ESB NETWORKS

Code of Practice for Avoiding Danger from Overhead Electricity Lines

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Code of Practice for Avoiding Danger from Overhead Electricity Lines

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Available for downloading
HSA website: www.hsa.ie
ESB Networks website: www.esb.ie/esbnetworks
Printed copies of this code are available from ESB Networks.
Email: esbnetworks@esb.ie
Phone 1850 372 757

This draft Code was initially edited by NALA's Plain English Editing Service. Since then, the ESBN has further edited the draft Code.

After you have read the draft Code and confirmed that it conveys required messages clearly and accurately, we will consult again with NALA around the text and layout. ESBN hopes to achieve NALA's Plain English Mark for the final Code.

For more information about the plain English guidelines used in this document, you might like to view NALA's Plain English Checklist for Documents.

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Terms used in this Code of Practice

A number of key terms appear in this Code of Practice. If you see a word in **red**, it is defined in this section.

Competent person: A person is deemed to be a competent person where, having regard to the task he or she is required to perform and taking account of the size or hazards (or both of them) of the undertaking or establishment in which he or she undertakes work, the person possesses sufficient training, experience and knowledge appropriate to the nature of the work to be undertaken.

Exclusion zone: An exclusion zone is a region around a live overhead electricity conductor which must never be breached in order to avoid electrical arcing or flashover. Figure 3 shows an example of the exclusion zone around the three overhead electricity wires on a single pole.

Hazard zone: The hazard zone is an area near an overhead electricity line which must normally be isolated from the work site by physical barriers. This minimises the risk of accidental contact or near contact with the overhead line by plant, equipment, scaffolding or other materials. Figure 2 shows an example of the hazard zone near an overhead electricity line.

Other useful terms explained.

HV: High Voltage

kV: Kilovolt

LV: Low Voltage

Overhead line: means any electric line suspended above ground carrying or intended to carry electrical energy at a voltage exceeding 80 volts to earth.

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1 About this Code of Practice

1.1 Who this Code of Practice is for

This Code of Practice (COP) is intended to provide practical guidance to **Clients, designers, planners, Project Supervisors Design Process** (PSDP), **Project Supervisors Construction Stage** (PSCS), **contractors, safety representatives** and any personnel who are involved in carrying out work where they are at risk from overhead electricity lines**.** It also applies to employers and employees whom while working are at risk from the hazards of electricity from overhead electricity lines. This COP also gives practical advice to plant and machinery drivers and operators to avoid coming into contact with overhead electricity lines.

The first edition of this Code of Practice (COP) was published in 2008. ESB Networks, with the assistance of the Health and Safety Authority, published this edition in 2017.

1.2 Purpose of this Code of Practice

The purpose of this COP is to improve the level of safety while working near overhead electricity lines. It provides guidance to assist personnel working near overhead electricity lines to manage risk and avoid dangers from electric shock and electrocution.

This COP does not address safety issues for underground electrical cables or other underground services.

To deal with underground services, including buried cables, the Health and Safety Authority has published a separate COP titled Code of Practice for Avoiding Danger from Underground Services.

1.3 The Code of Practice and the law

The Safety, Health and Welfare at Work (Construction) Regulations set statutory requirements which must be observed during the initial planning and implementation stages of construction projects.

This COP will help you comply with these regulations.

This COP is a joint initiative between ESB Networks and the Health and Safety Authority. Approval for it is pending with the Board of the Health and Safety Authority in line with Section 60(1)(b) of the Safety, Health and Welfare at Work Act 2005.

Accidents with overhead electricity lines may result in criminal prosecutions against individuals

and companies that were responsible for safety. If you or your company are taken to court, compliance or non-compliance with the guidelines in this COP may be permitted as evidence in the case.

The requirements of this COP are without prejudice to the general obligations placed on employers and others by the current Safety Health and Welfare at Work Act 2005, Construction Regulations 2013 and General Application Regulations 2007 and amendments and other relevant legislation. This means that employers must comply with the COP and all relevant legislation.

1.4 Activities that this Code of Practice (COP) will guide you on

This COP gives recommendations and practical guidance on working safely near overhead lines. The COP primarily covers construction activities such as;

- working on building and construction sites
- construction work on farms and in forests
- constructing and resurfacing roadways and roads
- constructing railways or navigable waterways
- using cranes and Mobile Elevated Work Platforms (MEWPs)
- using concrete-placing booms and pumps
- using lorry-mounted cranes and other high-reach plant
- using tracked and wheeled excavation equipment
- transporting high loads by road, rail or navigable waterway
- handling long lengths of material
- dumping spoil
- storing, loading and unloading materials
- other construction activities

1.5 Activities excluded from this Code of Practice

This COP does not cover:

- general agricultural or general forestry activities
- competent workers (as defined in definitions on page 7) authorised to work on the electricity network by the network owner/operator

For codes of practice that cover general agricultural and forestry activities, visit www.hsa.ie.

In the **construction sector**, deaths have occurred when workers were:

- installing aluminium gutters;
- carrying out lifting operations using a crane to install precast concrete floor slabs;
- levelling concrete using a bull-float;
- guiding a section of metal shuttering into position using a crane; and
- erecting poles.

There were also a number of serious accidents where workers were left with permanent and life-changing disabilities.

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2 Dangers of working close to overhead electricity lines

2.1 Dangers of overhead electricity lines

People are killed and injured each year by accidental contact or near contact with overhead electricity lines. Most of these accidents involve:

- cranes or excavators;
- tipping trucks or truck mounted cranes;
- mobile extendable machinery; or
- equipment such as scaffolding, gutters, long-handled concrete floats or ladders.

Electric shock can cause fatal injuries such as burns and damage to the heart.

Applying the methods and procedures in this COP will help eliminate these tragedies.

In common with electrical utilities worldwide, ESB Networks generally uses bare conductors for overhead electricity lines. When you find covered conductors, this covering is usually for mechanical protection of the overhead line and is not rated as insulation. This means that covered conductors must be treated with the same precautions as bare conductors. This applies to all voltage levels.

2.2 Risk of electricity arcing (or jumping) from overhead electricity lines

For overhead electricity lines, there is a risk of electrical arcing even if a person or object does not actually come in direct contact with an exposed live part. Arcing occurs when electrical current jumps across an air gap and flows through the gap from the source of electrical power to another object or body nearby. The size of the gap that electrical current can jump depends on many factors. The most relevant factors are:

- the voltage of the source of electrical energy;
- the level of moisture and other impurities in the air gap; and
- the nature of the object or body at the non-energised side of the gap and how well it is insulated from earth.

This COP advises on the dimensions of the exclusion zone for different voltages. Always contact the Network Owner/Operator for confirmation of the actual voltage levels for specific overhead electricity lines.

2.3 Range of voltages of overhead electricity lines

The range of voltages of overhead electricity lines on ESB Networks distribution and transmission systems varies from 230 volts to 400,000 volts (400kV).

Figure 1: The path of electrical current flowing to earth for a truck in contact or near contact with overhead lines

2.4 Definitions

2.4.1 Hazard zone

The hazard zone is an area near an overhead electricity line which must normally be isolated from the work site by physical barriers. This minimises the risk of accidental contact or near contact with the overhead line by plant and machinery, equipment, scaffolding or other materials. See Figure 2. The dimensions of the hazard zone are related to the voltage of the overhead line. See Table 1 for hazard zone distances for each voltage level.

Figure 2: Hazard zone

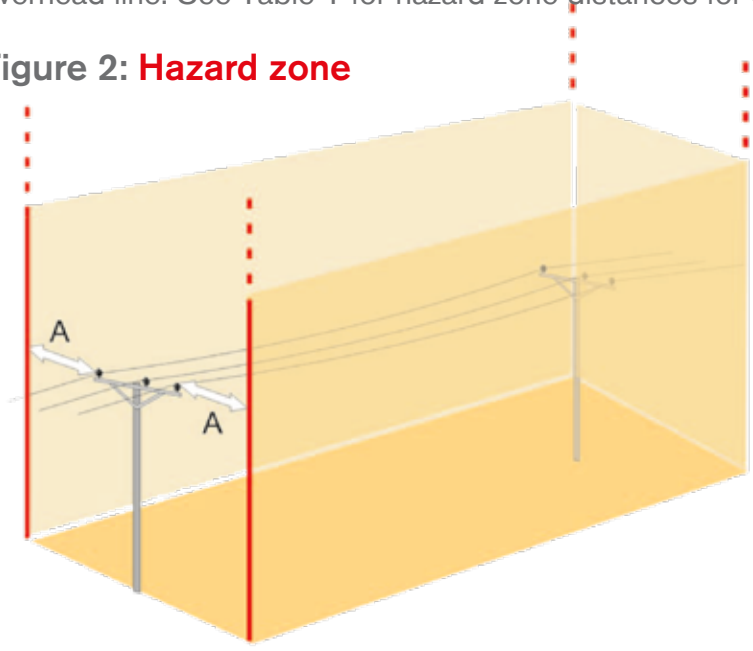
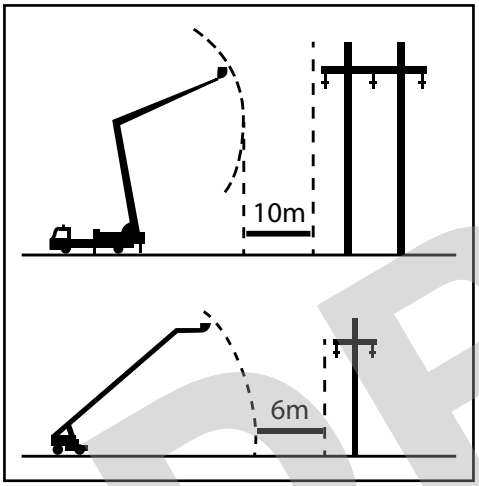


Table 1: Hazard zone minimum distances

Nominal phase-to-phase voltage of overhead line	Minimum horizontal distance in metres (A)
LV,10kV, 20kV and 38kV	6.0
110kV, 220kV, 400kV	10.0

Figure 3: plant and machinery minimum safe distance



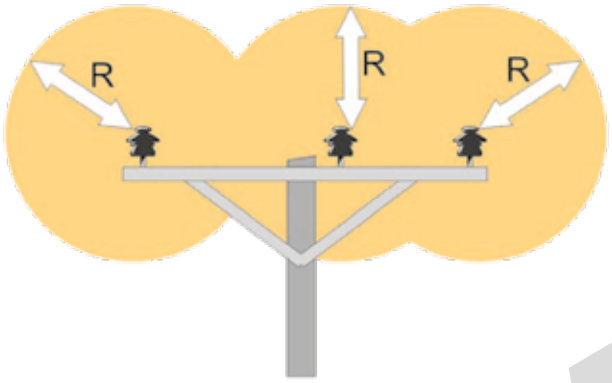
The diagram illustrates two recommended minimum safe distances

- 10m plus fully extended boom and falling distance (for 110kV and above)
- 6m plus fully extended boom and falling distance (for LV, 10kV, 20kV and 38kV)

2.4.2 Exclusion zone

An exclusion zone is a region around a live overhead electricity conductor which must never be breached in order to avoid electrical arcing or flashover. Figure 4 shows an example of the exclusion zone around the three overhead electricity wires on a single pole.

Figure 4: Exclusion zone



For the dimensions of R, see Table 2 below

The dimension R of the exclusion zone is determined by the operating voltage of the overhead electricity line. The exclusion zones for operating plant and machinery and materials are specified in Table 2.

Table 2: Exclusion zones in metres (which must NEVER be breached)

Nominal phase-to-phase voltage of overhead line	Exclusion zone in metres (R)
Insulated LV conductors. (insulation to be verified in all cases by ESB Networks prior to commencement of any work)	1.0
Un-Insulated LV conductors	3.0
10kV, 20kV and 38kV	3.0
110kV	4.5
220kV	6.0
400kV	8.0

2.4.3 No-tip zone

A no-tip zone is the area that no part of a tipped truck or other raised equipment must enter. A no-tip zone applies only to road strengthening and resurfacing works such as tarring and chipping existing roads. See Chapter 9 for more details.

2.4.4 Crossing point

A crossing point is a defined, protected corridor that crosses under an overhead electricity line. Crossing points are created by installing:

- goalpost-style height barriers; and
- warning signs for overhead lines at entrances and exits of the crossing point.

The purpose of a crossing point.

- it limits the location and the height of plant and machinery that can cross under the line.
- it alerts the drivers and plant operators of the hazard of the overhead line before they cross under it. Figure 7 in Section 7.3.2 (page 39) illustrates a crossing point.

2.4.5 Voltage levels

There are two levels of voltage.

Low voltage is any voltage **less than or equal to:**

- 1,000 volts (1kV) alternating current (AC); or
- 1500 volts direct current (DC).

Higher voltage is any voltage **greater than:**

- 1000 volts (1kV) alternating current (AC);
- 1500 volts direct current (DC).

2.4.6 Particular Risks

A particular risk is a situation that involves serious safety risks, which are referred to in the Safety Health and Welfare at Work (Construction) Regulations, such as working near high voltage electricity lines.

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3 Role of the Client

3.1 Introduction

A Client is a person or organisation for whom a construction project is carried out. Under the Safety, Health and Welfare at Work (Construction) Regulations the Client must appoint a Project Supervisor Design Process (PSDP) and a Project Supervisor Construction Stage (PSCS) to manage health and safety for the design and construction of the project.

Clients have a legal duty to reasonably satisfy themselves that the project supervisors they appoint are competent and will allocate sufficient resources to the project to comply with their legal safety and health obligations. Details can be found in HSA document: Clients in Construction, Best Practice Guidance. For further information see Clients in Construction Best Practice Guidance available from hsa.ie

3.2 Information from Clients

When a Client or a Client's agent engages a PSDP and PSCS, they must;

- give the PSDP and PSCS any information about overhead lines that they already have, making sure this information is as up-to-date as possible.
- give the PSDP and PSCS any safety file that is relevant to the work.

Am I a Client?

You are a Client if you commission:

- the building of a house or apartment or a scheme of housing
- the construction or renovation or the maintenance of farm buildings
- extend or carry out repair and maintenance work on commercial or domestic premises such as shops, supermarkets, cottages or apartments
- build, extend or refurbish **any** type of structure including roads, motorways, railways, waterways, electricity networks or telecommunications networks

If you commission work to be carried out on your home, you are a Client. You are subject to all the legal requirements that any other Client is subject to.

For further information see HSA Guide for Homeowners available from hsa.ie.

3.3 Notifying the Health and Safety Authority (HSA)

If construction work is due to last more than 30 days or 500 person days, a Client must notify the Health and Safety Authority that they are appointing a Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS). Use form AF1, which you can download from the HSA website.

When you appoint a PSDP you should submit an AF1 form, at the beginning of the detailed design process.

When you appoint a PSCS you should submit an AF1 form, before the construction begins.

3.4 Looking after health and safety

A Client must cooperate with the PSDP and PSCS to make sure the project complies with all health and safety requirements. This is particularly important in relation to timescales. A Client must agree to a timescale that can be achieved without compromising health and safety.

A Client is responsible for including a preliminary health and safety plan with any request for tenders for a PSCS. This preliminary health and safety plan is prepared by the PSDP.

3.5 Required alterations or diversions

In some projects, overhead electricity lines might have to be diverted or undergrounded to reduce risk in line with the Principles of Prevention that are defined in the Safety, Health and Welfare at Work Act (see Annex 1). The Client or PSDP shall consult with the Network Owner / Operator in advance of works commencing, who shall advise the best course of action to reduce as far as practicable the hazard relating to the overhead line. This may require the overhead line to be diverted or undergrounded. The Client may be requested to pay for some or all of this work before work commences.

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4 Design process: roles and activities

4.1 Definition of Designer

Design means preparing drawings, design details, specifications and bills of quantities for commercial and domestic construction. A **Designer** is any person who is involved in this work.

4.2 The Project Supervisor Design Process (PSDP)

All Designers' work should be coordinated by a Project Supervisor for Design Process (PSDP).

The PSDP may issue directions to Designers or contractors or others.

The PSDP must:

- prepare a written preliminary safety and health plan.
- organise co-operation between designers; and
- coordinate the work of Designers to ensure compliance
  - with the Principles of Prevention (Annex 1);
  - when there are unforeseen circumstances that result in a change to the design of a project, work with the designers on safety, health and welfare implications that result from a change to the design;
- prepare a safety file for the completed project and give it to the Client;

4.3 Contents of the preliminary safety and health plan

The preliminary safety and health plan must contain:

- an overall description of the project;
- the proposed timescale;
- appropriate information about other work on site; and
- details of any work that will involve Particular Risks such as working near overhead electricity lines.

For information about the voltage of overhead lines, contact Network Owner/Operator.

4.4 Overhead electricity lines as a design issue

The PSDP is initially responsible for coordinating design in relation to overhead electricity lines.

4.5 Using plans and site visits during design

Where possible, Designers should get up-to-date maps and records of all overhead electricity lines so they can assess the risks early in the design process. Annex 5 explains how to get copies of maps.

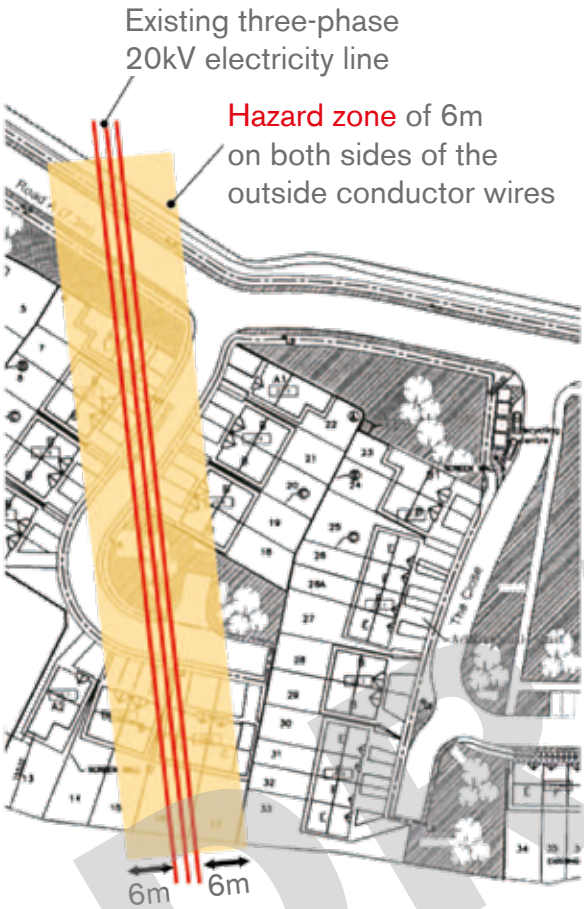
Designers should inspect the site to assess the situation in relation to overhead lines and consult with the PSDP to determine which design options to apply.

If overhead lines are present on site and if these lines will have an adverse effect on safety during construction, the PSDP should make sure the Network Owner / Operator is contacted to formulate a strategy to prevent accidental contact or near contact with the overhead lines during construction.

In consultation with Network Owner / Operator, adopt some or all of these strategies to reduce risk as much as possible.

- divert lines early or, where possible, put them underground
- agree with Network Owner/Operator on power outages at critical points
- use barriers, bunting, height-restricting goalposts, warning signs and lighting while the electricity lines are still in place

Figure 5: Overhead lines with a hazard zone overlaid on a map of a proposed development



4.6 Coordinating the design of temporary works

The PSDP is responsible for coordinating the design of temporary works on site. For overhead electricity lines, temporary works will generally involve putting up barriers, bunting, height restricting goalposts, warning signs and lighting where plant and machinery or vehicles may cross under lines. Other structures might also be installed to prevent unsafe activity in hazard zones.

Identifying these issues early in the design process and planning for them is key to controlling hazards.

Design drawings for temporary works should include these items.

- the routes of overhead lines that meet one or all of these criteria.
  - cross over the site
  - cross over the access route to the site
  - are next to the site boundary
- the voltage of the overhead lines
- the hazard zones (see Table 1)
- the level of construction works that may be permitted in hazard zones while the lines are still present and energised, provided the safety of site personnel, visitors and the general public is assured.

The PSDP and Designers should take into account any additional work that may be required, including:

- building roadways;
- excavation work that may be required to put overhead lines underground; and
- the potential impact of any excavations or other site works on the integrity and stability of the overhead line support structures, including stay wires.

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5 Construction stage: roles and activities

5.1 Project Supervisor Construction Stage (PSCS)

These are the key responsibilities of the PSCS.

- manage and co-ordinate health and safety matters during the construction stage.
- develop the safety and health plan for the construction stage.
- facilitate safe access to the site.
- coordinate the overall implementation of safe working procedures.
- work with contractors and the Network Owner / Operator to make sure the level of risk is as low as possible.
- apply the Principles of Prevention, which are explained in Annex 1 Examples include:
    - sequence the work to facilitate line removal or diversion as early as possible which may involve:
    - installing underground ducts early;
    - laying kerbs, footpaths and roadways; and
    - facilitating the positioning of items such as mini-pillars.

If lines have not been diverted employ other methods to minimise the danger.
Examples may include:

- arrange for the switching out and earthing of the line(s);
- using barriers, bunting, height restricting goalposts, warning signs and lighting; or
- in certain limited cases, using a dedicated observer electromechanical limiting devices, or both.
- make sure barriers, bunting, goalposts, warning signs and lighting are maintained in good working order. See Form OHL1 in Annex 2.
- segregate pedestrians from general and construction traffic to minimise the risk to them.

5.2 The Contractor

These are the key responsibilities of the contractor.

- cooperate with the PSCS
- cooperate with other contractors on health and safety
- work with the Network Owner/Operator to make sure the level of risk is as low as possible
- supply accurate information in a timely fashion to the PSDP to allow for the preparation of the Safety File
- supply accurate as-built drawings of underground cable ducts showing the location, depth and size of ducts to allow for the safe undergrounding of overhead electricity lines on site where applicable
- maintain the specific aspects of the safe systems of work and take direction from the PSCS, who has a statutory right to issue directions
- carry out site-specific risk assessments
- make sure that employees have adequate training
- make sure that any plant or machinery is, so far as is reasonably practical, safe and does not pose a risk to safety or health
- put in place measures to ensure that the health and safety of personnel are not adversely affected by the work they are doing

By the nature of their work, some contractors have a higher risk exposure from contact or near contact with electricity lines. These include:

- ground workers;
- road workers;
- piling contractors;
- plant drivers or operators;
- guttering installers;
- scaffolders; and
- roofers

The contractor is responsible for making sure all health and safety precautions are in place to protect these workers.

5.3 Employees and others at work

These are the responsibilities of workers on site.

- follow the safe systems of work used on site
- take reasonable care to protect their own safety and the safety of others who might be affected by their actions
- report immediately any defects in health and safety that might endanger anyone in the workplace such as missing signage, broken barriers or goalposts or plant and machinery coming near to overhead lines
- avoid any behaviour likely to endanger health and safety on site
- avoid alcohol or any other intoxicant which might place them or their colleagues at risk
- attend health and safety training and assessments that is required by their employers and update training requirements as necessary
- never intentionally or accidentally cause plant or equipment to enter the exclusion zone

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6 Consulting and working with ESB Networks

6.1 Consultation

Contact ESB Networks during the planning stage of works for consultation and to get maps and records for the lines if there is an overhead electricity line running:

- over the site;
- near the site boundaries; or
- over access roads to the site,

Contact details are in Annex 5.

ESB Networks will work with you to determine the best approach to minimising the hazard and risk. Options may include:

- switching out and earthing lines;
- putting lines underground; and
- diverting lines;
- implementing other measures such as physical barriers, which is covered in chapter 7.

Contacting ESB Networks or any other network owner / operator is the responsibility of the PSDP, PSCS, contractor or other person doing the work.

As soon as risk from overhead electricity lines is identified, contact ESB Networks for information.

6.2 Diverting lines or putting lines underground

As outlined in chapter 7, the PSDP should investigate the option of diverting overhead lines to address hazards.

If the work near a line does not involve building permanent structures above ground, diverting a line may not be appropriate.

If there is no alternative route for a line, it will not be possible to divert it. In general, lines with voltages of 110kV, 220kV and 400kV cannot be diverted. In these cases, the PSDP must design a safe system of work that minimises hazard without diverting lines.

It is critical to contact ESB Networks as soon as possible because of the time it takes to apply for and get a line diverted.

- diverting lines involves wayleave serving and balancing workload. This can take several months.
- diverting higher voltage lines involves applying for planning permission, wayleave serving and balancing workload. This can take a year or more.

6.3 Switching out and earthing overhead lines

In some cases, switching out and earthing overhead lines may be the best approach to reducing the hazard.

In general, switching out and earthing lines is possible only for a few hours at a time. It is not possible to switch out lines if work will take longer than that or if certain customers require an uninterrupted power supply.

If ESB Networks agree that switching out and earthing is appropriate, they will agree with you when the lines will be switched out. This will depend on local electricity demand, permitting enough time to change supply methods within ESB Networks and informing customers of an outage.

Before starting work, you must wait for ESB Networks to notify you that the line is switched out and earthed. **Do not begin works at the pre-arranged time;** wait for the notification from ESB Networks.

The contractor doing the work must be contactable at all times during the switch out in case ESB Networks need to switch the line back on.

6.4 Getting copies of maps and records

Maps and records can help you verify the location and voltage of overhead lines. Contact ESB Networks 1850 928 960 to request maps and records. Contact information is in Annex 5.

When applying for overhead maps or records, you should include:

- a reference map of the area where work is to take place;
- a contact name and phone number; and
- the email address where the information is to be sent.

ESB Networks will send maps to you by email within 10 days in PDF format.

If you frequently need electricity maps and records and you are a licensed holder of electronic Ordnance Survey map data, you can register with ESB Networks for access to an electronic version of the electricity networks map and records.You can email your request including your site map to dig@esb.ie.

Call 1850 928 960 **or** +353 (0)1 8582060
or
Fax 01 6388169

Alternatively, you can make a postal request to:

Central Site
ESB Networks
St Margaret's Road
Finglas
Dublin 11
Ireland
D11 X3W7

6.5 Applying to alter or divert overhead electricity lines

When applying to alter or divert existing overhead electricity lines, include:

- a written request; and
- a copy of a site plan showing any proposed developments.

Send the application to:

ESB Customer Service Bureau, PO Box 29, Garrycastle, Athlone, Co. Westmeath.

6.6 Requesting information and assistance

For general information or advice on dealing with overhead electricity line conflicts:

- phone 1850 372 757
- email esbnetworks@esb.ie

Your request will be forwarded to the local contact person for your area, who will get back to you.

6.7 Contacting ESB Networks in an emergency

For all emergencies, including accidental contact with overhead electricity lines, call

1850 372 999

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7 Construction sites where an overhead electricity line presents a hazard

When overhead electricity lines present a hazard, the best choice is to switch out or divert the lines before site works begin.

If the lines cannot be switched out or diverted, the nature of the work and the voltage at a site dictate the protective measures that are required. In all cases, you must establish a hazard zone.

Most sites can be categorised in one of three categories.

- sites where there will be no work or plant passing in or under the hazard zone
- sites where plant will pass under a live overhead line
- sites where work will be carried out in the hazard zone

7.1 No work or plant passing in or under the hazard zone: barriers

Determine the voltage during the planning stage and before any works begin. The voltage will affect the size of the hazard zone and the placement of barriers.

7.1.1 Set up barriers

On sites where machinery or plant may accidentally enter the hazard zone, you must erect a barrier on the work side (outside the edge of the hazard zone) at the correct distance from the line. **See Figure 6.**

Table 3: Minimum horizontal distances for barriers from the nearest conductor on plan

Voltage	Distance
LV, 10kV, 20kV and 38kV	6 m
110kV or greater	10 m

7.1.1.1 Barrier materials

Use a solid (strong and sturdy), non-conducting and clearly visible material. **See Figure 6.**

7.1.1.2 Visibility equipment

Put standard electricity hazard warning signs along the route at intervals of 20 metres or less. See Figure 6.

7.2 Maintain the hazard zone

Every week, survey barriers and visibility equipment to make sure they are in good condition and correctly positioned. Record the results on Form OHL1 from Annex 2 or on an equivalent form.

7.3 Prevent breaches of the hazard zone

Anything being used, moved or handled outside the hazard zone must not cross the barriers and breach the zone. For example, when installing guttering or handling roofing timbers. Erect scaffolding outside the hazard zone.

7.3.1 Create task-specific risk assessments and work method statements

If machinery, ladders, scaffolding or other equipment are being used outside the hazard zone and this equipment could fall or otherwise inadvertently breach the relevant exclusion zone, create a task-specific risk assessment and work method statement. Outline the control measures to be used to eliminate this risk.

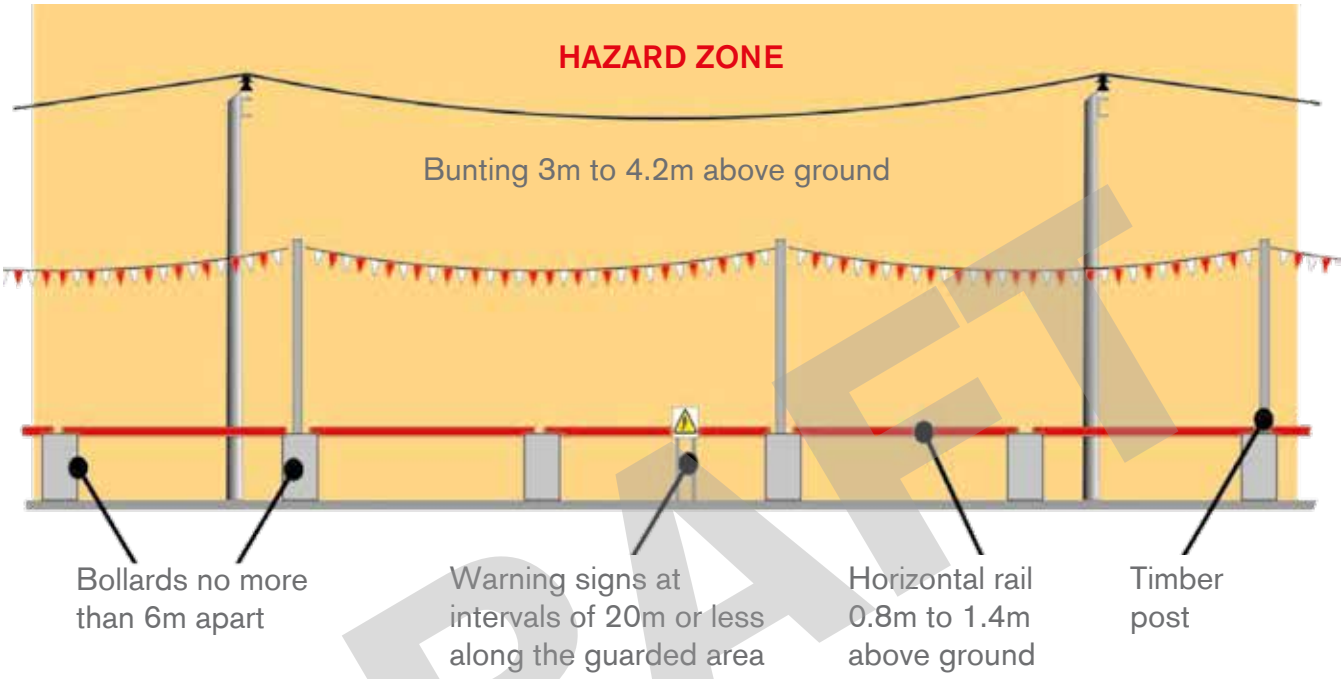
Make sure this risk assessment and method statement are available on site at all stages of construction.

For information on the area required for exclusion zones, see Section 2.4.2 and section 8.

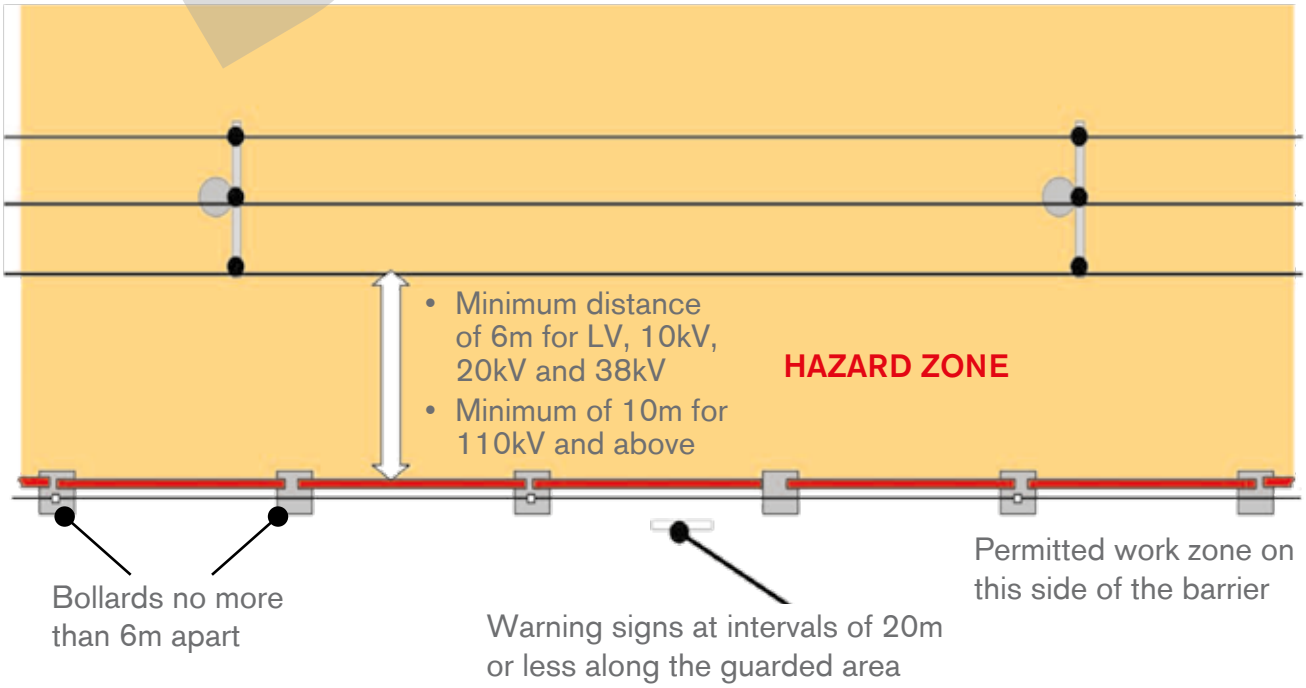
Make sure that safe systems of work are in use for all of the equipment.

Figure 6: Elevation and plan for a site where plant and machinery will not pass under electricity lines

Elevation



Plan



7.3.2 When crossing points are required

When you need to move plant and machinery under a live overhead electricity line, you must create crossing points.

To create crossing points, erect height-restricting goalposts. These must be made from rigid, non-conducting, clearly visible material at the entrance to the crossing point on each side of the line.

Figure 7 shows the correct design of a crossing point.

Table 4: Specifications for crossing points

Location	Outside the hazard zone and in line with the protection barriers.
Maximum height	4.2 metres measured relative to the original site ground level. This must be implemented by the dutyholder or responsible person.
Maximum width	9 metres Crossings should be as narrow as is practical and safe. 9 metres is a maximum width.

Place this equipment along the crossing point.

- Suitable rigid barriers 0.8 to 1.4 metres in height on both sides of the crossing point corridor to prevent deviation from the corridor
- Two warning signs near the goalposts at each entrance at spacings of 20 metres or less along the barriers

Do not erect bunting along the sides of the passageway. This may compromise safety clearances where the bunting crosses under the electricity line.

The clearances for overhead electricity lines can vary from time to time based on changing conditions such as:

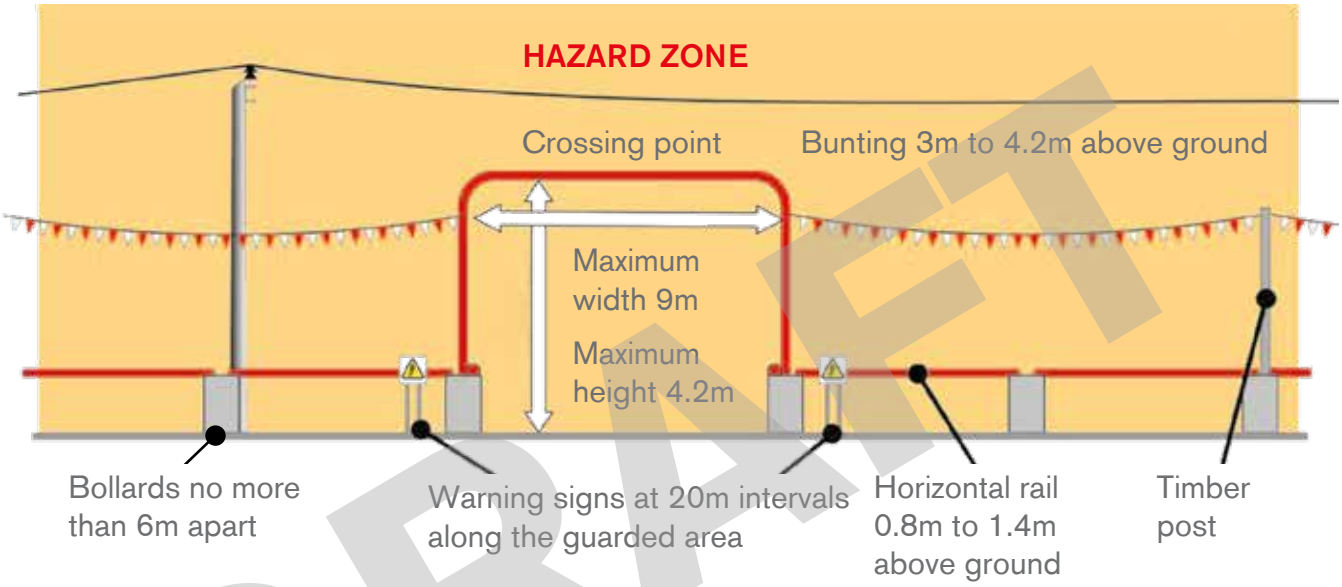
- external physical loading conditions like:
  - wind loading;
  - ice and snow loading; or
  - changes in ambient temperature
  - variations in the amount of electrical current flowing in the line, will cause variations in the temperature of the line conductors, which will cause variations in the line sags and ground clearances
  - other factors such as damaged poles, staywires or crossarms
  - any changes in ground levels close to the line

Where possible, select locations for crossing points that are closer to the supporting poles or towers rather than to the middle of the overhead line span. This will give greater clearances at the crossing points and reduce the variations in clearances.

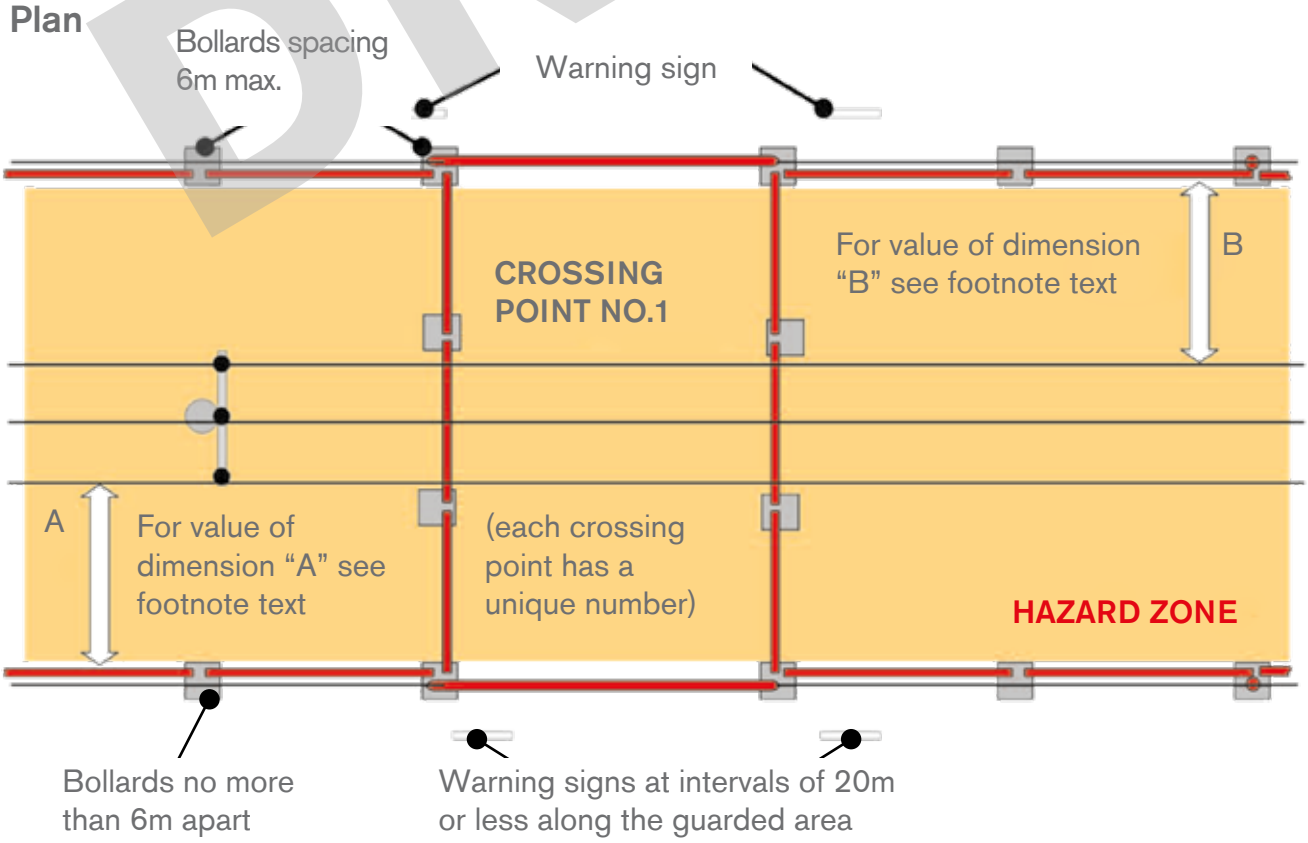
Figure 7: Elevation and plan for a site where plant and machinery will pass under electricity lines

At the crossing point , the maximum height of the crossbar must not exceed 4.2 metres except where this has been specifically approved by ESB Network, for that particular crossing location. This height must be measured relative to the original ground levels.

Elevation



Plan



Dimension A = 6m minimum for LV, 10kV, 20kV, 38kV
Dimension B = 10m minimum for 110kV, 220kV, 400kV

7.4 Where work will be carried out in the hazard zone

In certain very limited circumstances, work in the hazard zone of live overhead electricity lines, including the use of specified equipment, may be permitted.

In all cases, before work begins, you must:

- verify the line voltage with ESB Networks;
- determine the hazard zone; and
- determine the exclusion zone.

Do not dig or pour foundations for buildings within the hazard zone until lines that are to be diverted or put underground have been removed or disconnected.

Digging or pouring foundations is specifically excluded from the classification of work permitted under 7.4.1 and 7.4.2, below. For more information, read section 7.4.2.

7.4.1 Work that does not require consultation with ESB Networks

If works do not involve plant and machinery, equipment or activities that could breach the exclusion zone (table 2), you do not have to consult with ESB Networks after you have verified the voltage. However, the PSCS and contractor are responsible for safely managing the work. If in doubt about anything, consult with ESB Networks.

Depending on the equipment and the height of the line, this might mean using:

- a bulldozer;
- small front tipping dumpers; or
- mini diggers.

A site-specific risk assessment and work method statement must be prepared before deciding what work can be done in the hazard zone. The risk assessment and work method statement **must** cover:

- the height of the line, taking into account any possible sag;

- the maximum potential height that the equipment can reach, ignoring any mechanical, electronic or electromechanical height limiters that may be fitted to the equipment;
- the possible effect of varying or changing ground levels within the hazard zone on the height of the line
- the possible effect of works on support structures such as poles, towers, stay wires and other structures.

The work must be planned in order that it does not affect the structural integrity of the poles or towers supporting the electricity lines.

To access the hazard zone for this specific work, the barriers around the hazard zone may have to be temporarily removed. These barriers **must** be put back as soon as possible to prevent other vehicles or plant accessing the hazard zone.

7.4.2 Work that requires consultation with ESB Networks

In **extremely limited circumstances**, work that could accidentally breach the exclusion zone can go ahead if:

- ESB Networks is consulted before works begin;
- there is a comprehensive, detailed safety management plan in place and
- when it is appropriate to de-energise the network, that work does not begin until **after** ESB Networks switches out and earths the line.

It is not always possible to switch out or divert lines to permit work in an exclusion zone because of demand for electricity.

Where work that is permitted that could accidentally breach the exclusion zone the following minimum precautions apply:

- Prepare a written risk assessment and work method statement in consultation with the people who will be doing the work. See 7.4.1 for factors to include in the assessment and statement.
- establish and use a daily permit-to-work system.
- use only equipment that has certified limiters installed to prevent any part of the equipment breaching the exclusion zone.

- In the risk assessment, specify the limits to which the equipment can operate.
- On site, ensure only a competent person sets and fixes these limits and that the limits are verified by testing.
- Establish on-site management systems to make sure limits cannot be tampered with.
- Put in place a dedicated observer for each item of plant and equipment. The dedicated observer must be able to communicate with the machine operator at all times and must not do any other work while work in the hazard zone is in progress.

7.5 Possible special arrangements for some low-voltage (LV) overhead lines

For LV overhead lines, to facilitate certain work within the hazard zone, especially in urban environments, it may be possible for ESB Networks to:

- replace bare conductors with insulated bundled conductors; or
- temporarily insulate the conductors by applying approved temporary shrouding and other protection to the conductors.

In these situations, you must consult with ESB Networks to agree:

- site specific arrangements; and
- control measures for each individual conflict.

If LV overhead line conductors have been temporarily shrouded or appear to be insulated, this **does not** mean that they are safe to touch. The effectiveness of shrouding or insulation will depend on conditions such as the prevailing weather conditions.

If this insulation appears to be damaged or dislodged, stop all work within 3 metres of the damaged area and notify ESB Networks immediately.

Implement all control measures that are specified by ESB Networks and make all relevant employees and subcontractors aware of the safety requirements.

7.6 Maintain barriers and warning notices

The PSCS must put in place a care and maintenance system to make sure that barriers, bunting, warning signs, goalposts and lighting are in place and effective throughout the works. This system must include:

- daily visual checks of protective measures, the behaviour of site personnel and the operation of plant and machinery that is close to overhead lines;
- weekly recorded checks of protective measures; and
- a follow-up process for all protective measures and works to make sure defects are notified to the responsible person and corrected without delay.

See Annex 2 for Form OHL1, which is the recommended form.

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8 Operating high-reach plant near overhead electricity lines

8.1 Introduction

Using cranes, MEWPs and other high-reach plant near overhead electricity lines is hazardous, and there have been many deaths associated with this equipment. You must carefully manage works so they are safe.

8.2 Audience

This chapter outlines a safe system of work that you can use for minimising the risk from using high-reach plant. In situations where it may not be practical to use the system described here, use an alternative safe system.

Examples of high-reach plant include:

- concrete-placing booms;
- mobile elevating work platforms (MEWPs); and
- lorry-mounted cranes and other high-reach plant.

The safe system of work should include the following:

- qualified, competent supervisors
- written risk assessment and work method statement;
- effective controls for preventing contact or near contact with overhead lines and
- effective communication.

8.3 Planning for high-reach plant

8.3.1 Identify overhead electricity lines before works begin

Before cranes and high-reach plant and equipment are used on site, assess the proximity of overhead electricity lines and determine the location and area of hazard zones.

The area of a hazard zone is related to the voltage of the overhead electricity lines, so the voltage of overhead lines must be identified. To do this, contact ESB Networks for assistance or get maps and records from ESB Networks Central Site. Contact details are in Annex 5.

Always treat overhead electricity lines as live unless ESB Networks has confirmed they are switched out and earthed.

8.3.2 Assess the risks

Consider the factors listed here when you assess the risks and establish the safe work method. This list is not exhaustive: you may also have to consider other factors.

- **The type of crane or high-reach plant**

Different types of plant have different characteristics and operating methods. This means that safety requirements vary.

- **Load measurements**

Consider the weight, size, shape and surface area of the load. In particular, consider how the load will move as a result of the surface area facing the wind.

- **Overhead line span and support structures**

Wind can cause line conductors to swing sideways, which reduces clearances. This can be significant and is greatest on long spans and at the centre span position.

- **Nature of the load**

The materials in a load and the way it is secured may cause movement during an operation. This movement may breach the exclusion zone.

- **Terrain, ground and surface**

Consider the surface the plant is placed on. Is the surface likely to change or move? This can cause plant and equipment to move toward overhead lines or into the exclusion zone.

- **Visibility, light and weather**

Visibility, light levels and weather conditions all affect the operation of plant. Weather may affect how loads move.

- **Competent workers**

Ensure workers are competent and hold a valid CSCS (Construction Skills Certification Scheme) ticket where required by legislation.

Incorporate this information into your risk assessment and work method statement.

8.3.3 Position plant at a safe distance

When determining the safest position for cranes and high-reach plant, evaluate the maximum extended and falling distance of the plant and the voltage of the wire. Then place the plant further than its maximum extended and falling distance from the nearest point of the hazard zone for the particular voltage of overhead electricity line. See section 2.4.1 for hazard zone definition and dimensions.

Incorporate this information into your risk assessment and work method statement.

8.3.4 What to do if you cannot comply with 8.3.3

If it is not possible to achieve the recommended hazard zone clearances then every effort must be made during planning to re-design the set up and operation of plant and its load so that the exclusion zone cannot be breached.

If you cannot meet the requirements in 8.3.3 you must consider switching out and earthing the line and using an alternative safe systems of work (for example choosing different plant or a limiter on long reach plant).

In certain limited circumstances, you may be able to set up and operate the crane or high-reach plant closer to the overhead electricity line. In this situation, the hazard

zone might be breached during set up or operation. This means there must be a higher degree of safety management. In this situation, you must:

- consult with ESB Networks about the works;
- implement the special precautions in section 8.5; and
- observe the critical safety requirements for exclusion zones. These are specified in section 8.4.

Incorporate this information into your risk assessment and work method statement.

8.4 Critical safety requirements for exclusion zones

A person must not operate any crane or any other plant or equipment in a way that any of the following comes within or breaches the exclusion zone(s) as specified in section 2.4.2:

- any part of the crane or plant the load being moved;
- a person operating or working in a mobile elevating work platform (MEWP);
- any hand tools or other equipment held by any person involved with the operation.

8.5 Special precautions when the hazard zone may be breached

When there is no option but to set up high-reach plant where the hazard zone may be breached and the overhead electricity lines cannot be switched out and earthed, you must take these special precautions.

- Write a risk assessment and work method statement specifically for the high-reach plant. Detail the controls you will put in place to make sure that the plant does not breach the exclusion zone.
- Set up a daily permit-to-work system. This is the responsibility of the contractor.
- Put in place a dedicated observer for each item of plant. Section 8.5.1 explains this.
- Set up warning devices, limiting devices or both to notify the operator of any potential breach of the exclusion zone.
- Limit and control personnel in contact with the high-reach plant or load. Section 8.5.2 explains how to do this.

8.5.1 Using dedicated observers

There are special provisions that apply to

dedicated observers.

An operator's employer or self-employed operator is responsible for appointing a dedicated observer.

If a dedicated observer is required, the **operator must not operate high-reach plant** without a dedicated observer.

The dedicated observer must:

- warn the operator if any part of the crane, plant or load is about to enter the exclusion zone;
- be appropriately trained to be a dedicated observer;
- be able to instantly communicate effectively with the operator of the crane or plant at all times and use specialist equipment to communicate if necessary;
- be satisfied that there is adequate visibility or adequate lighting provided to perform their role;
- be fully aware of the boundaries of the exclusion zone and have an appropriate means of preventing encroachment, such as by placing appropriate markers in a safe position which the dedicated observer and the operator can easily see; and
- be satisfied that there is adequate visibility and be aware of blind spots, obstructions and lighting conditions; and
- if necessary, wear eye protection to reduce glare when the sun is at a low angle.

Dedicated observers must not:

- perform any other duty while acting as a dedicated observer;
- observe more than one item of high-reach plant at a time; or
- be in the basket of a MEWP that they are observing.

Dedicated observers must be appropriately trained.

8.5.2 Personnel near to high-reach plant when in operation or being moved

In the hazard zone, only authorised personnel should be near or on high-reach plant. All other personnel must keep clear of high-reach plant when it is being moved or is in operation.

Only two types of personnel are permitted to touch high-reach plant or its load when it is being moved: operators and appropriately trained personnel who are essential to the operation.

Operators may be near to the plant or load when:

- they are in the cabin, not standing on the ground beside the high-reach plant; or
- they are using **radio-operated** remote control and standing well clear of the plant. Remote control with directly connected control leads are not permitted.

Appropriately trained personnel who may

touch the high-reach plant or its load include:

- slingers;
- signallers; and
- workers helping set up the plant.

Personnel using guide ropes are in direct or continuous contact with plant, and they must not be in the hazard zone.

If personnel must make contact with the high-reach plant or its load, they should verify that all parts of the plant, load and slinging gear are outside the exclusion zone.

To control load movement, they must use non-conductive objects such as appropriately insulated poles, guide ropes or, where practical, insulated crane hooks.

When the voltage does not exceed 1000 V, wear insulating gloves that are in good condition. The insulation must be effective against the maximum voltage of an overhead electricity line. The employer or self-employed operator is responsible for making sure the insulation meets international standards.

8.6 General good practice guidelines for operating high-reach plant

- Always assume that overhead electricity lines are live unless ESB Networks has verified that they are switched out and earthed.
- Operate high-reach plant at a slower than normal rate when it is near overhead electricity lines.
- Exercise caution when travelling over uneven ground that could cause a crane or other high-reach plant to weave or jolt close to overhead electricity lines.
- Keep all personnel well away from high-reach plant that is close to overhead electricity lines.
- Exercise caution near long spans of overhead electricity lines. Wind can cause significant sway in the conductors and reduce the clearance between the plant and the line.
- Carry long objects horizontally and below shoulder level near overhead lines.
- Know what emergency procedures to follow if there is contact with a live overhead electricity line. See Annex 5 for details.

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9 Road strengthening and resurfacing works

9.1 Introduction

This chapter covers road strengthening and resurfacing works only. It does not cover new road construction.

Use this safe system of work for most road strengthening and resurfacing works. In situations where it may not be practical to use the system described here, use an alternative safe system.

Whatever system you use, you should:

- prepare a written risk assessment and work method statement
- put in place effective control for preventing contact or near contact with overhead lines; and
- evaluate whether it would be best to switch out and earth a line before work begins

9.2 Procedure for roads that are crossed by overhead electricity lines: recommended safe system of work

9.2.1 Minimum safety controls

When road strengthening and resurfacing works take place near overhead electricity lines, a **no-tip zone must** be established. These are the minimum safety requirements:

- a survey before works start
- appointment of a competent person to
- control work near the lines and in crossing or conflict locations; and
- communicate directly with operators of machinery and plant in or near the no-tip zone
- a no-tip zone with a minimum **horizontal** distance of 3 metres from the nearest live overhead electricity lines as measured in plan view. These are illustrated in Figures 8, 8a and 8b of this Code of Practice)
- fully lowered skips on all tipper trucks in the no-tip zone

9.2.2 Actions to take before works begin

- survey all overhead electricity lines
- assign a unique identification number to each place where an overhead line crosses the road or there is an overhead line conflict

- on the road and using indelible (permanent) paint:
- mark the boundaries of each no-tip zone; and
- label each no-tip zone with its identification number.

9.2.3 Actions to take during works

Every day, the dedicated control person must make sure that safety measures are in place.

- On the day works begin, verify the survey is complete and markings are in place.
- Every day on site, fill in an Electrical Hazard Risk Assessment (EHRA) for each crossing and conflict. The EHRA template is in Annex 3.
- Warning signs at the entrance and exits of the no-tip zone. For visual guidance on placing these signs, see Figure 8.
- Audit site safety [frequency is determined by the nature, scale and complexity of the works as determined by the PSCS]. A template for a safety audit form is in Annex 4.

9.2.4 Safely operating machinery in the no-tip zone

9.2.4.1 Operating a tipper truck

When the tipper truck reaches the beginning of the no-tip zone, lower the skip completely.

Move forward until the rear of the truck has passed far enough beyond the exit that no part of the skip will be in the no-tip zone when it is tipped. Allow enough space between the exit and the truck to permit a paver or chip spreader to be filled safely.

Do not reverse into the no-tip zone with the skip raised.

> Ensure a safe system of work in place at all times and tipper truck is in good working order and on safe level ground and be aware that tipper trucks may overturn. Maintain a safe distance from the truck.

9.2.4.2 Filling a paver

Ensure the paver is moved beyond the exit point to ensure that there is sufficient clearance from the no-tip zone, during the tipper truck carrying out the loading process.

To reduce hazards while filling pavers, consider using low equipment such as a front-tipping dumper instead of a tipper truck.

For visual guidance on using pavers, see Figures 8, 8a and 8b.

9.2.4.3 Filling a chipping spreader

Ensure the chipping spreader is moved beyond the exit point to ensure that there is sufficient clearance from the no-tip zone, during the tipper truck carrying out the loading process.

The chipping spreader will reverse or be towed backwards through the no-tip zone.

9.2.4.4 Using a planer or other elevated equipment

At all times, make sure that **no part** of the planer or other equipment **or any person** positioned on the equipment **is more than 4.2 metres above the road surface** while in the no-tip zone.

9.2.5 Alternative safe systems of work

If the safe system of work outlined in this section is not practical, you should use a system that includes risk control measures, such as goalposts, that are at least equivalent to the measures described in this section.

9.2.5.1 Using goal posts

Goal posts are required to restrict the height of plant passing close to or underneath live overhead electricity lines.

The maximum height of the goal posts must not be more than 4.2 metres above the original road surface level unless it has been specifically determined that a greater height is permissible for the specific crossing or conflict.

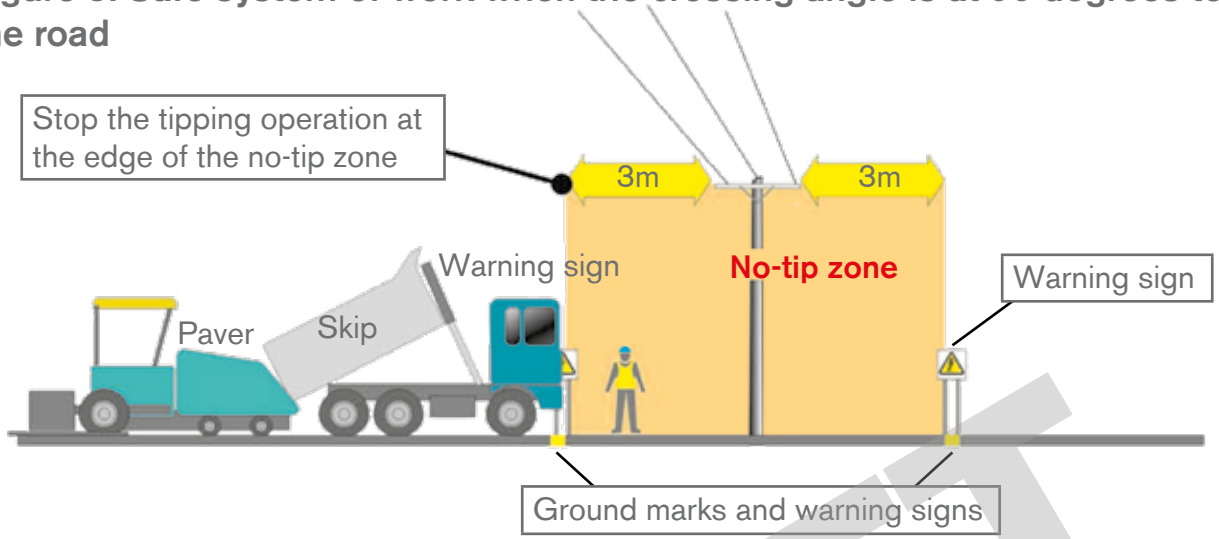
When you determine the maximum height for goal posts, take account of:

- the minimum height of the overhead electricity line; and
- the appropriate radial exclusion zone clearance for the voltage of the line involved

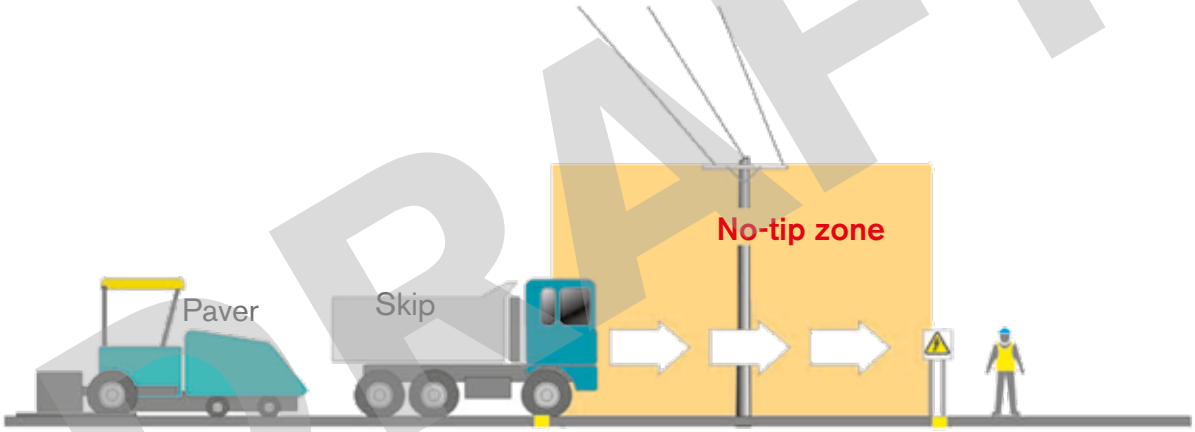
When you assess the exclusion zones for goal posts,please refer to section 2.4.2.. The values of the exclusion zone are re-stated in section 9.3.1.

You must also evaluate and control for the risks associated with carrying out the erection of the goal posts.

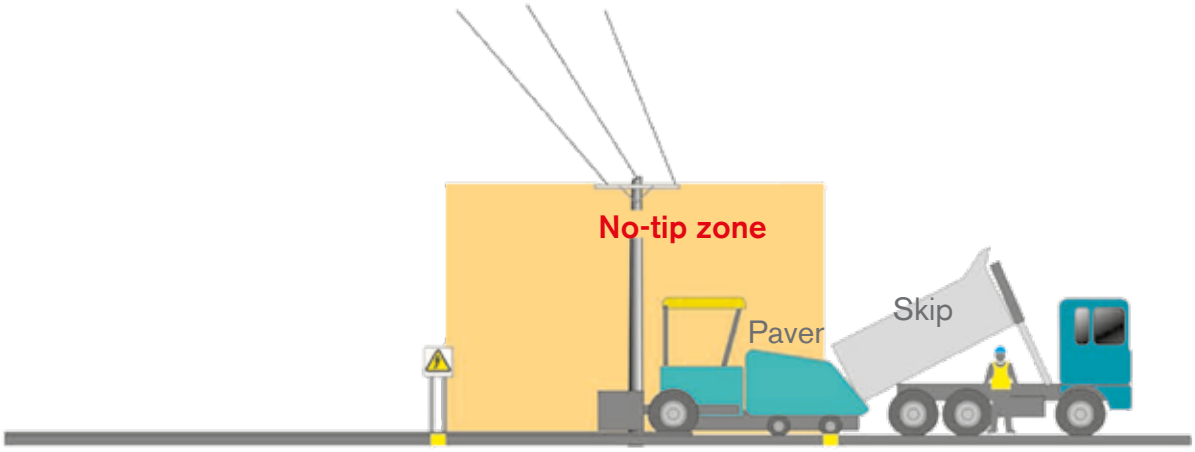
Figure 8: Safe system of work when the crossing angle is at 90 degrees to the road



1. Load the paver hopper outside the no-tip zone.



2. Lower the skip on the tipper truck, and lower any other elevated plant, such as a planer.



3. Continue normal operation when the tipper truck or other elevated plant is completely clear of the no-tip zone.

Figure 8a: Safe system of work when the crossing angle is equal to or greater than 45 degrees to the road

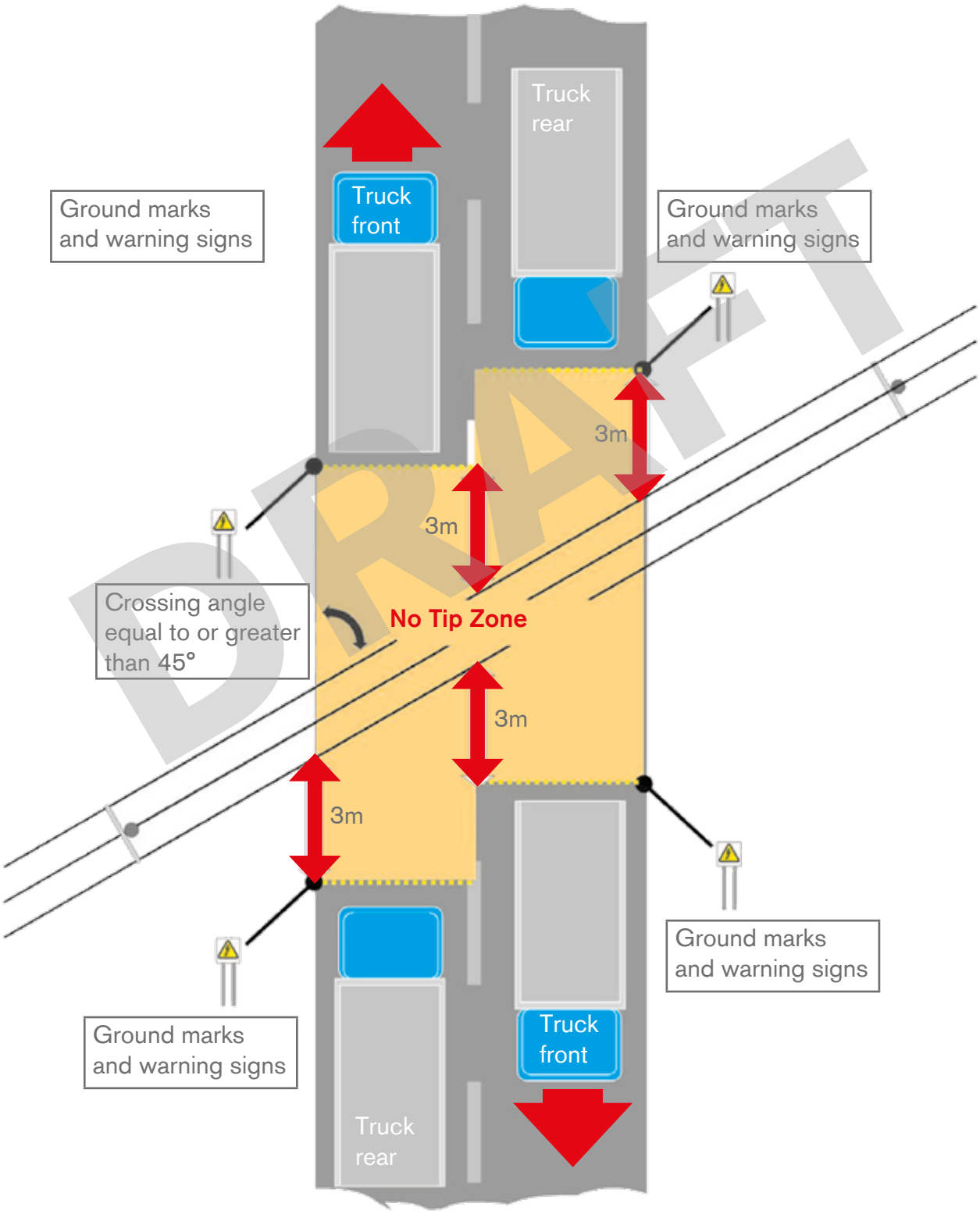
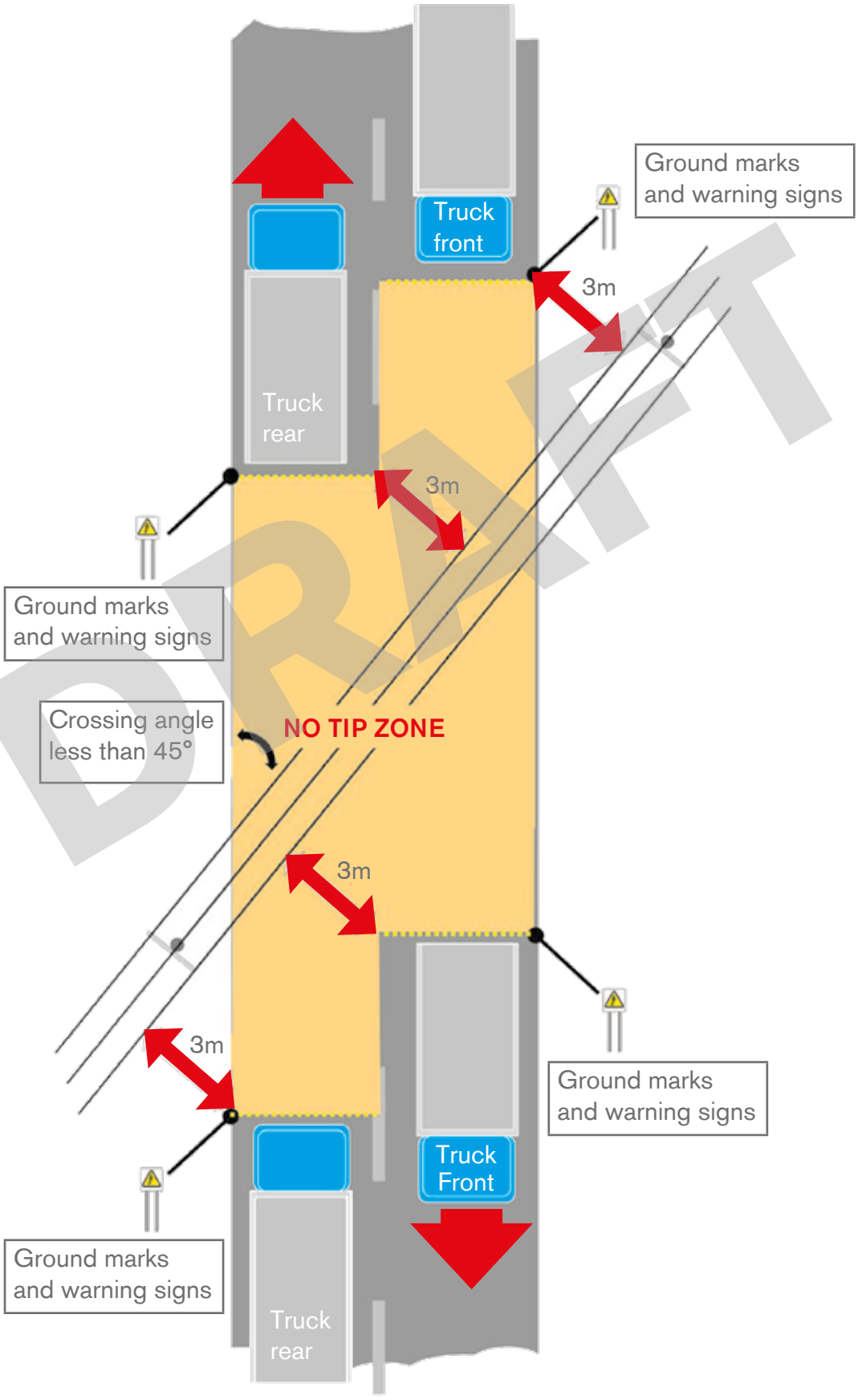


Figure 8b: Safe system of work for road resurfacing when the crossing angle is less than 45 degrees to the road



9.3 Procedure where overhead electricity lines approach close to or are parallel to the roadway.

Some overhead electricity lines may not cross roadways, but they may approach close to or run parallel to the roadway for a section of the road.

The preliminary site survey must identify locations where overhead electricity lines could present a hazard to tipping trucks, taking into account:

- the route of the resurfacing works
- the camber of the road
- the presence or use of lay-bys
- material storage dumps; and
- any other relevant factors

If the risk assessment identifies a risk of accidental contact or near contact, **apply appropriate additional controls in addition to the controls listed in Section 9.2.**

To work out the clearance that must be maintained, determine the operating voltages of the overhead electricity lines. This must be done at the planning stage and in advance of any work commencing.

Consult electricity maps and records to determine voltages, or contact ESB Networks. See Annex 5 for contact information.

For this type of work, the minimum clearance for the relevant voltage is the **minimum horizontal clearance as measured on plan view between the skip of the tipper truck and the nearest overhead line conductor.**

9.3.1 Minimum clearances for different overhead line voltages

For road strengthening or resurfacing works where overhead electricity lines approach close to and/or run parallel to the roadway, use the clearances in Table 5.

Table 5: Minimum lateral clearance from the nearest point of the skip of a truck as measured horizontally on plan view

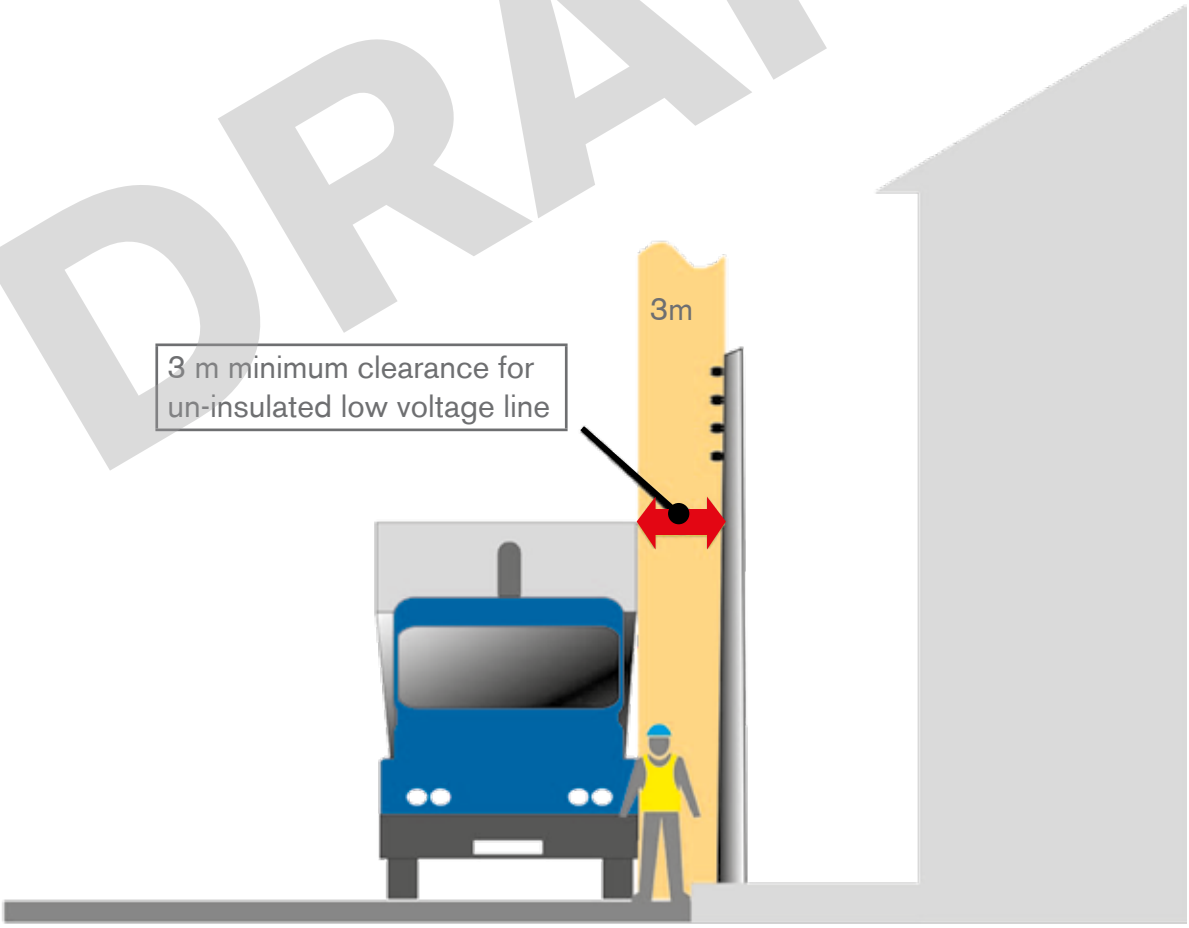
Nominal phase-to-phase voltage of overhead line	Minimum lateral clearance in metres
Insulated LV conductors	1.0
Un-Insulated LV conductors	3.0
10kV, 20kV and 38kV	3.0
110kV	4.5
220kV	6.0
400kV	8.0

If the risk assessment identifies that the relevant minimum clearances cannot be achieved at all times, **use an alternative safe method**. Some alternative methods are:

- using a low level front tipping dumper to transport the road materials to the paver or spreader
- using combination spreader units; and
- using height-limiting control measures in conjunction with a competent dedicated observer

In certain limited situations, it may be necessary to have an electricity line switched out and earthed before proceeding with the work.

Figure 9: Road resurfacing parallel or near an un-insulated low voltage line



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10 Installing overhead services for telecommunications

10.1 Introduction

Overhead telecommunication networks involve the installation of equipment on poles which can be close to overhead electricity lines. Work on these telecommunication networks must be planned and carried out to make sure that the exclusion zone, as specified section 2.4.2, is never breached. The best and safest way to achieve this is to ensure that all work is carried out outside of the hazard zone. This requirement is particularly important where poles are being installed and/or replaced and when using high reach equipment.

Where work is done inside the hazard zone, additional safety controls are needed.

10.2 Scope

This section identifies what must be done to be able to work safely on overhead telecommunication networks where an overhead electricity line presents a hazard. These requirements are additional to the more general requirements, specified elsewhere in this Code of Practice, including section 7 and section 8. This section does not cover activities relating to attaching communication networks on electrical networks as provided for in SI 391 of 2016 European Union (Reduction of Cost of Deploying High- Speed Public Communications Networks) Regulations. These are subject to compliance with separate requirements.

10.3 Roles and responsibilities

The telecommunications asset owner must make sure that responsibility is properly assigned to key personnel to ensure compliance with the requirements of this Code of Practice.

10.4 Safety management requirements

The telecommunications asset owner must put procedures and processes in place to manage the risks associated with carrying out telecommunications work close to overhead electricity wires. **The exclusion zone must never be breached.** The work must comply with the requirements of the network asset owner, including standards that govern the relative positioning of telecommunication networks and electricity networks.

10.4.1 Work outside the hazard zone:

Where possible, all work must be carried out outside of the hazard zone. Where you need to operate plant near to live overhead electricity networks, you must:

- plan and assess the likely risks, and
- make sure that the appropriate controls and method statements are in place.

These measures will ensure that the exclusion zone can never be breached.

10.4.2 Work inside the hazard zone:

Where the work takes place inside the hazard zone, additional controls to those listed in section 7.4. need to be put in place. Additional controls include the use of a dedicated observer. These additional controls will help to ensure the exclusion zone can never be breached.

This practice applies to all work inside the hazard zone but especially to work that involves installing and/or replacing poles and the use of high reach equipment.

10.4.3 Work which could lead to an inadvertent breaching of the exclusion zone:

Where existing telecommunications assets are in place, and the exclusion zone could be inadvertently breached, this work cannot proceed until the electricity network is switched out and earthed by ESB Networks.

The owner or operator of the telecommunications networks must put in place controls to ensure that:

- existing telecommunications installations are identified,
- procedures to manage and maintain an up-to-date record of such installations and the use of safety signage are in place.

Annex 6 is an example of appropriate safety signage.

10.5 Communications and work management

The telecommunications asset owner/ operator must put in place effective work management and communications arrangements to facilitate:

- the safe working of the electricity network system by ESB Networks,
- the safety of all personnel,
- the safety of members of the public; and
- the switching out and earthing of overhead electricity network by ESB Networks **before** work can proceed.

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11 Transporting high loads by road

11.1 Introduction

When moving high loads, implement appropriate control measures to address the electrical and physical hazards of overhead electricity lines.

Electrical hazards arise from the risk of a high load contacting live electricity lines or coming close enough to cause electricity to flash over from live electricity lines.

Physical hazards arise from electricity lines, but also from obstacles such as telecommunications lines, trees and bridges.

11.2 Definition of a high load

As specified in the Road Traffic (Construction And Use Of Vehicles) (Amendment) Regulations 2008, a high load is any load that is more than 4.65 metres high at its highest point. This height is measured vertically from a flat horizontal surface where the loaded transporting vehicle is parked.

ESB Networks standard clearances for electricity lines that cross public roads are designed to enable loads up to 4.65 metres high to pass safely. No special measures are required for loads up to this height, and it should not be necessary to consult with ESB Networks in these cases.

For loads greater than 4.65 metres high, you **must** consult ESB Networks well before the proposed transportation date.

11.3 Planning for the transport of high loads

Before transporting a high load, you must consult ESB Networks to assess the effects of the transportation and to agree control measures.

Voltage determines the minimum safe clearance required between the nearest point of any load and a live electricity line. This minimum safe clearance can vary substantially across the possible range of voltages – public roads are crossed by overhead lines ranging from 230 volts to 400,000 volts.

To determine the control measures required for a high load, ESB Networks will have to individually assess each overhead line crossing on the proposed route. In some cases, no specific control measures beyond this assessment may be required. In general, control measures may vary from having to arrange for ESB Networks to supervise load transport to switching out and earthing lines or, in more extreme cases, making arrangements for raising the height of the lines before the load is transported.

11.4 Information required by ESB Networks

When you contact ESB Networks about transporting a high load, provide this information.

- a clearly marked road map that shows:
- the planned route for the load
- planned deviations to avoid other hazards such as bridges
- the starting and finishing locations of the journey
- accurate detailed dimensions of the load including maximum height and width
- the name and contact details of the road transport operator
- the planned schedule for transporting the load including:
  - dates and times;
  - stopover arrangements; and
  - whether more than one load is involved

11.5 Responsibilities of the road transport operator

A road transport operator must:

- Notify ESB Networks of its intention to move a high load under or close to ESB Networks overhead electricity lines or equipment.
- Provide accurate information on the high load to ESB Networks.
- Comply with all precautions and control measures advised by ESB Networks.
- Comply with all directions given by any ESB Networks staff that escort the high load.

11.6 Additional requirements and recommendations

You may be required to apply for a permit to transport a high load before you transport the load.

The definition of high loads in section 11.2 relates to safe passage under ESB Networks overhead electricity lines **only**. When you apply for permission or approval to move a high load, the height definition may be different than the one used in this Code of Practice.

12 Emergency procedures 68

12 Emergency procedures

These emergency cases are designed to reduce the risk of injury and death if there is accidental contact with electricity networks.

Emergencies include:

- fallen or low conductors
- conductors in contact with a vehicle or machine
- an injury on site
- road accidents
- fire
- medical emergencies; and
- damage to overhead lines, underground cables or other electrical plant

If you are unsure of the voltage of overhead lines, treat them as if they are high voltage. Remember, low voltage (LV) is less than or equal to 1000 volts (1.0kV). High voltage (HV) is more than 1000 volts (1.0kV)

For all emergencies, including contact with overhead electricity lines, call

1850 372 999

Case 1: An electricity line is on the ground or conductors are low or fallen

- **Stop work**, remain calm and stay away.
- Keep everyone away from live conductors.
- Do not allow yourself or others to come into contact with a person who is in contact with live conductors.
- Contact the ESB Networks emergency service at 1850 372 999 to get the network disconnected.
- Do not leave the site unattended. Remain on site until ESB Networks staff arrive.
- Do not approach conductors until ESB Networks confirm it is safe.

Case 2: A machine, truck or high-lift plant is in contact with an overhead line

There are two scenarios in this case.

- The machine is 'not-operable'. There is no immediate risk from fire or other hazards.
- The machine is 'not-operable'. There is an immediate risk from fire or other hazards.

Machine is operable

- **Stop work**, remain calm and stay in the cab.
- Instruct everyone outside the vehicle not to approach it or to make contact with it.
- Disengage from the line. Lower the plant.
- **Slowly** drive well clear of the line only if this does not risk breaking the conductor

or dragging it to the ground.

- Contact ESB Networks emergency service at 1850 372 999 to get the network disconnected.
- Do not leave the site unattended. Remain on site until ESB Networks staff arrive.
- Do not leave the cab until ESB Networks confirm it is safe.
- After the emergency has ended, check vehicles for damage before using them again.

Machine is not operable. There is no immediate risk from fire or other hazard

- **Stop work**, remain calm and stay in the cab.
- Instruct everyone outside the vehicle not to approach it or to make contact with it.
- Contact ESB Networks emergency number at 1850 372 999 to get the network disconnected.
- Do not leave the cab until ESB Networks confirm it is safe.
- Do not leave the site unattended. Remain on site until ESB Networks staff arrive.
- After the emergency has ended, check vehicles for damage before using them again.

Machine is not operable. There is a risk from fire or other hazard.

- **Stop work** and remain calm.
- Instruct everyone outside the vehicle not to approach it or to make contact with it.
- Jump clear of the machine or plant.
- Land with your feet as close together as possible.
- Avoid placing your hands on the ground.
- Avoid making contact with any part of the vehicle when you are on the ground.
- Shuffle away from the vehicle. Take half steps only or hop with both your feet together. Avoid taking full steps or spreading your feet in any direction.
- When you are clear of the vehicle, machine or plant, continue to treat the conductors and vehicles as if they are live.
- Contact ESB Networks Emergency Service at 1850 372 999 to request disconnection of the network.
- Do not leave the site unattended. Remain on site until ESB Networks staff arrive.
- After the emergency has ended, check vehicles for damage before using them again.

The pictures show the correct and safe way to exit a vehicle in this situation.

Figure 10: If you contact an overhead line

Correct method for exiting a vehicle when there is a risk of fire or other hazard

Keep all people well clear. **Call ESB Networks**

1850 372 999

ANNEXES 72

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Annex 1: Principles of Prevention

Schedule 3 to the Safety, Health and Welfare at Work Act 2005 lists the general principles of prevention of accidents and ill-health in the workplace. The Principles of Prevention are a hierarchy of control methods for risk elimination and risk reduction.

The General Principles of Prevention are set out in descending order of preference.

1. Avoid risks.
2. Evaluate unavoidable risks.
3. Combat risks at source.
4. Adaptation work to the individual.
5. Adapt the place of work to technical progress.
6. Replace dangerous articles, substances, or systems of work by non-dangerous or less dangerous articles, substances, or systems.
7. Use collective protective measures over individual measures.
8. Develop an adequate prevention policy.
9. Give appropriate training and instruction to employees. The PSDP and PSCS are responsible for implementing these principles.

The employer / employee / PSDP and PSCS are responsible for implementing these principles.

Annex 2: Form OHL1

Protective measures: safety check for barriers, goalposts, warning signs, bunting and other protection (example)

Recommended weekly safety check for overhead line protection				Site: ABCD at Newtown Road PSCS: Joe Bloggs	
Date and time	**Inspected by**	**Location and crossing ID**	**Protection type**	**Comment**	**Action**
01-May-16 11.00 am	J Smith Safety Officer	Grid 3-5, A-B	Bunting	Bunting damaged at the north side of the ESB line	Reported to J Murphy, site engineer at 13.00, 1 May 2016
"	"	"	Goalposts	In order	Reported to J Murphy, site engineer at 13.00, 1 May 2016
"	"	"	Traffic barriers	In order	No action
"	"	"	Signage	In order	No action
"	"	Grid 6-12, A-B	Bunting	In order	No action
		"	Goalposts	Not applicable	Not applicable
"	"	"	Traffic barriers	4 traffic barriers removed at the south side of the line	Reported to J Murphy, site engineer at 13.00, 1 May 2016
"	"	"	Signage	In order	No Action

Every day, check the condition and placement of protective measures.

Once a week, fill in a copy of OHL1 or a similar form and file it in your safety file.

Annex 2: Form OHL1

Protective measures: safety check for barriers, goalposts, warning signs, bunting and other protection (template)

Recommended weekly safety check for overhead line protection				Site: ABCD at Newtown Road PSCS: Joe Bloggs	
Date and time	Inspected by	Location and crossing ID	Protection type	Comment	Action

Every day, check the condition and placement of protective measures.

Once a week, fill in a copy of OHL1 or a similar form and file it in your safety file.

Annex 3: Electrical hazard risk assessment form: ERHA (template)

On-site electrical hazard risk assessment form: EHRA

Fill in this form when you are resurfacing or strengthening roads near live overhead electricity lines or equipment.

Every day, fill in a form for **every** overhead line conflict.

Name of contract: _____

Road number and section number : _____

Conflict identification number					
Specify the **voltage** of electricity lines that run parallel to or closely approach a road (LV; 10/20/38kV; 110kV; 220kV; 400kV)					
Are the crew familiar with chapter 9 of the Code of Practice for Avoiding Danger from Overhead Electricity Lines?(LV; 10/20/38kV; 110kV; 220kV; 400kV)	Y / N*	Y / N*	Y / N*	Y / N*	Y / N*
Are the **extremities of the no-tip zone** established and marked out on site?	Y / N*	Y / N*	Y / N*	Y / N*	Y / N*
Are **warning signs** erected at both entry and exit of **no- tip zone**?	Y / N*	Y / N*	Y / N*	Y / N*	Y / N*
Has a person being **appointed to control work** at the overhead line crossing or conflict location?	Y / N*	Y / N*	Y / N*	Y / N*	Y / N*
Has a **procedure for safe working** at the overhead line crossing or conflict location been decided by the person in charge (PIC)?	Y / N*	Y / N*	Y / N*	Y / N*	Y / N*
Do all staff understand the **proposed safe work method statement** and agree that work can proceed safely with the networks **live**?	Y / N*	Y / N*	Y / N*	Y / N*	Y / N*

Signed by person in charge (PIC): _____ Date: _____

Agreed by crew (Circle one): Yes / No* ESB Emergency Phone: 1850 372 999

*If the answer to any of these questions is **no**, appropriate action **must** be taken to address the issue before working at that location.

Annex 4: Road resurfacing safety audit form (template)

Contractor:		Audit Date:
Work location:		Auditor(s)
Description of work:		Names of crew members:

Issue	Status	Comments
Does the crew have a copy of the preliminary survey or pre-work planning assessment?	Y / N*	
Has an electrical hazard risk assessment (EHRA) being completed for all relevant crossings and conflicts?	Y / N*	
Is the crew familiar with EHRA requirements?	Y / N*	
Are no-tip zones established, marked on site and being complied with?	Y / N*	
Are there warning signs at crossing and conflict locations?	Y / N*	
Is there an appointed person controlling work at crossing and conflict locations?	Y / N*	
Are crew members trained for the tasks they are completing?	Y / N*	
Is the crew working in line with the appropriate method statement?	Y / N*	
Has the crew got the ESB Networks Emergency contact number? (1850 372 999)		
Commendable safe actions		
Deviations observed		
Suggestions taken and items for follow up		

Signed by Person in Charge (PIC): _____ Date: _____

Signed by auditor: _____ Date: _____

Annex 5: Contacting ESB Networks

For all emergencies, including contact with overhead electricity lines, call 1850 372 999

ESB Network's general queries number: 1850 372 757

Use this general number to find out about:

- new electricity connections;
- increased capacity;
- voltage enquiries; and
- safety and technical queries.

ESB Network's website esbnetworks.ie

To get electricity line maps or records

Email us at: dig@esb.ie

Phone us at: 1850 928 960
+353 1 858 2060

This service operates Monday to Friday only.

Fax us at: 01 638 8169

Write to us at: ESB Networks Central Site,
St Margaret's Road,
Finglas,
Dublin 11.
D11 X3W7

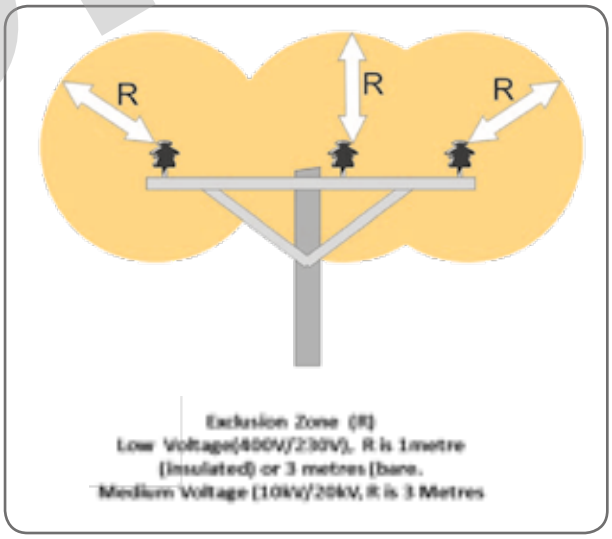
To get copies of free safety material

Email us at: esbnetworks@esb.ie

Phone us at: 1850 372 757

Visit our website: esb.ie/esbnetworks

Annex 6: Telecommunications Danger Notices



Annex 7: Other useful contacts

Gas Networks Ireland

24 Hour Emergency Service: 1850 20 50 50
Gas Networks Ireland 'Dial Before You Dig': 1850 427 747
Gas Networks Ireland Transmission Enquiries: 021 453 4562
Email: dig@gasnetworks.ie

EIR

'Click Before You Dig'

http://support.eir.ie/article/clickbeforeyoudig

Eir Home: 1800 773 729

Annex 8: Avoiding Danger from Overhead Electricity Lines

To help you use this document, the main changes from the 2008 version of the Code of Practice for Avoiding Danger from Overhead Electricity Lines are listed below:

- The improved readability of the Code by its compliance with the NALA (National Adult Literacy Agency) Plain English Mark.
- The increased use of bullet pointing in the COP to simply the communication style of the document.
- The early introduction of definitions for "Competent Person", "Exclusion Zone", "Hazard Zone" "Overhead Line" and the explanations of abbreviations such as HV, LV and kV.
- The more general use of the term "Network Owner" rather than "ESB Networks" to more reflect the possibility of different network owners.
- The early introduction in the COP of what the COP does and doesn't cover and specifically the exclusion from code of workers competent to deal with the hazards of electricity. (It had previously been the case that certain ESB crews were concerned that the provision of the 2008 version of the COP could be interpreted as placing an impediment on competent workers coming within 6 metres (or indeed 10 metres in certain instances) of an overhead line, even if adequate safety precautions were in place)
- The inclusion in the COP of practical situations where serious incidents had happened in the past.
- The explanation in the Code of the use of bare and insulated overhead lines and the need for similar levels of caution in both cases.
- The inclusion throughout the Code of more Irish and up-to-date photos and graphics to more clearly illustrate the messages contained within the COP.
- The updating of the role of the client in accordance with the 2013 Safety Health and Welfare at Work (Construction) Regulations.
- The inclusion of additional information on the notification of the HSA of construction activities.
- The removal of inconsistencies between the COP and the HSA "Guidelines on the Procurement, Design and Management Requirements of the Safety Health and Welfare at Work (Construction) Regulations 2013".

- The inclusion of emergency procedures in the body of the text (rather than in an appendix) and the updating of these procedures with up-to-date graphics.
- The inclusion of additional and up-to-date contact information in Annex 7.
- The introduction of a bibliography after Appendix 7.
- Technical updates with regards to references to current legislation.
- Sections are colour coded for ease of use.
- Introduction of Table of Figures and Tables
- Figures and Tables are cross referenced throughout the document for ease of use.

Other useful codes of practice and guidelines

Guidelines for Safe Working near overhead lines in Agriculture (HSA)

FISA 804 Electricity At Work: Forestry

Code of Practice for Avoiding Danger from Underground Services (HSA)

Summary of Key Duties under the Procurement, Design and Site Management Requirements of the Safety Health and Welfare at Work (Construction) Regulations, 2013 (HSA)

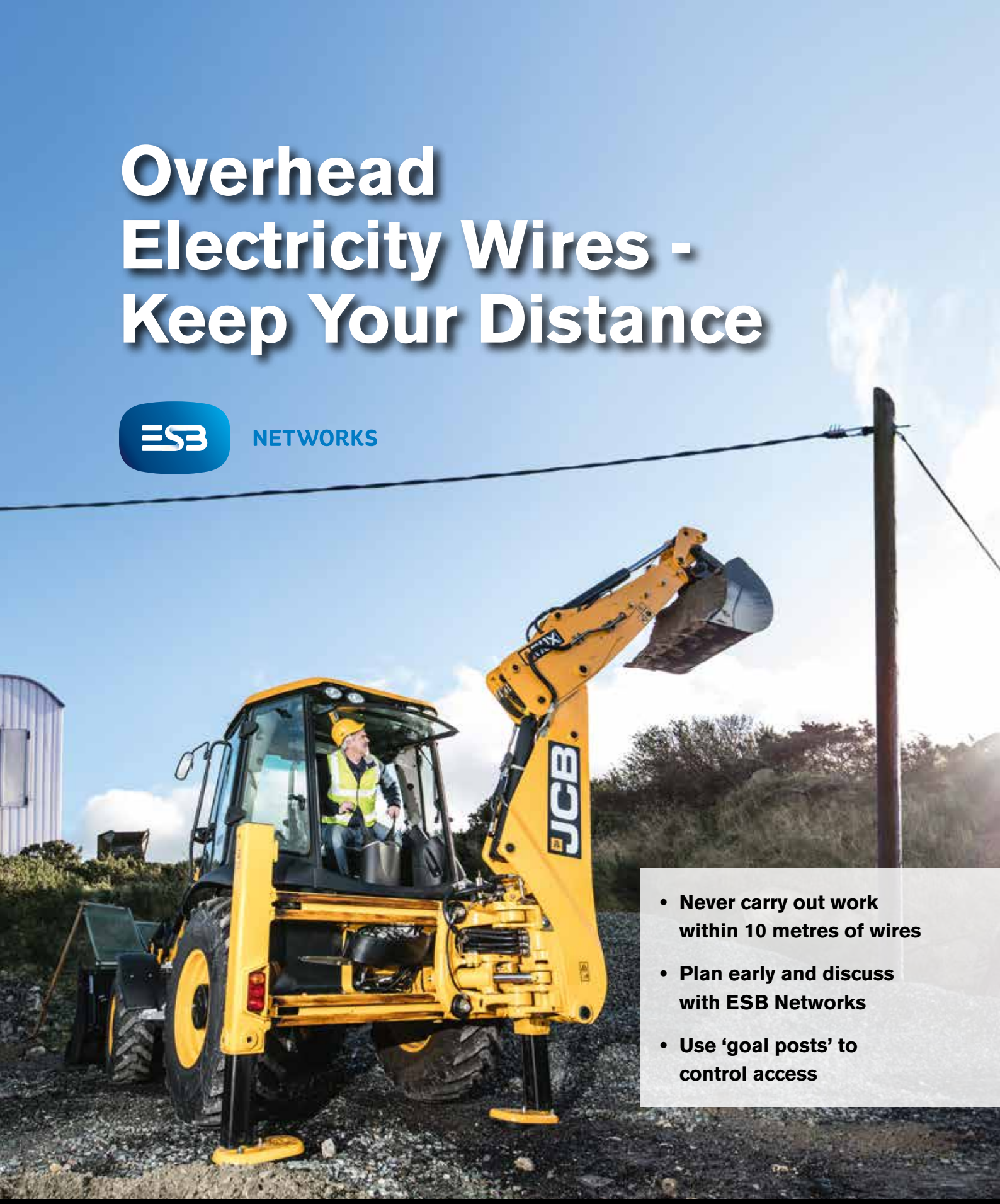
Guidelines on the Procurement, Design and Management Requirements of the Safety health and Welfare at Work (Construction) Regulations 2013 (Updated)

Guide for Homeowners. Getting Construction Work Done Safely. (HSA)

Mobile Elevated Work Platforms (MEWPs) Guidance on Safe Operating Procedures (HSA)

Overhead Electricity Wires - Keep Your Distance

ESB NETWORKS



- Never carry out work within 10 metres of wires
- Plan early and discuss with ESB Networks
- Use 'goal posts' to control access

Electricity Wires are always live!

Emergency No.1850 372 999 (24 Hour/7 Day)

Notes

Notes