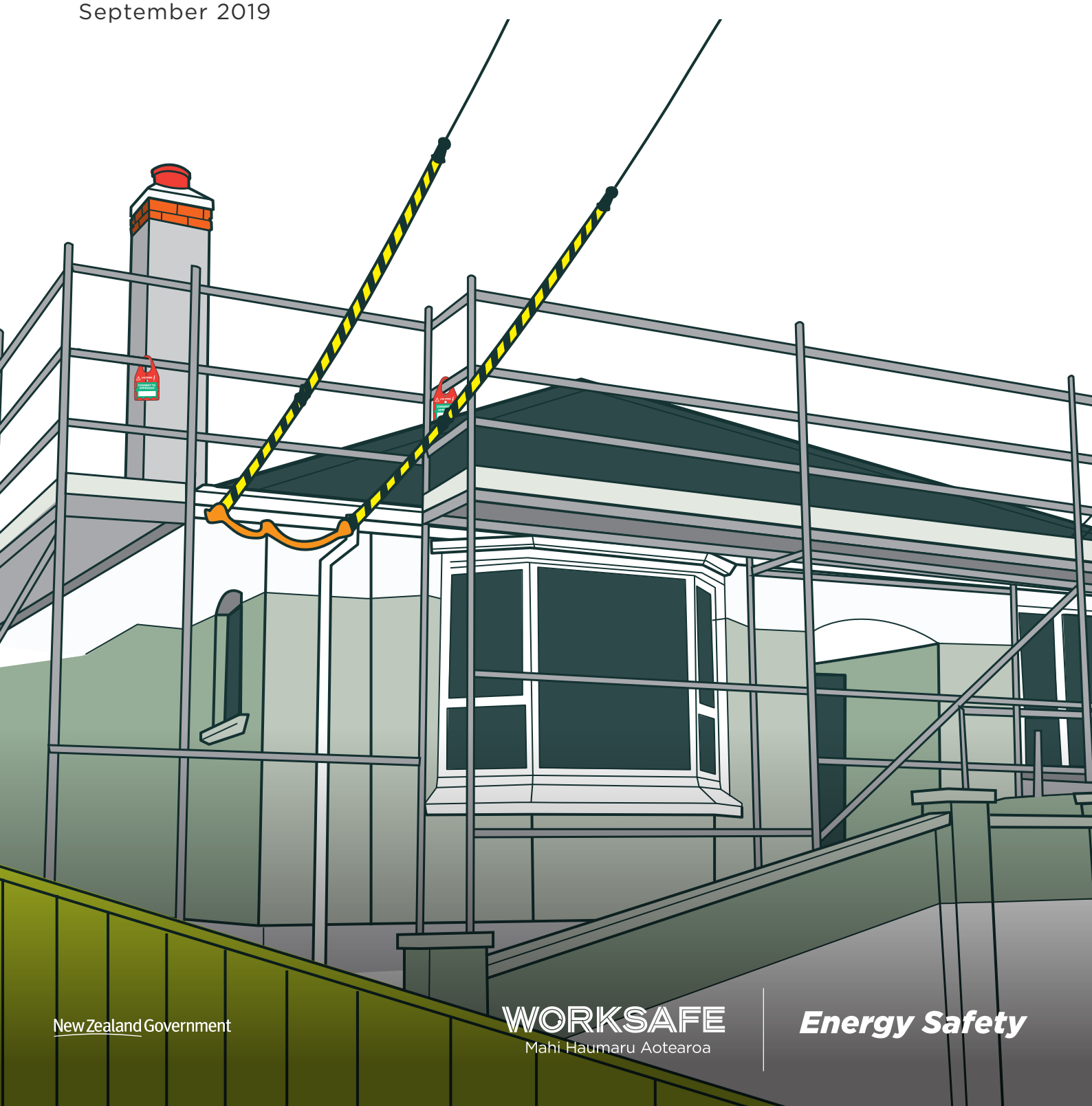
HSWA

QUICK GUIDE

Working near low voltage overhead electric lines

September 2019



New Zealand Government

WORKSAFE
Mahi Haumaru Aotearoa

Energy Safety

Notes

Use of ‘must’ and ‘should’

The words ‘must’ and ‘should’ indicate whether an action is required by law or is a recommended practice or approach.

TERM	DEFINITION
Must	Legal requirement that has to be complied with
Should	Recommended practice or approach

Key terms

Appendix 1 of this guide has a list of the technical words, terms and abbreviations used in this guide and explains what they mean.

Guide to measurements

m	metre
0.5 m	500 mm (half a metre)
0.1 m	100 mm

Images

Images are a guide only. They are not intended to provide technical specifications.

ACKNOWLEDGEMENTS

WorkSafe acknowledges and thanks the stakeholders who have contributed to the development of this guidance by sharing their feedback and expertise.

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1.0
Key points

Touching a live low voltage overhead electric line with any part of the body, a tool or equipment can cause death or serious injury.

If work needs to be done near a live low voltage overhead electric line, the safest option is to eliminate the risk of electric shock by having the electricity supply to the property isolated before work starts.

If isolating the electricity supply is not possible, workers must maintain a minimum approach distance (MAD) so that they keep their body, tools and equipment a safe distance from the overhead line.

- **With written consent** from the property owner, workers must maintain a MAD of **at least 0.5 m from the overhead line**.
- **Without written consent** from the property owner, workers must maintain a MAD of **at least 4 m from the overhead line**.
- The property owner owns the electrical assets inside the property boundary, including the overhead line.

There are also specific MADs for temporary structures (such as scaffolding) and mobile plant in use near an overhead line.

As well as maintaining a MAD, WorkSafe expects additional control measures to be used to minimise the risk of electric shock.

MADs are specified by law and are described in detail in the New Zealand Electrical Code of Practice for Electrical Safe Distances: NZECP 34

Always get advice from a competent electrical worker before work starts near a low voltage overhead electric line.

2.0 Introduction

Any work done near a live low voltage overhead electric line carries a risk of electric shock.

Touching a live overhead line with any part of the body, a tool or equipment can cause death or serious injury, even if the line appears to be insulated.

What this guide covers

This guide provides information on how to manage the risk of electric shock while work is being done near a live low voltage overhead electric line.

Temporarily isolating the electricity supply to the property is always the safest option.

The guide explains that a minimum approach distance (MAD) must be maintained to keep workers a safe distance from the overhead line if it is not possible to isolate the electricity supply.

NZECP 34 states the distance that must be kept between a live low voltage overhead electric line and:

- a worker
- a temporary structure
- mobile plant.

Work can only take place closer to the line if written consent has been obtained from the property owner. Section 10 of this guide describes the process for obtaining consent.

As well as maintaining a MAD, WorkSafe expects a combination of control measures to be put in place to minimise the risk of electric shock.

The guide outlines the different MAD requirements for:

- people working near a line, such as painters or builders (see Section 5 of this guide)
- temporary structures set up near a line, such as scaffolding, ladders and other height access equipment (see Section 6 of this guide)
- mobile plant operating near a line, such as a crane, elevating work platform, or other equipment with a jib or boom (see Section 7 of this guide).

This guide will help you to comply with the following:

- Health and Safety at Work Act 2015 (HSWA)
- Electricity Act 1992
- Electricity (Safety) Regulations 2010
- New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34).

Who should read this guide

This guide is for:

- persons conducting a business or undertaking (**PCBU**s), who are responsible for managing the risks of working near a low voltage overhead electric line, for example, roofing or scaffolding businesses
- **tradespeople** such as roofers, painters, scaffolders, builders or other workers carrying out work near a low voltage overhead electric line
- **property owners** who need to know their obligations when work is being carried out near a low voltage overhead electric line on their property.

Work this guide applies to

This guide covers specific types of work near a low voltage overhead electric line. A low voltage overhead electric line is the line that crosses a boundary into a property (see Figure 1).

The property owner owns that part of the line between the property boundary and the buildings on that property.

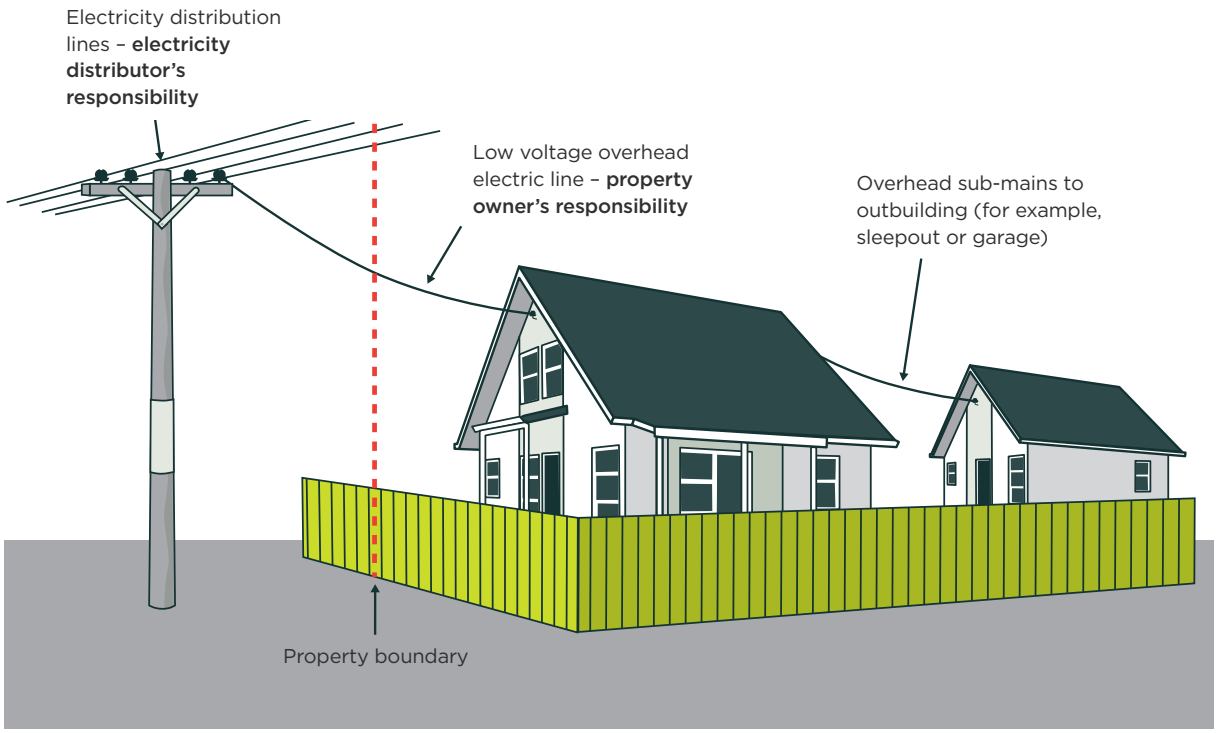

FIGURE 1: Low voltage overhead electric line providing electricity supply to buildings

WORK THIS GUIDE APPLIES TO (but is not limited to)	WORK THIS GUIDE DOES NOT APPLY TO
– painting – building maintenance – roofing and guttering work – erecting and dismantling scaffolding – construction work – house washing/water blasting – any work using mobile plant or height access equipment, for example: - scaffolding - ladder - cherry picker - equipment fitted with a jib or boom, such as a crane - scissor lift or other mobile elevating work platform – other (non-electrical) work where workers may come into contact with a low voltage overhead electric line.	– work on vegetation (for example, tree trimming, pruning and removal) – work near high voltage overhead electric lines – work near electricity distribution lines. **Note**: Seek permission from the electricity distributor before carrying out work near high voltage overhead electric lines or any overhead lines owned by electricity distributors.

TABLE 1:
Work this guide applies to

3.0 Assess the risk of harm before work starts

WorkSafe encourages PCBUs to use the Plan-Do-Check-Act approach shown in Figure 2 to assess, manage, monitor and review work risks. WorkSafe's guide Identifying, assessing and managing work risks describes this approach in more detail and includes a simple risk management process.

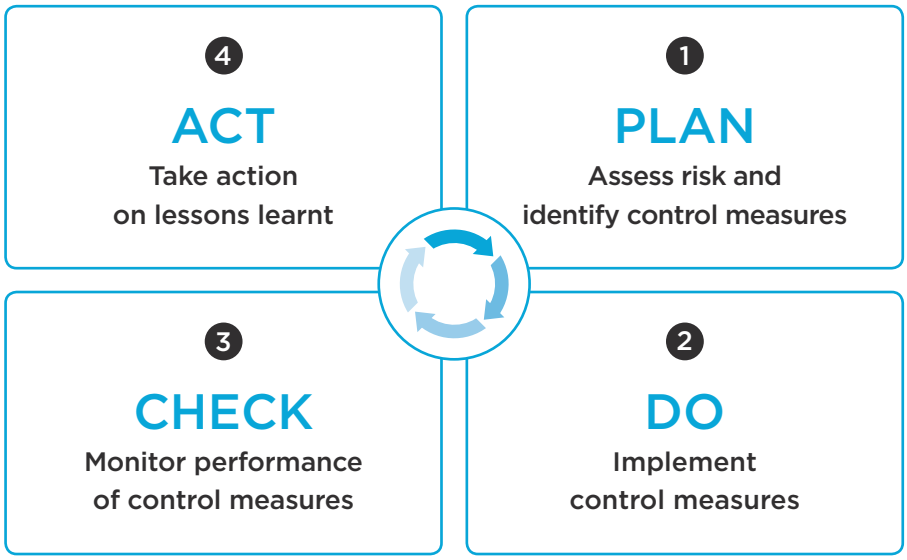

FIGURE 2: The PLAN-DO-CHECK-ACT approach

Managing the risk of electric shock

Thorough planning is essential. **Before work starts PCBUs should**:

- **identify** all low voltage overhead electric lines in the area where work will be carried out
- **assess** the risk of harm
- **eliminate** the risk of electric shock by isolating the electricity supply to the overhead lines
- if elimination is not reasonably practicable then **minimise** the risk by following the suggestions in this guide.

'Reasonably practicable' means doing what is reasonable in the circumstances to ensure health and safety.

WorkSafe's Reasonably Practicable fact sheet explains what to consider when deciding what actions to take.

See Appendix 1 of this guide for the full HSWA definition of 'reasonably practicable'.

Appendix 2 of this guide outlines what WorkSafe expects a PCBU to check when a site is first set up, as well as what should be checked daily, regularly, and as needed.

Minimising risk

If the electricity supply will not be isolated, the risk of electric shock must be minimised by using control measures to manage the risk. A PCBU should use the hierarchy of controls (Figure 3) to work out the most effective control measures to minimise the risk.

For example, if consent has been obtained from the property owner allowing work between 0.5 and 4 m from a low voltage overhead electric line, additional control measures will minimise the risk of electrical shock. A physical barrier such as a hoarding – with a warning sign – could be put in place to prevent workers getting closer than 0.5 m to the overhead line. See Chapter 6 for more information about hoardings.

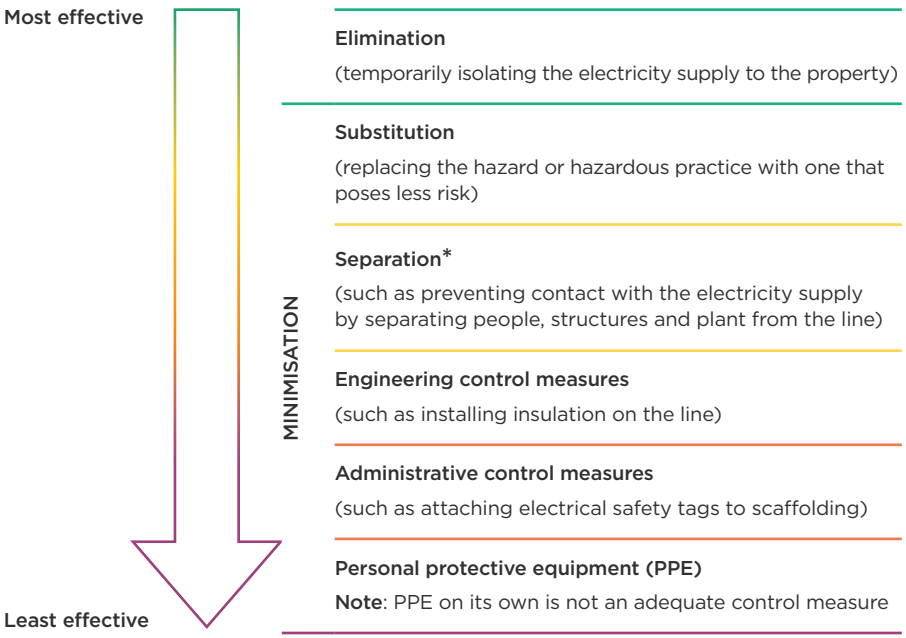

FIGURE 3:
Hierarchy of controls

Managing risks when there are multiple businesses on a site

A PCBU working on a site with other businesses must consult, cooperate and coordinate activities with those businesses. For example, a painter, scaffolder and roofer working on the same site must together manage the risks of working near a low voltage overhead electric line.

For more information

Overlapping duties

* Typically called 'isolation'. This has a different meaning to the electrical meaning of isolation which refers to disconnecting a property's electricity supply from the electricity distribution lines.

4.0 Eliminating the risk of electric shock – isolation

Isolating the electricity supply

Isolating the electricity supply to a property eliminates the risk of electric shock.

'Isolate' means to disconnect a property's electricity supply from the electricity distribution lines so that the low voltage overhead electric line to the property is no longer live. Isolation is temporary – for a specified period of time while work takes place.

Electricity retailers have contractors who are able to isolate the electricity supply to a property on request. This website lists retailers by area: www.whatsmynumber.org.nz/RetailersInYourArea

The electricity supply to a property must be isolated for all work that could bring a worker, their tools or their equipment closer than 0.5 m to an overhead line. For example:

- erecting or dismantling scaffolding in an area less than 0.5 m from the line
- painting around the area where the line is connected to the house.

For all work between 0.5 m and 4 m from an overhead line, the safest option is to eliminate the risk of electric shock by isolating the electricity supply to the property while that work is being done.

Keep people informed so that they can plan ahead

Find out who needs to know that the electricity supply will be temporarily isolated. For example:

- the property owner
- other people living at the site, including any tenants
- people working at the site
- other businesses working at the site – businesses must consult, cooperate and coordinate activities to manage shared health and safety risks.

Anyone who could be affected by isolation of the electricity supply should be told:

- how long the power will be off
- who will be affected and when
- what will be done to ensure that the power is off for as short a time as possible.

Make sure that everyone knows when work in the area has been completed and the power is about to be restored.

The power **should not be restored** if workers, their tools or their equipment still need to be within 4 m of the overhead line (or within 0.5 m with consent from the property owner).

Properties depending on mains electricity for critical medical support

Confirm that there are suitable alternative arrangements in place before isolating the electricity supply to a property that depends on mains electricity for critical medical support. This includes equipment such as ventilators and renal dialysis machines.

Temporary sources of electricity may be needed

People whose lives, work or everyday activities will be affected may need to arrange an alternative temporary source of electricity.

Confirm that there is no alternative source of electricity to the property

When the electricity supply has been isolated, always confirm that there is no alternative source of electricity to the property that could allow an electrical backfeed to occur while work is being done.

Someone could receive an electric shock if a generator, photovoltaic system or other alternative power system is still supplying electricity to the property.

If isolating the electricity supply is not possible

If isolating the electricity supply to a property is not possible, risk must be minimised so far as is reasonably practicable. The following sections of this guide outline what should be done to minimise the risk of electric shock.

5.0 Managing the risk to people working near an overhead line

This section of the guide covers how PCBUs should manage the risk to people working near a low voltage overhead electric line. See Sections 6 and 7 of this guide for the additional requirements for managing the risk of working near an overhead line when using temporary structures (for example, scaffolding) or mobile plant.

Minimum approach distances (MADs)

If work needs to take place near a low voltage overhead electric line and isolating the electricity supply is not reasonably practicable, then the worker's body, their tools and their equipment must be kept a safe distance away from the overhead line. This safe distance is known as the minimum approach distance, or MAD.

The MAD sets the distance that separates workers from a live overhead line. This reduces the risk of accidental contact that could cause an electric shock.

The MAD is not required if the electricity supply to a property has been isolated, locked out and tagged.

A MAD is specified by law. A MAD is the minimum distance that must be kept between a low voltage overhead electric line and:

- any part of a worker's body
- objects the worker is holding (including tools or scaffolding poles that could conduct electricity)
- equipment the worker is operating or standing on (such as scaffolding).

There are different MADs for:

- people working near a line – such as painters or builders (see Section 5 of this guide)
- temporary structures near a line – such as scaffolding (see Section 6 of this guide)
- mobile plant being operated near a line – such as a crane or mobile elevated work platform (see Section 7 of this guide).

WorkSafe recommends that MADs are used in combination with one or more other control measures.

Never use an object that conducts electricity – such as a metal tape measure or a metal ruler – to measure a MAD.

How close to the overhead line will the worker be?

If a person will be working near a low voltage overhead electric line, the PCBU should find out how close the person will need to work.

- If **less than 0.5 m**: the electricity supply to the property must be isolated before work starts and until the work is done. For example, if a painter needs to paint around the area where an overhead line enters a house.
- If **0.5 m to 4 m**: before work starts, written consent is needed from the property owner before work can take place. See Section 10 of this guide for more information.
- If **more than 4 m**: work can start. Consent is not needed from the property owner for work to take place. However a risk assessment should still be carried out and control measures put in place.

Table 2 shows the MADs for work near a live low voltage overhead electric line. See Section 9 of NZECP 34 for the complete requirements.

HOW CLOSE TO A LIVE LOW VOLTAGE OVERHEAD ELECTRIC LINE PEOPLE CAN WORK

	Less than 0.5 m	0.5 – 4 m	Over 4 m
Competent electrical worker doing work near the line	✓	✓	✓
Person with close approach consent from property owner	✗	✓	✓
Person without close approach consent from property owner	✗	✗	✓

TABLE 2:
Minimum approach distances (MADs) for people working near a live low voltage overhead electric line

Figure 4 shows the MAD between a low voltage overhead electric line and a worker who has consent to work up to 0.5 m from the line.

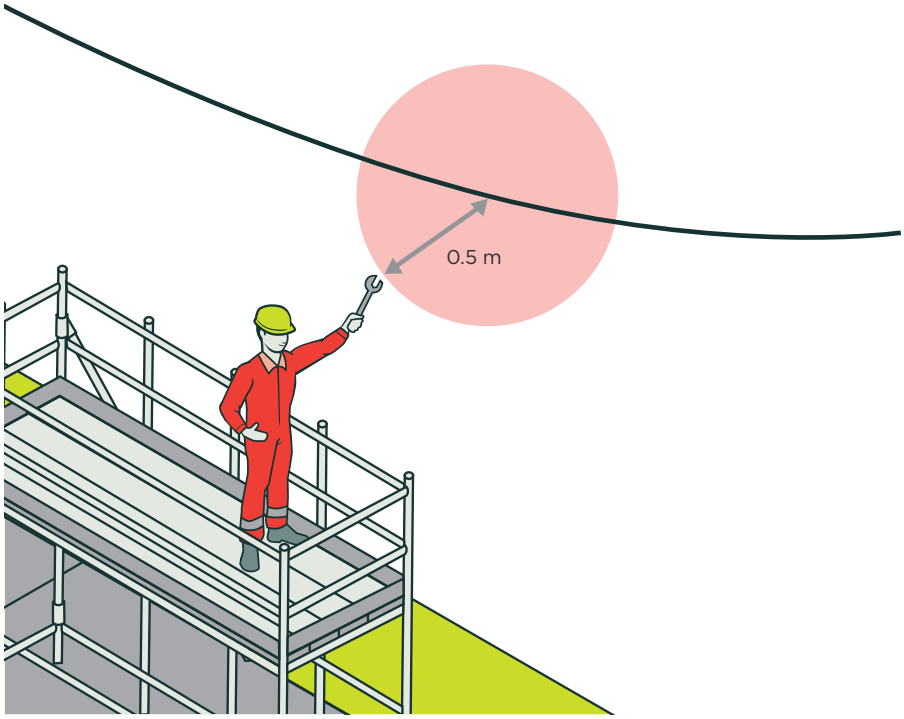

FIGURE 4:
Worker with consent to work up to 0.5 m from the low voltage overhead electric line

Use MADs with other control measures

A MAD will be a more effective control measure if it is used with additional control measures. First, consider:

- using insulated or non-conductive coverings on the low voltage overhead electric line (see below for more information)
- replacing bare electrical wires with an insulated cable, such as a neutral screened mains cable.

Then, consider:

- using tools that cannot conduct electricity
- putting visual indicators on the overhead line to draw attention to hazards
- using a safety observer to make sure that workers stay a safe distance (the minimum approach distance) from the line.

Check that control measures will not introduce new hazards.

Insulation

Insulating the low voltage overhead electric line is a suitable control measure to minimise the risk of electric shock. However, people working near an overhead line could still receive an electric shock even if the line is insulated. For example, if the insulation has been damaged. Insulation, such as the 'tiger tail' shown in Figure 5, should:

- comply with AS 4202
- be installed by, or under the direct supervision of, a competent electrical worker
- have a voltage rating suitable for low voltage overhead electric lines
- be installed for the full length of the work area – which includes roof edge protection or scaffolding – plus a minimum distance of 2 m beyond the area where work is being carried out (subject to a risk assessment)
- be installed, maintained, stored and handled in accordance with manufacturer's instructions.

Tiger tails (see Figures 5, 6 and 7) provide mechanical and environmental protection as well as giving a visual reminder that the overhead line is close. Insulated mats (the orange material shown in Figures 6 and 7) should comply with AS 4202.

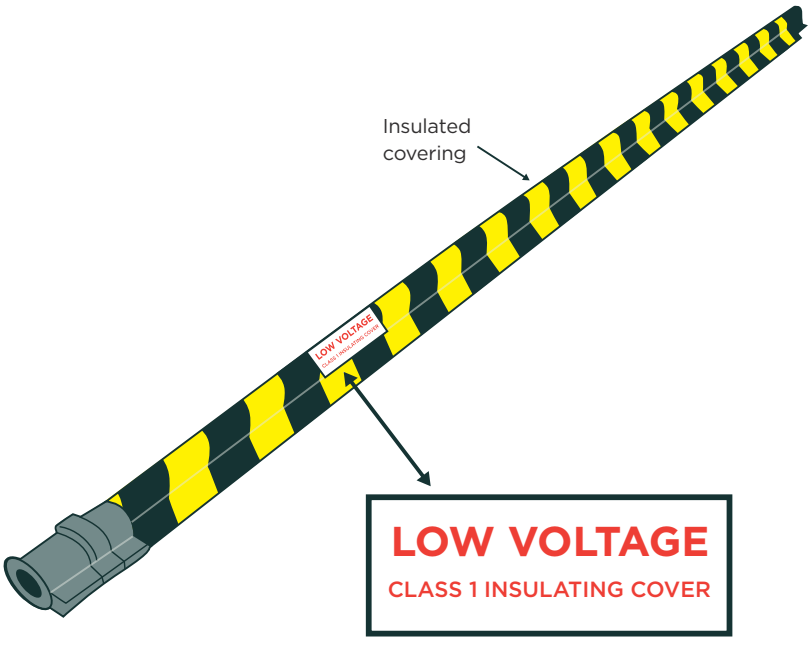

FIGURE 5:
Tiger tail in detail

FIGURE 6:
Tiger tail on
an overhead line

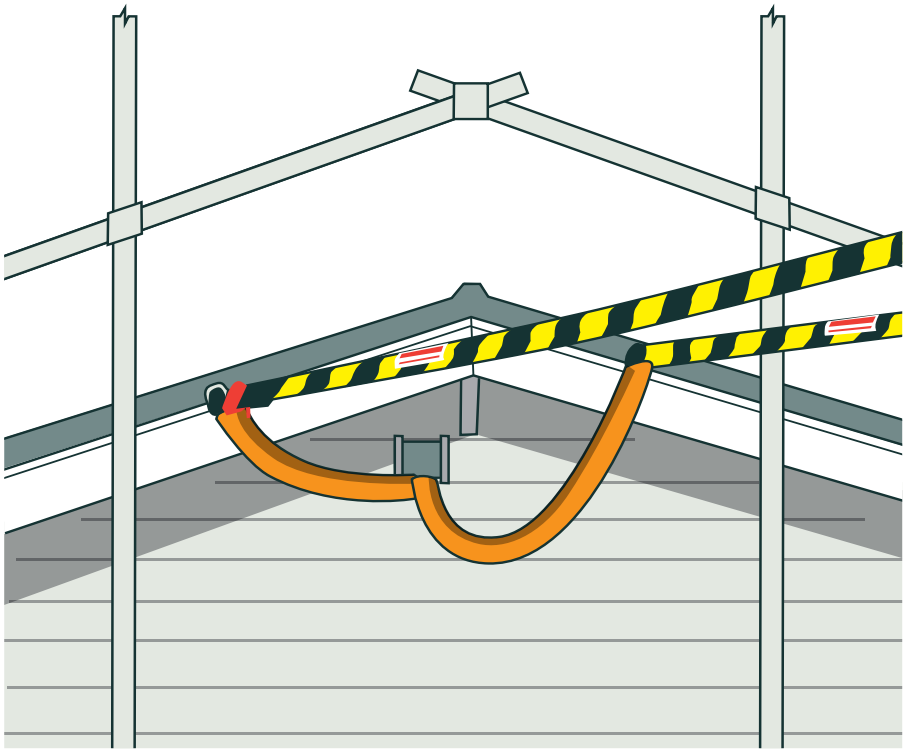

FIGURE 7:
A combination of tiger tails and insulated covering

Uninsulated or inadequate covering will not protect anyone from electric shock. Never assume that an existing line covering is insulated.

Although a line covering may appear to be insulated, wear and tear can make insulation defective.

6.0 Managing the risk of work on temporary structures near an overhead line

The PCBU should manage the risk of work on temporary structures located near a low voltage overhead electric line. Section 3 of NZECP 34 covers the MAD requirements applying to temporary structures such as:

- scaffolding used for building work
- ladders or trestles used by painters
- portable climbing equipment, and
- other height access equipment, such as a platform on wheels.

An engineering study is required before constructing a permanent building (or other structure) that will be located near an overhead line.

However, an engineering study is not required for a temporary structure located near an overhead line, such as scaffolding that has been set up so that maintenance or repair work can be done on an existing building (or other structure).

See Section 3 of NZECP 34 for details.

MADs for scaffolding or other temporary structure

Before erecting scaffolding or any other temporary structure, the distance needed between the structure and a low voltage overhead electric line should always be checked.

Figure 8 shows how close to the line scaffolding or any other temporary structure can be positioned if the property owner has provided written consent (see Section 10 of this guide). The distances shown in Figure 8 also apply when setting up, altering or dismantling scaffolding. No part of the structure can touch or be able to fall onto the line.

Figure 8 is not intended to provide technical specifications for erecting scaffolding as it is not possible to show all details.

If written consent has not been obtained from the property owner then the power must be isolated if scaffolding or any other temporary structure needs to be closer than 4 m to the line.

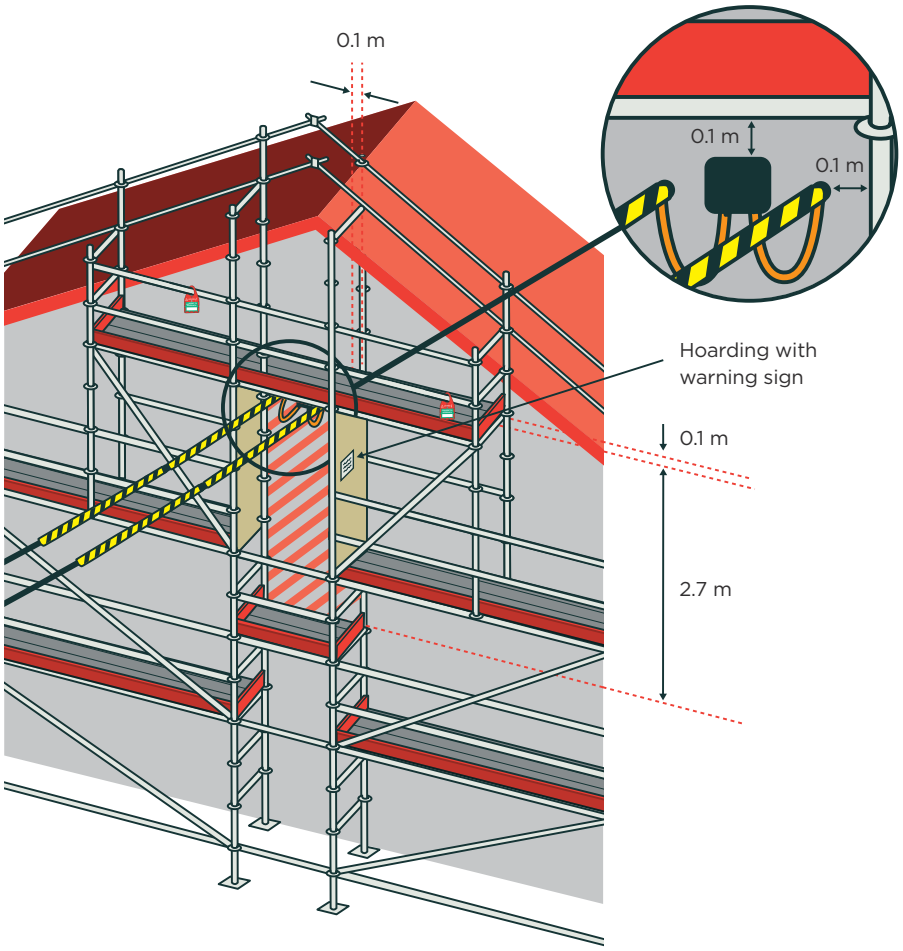

FIGURE 8:
Scaffolding positioned close to line with written consent from property owner

MADs for workers on a temporary structure

Any **person** working on the platforms next to the cross-hatched area must be at least 0.5 m from the overhead line and have written consent from the property owner.

If a **person** needs to work **less than 0.5 m** from the overhead line, then the electricity supply to the property **must be isolated**.

See Section 5 of this guide for more information about how to manage the risk to people working near an overhead line.

Additional control measures

Hoardings or enclosures

Hoardings or enclosures can be installed on scaffolding to prevent workers (or anything workers hold or are attached to) from coming closer than the minimum approach distance (see Figure 9). They are usually made from sheets of plywood or other suitable non-conductive material.

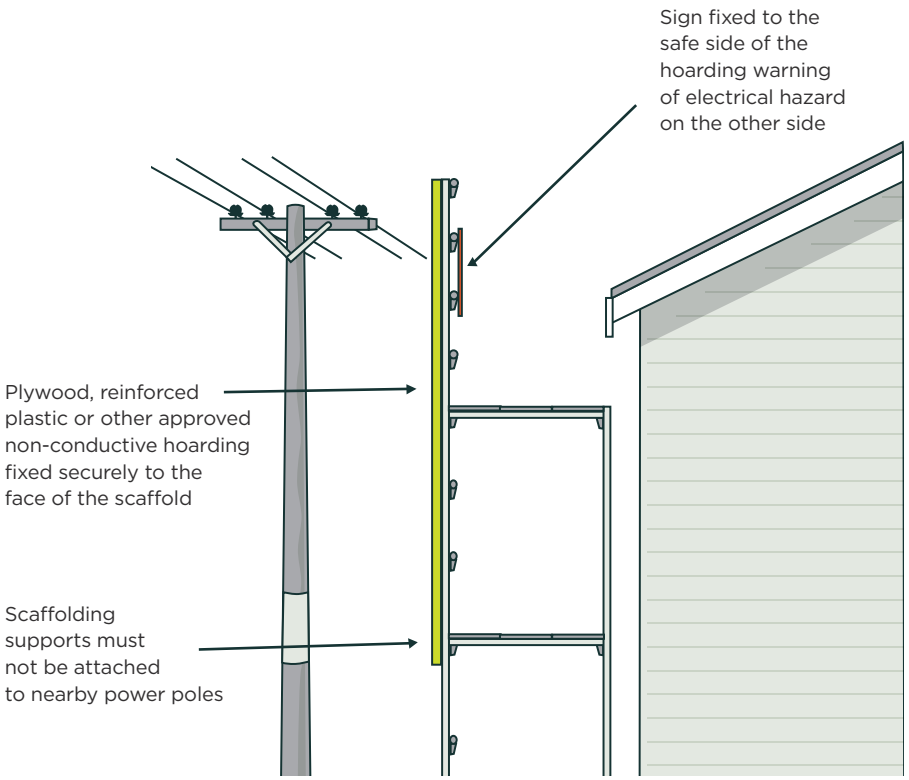

FIGURE 9: Scaffolding with hoarding

When installing hoardings or enclosures, make sure that:

- gaps between sheets (or other material) do not exceed 3 mm
- there are no exposed cut or drilled holes in the sheets
- sheets are attached to the scaffold using methods that can withstand the wind load
- signs are attached to the non-exposed ('safe') side of the hoardings or enclosures:
  - to warn of the electrical hazard behind the hoardings, and
  - to make it clear that the hoardings or enclosures must not be removed.

Be aware that a hoarding attached to scaffolding could create large wind loads that may cause the scaffolding to collapse.

Keep scaffolding and other height access equipment secure

Scaffolding and other height access equipment should be kept secure to prevent unauthorised people climbing onto it. They could receive an electric shock if they touch a live low voltage overhead electric line.

Insulation

As well as the insulation options described in Section 5 of this guide, using non-conductive scaffolding or insulated elevating work platforms can help to minimise risk.

Electrical safety tags

Electrical safety tags attached to scaffolding can clearly display safety information.

TAG COLOUR

The colour of the tag indicates how close workers can get to the low voltage overhead electric line.

- **If tag is red**
  The wires are live. Work must be carried out **at least 4 m away from the overhead line**.
- **If tag is red with a green insert**
  The wires are live. Consent has been given for work to be carried out **within a specified safe distance (the minimum approach distance) with suitable control measures in place**.

Tags should be positioned on – or as close as possible to – the low voltage overhead electric line. They should be visible to anyone working near the line.

Figure 10 shows a tag with and without an insert.

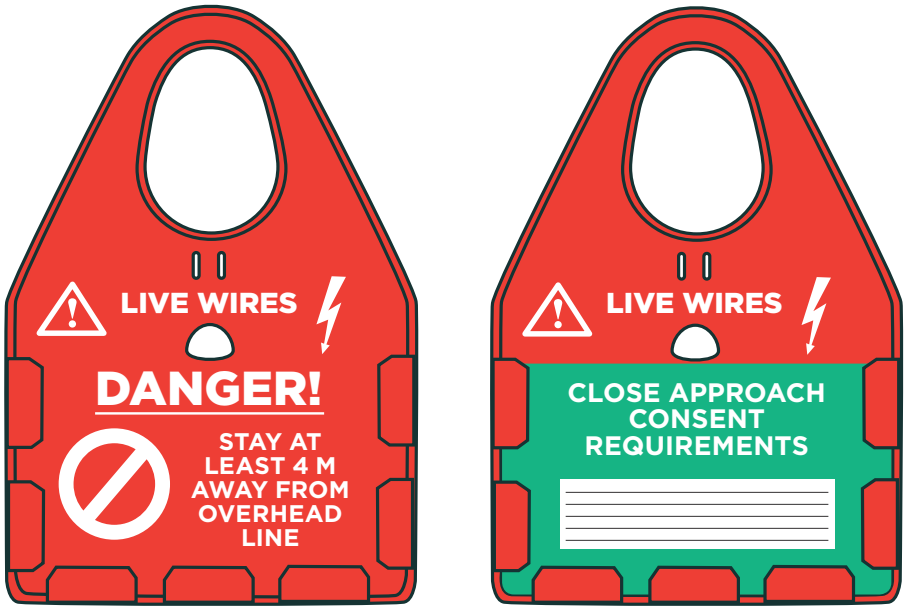

FIGURE 10:
Electrical safety tag: example of Side One

The green tag insert has two sides.

Side One could include information from the Close Approach Consent Form signed by the property owner. For example, the control measures that will be used to eliminate or minimise the risk of electric shock. See Section 10 and Appendix 3 of this guide for information about Close Approach Consent Forms.

Side Two (Figure 11) could be used to record checks on control measures and any changes or fixes made.

RECORD OF CONTROL MEASURE CHECKS			
Control measure	**Date**	**Person who checked** (name/contact details)	**Notes** (for example, reason check carried out; fix required/made)

FIGURE 11: Electrical safety tag: example of Side Two

7.0 Managing the risk of operating mobile plant near an overhead line

The PCBU should manage the risk of operating mobile plant near a low voltage overhead electric line. 'Mobile plant' is defined in NZECP 34 and includes cranes, mobile elevated work platforms, and tip trucks.

The mobile plant operator and anyone nearby could receive an electric shock if the mobile plant or its load touches a live overhead line. If the line is contacted by the mobile plant this could also damage the line.

When working near an overhead line, the mobile plant operator should be aware that wind or temperature change can shift the position of the line.

MADs

Table 3 shows how close to a live overhead line any part of a mobile plant or its load can be operated. See Section 5 of NZECP 34 for the complete requirements.

Section 10 of this guide has information about the consent process.

HOW CLOSE TO A LIVE LOW VOLTAGE OVERHEAD ELECTRIC LINE MOBILE PLANT CAN BE OPERATED

	Less than 0.15 m	0.15 – 4 m	Over 4 m (beside or under the line)
Mobile plant operated with close approach consent from property owner	✗	✓	✓
Mobile plant operated without close approach consent from property owner	✗	✗	✓

TABLE 3: Minimum approach distances (MADs) for mobile plant operated near a live low voltage overhead electric line

Figure 12 shows a worker using mobile plant maintaining a 4 m MAD. The worker does not have consent to work any closer to the overhead line.

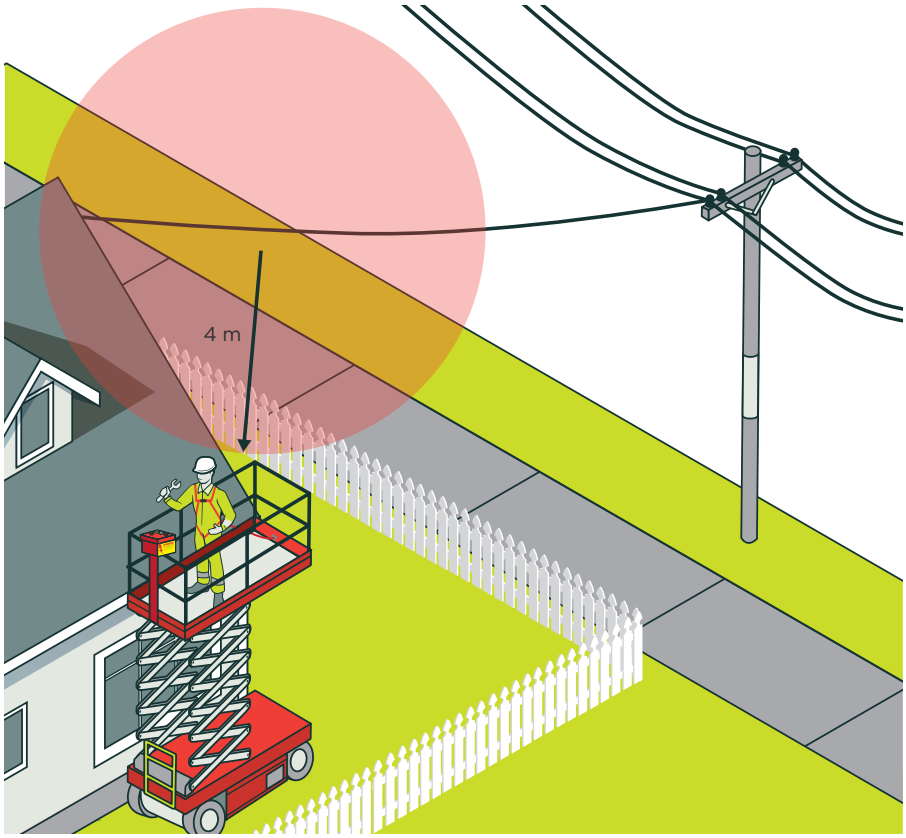

FIGURE 12:
Worker on mobile elevated work platform maintaining 4 m minimum approach distance

Approved warning notice required

If mobile plant is likely to be used near a low voltage overhead electric line, the owner or operator of the plant must fix an approved warning notice in an obvious place as near as practicable to the operator's position. The notice should be easy to see and read. It must say:

> WARNING, KEEP CLEAR OF POWER LINES

Figure 13 shows an example of a warning label suitable for fixing onto mobile plant.

FIGURE 13:
Warning label suitable for mobile plant

8.0 Check control measures

The PCBU should check control measures often to confirm that they are effectively managing risk. Use the checklist in Appendix 2 as a starting point. Everyone on site should know if anything on the site has changed and what they need to do to eliminate or minimise any new risks.

Daily checks

Every day – before work starts – a person authorised by the PCBU (such as a site foreperson who has control over the site) should look closely at the:

- insulation (including insulated tiger tails)
- hoardings, enclosures or other physical barriers
- electrical safety tags.

The authorised person should check that the required control measures are in place.

Checks following changes or events

Control measures should be checked by a person with suitable training and experience after:

- any significant modification to the scaffolding
- any significant modification to the position of the low voltage overhead electric line
- any damage to the scaffolding, insulation, physical barriers, enclosures or electric line
- earthquakes
- harsh weather, including severe rain, snow or wind conditions.

The PCBU should make sure that the risk is still being managed. Any damage or changes that may decrease the effectiveness of the control measures should be fixed before work resumes. A competent electrical worker can provide advice, if needed.

Review the effectiveness of control measures – take action

The PCBU should regularly review the effectiveness of control measures. Incidents and events where control measures have failed or been damaged should be reviewed and action taken. For example:

- talk with workers to identify the situations or behaviours that have reduced the effectiveness of control measures
- use the results from reviews and investigations to decide what changes are needed
- ask a competent electrical worker for advice
- get suggestions from WorkSafe.

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9.0
What the property owner needs to know

The property owner needs to know that:

- it's the responsibility of the PCBU who is carrying out the work to manage the risks of working near the low voltage overhead electric line
- if more than one business is involved in the work, businesses must:
  - consult, cooperate and coordinate activities with each other, and
  - agree on who is going to do what to manage the risks, for example, who will be responsible for arranging for tiger tails to be put on the overhead line
- written consent must be obtained from the property owner for work to be carried out between 0.5 and 4 m from the overhead line, unless the electricity supply to the property has been isolated.

The property owner should get advice from a competent electrical worker before giving written consent.

Section 10 of this guide describes the consent process.

Example

A property owner contracts a roofer to replace the roof on their home. The roofer will need to work near a low voltage overhead electric line to reach some parts of the roof.

If it is not reasonably practicable for the electricity supply to the property to be temporarily isolated, the PCBU of the roofing business must request written consent from the property owner to work between 0.5 m and 4 m from the overhead line.

If written consent is not given, the roofer cannot work less than 4 m from the overhead line. This will affect their ability to complete the job.

If the roofer will be working on scaffolding, the PCBU of the roofing business and the PCBU of the scaffolding business must decide together on the most appropriate control measures. If it is not reasonably practicable for the electricity supply to the property to be temporarily isolated, they must agree on who will approach the property owner for written consent for scaffolding to be erected close to the overhead line and for the roofer to work between 0.5 m and 4 m from the line.

10.0 Close approach consent form

Written consent from the property owner is needed for work to take place within certain distances from a low voltage overhead electric line. A Close Approach Consent Form is one way to obtain consent. Appendix 3 has an example of a Close Approach Consent Form.

A completed Close Approach Form does not guarantee workers' safety. Before work starts, the PCBU should always check that risks have been identified, assessed and managed. The effectiveness of the control measures should also be checked regularly.

The property owner is the overhead line owner

The property owner owns the electrical assets inside the property boundary, including the low voltage overhead electric line.

The property owner cannot give consent for work to be carried out less than 0.5 m from the overhead line.

The electricity supply must be isolated by the electricity retailer for all work less than 0.5 m from a low voltage overhead electric line.

When written consent is required

Written consent is needed from the property owner **before work starts** if:

- anyone (such as a builder, painter, roofer, or scaffolder) needs to work between 0.5 m and 4 m away from a live low voltage overhead electric line
- scaffolding or another temporary structure needs to be erected close to the line
- mobile plant (such as a crane or mobile elevating work platform) will be used close to the line.

What written consent should cover

Applications for consent must be in writing and should cover:

- details of the work to be done
- how close to the low voltage overhead electric line that work can take place
- other control measures that will be put in place to manage the risk of working close to the line (for example, barriers and warning signs).

A competent electrical worker can provide advice

WorkSafe recommends that the property owner gets advice from a competent electrical worker before providing consent for work to start.

The property owner should ask the electrical worker to confirm that they have a current New Zealand practising licence and the relevant experience to provide advice about work near a low voltage overhead electric line.

A competent electrical worker can provide advice to the property owner and PCBU about:

- risk assessment
- how to complete a Close Approach Consent Form.

They can test and confirm that the electricity supply has been isolated.

11.0 Workers' rights and responsibilities

The Health and Safety at Work Act 2015 (HSWA) gives workers a number of rights and responsibilities. See Your rights and obligations for information and links to fact sheets in English, Māori, Chinese, Hindi, Samoan and Tongan.

Workers must:

- take reasonable care of their own health and safety
- take reasonable care that what they do, or don't do, does not negatively affect the health and safety of other people
- cooperate with any reasonable work health and safety policy or procedure that their business has
- comply with any reasonable instructions given by the business they work for.

Workers have the right to stop work or refuse to carry out work if they believe that doing the work would:

- expose them to a serious health or safety risk caused by immediate or imminent exposure to a hazard
- expose anyone else to a serious health or safety risk caused by immediate or imminent exposure to a hazard.

If workers have stopped work, they need to let the business know as soon as possible.

Workers must be able to have a say on any health and safety matters that could affect them, and their suggestions on how to improve health and safety at work must be considered.

Resolving work health and safety issues

Sometimes there are different opinions about a work health and safety issue – such as risks or potential risks, or what should happen in a particular situation.

When a work health and safety issue is raised (for example, by a worker or a worker's representative) the people involved must make reasonable efforts to achieve a timely, final, and effective resolution.

Where attempts have been made but have failed to resolve a work health and safety issue, a person involved in the issue (for example, the PCBU, a worker's representative, or a worker) can request WorkSafe to appoint an inspector to assist with the resolution of the issue. However, there must be evidence that reasonable efforts have been made to resolve the issue before getting in touch with WorkSafe. See *Resolving Workplace Health and Safety Issues* for details.

12.0
More information

WorkSafe guidance

Special guide
Introduction to the Health and Safety at Work Act 2015

Quick reference guide
Health and Safety at Work

Good practice guidelines
Scaffolding in New Zealand

Fact sheet
Working safely near overhead electric power lines
(guidance for workers operating horticultural mobile elevating work platforms)

Best practice guidelines
Working on roofs
Mobile elevating work platforms

Legislation

Health and Safety at Work Act 2015 (HSWA)

Electricity Act 1992

Electricity (Safety) Regulations 2010 (ESR)

Code of practice

New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34)

Standards

AS 4202 – Insulating covers for electrical purposes (Australian Standard)

Electricity retailers in each region

www.whatsmynumber.org.nz/retailersinyourarea

Appendix 1: Key terms used in this guide

These are the key terms that anyone working near a low voltage overhead electric line should know and understand.

Many of the definitions below are based on definitions in the Electricity Act 1992, the Electricity (Safety) Regulations 2010, the New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34), or AS/NZS 3000.

TERM	DEFINITION
Barrier	An insulating or non-conducting material that separates a worker from a live electrical line.
Competent person	In this guide, a 'competent person' is a person who has the relevant knowledge, experience and skill to carry out work in the vicinity of low voltage overhead electric lines (or exposed live metal) using appropriate techniques and procedures, and: – has a relevant qualification proving that they have the knowledge, experience, and skill required, or – their business has evidence (such as training records) demonstrating that the person has the required knowledge, experience, and skill.
Competent electrical worker	A registered person who is authorised to do, or assist in doing, prescribed electrical work under a current New Zealand practising licence.
Covering	Insulation applied to live parts to provide basic protection against electric shock. Contact with covering is considered to be indirect contact with live parts.
Electric line (conductor)	All conductors (including fittings supporting, or connected to, those conductors), whether above or below ground, that are used or intended to be used in, or in connection with, the supply of electricity.
Electrical installation	The electrical fittings beyond the point of supply (in most cases, this is the property boundary) used to convey electricity to the points where it is used.
Electricity distributor	An electricity network company that distributes electricity to the boundary of consumer installations. Distributors are responsible for the transport of electricity from the transmission system to consumers. For the majority of consumers the distributor will be the network company or lines company who owns and operates the regional networks of overhead wires and underground cables, but some consumers are supplied from dedicated networks embedded within the regional network.
Electricity retailers	Electricity retailers sell electricity to consumers. They have contractors who are able to isolate (disconnect) the electricity supply to a property on request. Electricity retailers in New Zealand – by area
Electrical safe distance	Electrical Safe Distances are specified in the New Zealand Electrical Code of Practice 34 (NZECP 34:2001).
High voltage	Voltage exceeding 1,000 volts AC or 1,500 volts ripple-free DC.
Hoarding	Sheeting fixed to the outside of a scaffold to separate workers from electrical hazards. The sheeting forms a physical barrier between workers and low voltage overhead electric lines (and related electrical equipment, such as a point of entry connection).
HSWA	Health and Safety at Work Act 2015.
Insulation	– Double insulation: Insulation comprising both basic insulation and supplementary insulation, or – Reinforced insulation: A single insulation system applied to live parts that provides a degree of protection against electric shock equivalent to double insulation.
Isolate	To disconnect a property's electricity supply from the electricity distribution lines so that the low voltage overhead electric line to the property is no longer live.
Line owner	See Property owner.
Live	Connected to a source of electricity. (Also described as 'alive' or 'energised'.)
Low voltage	Typically 230 – 240 volts. (May be any voltage exceeding 50 volts AC or 120 volts ripple-free DC but not exceeding 1 000 volts AC or 1 500 volts ripple-free DC.)

TERM	DEFINITION
Low voltage overhead electric lines	For the purpose of this guide, these are the lines within the boundary of a property that are owned by the property owner.
Minimum approach distance (MAD)	The specified distance that must be kept between low voltage overhead electric lines or electrical equipment and any part of a worker's body, objects the worker is handling (including tools), or equipment the worker is operating or standing on (such as scaffolding).
Mobile plant	Cranes, elevating work platforms, tip trucks or similar plant, irrigation booms, any equipment fitted with a jib or boom and any device capable of being raised and lowered (as defined in NZECP 34).
NZECP 34	New Zealand Electrical Code of Practice for Electrical Safe Distances.
PCBU	A person conducting a business or undertaking. The term PCBU describes all types of working arrangements (eg contractors, partners in a partnership) that we commonly refer to as a business. A PCBU may be an individual person or an organisation. Most New Zealand businesses, whether large corporates, sole traders, or self-employed people, are PCBUs.
Primary duty of care	A PCBU must ensure, so far as is reasonably practicable, the health and safety of workers, and that other persons are not put at risk by its work.
Property owner	The owner of the property on which a low voltage overhead electric line crosses the property boundary. The property owner owns the electrical assets inside the property boundary that are used to convey electricity.
Reasonably practicable	In HSWA, unless the context otherwise requires, reasonably practicable (in relation to a duty of a PCBU set out in subpart 2 of Part 2) means that which is, or was, at a particular time, reasonably able to be done in relation to ensuring health and safety, taking into account and weighing up all relevant matters, including: a. the likelihood of the hazard or the risk concerned occurring; and b. the degree of harm that might result from the hazard or risk; and c. what the person concerned knows, or ought reasonably to know, about: i. the hazard or risk; and ii. ways of eliminating or minimising the risk; and d. the availability and suitability of ways to eliminate or minimise the risk; and e. after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.
Roof edge protection	A temporary barrier or system to prevent persons falling from height.
Safety observer	A competent person who is risk aware and who continuously observes a worker who is working near a low voltage overhead electric line to ensure that safety procedures are being followed. The safety observer makes sure that the worker stays a safe distance (the MAD) from the line by warning the worker if they are: – at risk of accidental contact with the line – facing other hazards.
Scaffold/scaffolding	A temporary framework or structure used to: – support or protect persons carrying out construction work, and – support materials, equipment or items used during such work.
Tiger tail	A line covering complying with AS 4202 that may provide temporary electrical insulation, mechanical protection, or visual warning of overhead electric lines. Tiger tail line coverings typically have black and yellow stripes.
Worker	An individual who carries out work in any capacity for a PCBU, including: – employees, contractors or sub-contractors – employees of contractors or sub-contractors – employees of labour hire companies – apprentices or trainees – people doing work experience or a work trial – outworkers (including home workers) – volunteer workers.

Appendix 2: PCBU checklist for work near low voltage overhead electric lines

Use this checklist before and during work near low voltage overhead electric lines.

Who is this checklist for?

This checklist is a guide for a person conducting a business or undertaking (PCBU) carrying out work near low voltage overhead electric lines.

It outlines what WorkSafe expects you to check when a site is first set up, and what should be checked daily, regularly, and as needed.

The checklist can help you to identify where you may need to take action but it does not cover all legal requirements. The Health and Safety at Work Act 2015 (HSWA) is the key work health and safety law. It sets out the health and safety duties that must be complied with. It's your responsibility to make sure that you are familiar with your work health and safety duties.

Site name:

Site location:

Checklist completed by: (name, title, company)

Date: DD / MM / YEAR

Process for notifying WorkSafe about electric shocks and other notifiable incidents

You must notify WorkSafe if an electric shock exposes a worker or any other person to a serious risk to their health and safety, or if someone is seriously injured at work.

- ○ Do you have a process for notifying WorkSafe about a notifiable incident?
- ○ Does everyone on site know the process to follow after an electric shock or other notifiable event?
- ○ Does everyone on site know who is responsible for notifying WorkSafe?

Isolating the electricity supply

The safest option is to eliminate the risk of electric shock by asking the electricity retailer to temporarily isolate the electricity supply to the property while work is being carried out **less than 4 m** from a low voltage overhead electric line.

The electricity supply must be isolated by the electricity retailer for **all work less than 0.5 m** from a low voltage overhead electric line. (Only a competent electrical worker doing work near the line can work less than 0.5 m from a live line.)

Set-up checks

Check the points below when setting up your site. Then check them regularly while work is being carried out at the site. Minimum approach distances are specified by law, and are described in detail in the New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34).

- ○ If work will take place less than 0.5 m from a low voltage overhead electric line, has the electricity supply to the property been isolated?
- ○ If work will take place between 0.5 and 4 m from the line, do you have signed written consent from the property owner?
- ○ Does everyone know how close to the line:
  - ○ people can work?
  - ○ scaffolding, ladders and other height access equipment can be set up?
  - ○ mobile plant can be operated?
- ○ Have you identified and assessed the risks of working near low voltage overhead electric lines?
- ○ Have you identified all reasonably foreseeable hazards?
- ○ Have you put control measures in place?

Check these things every day

Everyone on site should know if anything on the site has changed and what they need to do to eliminate or minimise new risks.

- ○ Are there any new risks?
  - ○ If yes, has everyone been told about each risk and how it will be controlled?
- ○ Are there any new workers?
  - ○ If yes, have you given them any information, training, instruction and supervision they need to work safely near low voltage overhead electric lines?
- ○ Is there any new equipment?
  - ○ If yes, have you given workers the information, training, instruction and supervision they need to use it safely?
- ○ Have workers been told about any changes to the site layout?
- ○ Is insulation (including insulated tiger tails) in place and undamaged?
- ○ Are hoardings, enclosures or other physical barriers in place and undamaged?
- ○ Are electrical safety tags in place, filled out and up-to-date?

Regular/ongoing checks

PCBUs have a duty to maintain and review control measures so that they remain effective.

- Are you regularly reviewing control measures to check that they are still effective?
- When control measures fail or are damaged do you review what happened and then take action?
  - Find out what happened, and why.
  - What needs to change to stop this from happening again?

Assessment following changes or events

Have control measures been checked following:

- any significant modification to scaffolding?
- any significant modification to other plant on site?
- any significant modification to the position of the low voltage overhead electric line?
- any damage to the scaffolding, insulation, physical barriers, enclosures or the line?
- harsh weather, including severe rain, snow or wind conditions?

Any damage or changes that may decrease the effectiveness of the control measures must be fixed before work resumes.

Talk with workers often

Workers must be able to have a say on any health and safety matters that could affect them, and their suggestions on how to improve health and safety at work must be considered.

- Are you talking with workers often to check whether control measures are effectively eliminating/ minimising work risks?

Appendix 3:

Close approach consent form example

Before work starts written consent is needed from the property owner:
- for **any** work to be done between 0.5 m and 4.0 m from a live low voltage overhead electric line on their property
- for a temporary structure or mobile plant to be placed or operated near a live low voltage overhead electric line on their property.

This form is one way to provide written consent. All sections of this form should be completed.

Section 1: to be completed by the business carrying out the work (if more than one business is involved, the main contractor should obtain consent).

Section 2: to be completed by a competent electrical worker with a current practising licence.

Section 3: to be completed by the property owner after Sections 1 and 2 have been completed. See the notes on the next page for instructions.

All work must comply with the New Zealand Electrical Code of Practice for Electrical Safe Distances – NZECP 34.

Section 1. Application

Application for consent for work to take place near low voltage overhead electric lines not exceeding 1 kV, within the boundary of the property identified below (business carrying out the work to complete)

Name:

Business name:

Phone number:

Email:

Address: (where work to take place)

Details of work to be done:

Dates work to be carried out: DD / MM / YEAR to DD / MM / YEAR

Consent requested (select all that apply)

- ○ For workers to carry out work within a distance of 0.5 m and 4.0 m from a low voltage overhead electric line, as per Section 9 of NZECP 34. **Consent cannot be given for work closer than 0.5 m.**
- ○ For scaffolding or any other temporary structure to be positioned near a low voltage overhead electric line, as per section 3 of NZECP 34. **See WorkSafe's guide *Working near low-voltage overhead electric lines* for minimum approach distance information.**
- ○ To use mobile plant within 0.15 m and 4.0 m from low voltage overhead electric lines, as per Section 5 of NZECP 34.

Control measures to be used: (to eliminate or minimise the risk of electric shock)

Control measures will be put in place by: (person/business)

Before work begins on: DD / MM / YEAR

Section 2. Assessment of control measures

Assessment of proposed control measures
(electrical worker with a current practising licence to complete)

Name:

Business name:

Phone number:

Email:

- ○ I have assessed the proposed control measures in Section 1.
- ○ The proposed control measures satisfy the requirements of NZECP 34.

Signature:

Date: DD / MM / YEAR

Section 3. Consent

Close approach consent
(property owner to complete, see notes on next page)

Note: WorkSafe recommends that the property owner seeks advice from a competent electrical worker with a current practising licence before giving consent.

Property owner name:

Phone number:

Address:

- ○ I give consent for work to take place near a low voltage overhead electric line on my property

Signature:

Date: DD / MM / YEAR

Notes for the property owner

- You have been given this form to complete because a contractor needs to do work on your property near a live low voltage overhead electric line (power line).
- Before work needs to start, the contractor should give you enough time to read and complete this form.
- As the property owner, you own the power line from where it crosses your property boundary to where it connects to your house or building.
- NZECP 34 requires that you, as the line owner, must provide consent before workers can:
  - work within 0.5 m to 4.0 m of a live power line on your property, or
  - erect or place scaffolding or other temporary structure near a live power line on your property, or
  - use mobile plant* near a live power line on your property.

Workers cannot work closer than 0.5 m to the power line unless the line has been isolated (the power cut off at the street).

Section 1 of this form provides details of:

- the work to be done, and
- what actions will be taken to keep workers safe from electric shock while working near the line. These actions are called 'control measures'.

Section 2 of this form is to be completed by a competent electrical worker with a current practising licence to confirm that the proposed control measures satisfy the requirements of NZECP 34.

WorkSafe recommends that you seek advice from a competent electrical worker with a current practising licence to confirm that the proposed control measures satisfy the requirements of NZECP 34.

You should not sign this form until Sections 1 and 2 have been completed.

Signing this form means you are giving consent for workers and/or temporary structures or mobile plant to be near a live power line on your property provided the confirmed control measures are put in place first to keep workers safe.

The completed consent form should be returned to the main contractor named in Section 1 before work starts.

It is recommended that you keep your own copy of the completed form.

Where to find more information

WorkSafe's guide *Working near low voltage overhead electric lines*

New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34)

* 'Mobile plant' is defined in NZECP 34 and includes cranes, mobile elevating work platforms, and tip trucks.

Notes

Disclaimer

This publication provides general guidance. It is not possible for WorkSafe to address every situation that could occur in every workplace. This means that you will need to think about this guidance and how to apply it to your particular circumstances.

WorkSafe regularly reviews and revises guidance to ensure that it is up-to-date. If you are reading a printed copy of this guidance, please check worksafe.govt.nz to confirm that your copy is the current version.

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