Working in Proximity

to

Low Voltage Overhead Power Lines

Danger

Overhead live wires

hseni

CONTROLLING RISK TOGETHER

Foreword

This, HSENI accepted, industry-approved guidance only applies to work in proximity to low voltage (up to 1000 volts) overhead power lines. The methods described complement GS6 "Avoidance of danger from overhead electric power lines" This guidance does not have the special legal status associated with an ACoP. This document is intended to provide a standard of good practice for safe working. Following the guidance is not compulsory and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and Safety inspectors seek to secure compliance with the law and may refer to this guidance as illustrating good practice.

The document is intended to guide the client and designer through the design process and through the considerations that are necessary to produce safe and effective designs. The document is also intended to provide the contractor with options for carrying out the works that will ensure the safety of the workers and the public. Additionally the document presents duties for the owners of lines (utilities).

HSENI thanks Ciaran McAleenan (Chair of the working group) and the industry representatives that participated in the development of this guidance, from the following organisations;

Construction Industry Group (NI),
Department for Regional Development: Roads Service,
Northern Ireland Electricity, and
Northern Ireland Water.

This document is to be reviewed when significant changes in legislation, standards, technology or processes occur.

Electronic Copies

Electronic copies of this document are available on the HSENI website; www.hseni.gov.uk

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Scope

This Guidance Note covers electrical safety for work that is to take place in proximity to low voltage (LV) overhead power lines (up to 1000 Volts [1]), that is LV overhead power lines that run adjacent with the carriageway or footpath, cross the carriageway or run along the façades of buildings. The guidance note gives the owner(s) of the lines, clients, designers and contractors advice on how to deal with interface problems involving construction work in a reasonably practicable way in order to ensure a consistent and safe approach, including when organisational interests overlap.

Please Note: the use of the terms client, designer and contractor have the same meanings as those assigned in the Construction (Design and Management) Regulations (Northern Ireland) 2007.

The guidance deals with the following working conditions;

- Work in proximity to LV overhead power lines not involving 'slewing' plant.
- Work in proximity to LV overhead power lines involving 'slewing and rising' plant.

[1] **Note**: The line configuration doesn't give an accurate indication of the voltage. If you are in any doubt contact the utility provider.

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Exclusions

Please note:

This guidance does not apply to the situations described below;

High Voltage Overhead Power lines The precautions needed to prevent contact with High Voltage overhead power lines detailed in the HSE's Guidance Note (GS6) shall be complied with.

Work Directly Above the Line This guidance document does not address work directly above overhead power lines.

Night Working/ Visibility This guidance only applies to operations carried out within daylight hours and in adequate visibility (i.e. overhead power lines must be clearly visible).

Structures The construction of a structure in the vicinity of overhead power lines, such as scaffolding.

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Working in Proximity to Low Voltage Overhead Power Lines

Planning Process – All Work

Actions	Duty Holder
The personnel involved in the design and work planning process are to have a full working knowledge of this document and the requirements of GS6**.** Other appropriate guidance documents are listed in the Reference section.	Designers, Contractors and Owner(s) of Lines
Give the designer any relevant information in your possession, relating to overhead power lines.	Clients, Owner(s) of Lines
In order to be able to produce a safe design establish height, position and voltage of any overhead power lines present at the proposed work location. (This may involve requesting marked up drawings from the owner(s) of lines). The following information will be necessary to select the appropriate safe option; • verge, footway and/ or road widths, • road camber, • overhead power line and pole position and • height of the overhead power line above the road surface level.	Te
Carry out a survey of the work location, prior to starting any construction activity, • to verify the information provided by the designer and/ or owner(s) of the lines • to identify whether the position of any overhead power lines will present a hazard • to confirm that the exclusion zone (refer to Definitions) can be maintained.	Contractors
In order to maintain a 1.0m exclusion zone at cable height the vehicle(s) may need to stay out a further distance to take account of the road camber. For example: Using a standard camber of 2.5% from centre of the carriageway the additional clearance required at road level for a lorry of 10m tipping height would be 0.25m (Total distance 1.25m).	Designers and Contractors

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Planning Process – All Work (Cont'd)

Actions (Cont'd)	Duty Holder
Where the control measures set out in this guidance cannot be achieved, for example; • Where the 1.0m exclusion zone cannot be achieved **(**Appendix 1: Figure 1). • Where vehicles/ plant cannot stay more than 600mm from the pole or stay wire. • Where there is a complex overhead power line layout. Agree and record an appropriate safe working method with the owner(s) of the lines. Work shall not proceed until the safe working method has been agreed between the parties (Note: Owner(s) of Lines may have to isolate the overhead power line [make the lines dead] to allow the work to proceed).	Owner(s) of Lines and Designer or contractor
Consultation with all parties involved is essential. A site meeting may be held if any party deems it necessary.	Owner(s) of Lines and Designer or contractor

Working in Proximity to Low Voltage Overhead Power Lines

Work not involving Slewing Plant (e.g. Surface Dressing)

Controls	Duty Holder
All overhead power lines are to be treated as live.	Contractor
A nominated site supervisor must be in possession of up-to-date plans showing the location of overhead power lines and equipment prior to any work starting.	
An 'Exclusion Zone' of 1.0 metre clearance from LV Overhead power lines is to be maintained at all times during the course of the work (Appendix 1: Figure 1).	
Vehicles and plant are not to be positioned any closer than 600mm from the pole or stay wire (Appendix 1: Figure 1).	
A nominated site supervisor is to closely watch the operation of the plant and equipment to ensure that it does not infringe the 1.0 metre Exclusion Zone.	
Where the overhead power line crosses the road sufficiently robust, coloured/ highly visible marker posts are to be placed in the verge and maintained (See notes below).	
The marker posts are to be located a minimum of 6m in advance of the overhead power line where it crosses the road. (Note: Where the overhead power line crosses at an angle or encroaches onto the road repeater marker posts will be required at 6m intervals at both sides of the road – Appendix 1: Figure 2).	
A nominated site supervisor is to ensure that no item of plant rises between the first and last marker posts.	

Notes:

1. The marker posts are to be at least 1.2 metres high and a minimum of 45mm square or 45mm diameter cross-section, be highly visible and a have a hazard warning sign attached.
2. Care must be taken when posts are to be driven into the ground refer to the "Protocol for the Management of Underground Services" www.roadsni.gov.uk .

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Work involving Slewing/ Rising Plant

Controls	Duty Holder
Consider whether other materials or techniques such as directional drilling, pipe bursting or use of smaller plant and equipment could be used to avoid working in the vicinity of overhead power lines.	Designer
Determine whether the power supply can be isolated [made dead].	Designer Owner(s) of Lines
Consultation with all parties involved is essential. A site meeting may be held if any party deems it necessary.	Owner(s) of Lines Designer or Contractor
A nominated site supervisor must be in possession of up-to-date plans showing the location of overhead power lines and equipment prior to any work starting.	Contractor
All overhead power lines are to be treated as live unless an electrically competent person nominated by the owner of the line demonstrates that the overhead power line is dead.	Owner(s) of Lines Contractor
If isolation [making dead] of overhead power lines is not viable the controls detailed below are to be followed.	Contractor
Vehicles and plant are not to be positioned any closer than 600mm from the pole or stay wire (Appendix 1: Figure 1).	
Barriers, goal posts, bunting, flags and warning notices are to be erected to establish an 'Exclusion Zone' of 1.0 metre clearance from LV Overhead power lines. These are to be maintained at all times during the course of the work.	
Plant should be positioned where it cannot reach inside the exclusion zone.	
When this is not possible plant such as cranes, lorry mounted cranes and excavators, are to be modified by the addition of suitable limiters or restraining devices so that they cannot reach inside the 1.0m Exclusion Zone. (Where appropriate consult with the manufacturer).	

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Work involving Slewing/ Rising Plant (cont'd)

Controls (cont'd)	Duty Holders
If the plant noted above is fitted with telescopic jibs, fly jibs or similar, additional limiters or restraining devices to prevent alteration in length of jib or angle of fly jib is to be provided.	Contractor
A nominated site supervisor is to ensure that limiters or restraining devices are set and operated to prevent the 1.0m Exclusion Zone being infringed.	
Where the overhead power line crosses the road the goal posts are to be located a minimum of 6m in advance of the overhead power line where it crosses the road. (Note: Where the overhead power line crosses at an angle or encroaches onto the road repeater marker posts will be required at 6m intervals on both sides of the road)	
Where the overhead power lines crosses the road a nominated site supervisor is to ensure that no item of plant slews or rises between the first and last set of goal posts.	

Definitions

High Voltage (HV)	A voltage exceeding 1000 volts (reference: Council Directive 73/23/EEC)
Low Voltage (LV)	A voltage up to 1000 volts (reference: Council Directive 73/23/EEC)
Exclusion Zone	A zone where no part of body, tool, equipment or material may encroach within 1.0 metre of the overhead power line, at any time. In addition, no vehicles or plant shall come within 600mm of the pole or stay wire. (Appendix 1: Figure 1)
Slewing & Rising Plant	Any tipper lorry or item of plant that is capable of raising, swinging or turning. Such as excavator or crane.
Surface Dressing	A surface dressing operation is a continuously moving mobile operation that does not include the use of excavating plant or machinery that is capable of slewing.
Restraining Devices	Apparatus designed to limit the height or slew of an item of construction plant. Restraints may be electrical or hydraulic systems fitted to the plant, or mechanical devices such as chains.
Road Resurfacing	Any activity associated with the improvement of an existing road or footway surface which does not include the use of excavating plant or machinery that is capable of slewing.

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References

The guidance in this document should be used in conjunction with;

1. HSE Guidance Note, "GS6 - Avoidance of Danger from Overhead Electric Power Lines"
2. HSENI book, "Health and Safety in Construction in Northern Ireland".
3. "Protocol for the Management of Underground Services" www.roadsni.gov.uk. (Search for from the home page)
4. Temporary Traffic Management Systems - (TTM) Decision Tree published by Roads Service www.roadsni.gov.uk (Search for from the home page)
5. Safety at Street Works and Road Works Approved Code of Practice (the. "Red Book"),
6. Chapter 8 of the Traffic Signs Manual - Traffic Safety Measures and Signs for Road Works and Temporary Situations

Relevant Contacts

Northern Ireland Electricity

Tel: 08457 643643 (Advice and Emergency)

http://www.niesafety.co.uk

Health and Safety Executive for Northern Ireland

Tel: 028 9024 3249

http://www.hseni.gov.uk

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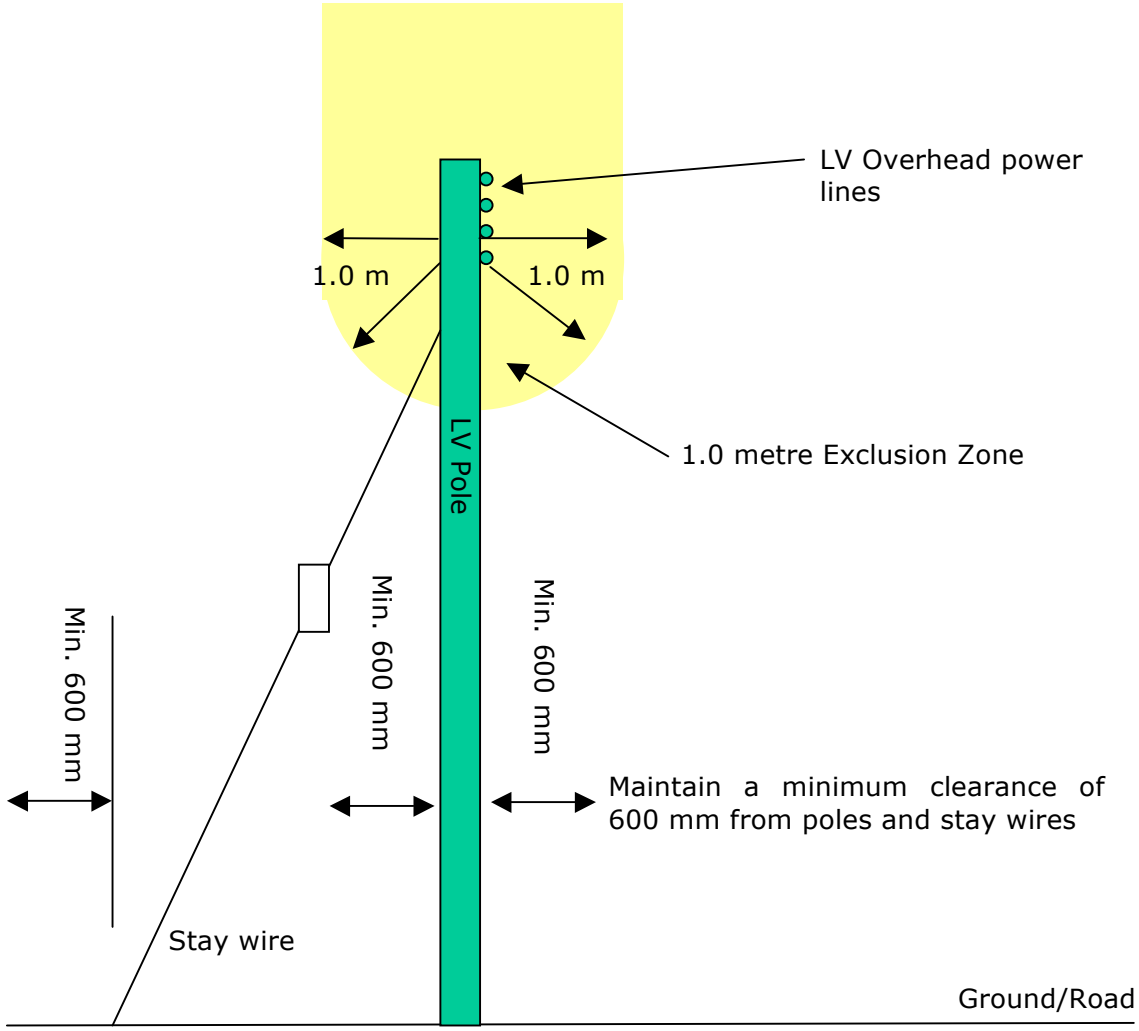
Appendix 1

Figure 1 - Exclusion Zone



Note: In order to maintain a minimum 1.0 metre clearance the vehicle may have to stay further out from pole; for example, to take account of the road camber.

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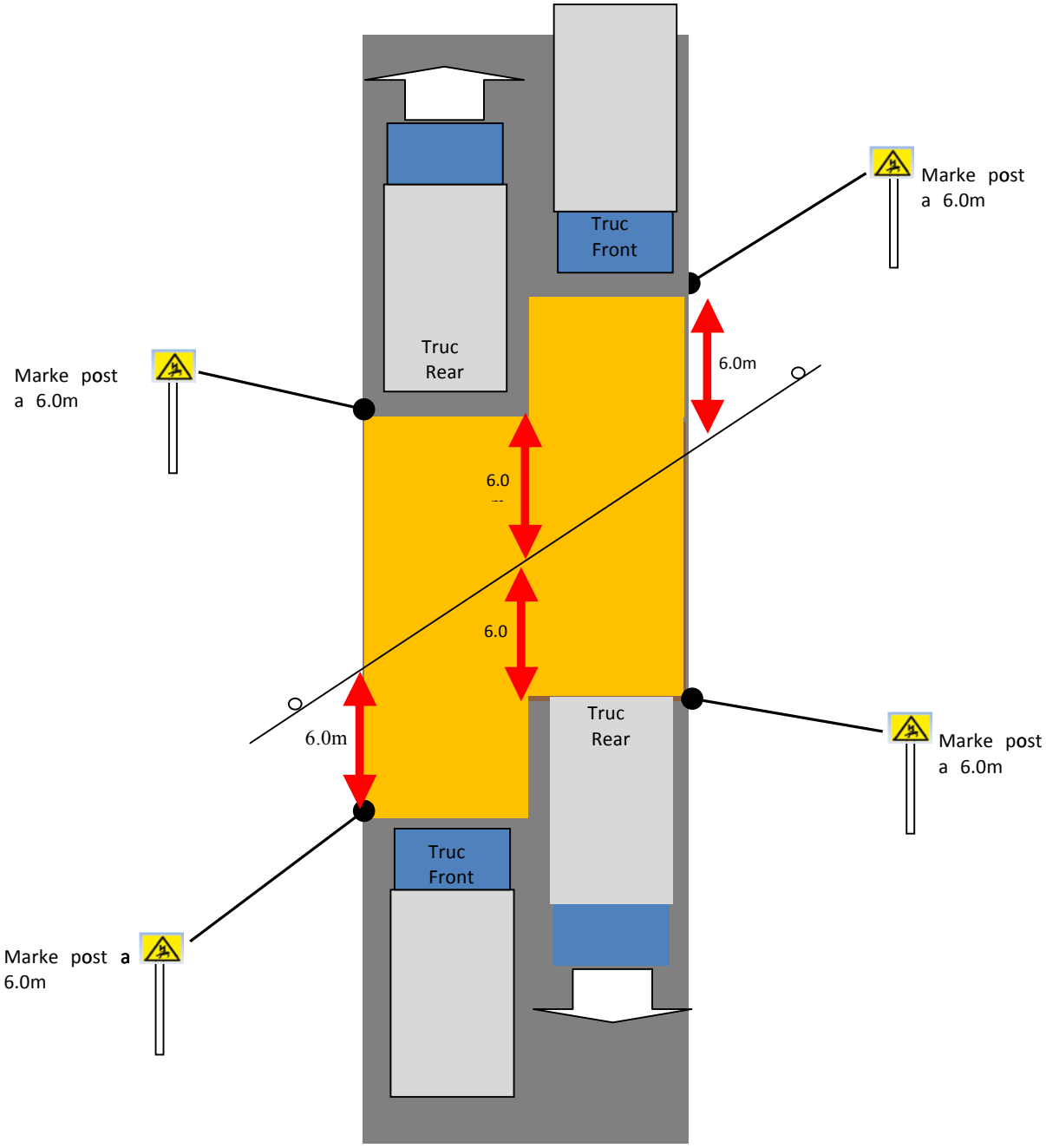
Appendix 1

Figure 2 - LV overhead crossing road at an angle



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