Overhead Services Standard

(SHEMS-STD-GR-031)

Unitas
Stoke-on-Trent Ltd.

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1 Introduction

The purpose of this standard is to set out the requirements to ensure that all personnel involved in works that may encounter overhead services are provided with suitable and sufficient information to carry out the works in a safe manner, preventing injury to Unitas personnel and others and accidental damage to utility services or properties.

This standard requires that:

- Where reasonably practicable, Overhead Services are diverted or switched off before work commences.
- Where work in close proximity to live overhead services cannot be avoided, safe working distances and working methods are established prior to commencement of work
- Visual Inspection of Overhead Services to establish any risks and permits issued.

2 Scope

The scope of the SHEMS covers all persons, workplaces and operations.

2.1 References

ENA	Energy Networks Association
G39/2	ENA Engineering Recommendation G39/2 2013 - Model C of P-Electrical Safety in the Planning, Installation, Commissioning & Maintenance of Public Lighting & Other Street Furniture
GS6	HSE Guidance Note GS6 (Fourth Edition) – Avoiding Danger from Overhead Power lines.
Look out, Look Up	ENA Guidance Leaflet

3 Unitas Requirements

3.1 General Maintenance Activities – Working close to or under overhead services

Senior Managers, Operation Managers and Supervisors must ensure that these requirements are adopted in all areas under their control. They must also ensure that this process is cascaded to employees and supply chain involved in work close to or under overhead services and that it is complied with at all times.

Operations Managers/Supervisors must plan the activity and ensure that only personnel with the relevant experience, training and competencies undertake any works close to or under overhead services. The employee also has responsibilities within the system, again these must be documented to instruct and inform the employee as to what is required and issue a Trade Permit To Work.

Where overhead cables are identified at planning stage, the service provider should always be approached to ascertain if it is practical to either divert or isolate the service before works are due to begin.

Where work has to be carried out close to or under overhead lines (e.g. road works, pipe laying, grass cutting, potholing etc.) and there is absolutely no risk of accidental contact or safe clearance distances being breached, no further precautionary measures are required. However consideration must be given to situations that may lead to danger from overhead services (i.e. working from the back of a vehicle, erection of temporary lighting towers or on top of machinery) and suitable safe systems of work (SSW) developed.

3.2 Risk Control

Overhead power cables have the potential to cause life threatening or serious injuries, or damage to property.

Standard Risk Management hierarchy **Figure 1** defines precautions to control risks.

Eliminate	Eliminate foreseeable risks (avoiding the hazard), or find an alternative
Reduce	Reduce the harmful to less harmful, reduce the time individuals are exposed to a risk, or reduce the number of people exposed or install enclosures to separate individuals form the risk
Inform	Provide appropriate information relative to the design, build, maintenance, workplace, key risks and residual risks. Provide relevant instruction, training, SSW/Method statements
Control	Design to address/minimise the risk (e.g. use of safe access system, consider opportunities to pre-fabricate, identify sequencing of work, use standing craneage or temporary works etc.)Supervision
	Collective - Priority to collective measures over individual protection
PPE	Personal Protective Equipment (PPE) as a last resort
Discipline	Discipline - Mentor, retrain, understand why standards and controls are not followed

Figure 1 - Risk Management Hierarchy

For works under or near overhead power lines, application of this hierarchy sets out the following actions:

- Can the work be avoided? (Eliminate) If No;
- Divert all overhead lines clear of the work area (Reduce) If No;
- Make the lines dead (Reduce) If No;
- Inform and work around the overhead cables using a combination of risk management controls particularly where overhead lines pass over permanent work areas.

Close liaison is required with the overhead service owner who must determine the feasibility of the above control measures.

If the overhead line cannot be diverted or switched off, and there is no alternative to carrying out the work near it, consideration shall be given as to how the work can be done safely. **If it cannot be done safely, it must not be attempted and the client informed accordingly.** A site-specific risk assessment must always be completed; and a SSW developed.

Your risk assessment and safe system of work must address as a minimum:

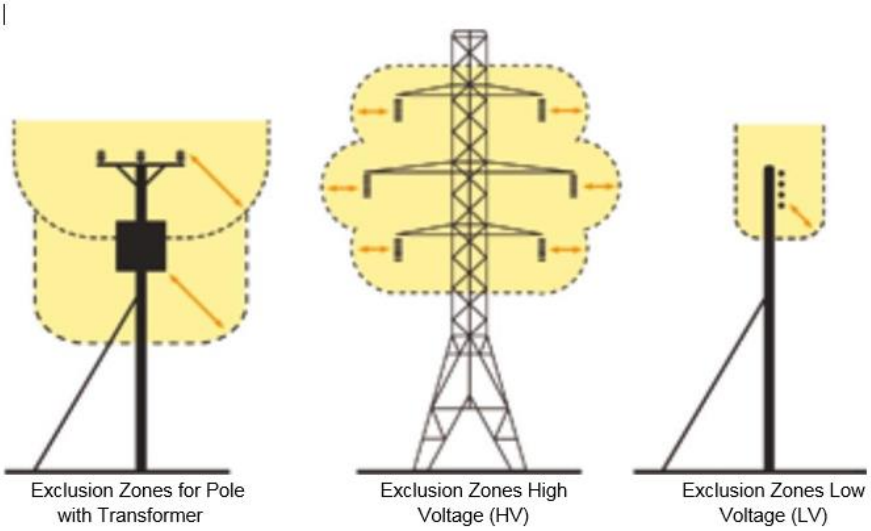
- The voltage and height above ground of the wires. (NB. If the cable owner has not been able to supply the required information in a timely manner, their height can be measured by a suitably trained and competent person using a non-contact measuring device).
- The nature of the work and whether it will be carried out close to or underneath the overhead line, including whether access is needed underneath the wires.
- The height and reach of any machinery or equipment to be used near the overhead line.
- The safe clearance distance needed between the wires and any machinery or equipment being used and/or any structures being erected. If in any doubt, the overhead line's owner must be asked to advise on safe clearance distances.
- The site conditions and their likely effect on plant working in close proximity to overhead cables, e.g. undulating terrain may affect stability of plant etc.
- The competence, supervision and training of people working at the site.

3.3 Guidance on General Exclusion zones around overhead powerlines.

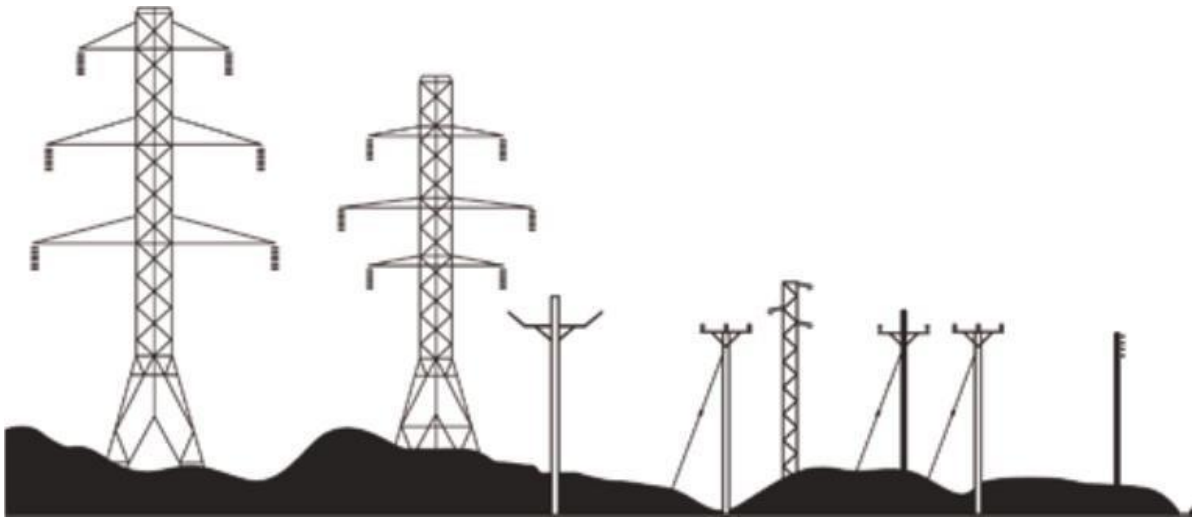
- Always assume that overhead lines are LIVE unless informed otherwise by the service provider.
- Always assume that an overhead line is a powerline unless you know for sure that it belongs to a telecom provider.

Overhead power lines are not normally insulated, so any contact may result in serious or fatal injuries to those involved.

Electricity at higher voltages can jump gaps with no warning so you must ensure that plant does not encroach within either the specific clearances identified by the service provider or otherwise the general exclusion zones given below.



The yellow highlight indicates how to measure the exclusion zone around various types of typical transmission pylons/poles.



275kV or 400kV	132kV	11kV or 33kV	LV 230/400V
Exclusion Zone 7m	Exclusion Zone 6m	Exclusion Zone 3m	Exclusion Zone 1m

When working near to transmission poles, you should also try to maintain an exclusion zone of at least 600mm around the base of the pole, pylon or stay wires. For activities such as grass cutting and vegetation removal, suitable controls to enable compliance with this requirement should be agreed with the client.

These exclusion zones are absolute minimum distances and are for guidance only when developing a safe system of work. The distances quoted should always be confirmed with the local service provider.

Any item of plant (e.g. raised tipper units, sheeting devices), equipment (e.g. ladders) or materials being transported must not be permitted to enter the exclusion zone at any time.

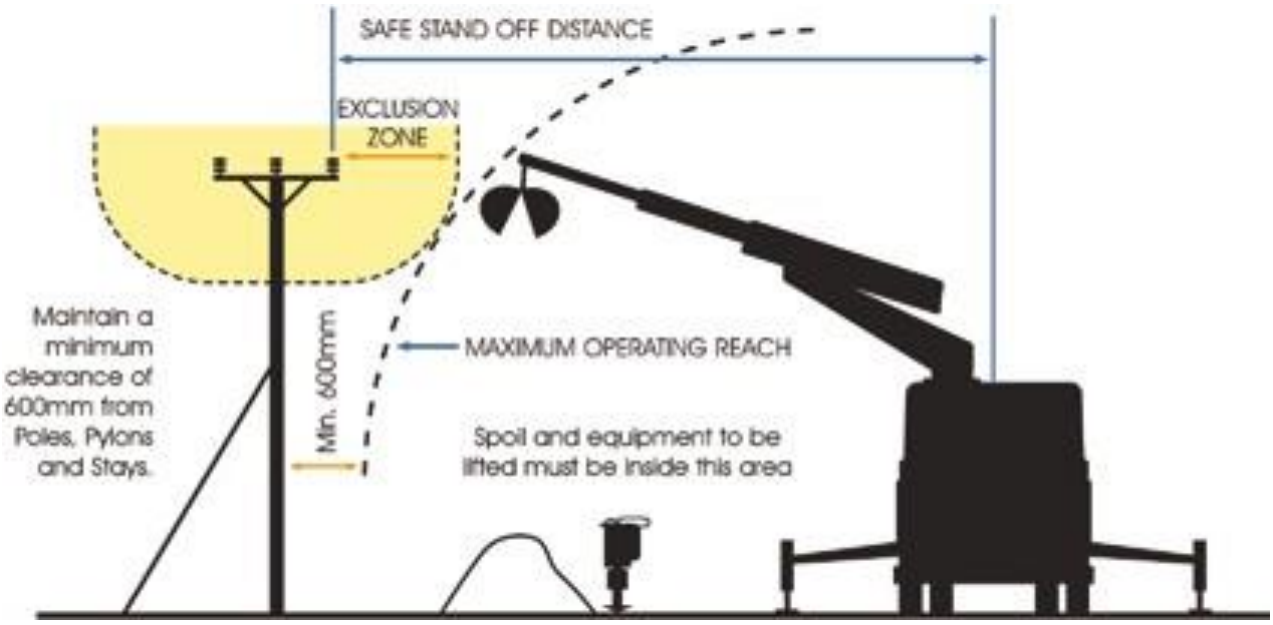
Materials, plant or other items must not be stored or stacked close to overhead lines such that the exclusion zones might be infringed by people standing on them.

3.4 Safe operation of plant

Where overhead cables are identified at planning stage, the service provider should always be approached to ascertain if it is practical to either divert or isolate the service before works are due to begin.

If using plant in close proximity to overhead cables then a safe stand off distance must be established to ensure that you do not encroach within the exclusion zones detailed above.

The safe stand off distance is equal to the maximum operating reach of the plant added to the minimum exclusion zone distance determined from above. The vehicle or item of plant must be positioned at least this distance from the cable to ensure that there is no risk of accidental contact with or arcing from the overhead line.



Where safe stand off distances cannot be achieved with the intended plant due to its size or site constraints then you must consider either the use of smaller plant or as last resort the fitting of either mechanical or electronic restraints to the reach of the plant.

Consideration should also be given to the fitting of electronic overhead cable warning systems which alert the driver of any at risk plant to the proximity of an overhead cable. This type of control should be considered in addition to and not as an alternative to the other controls set out in this standard.

Operators of plant, and persons who may be required to dig, lift or work under overhead services must be briefed in the Safe Systems of Work for the site and emergency plans should a service be damaged. Records of the Tool Box Talks (TBT)/briefs must be recorded.

Permits must be used where mechanical excavating plant is in operation.

A trained and competent banksman, who has been informed of the overhead cables on the work site must be employed at all times whilst work is taking place in close proximity to or below overhead cables.

3.5 Depots and site compounds

Controls for construction or maintenance works that are undertaken close to or under overhead services, should also be applied to work in site compounds and depots.

Consideration must be given to ensuring the safe access and egress arrangements, movements within the compound/depot and the positioning of storage areas for materials and waste.

Where overhead cables cross a depot yard, the risk must be assessed as part of the depot/compound risk assessment and any associated task based risk assessments. Cables must be highlighted by use of suitable measures in the yard to ensure that delivery drivers and plant operators are made aware of their presence.

3.6 Working in proximity to and underneath overhead services

Close liaison is required with the overhead service owner throughout the planning process to determine the feasibility of the control measures noted below.

Where overhead services have been identified, management must ensure that:-

- Full details of the type and nature of the overhead services are obtained and made known to all operatives, drivers and plant operators who may be affected whilst on site.
- Operations management must be familiar with and working to the guidance provided in HSE-GS6 Avoiding Danger from Overhead Power Lines (http://www.hse.gov.uk/pubns/gs6.pdf)and ENA Engineering Recommendation-G39/2 for street lighting work.
- The service provider must be consulted to determine safe working distances from the cable. Where practical the cable should be temporarily isolated or diverted in order that works may proceed safely. The service provider must always advise on whether the service can be isolated or diverted.
- Where a safe working distance is to be maintained, substantial physical barriers must be erected to prevent unauthorised encroachment of the works into the safety zone – see **Appendix 2** for guidance on suitable arrangements.
    - Where overhead cables are encountered which encroach upon the working space, the Operations Management/Supervisors are required to:
    - Have understanding of the type of overhead cable involved and awareness of the requirements for avoiding danger from overhead cables i.e. clearly distinguishable goalposts which shall limit the width and height of passing plant. These shall be supplemented with highly visible “Danger overhead cables” signs and cones displayed at ground level (**see**

appendix for example).

- Domestic scaffolds require barriers to prevent accidental contact with cables.
- Assume all cables are live until informed otherwise by the service provider
- Ensure a permit to work system and SSW are in operation to control access to the safety zone and prevent the risk of objects encroaching into the safe radial clearance area around live cables i.e. ladders, scaffolding poles etc.
- Ensure all site personnel undertake their duties with minimal risk to themselves and others working within close proximity to overhead cables
- Ensure no materials are stored within the safety exclusion zone
- Ensure that where work beneath overhead cables is unavoidable, that all plant, cranes, excavator's etc. are fitted with height limiter devices to restrict potential proximity of plant encroaching to the cable
- Ensure goalposts or equivalent control measures are erected whenever construction works are being undertaken below overhead services, irrespective of voltage or sheathing. It must be noted that goal posts are a requirement from **GS6** and must be enhanced with appropriate signage and a documented safe system of work for each worksite

Any exemptions from this requirement must have a specific site risk assessment to justify the reasons why goal posts are not required and how the risk is to be managed. The risk assessment and justification shall be authorised by the SHE Director.

3.7 Working Site Controls

Site managers must consider **GS6** to be the minimum acceptable standard of protection for working adjacent to overhead power lines and **G39/2** to be the similar acceptable minimum standard for street lighting works.

The Site Manager shall contact the overhead service provider for advice in all cases where overhead cables are on site or fall within the working radius of plant outside site boundaries. Responsibilities for this process must be identified prior to works commencing.

The Site/Contract Manager or Services Coordinator shall contact the overhead service provider informing them of the scope and timescale of the proposed work and confirming any comments or recommendations they have made. A request must be made for the lines to be diverted, or the lines isolated if practicable.

A schedule of overhead lines affecting or crossing the site must be established and the power loading of the lines ascertained. Survey information shall be added indicating actual line heights along with the clearance recommendations obtained from the supplier. This information must be included within the sites Method Statement and Risk Assessment and shall determine whether works can proceed.

Following consultation with the service provider, barriers, goal posts and warning signage to comply with GS6 and/or **G39/2** shall be established and maintained. Protection in accordance with the guidance shall be established before work or passage under such lines takes place.

Where attention of the plant operator or driver is likely to be focused more at ground level (e.g. during surfacing operations) the goalposts and signage shall be supplemented by ground level coning (see example in **Appendix 1**). This coning shall be placed alongside the route to be travelled by plant, at 1m intervals in a run extending at least 5 m either side of the cable.

The Site Manager shall appoint a competent member of staff to supervise all works beneath power lines. The Site Manager shall ensure that Method Statements and Risk Assessments are produced to ensure that a Safe System of Work is adopted for working under or around overhead power lines. All Risk Assessments must be completed using the site specific advice provided by the overhead service provider.

Materials must not be stored under any overhead cables or within the protection areas. Ground levels must not be raised without re Risk assessment, revised Method Statement and consultation.

3.8 Protective Measures

It is important to consult with the overhead service provider prior to any works commencing around, under or passing beneath existing overhead services. Communication must be maintained by Unitas until the works are complete.

Operational management and plant operators must be aware of boom and jib lengths when operating in close proximity to cables. Plant such as cranes and excavators must be modified (either by the size of the plant or by the addition of suitable physical restraints)so that it cannot reach beyond the plants safe clearance limit. Restraining devices may be fitted to the derricking or slewing mechanism, or both, if required.

Restraining devices may take the form of mechanical stops, chains, or of limit switches for electrically driven cranes, or oil or fuel valves respectively for engine driven cranes with hydraulic or mechanical transmission.

Method statements and risk assessments must prescribe SSW for personnel carrying metal scaffold poles, ladders or other conducting objects within or under overhead services, barriers and signage must be arranged to prevent unauthorised access by both personnel and mobile plant.

Where plant may pass under the line:

- Entrance points using either wires or bunting must be positioned a minimum of 12m from power lines
- The area must be as small as possible and not more than10m wide
- Passageway must be clearly defined by fencing barriers and goalposts
- Goalposts must be of rigid constructions and of non-conductive materials
- Clearances must be specified by service provider
- Barriers and goalposts to be distinctly marked (red and white)
- Warning notices indicating height to be displayed
- Notice giving cross bar clearance to be displayed
- Advance warning notices required for crane and other such heavy plant movements
- Appoint a responsible person to ensure precautions are observed
- Banksman to be competent and instructed and in attendance at all times
- Use a permit to work system for movement under the line

Where work will be carried out beneath a line:

- It may be necessary to take further precautions than those listed above. Consult HSE GS6 guidance, the relevant service provider and your SHE Advisor

Where overhead services are in the vicinity of the works:

- Erect barriers parallel to overhead lines
- Barriers must not be less than 6m from the service poles
- Distances must be agreed with the service provider
- Distances are measured from ground level
- No materials to be stored under lines in any circumstances.

3.9 Domestic Overhead Power Lines

When working on a building there is the likelihood that domestic power lines maybe present. These are often spurred from an overhead cable source and are sometimes found entering into the side of a building and can often be unsheathed i.e. unprotected. Where the work is likely to be in close proximity (within 3 metres) the service provider must be contacted to either isolate (turn off) or sheath the wires and associated equipment.

A compulsory visual inspection must be completed before any works commence ensuring that the condition of cabling throughout the working area has no damaged or exposed areas.

3.10 Training

Line management and operatives shall be trained to identify hazards from overhead services and made aware of the safe working procedures required to work in the vicinity of overhead services.

Where operatives are required to measure the height of overhead services as part of development of a SSoW, they must be suitably trained and competent in the use of an appropriate non-contact measuring device.

3.11 Emergency plan

If contact is made with an overhead power line, staff must immediately clear the area and suspend all work within 50m of the damage because the line could still be live, or become live again.

The operator of a machine that is in accidental contact with an overhead line should take the following steps:

- If the machine is still operable:
- lower any raised parts that are controlled from the driving position and/or
- Drive the vehicle clear of the line, as long as neither of these actions risk breaking the line or dragging it to the ground

If the machine is not operable or cannot be driven clear of the line:

- **Stay** in the cab
- Contact your site manager immediately **by radio or mobile phone** or as soon as possible by any other method and ask them to inform the electricity company
- Instruct everyone outside the vehicle not to approach it
- Do not exit the cab until given confirmation BY ELECTRICITY COMPANY PERSONNEL that it is safe to do so.

If the machine is inoperable or cannot be driven free and there is risk of **fire or other immediate life threatening hazard**:

- Jump clear of the vehicle, avoiding simultaneous contact with any part of the machine and the ground.
- Try to land with your feet as close together as possible.- where possible, continue to move away from the vehicle using **“bunny hops” with your feet together until at least 15m from the vehicle**.
- Instruct other people in the vicinity not to approach the vehicle.
- Do not return to the vehicle until given confirmation **BY ELECTRICITY COMPANY PERSONNEL** that it is safe to do so.

Whatever the circumstances, site management must contact the service provider **immediately** and tell them what has happened.

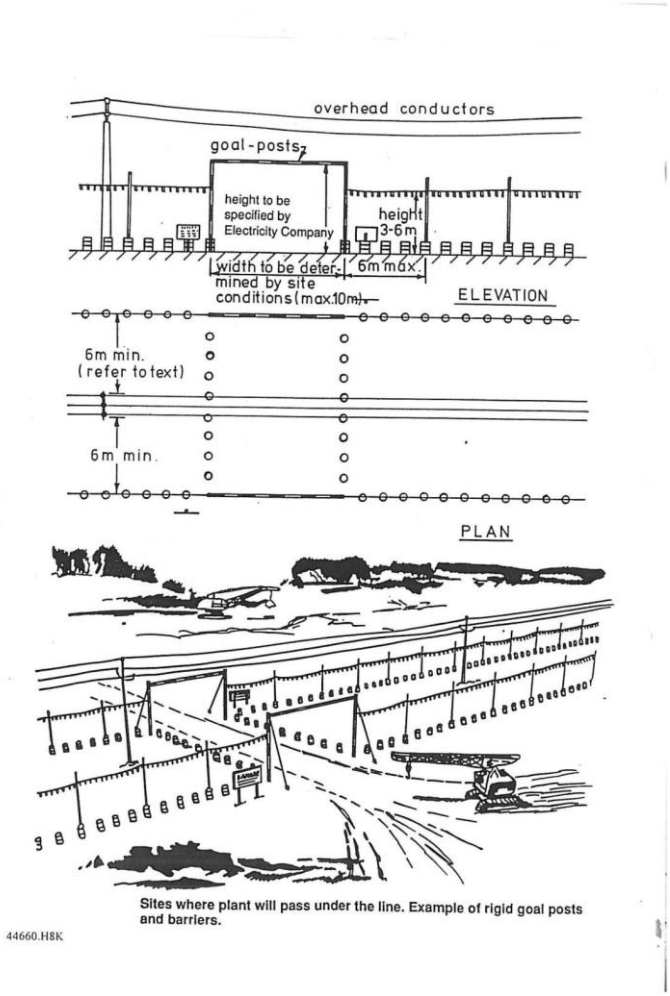
Report any damage or contact no matter how minor they may seem at the time. Refer to Incident Management and Near Miss Reporting Standard SHEMS-STD-GR-011.

Whilst the damage may not cause a serious problem at the time of contact it may fail later, causing danger to

electricity company staff, members of the public and/or disruption to supplies.

APPENDIX 1 – Example of ground level coning to be used to denote overhead cables.

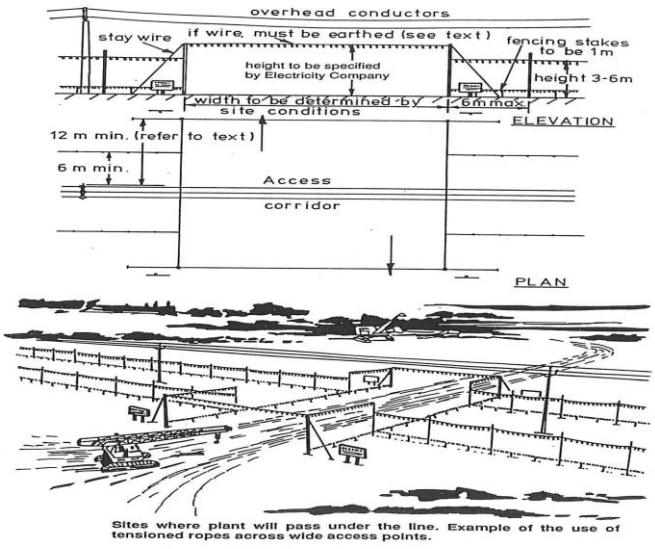
N.B. This cone must not be placed on the highway as part of traffic management coning – it MUST only



Sites where plant will pass under the line. Example of rigid goal posts and barriers.

be used inside the working area or off carriageway.

APPENDIX 2 – Examples of Physical guarding for overhead cables.



Sites where plant will pass under the line. Example of the use of tensioned ropes across wide access points.

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