sighting time cannot be achieved, you must stop the work and leave the track with the work group.

35.3 If personnel need to leave early

If personnel are required to leave the worksite, you must:

- ensure they hold the correct track safety certification
- check they are familiar with local conditions
- give a full safety briefing.

35.4 On completion of work

When work has been completed you must make sure that:

- the worksite is left in a condition which is safe for trains to run
- the track is clear of tools, equipment and any other items
- anything being left at the site is authorised to be stored and secured.

36 Implementing the protection for the journey back

You must give a protection arrangements briefing to the lookout(s)/handsignallers (engineering) which must include:

- any changes to the details given at the previous safety briefing
- the route of the journey from the worksite
- number of lookouts/handsignallers (engineering) and their location.

Once the lookout(s)/handsignallers (engineering) have been positioned you must:

- test the protection arrangements
- adjust the protection arrangements if necessary
- give a post work safety briefing to the work group once the protection arrangements have been implemented.

36.1 Post work safety briefing

Before the journey from the worksite you must conduct a post work safety briefing detailing the protection arrangements for returning to the point of access. The safety briefing should contain the following information:

- any changes to the details given at the previous safety briefing
- the route to be taken
- any other relevant information.

You should ask the work group questions to make sure that the safety briefing was understood.

36.2 Journey from the worksite

During the journey from the worksite the PWT-TH providing the protection must lead the work group. If an additional PWT is required then they should walk behind the work group to make sure all personnel remain together.

You must make sure that:

- the work group remain together and is in a place of safety
- a minimum of 25 seconds warning time is maintained
- warnings are acknowledged
- the work group do not move after the passage of a train until instructed
- all tools and equipment are carried in a safe manner
- all personnel are clear of the track
- you inform the lookout(s) they are no longer required
- once off the track, instruct the work group not to return to the track, as protection is being removed.

36.3 Once the work group are off the track

Once the work group are off the track you must contact the controller stating:

- your name
- location
- that the work is finished and all staff are clear of the track.

37 Working on station platforms during Traffic Hours

There will be occasions when protection will be required when working on station platforms.

When working on station platforms during Traffic Hours you will need to tell the station supervisor and they will require the following information:

- location of work
- type of work
- how long it will take
- number of staff involved
- risk to passengers.

The appropriate protection procedures must be followed, if the work on the station platform requires any of the work group, equipment or materials to:

- infringe over the platform edge
- enter the gauge of a passing train.

The platform is no longer divided into different areas. Planned work can take place providing the work has been authorised by the LU Access team through the issue of an approved SABRE number(s) which detail the work to be undertaken.

There is no longer a requirement for the station supervisor to give permission for approved, planned work to take place on platforms.

37.1 Emergency work on platforms

Emergency work is allowed whilst trains are running, providing both the station supervisor and controller give permission, and the relevant protection arrangements have been put in place. If necessary, the station supervisor must close the platform to passengers and/or arrange protection by holding a train in the platform.

38 Emergency work in Traffic Hours

Where it is necessary to undertake emergency work during Traffic Hours you must:

- check if the work will affect the normal running of trains
- inform the controller for permission to implement the protection arrangements as this may mean stopping the train service until the work is complete
- be aware of the number of staff being protected and the work location.

If the work requires traction current to be discharged, you must ask the controller to switch off traction current.

You must agree with the controller that traction current will remain switched off until the:

- work group are clear of the track
- controller is informed that the work is finished.

The PWT-TH must check the status of traction current by:

- placing a CRID on the track
- using a P-CRID.

Emergency repair work can be carried out when train frequencies are above 12 trains per hour as long as the relevant protection arrangements are in place.

Method statements will not be issued for emergency work.

Information on placing a CRID and using a P-CIRD can be found in the Rule Book support leaflets.

39 Arranging for a train to protect a work group or access a trackside location

When arranging for a train to protect a work group or drop a work group off at a trackside location you must:

- get permission from the controller
- make all arrangements through the station supervisor at the access station.

If permission is granted, the controller will designate the train to be used and will decide how long the train can be held as protection, usually five minutes.

You must agree any additional protection arrangements and ask the station supervisor to obtain permission from the controller to use the procedure.

If permission is granted by the controller, the station supervisor will tell the PWT-TH:

- the time allocated for the activity
- details of the designated train to be used
- to test the means of communication (if available) before leaving the platform and after arriving at the worksite
- the agreed time to be picked up if there is no means of communication, or if it fails
- that handsignallers have been positioned to control train movements (if required)
- any other relevant information or arrangements.

If handsignaller(s) are required as part of the protection arrangements you must:

- receive the details of the location of the handsignaller(s) from the station supervisor
- receive the protection check form(s)
- read and fill in part B of the protection check form(s).

You must travel in the cab of the train and tell the train operator the details of where to stop. When the train arrives at the worksite you must:

- tell the work group to get off the train and go to the indicated place of safety
- authorise the train operator to continue by showing a hand signal displaying a yellow aspect when all personnel are in a place of safety
- test the communication system (if available) by contacting the station supervisor.

If you are unable to make contact with the station supervisor, you should expect to be picked up at the time agreed with the station supervisor.

If more time is required you must ask the controller for more time through the station supervisor or the train operator. You must tell the station supervisor:

- the reason for requesting more time
- the time required
- any other relevant information.

You must tell the station supervisor at the access station:

- that all staff are clear
- that the work has finished
- to tell the controller that the work is finished.

If handsignallers were used as part of the protection arrangements, the PWT-TH must complete part C of the protection check form(s) and return the completed form(s) to the station supervisor at the access station.

40 Using a train for access or protection

If the work is between the last car count – up marker and the next platform, a train will be secured at the worksite to provide protection.

40.1 Train secured at the worksite

If a train is to be secured at the worksite, you must make sure that the work group travels to the worksite on the train, which is providing the protection.

40.2 End of the platform and the last car count- up marker

If the work is between the end of the platform and the last car count- up marker, a train will be secured in the platform to provide protection. This is to avoid the train being stopped part way out of the platform.

If the train is secured in the platform, you must make sure that the work group access the worksite by walking from the platform whilst the train is secured.

If the work is in a double or multi–track area, you must tell the station supervisor to position handsignallers to warn all train operators approaching the worksite on adjacent tracks, if the trains could affect the work group.

You must place a blue flashing lamp at the worksite if the work group have to return. The lamp must be removed once the work is finished.

- If the work is taking place outside station limits, the PWT-TH must:
- board the train with the work group
- return the train operators key and authorise the train operator to unsecure the train

- ask the train operator to operate the train to the next station.

If the work is taking place within station limits, you must:

- return to the platform with the work group
- return the train operators key and authorise the train operator to unsecure the train
- tell the train operator to resume normal duties.

40.3 On arrival at the station platform

If the work has not finished you must:

- return with the work group to the access station and
- ask the station supervisor to arrange for another train to be used and then repeat the procedure.

If the work is finished you must tell the station supervisor:

- that all personnel are clear of the track
- all work has finished
- to tell the controller that the work is finished.

If handsignallers were used as part of the protection arrangements, you must fill part C of the protection check form(s) and return the completed form(s) to the station supervisor at the access station.

41 Signing out of a staffed station

As a PWT you must:

- sign out in the visitor's book
- return all visitor passes
- sign the' Person in Charge' declaration-exit section of the PiCER form
- take copy of the PiCER form from the station supervisor.

You must now leave the station and make sure that all members of the work group (if applicable) have left the station.

42 Additional protection when engineer's trains are moving during Engineering Hours

There are situations during Engineering Hours when personnel on the track will need protection from moving trains and or traction current, if the work group is associated with the engineer's train, even if working away from the train work group, they must be warned either by the PWT-TM, PWT-TH or lookout.

Where a work group unrelated to the engineer's train is working within a SA:

- the PWT-TM and PWT-TH must reach agreement on a safe system of work and sign the appropriate documents
- make sure that all personnel are certificated for Traffic Hours, if the engineer's train is required to move
- a lookout is not required if the limits of the unrelated work are defined using lamps and detonators.

Where a work group is on the track adjacent to a SA a physical barrier must be erected at the worksite midway between the tracks, for example in the six foot. This will also provide protection in the event of late surrender protection.

If a physical barrier cannot be erected a lookout is required.

42.1 Multi track areas Engineering Hours at the worksite Traffic Hours on an adjacent line

A physical barrier must be erected at the worksite midway between the tracks, for example in the six foot. This will also provide protection in the event of late surrender protection.

43 Possessions

A possession is a designated area of track taken out of service, under the control of a Possession Master (POM) and a Protection Support Manager (POSM) and protected against unauthorised trains.

Any possession on LU's infrastructure must be adequately protected by an approved method such as:

- maintaining signals at danger
- securing facing points to divert trains away from the area
- securing a vehicle
- Line Clear/Line Safe procedures to create buffer zones
- operation of a protection key switch
- closing tracks on lines fitted with Transmission Based Train Control (TBTC)
- temporary blocks in depots.

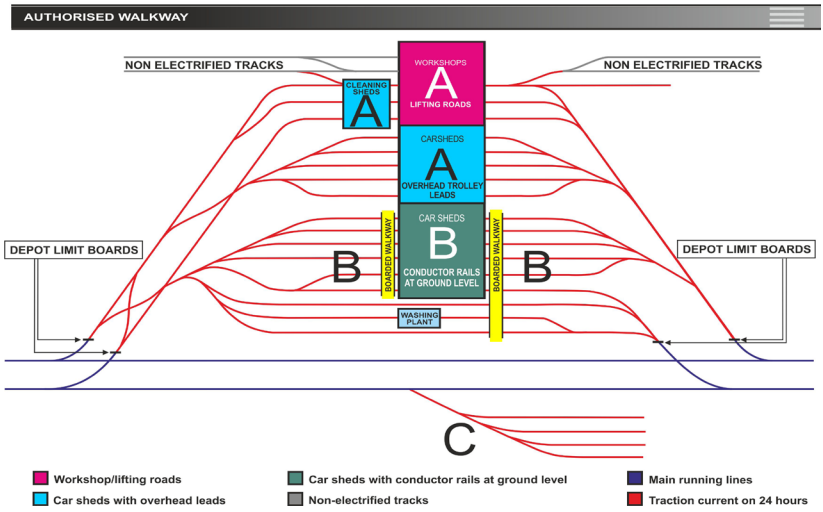
Some or all of the protection arrangements can be delegated to suitably qualified personnel.

You must hold the relevant certification before assisting with the protection arrangements for possessions.

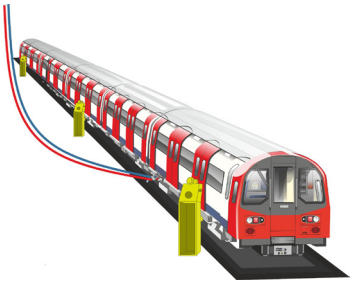
44 Depot environment

Depots are locations where trains are stabled, and traction current is normally 'live' 24 hours a day. Depot personnel carry out general train maintenance and overhauls, within the various areas of the depot.

Depots and sidings can be divided into three separate areas:



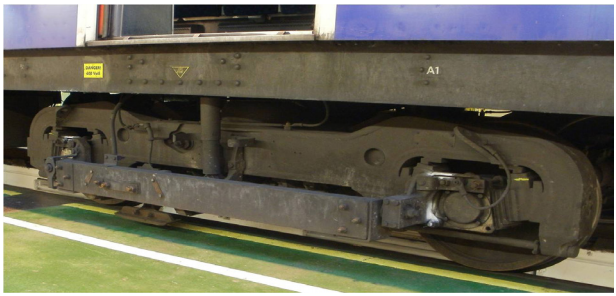
44.1 Area A:



- sheds with no traction current rails at ground level
- sheds with raised platforms for access to the interior of a train, and where traction current rails can be isolated locally using switches
- sheds with overhead trolley leads.

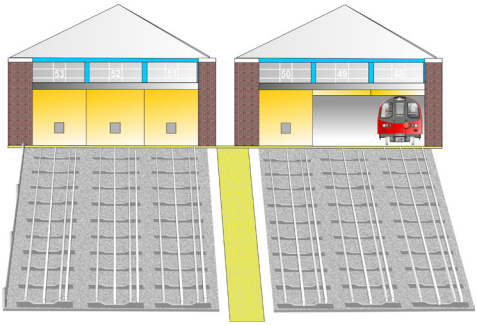
You cannot work in area 'A' unless you are suitably certificated.

44.2 Potential dangers of collector shoes



Collector shoes and the associated equipment may be live, even when not in contact with the conductor rails, therefore additional care must be taken to make sure that nothing worn or carried can touch the shoe gear when walking along both sides of a train.

44.3 Area B:



- all track within depot limits, but not including area 'A'
- all track outside in the depot yard where traction current (excluding area 'A') where traction current rails are at ground level
- non – electrified track (permanent way sidings)
- stabling sheds with conductor rails at ground level that cannot be isolated locally
- wash plant.

You cannot work in area 'B' unless you are protected by a PWT-D or you are suitably certificated to protect yourself.

44.4 Walkways and walk boards

Using walkways and walk boards is the safest method of crossing the track in depots and sidings.

When using walkways and walk boards that cross the track, or an area within 2 metres of the nearest rail, and there are no physical barriers, personnel must be suitably certificated.

Walk boards:

- are raised to the same height as the running rails
- have anti slip surfaces
- have conductor rails cut back.

When crossing the track using walk boards:

- look in each direction for moving trains
- be aware that trains may be stabled up to the walk board
- if driver's cab is occupied, get permission to cross in front of the train
- be aware of hidden train movement.

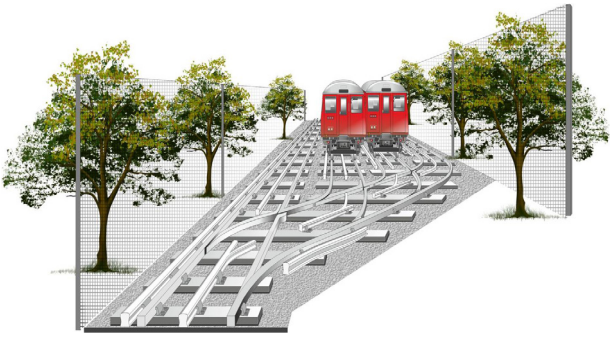
44.5 Crossing live rails

If you are unable to use walk boards and need to cross live rails you must:

- take the safest and shortest route
- look in each direction for moving trains
- have a minimum of 25 seconds sighting time
- look out for obstructions and slippery conditions
- step over each rail
- step on the ballast
- not put your feet where it could become trapped by moving equipment
- leave at least 20 metres between you and a stabled train, unless arrangements are made to make sure the train will not move.

You must not cross live rails unless absolutely necessary and have sufficient sighting times.

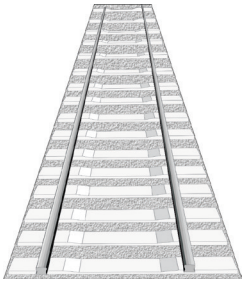
44.6 Area C:



- all stabling sidings where traction current is on 24 hours
- conductor rails at ground level that cannot be isolated locally.

You cannot work in area 'C' unless you are protected by a PWT-D or you are suitably certificated to protect yourself.

44.7 Non-electrified track



These are sections of track which do not have conductor rails, normally found at the ends of the lines or within certain depots and sidings. Due to the nature of these lines having no traction current rails, Engineering Hours does not apply. At these locations, Traffic Hours/depot protection or a possession is required to access the track.

44.8 Train hazards in depots

There are several hazards relating to trains in depots in that:

- train movements are bi-directional and can approach from any direction
- trains move more slowly (5, 10, 15 mph) and quietly
- trains may move even when uncoupled, or with no driver's cab
- there may be hidden train movements behind stationary trains.

45 Signing in at depots

When arriving for work at a depot that is not your normal place of work, you must:

- be suitably certificated
- use the authorised walkways to enter the depot
- sign in at the security point in the gatehouse or depot entrance, if required
- sign in at the general office and obtain a visitor's pass
- sign in at the DDM/MMO's office if the general office is closed
- have received the local tour of the depot.

Unless instructed otherwise, always use the authorised or designated walkways and walk boards in the depot/sidings; these are marked out with yellow lines.

45.1 Signing in at stabling sidings

When you as the PWT-D needs to access stabling sidings you must always:

- report to the accountable manager if the sidings are not your normal place of work
- use authorised or designated walkways
- use walk boards
- use footbridges.

You must not cross 'live' rails unless you are suitably certificated.

At locations where the stabling sidings cross the main line or are split either side of the main line you must follow the local procedures for these locations.

At certain locations you must be certificated and competent to NR standards if you need to go beyond the depot limits onto any area of the operational railway which is designated as being under NR rules.

46 Planning protection within depots and sidings

To be able to go on the track and provide protection within a depot or stabling siding you must:

- be certificated PWT-D as a minimum
- be in possession of the required protection and communications equipment
- be familiar with local conditions
- have read the relevant documentation
- pass on safety critical messages using the correct format
- always have a place of safety
- have at least 25 seconds continuous sighting time
- complete your 'Traffic Hours' log book, every time protection activities are carried out.

46.1 Certification

As a PWT-D you must:

- be suitably certificated
- make sure all staff under your protection are certificated minimum Basic Track Awareness/Depot Track Accustomed.

46.2 PWT-D equipment

You must be in possession of a:

- 'PWT' armband
- Traffic Hours log book and pen
- working time piece
- red and green flags
- horn or whistle
- CRID.

46.3 Site Familiar

When providing protection you must be familiar with the following:

- approved points of access to the track
- direction from which trains might approach
- location of any restricted access
- limited sighting conditions of trains
- depot train speed
- the layout of the area, and the planned route to and from the worksite
- environmental conditions
- limited clearance areas
- lighting conditions
- poor underfoot conditions
- other obstructions.

46.4 Documentation

See section 7 of this learning information booklet.

46.5 Place of safety

There are very few clearly defined places of safety in depots, so the PWT-D may have to create a temporary place of safety using the appropriate protection procedures.

46.6 Temporary place of safety

You must set up a temporary place of safety for personnel to move into when a train approaches the worksite. As a PWT-D you can create a temporary place of safety by using one of the following methods:

- securing a train in front of the worksite or on the adjacent road
- securing points to divert trains away from the worksite
- agreement with the shunter.

If there is no place of safety and you cannot create a temporary place of safety, the work must be undertaken in a possession.

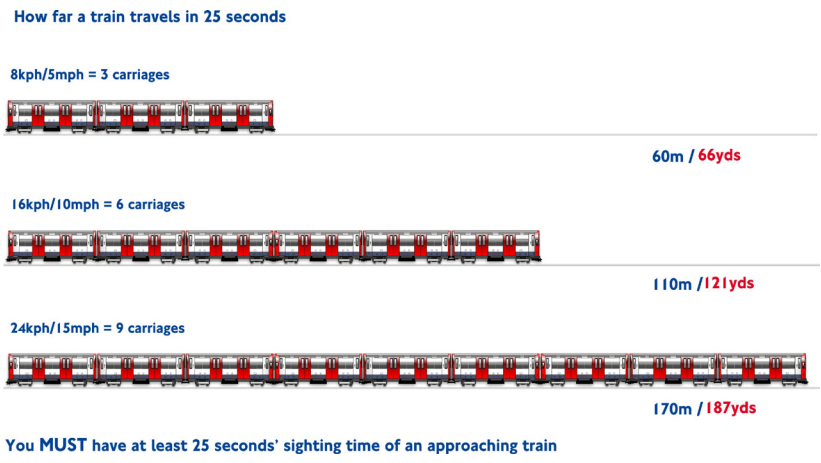
47 Sighting time and distances in depots

If it is not possible for the PWT-D to achieve the required sighting time by timing trains, the safe sighting distance method must be used.

To do this you must know the maximum train speed for the depot/road and look up the safe sighting distance.

Once you have obtained the maximum speed for the road, you can, with the use of train carriages, determine the sighting time for the worksite.

The times are calculated by the distance a train will travel in mph, for example, a train travelling at 10 mph will travel 111.75M in 25 seconds.



You must consider a number of factors when determining whether the sighting time needs to be increased:

- type of work
- tools and equipment
- number of staff
- level of certification and experience of the work group
- location of the place of safety
- limited clearances
- road speed
- noise, smoke, fumes or emissions created by the work
- other noise in the area
- weather conditions and visibility
- underfoot conditions.

You must appoint a lookout(s) if you are unable to give the work group the minimum required warning time by looking out for trains alone.

47.1 Warning codes

See section 25.4 of this learning information booklet.

47.2 Traffic Hours log book

See section 23 of this learning information booklet.

48 PWT-D providing protection alone

When you are carrying out protection without using a separate lookout, you must:

- be able to undertake both protection and lookout activities
- not do any other work
- not be distracted from looking out for trains
- remain at the worksite
- give a safety briefing(s) to the work group
- have adequate continuous sighting time
- provide the work group with the minimum warning time
- give the work group the agreed warning when a train approaches
- tell the work group to acknowledge when in the place of safety
- tell the work group when it is safe to continue working after the passage of a train
- remain within verbal contact range of the work group
- make sure the work group remain visible
- be visible to the train operator
- stand in a place of safety
- make sure that the work group have a separate PWT/SPC in charge of the work.

You must appoint lookout(s) if you are unable to provide the work group with the minimum required sighting time by looking out for trains yourself.

49 Protection arrangements briefing

You must agree with the lookout(s) at the protection briefing:

- the route to the worksite
- how many lookouts are required and their positions
- who will indicate to staff that it is safe for them to continue after a train has passed and how this will be done.

If the requirements for protection change the:

- work group must be assembled in a place of safety
- lookout(s) are briefed on the new protection arrangements.

49.1 Procedure for a lookout in a depot

When a lookout is positioned in a depot the lookout may have to stop the train before warning the work group.

Once the train has been stopped by displaying a red hand signal held steady the lookout must:

- ask the train operator which route they will be taking
- tell the train operator the location of the work group
- warn the work group if the train will affect them
- make sure that the staff move to the place of safety or temporary safe haven and acknowledge
- when the staff are clear and have acknowledged, tell the train operator to proceed by displaying a green hand signal held steady.

50 Journey to site safety briefing

You must hold a safety briefing with the work group before going on the track to the worksite. You must tell the work group:

- the details of the protection arrangements
- places of safety to be used
- any warning codes to be used
- to acknowledge all warnings
- about any other work which could affect them
- the lookout will indicate it is safe to continue walking after a train has passed and how this will be done
- direction from which trains might come
- obstructions they are likely to come across
- slip and trip hazards
- adjacent NR infrastructure
- type of work
- location of the worksite
- any other relevant information.

You should ask the work group questions to make sure that the safety briefing was understood by the work group.

In some circumstances where protection is not required to gain access to the worksite, the PWT-D will not have to give the journey to site safety briefing. The PWT-D must therefore ensure that all relevant information is included in the pre-work safety briefing.

50.1 Journey to the worksite

During the journey to the worksite the PWT-D providing the protection must lead the work group. If an additional PWT is required then they should walk behind the work group to make sure all personnel remain together. The PWT-D providing the protection must make sure all personnel remain together and ensure that:

- a minimum of 25 seconds warning time is maintained
- warnings are acknowledged
- the work group are in a place of safety
- the work group do not move after the passage of a train until instructed
- all tools and equipment are carried in a safe manner.

The PWT-D must make sure that personnel do not carry anything to the worksite which could stop them from reaching a place of safety or put them in danger from passing trains.

50.2 Walking through areas of limited clearance

See section 31.3 of this learning information booklet.

50.3 Implementing the worksite protection

Once at the worksite you must give a protection arrangements briefing to the lookout(s) which must include:

- any changes to the details given at the previous safety briefing
- location and extent of the worksite
- number of lookouts and their location.

You must test and adjust the protection arrangements as necessary.

50.4 Arrival at the worksite

On arrival at the worksite you must make sure the work group are in a place of safety before positioning any lookout(s) and undertaking the pre-work safety briefing. You must tell the work group not to leave the place of safety until instructed.

51 Pre-work safety briefing

Before work commences you will conduct a pre-work safety briefing detailing any changes from the journey to the site safety briefing. The pre-work safety briefing will include the following:

- the extent of the worksite
- any changes to the details given in the previous safety briefing
- any other relevant information.

You should ask the work group questions to make sure that the safety briefing was understood.

You must:

- authorise staff to work, only when it is safe to do so
- give a safety briefing for any additional staff who join the work group after the briefing(s).

51.1 Monitoring worksite protection arrangements

See section 35 of this learning information booklet.

51.2 On completion of work

When the work has been completed, you must:

- check that the worksite is clear of staff, materials, equipment and anything that could endanger the train service
- make sure that anything being left at the site is secured
- make sure all assets related to the work have been inspected by a licensed person.

51.3 Implementing the protection for the journey back

As the PWT-D you must give a protection arrangements briefing to the lookout(s) which must include:

- any changes to the details given at the previous safety briefing
- the route of the journey from the worksite
- number of lookouts and their location.

52 Post work safety briefing

Before the journey from the worksite you must conduct a post work safety briefing detailing the protection arrangements for the return to the point of access. The safety briefing should contain the following information:

- the route to be taken
- any changes to the protection details given in the previous safety briefing
- any other relevant information.

You should ask the work group questions to ensure that the safety briefing was understood.

52.1 Journey from the worksite

During the journey from the worksite the PWT-D providing the protection must lead the work group. If an additional PWT is required then they should walk behind the work group to make sure all personnel remain together.

The PWT-D providing the protection must:

- lead the work group off the track
- not allow personnel to carry anything from the worksite which could stop them reaching a place of safety
- maintain protection whilst leaving the worksite
- indicate to the work group when it is safe to continue walking after the passage of a train
- make sure that all personnel are clear of the track
- inform the lookout(s) they are no longer required
- once off the track, instruct the work group not to return to the track because protection is being removed.

The PWT-D must take the work group off the track once they have reached a place of safety, inform the work group that protection will be removed and they are not to go back onto the track.

53 Signing out at depots and stabling sidings

Once the work is complete you must:

- sign out at the DDM/MMO's office in the depot, if the general office is closed
- sign out with the accountable manager in a stabling siding
- sign out at the security point in the gatehouse or depot entrance, if required
- always use the authorised walkways to leave the depot or stabling sidings.

54 Emergency actions

54.1 Injured person

You must not move a seriously injured person, unless leaving them where they are, would place them in greater danger and cause further injuries.

If a person is seriously injured, and not in contact with live conductor rails, contact the controller or the DDM/MMO, if in a depot, who will implement the local depot emergency procedures.

If a person is in contact with the 'live' conductor rails you must:

- consider your own safety first
- get traction current switched off immediately whenever possible
- use a piece of dry wood or an insulated tool to roll them off.

54.2 Getting traction current switched off in an emergency

If traction current needs to be switched off on the running line, depot or stabling siding in an emergency you must:

- contact the controller or the DDM/MMO
- get the current switched off in the particular traction current section
- check that the DDM/MMO has been advised (if applicable).

The controller or DDM/MMO will want to know the following:

- your name
- department or company
- location and section of track which switch off is required
- reason for switching traction current off.

You must always wait for confirmation that traction current has been switched off.

If you get traction current switched off, it is also your responsibility to contact the controller or DDM/MMO again to say when it is safe for traction current to be switched on – unless you have:

- arranged for someone else to take over the responsibility to do this
- told the controller or DDM/MMO who that person is.

If a seriously injured person needs to be moved across the track in an emergency you must record the:

- details of the incident and the identity of the injured person
- nature of the medical assistance required
- rendezvous point for the medical assistance
- identity of the person meeting the medical services.

If the injured person needs to be moved you must tell the controller or DDM/MMO to:

- arrange for traction current to be switched off and stop all train movements
- confirm when traction current is switched off and train movements have ceased.

55 References

Rule Book 1 Communications

Rule Book 3 Traction current and high voltage supply

Rule Book 10 Station access

Rule Book 15 Possessions protection methods

Rule Book 16 Going on the track in Engineering Hours

Rule Book 18 Engineer's trains, vehicles' and trolleys

Rule Book 20 Engineering staff – Traffic Hours protection

Rule Book 21 Personal safety on the track

The Regulatory Reform (Fire Safety) Order 2005

The Fire Precautions (Sub-station Railways Stations) (England) Regulations 2009

The Health and Safety (First Aid) Regulations 1981, Approved code of Practice and Guidance (L74)

Electricity at Work Regulations 1989