

CLOSE APPROACH GUIDE

WORKING SAFELY AROUND
AURORA ENERGY'S
ELECTRICITY AND FIBRE NETWORKS

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1 INTRODUCTION

KEEPING SAFE

At Aurora Energy we want to keep everyone safe when working near our electricity network.

We own and operate the electricity distribution network and a fibre optic network in Dunedin, Central Otago and Queenstown Lakes.

Whenever you are digging on private or public property or working near overhead lines there is a serious risk to life and property.

This booklet is a guide for persons conducting a business or undertaking (PCBUs) and workers when working near our electricity and communications networks.

The guide provides information about your responsibilities and the services we provide to help you work safely.

2 PURPOSE AND SCOPE

Our electricity distribution network supplies essential power to the community. It is important to ensure the electrical hazards and risks associated with working near our network are managed safely and that network equipment is not damaged in any way.

This guide has been produced by Aurora Energy to provide practical guidance on the principles and requirements for working safely near our network.

It is intended for employers, employees and any other persons who have responsibilities for managing hazards and risks associated with working near our electricity distribution network.

A close approach consent will only be issued to a PCBU. If you are a member of the public or individual planning to work within 4 metres of our electricity network, you will need to engage a third party contractor to carry out the work under a close approach consent on your behalf.

This guide details minimum safe distances for working near Aurora Energy's network to:

- Protect workers and the public from serious or fatal injuries
- Reduce the risk of damage to network equipment and mobile plant
- Avoid customer supply interruptions
- Avoid additional associated costs.

While the safe distances recommended in this guide will assist PCBUs to manage their safety risks when working near electricity, you still need to consider your own specific circumstances.

PCBUs must ensure they comply with and meet their legal and health and safety obligations, ensuring no lesser degree of safety protection than what is outlined in this guide.

This guide does not provide detailed information on safe work methods. For further information, refer to WorkSafe at

www.worksafe.govt.nz.

3 YOUR LEGAL DUTIES

New Zealand has laws and regulations that specify minimum safe distances and safe working practices which must be followed when working near electricity network equipment:

- *Health and Safety at Work Act 2015*
- *Electricity Act 1992*
- *Electricity (Safety) Regulations 2010*
- *NZ Electrical Code of Practice 34:2001 Electrical Safe Distances (NZECP 34)*.

WorkSafe also provides important guidance on how to keep workers safe when working near utilities and services, including:

- *Excavation Safety*
- *Guide for Safety with Underground Services*
- *Scaffolding in New Zealand*.

Aurora Energy puts your safety first. If a third party is found to have breached their obligations relating to our network, we may refer the matter to WorkSafe for investigation.

We may also take legal action to recover the cost of repairs and the cost of lost business from any party or parties responsible for damaging our network.

Under the *Electricity (Safety) Regulations 2010*, failure to maintain safe distances in accordance with NZECP 34 can result in penalties of up to \$10,000 for an individual or up to \$50,000 for an organisation.

4 APPLICATION PROCESS



5 ELECTRICAL HAZARDS

ELECTRICITY IS DANGEROUS

Aurora Energy's electricity distribution network carries high-voltage electricity through overhead lines and underground cables.

Getting too close or contacting power lines, underground cables or other live network equipment can cause serious harm to workers and nearby people, cause damage to property and start fires.

It's not always necessary to directly touch an overhead line or live cable to receive an electric shock. At the moment of contact, a machine, tool, or person is live at the same voltage as the line or cable.

If an electricity cable is cut by an excavator, or contact is made with an overhead line, anyone touching the machine is likely to receive an electric shock or be electrocuted.

Electricity can also travel through the ground, causing the ground to become live and potentially posing a risk of electric shock.

If you hit an electricity cable or overhead line, there is a risk of:

- Electric shock causing serious injury
- Electrocution (death)
- Flashover
- Explosion
- Fire.

The effects of high-voltage electric current on the human body are serious and can be fatal, including:

- Restlessness or irritability
- Loss of consciousness
- Possible convulsions
- Entry and exit burns
- Fractured bones
- Vision problems
- Swollen tongue that may obstruct airway
- Irregular heartbeat or cardiac arrest
- Paralysis
- Difficulty breathing or respiratory arrest
- Muscle tenderness and possible twitching.

If you come into contact with a fibre-optic cable, there is a risk of eye injury and possibly blindness.

OVERHEAD LINES

Our overhead lines carry voltages ranging from 230 volts to 66 kilovolts.

Overhead lines rely on an air gap to insulate electricity from the ground.

The human body, most tools, vehicles, and even trees can all conduct electricity very effectively.

Electricity can arc through the air to any conductive object that gets too close. The higher the voltage, the further the electricity can arc or jump so the greater the distance we need to maintain from lines.

KEEP MACHINES AWAY FROM LIVE LINES

Getting too close or contacting power lines with a vehicle or machinery can:

- Cause electrical current to pass through the vehicle or machinery and energise the ground
- Damage vehicles
- Start a fire
- Cause a tyre fire that leads to an explosion
- Cause harm to nearby people.

STEP AND TOUCH POTENTIAL

The ground can become energised when machines get too close or contact power lines, or when a power line falls to the ground.

Electricity will flow down through the machine and liven the ground around it. This can cause harm to people nearby through step potential.

Step potential is the voltage difference between a person's feet when standing near an electrically live object.

Step potential occurs when the ground becomes live. This can cause current to flow in one foot and out the other, causing electric shock and burns.

Touch potential is the voltage difference between parts of person's body when they are near or touching an electrically live object.

Touch potential occurs when machinery or equipment become live when it is near or touching a live line or cable. This creates a risk of electric shock and burns to anyone who touches or approaches the machinery or equipment.

UNDERGROUND CABLES

Our underground cables carry voltages ranging from 230 volts to 66 kilovolts.

These cables are commonly found in roadside and residential areas.

Underground cables are easily damaged by excavators, crowbars, or picks.

Piercing the insulation can trigger an electrical arc-flash (explosion), which can result in fatal or life-changing injuries.

EXPECT A CABLE TO BE AT ANY DEPTH

Our cables are laid at different depths in the ground varying from 400mm to over 1200mm.

Over time, alterations to the ground cover may reduce or increase the depths. We cannot guarantee the exact depth of any cable.

Don't rely on finding buried marker tape when you dig as it may have shifted over time and depending on the age of the cable, tape may never have been laid.

If you expose a cable during excavation, you must ensure that the cable is adequately supported and protected.

Any exposed cable must be protected from damage:

- Never move an exposed cable under any circumstances
- Never stand on or climb over exposed cables
- Never drop fill or waste material on an exposed cable.

The cable must be correctly reinstated after the work is complete. You will need to ensure the correct depth, fill materials and warning indicators are used. Refer *Section 10: Reinstatement after excavation* and *Section 13.27: Cable reinstatement* below.

6 MINIMUM SAFE DISTANCES

It is a legal requirement to follow the minimum safe distances in *NZEC* 34.

The minimum safe distance for working near live electricity distribution equipment is 4 metres. Live equipment includes overhead power lines, pole-mounted transformers and switchgear, ground-mounted transformers and switchgear and underground cables.

This means that you must not carry out work within 4 metres of Aurora Energy's network equipment unless we have issued you a close approach consent.

The minimum safe distance for excavating near a pole or stay wire is 5 metres. If creating an unstable batter, the minimum safe distance is 8 metres.

This means that you must not carry out excavation within 5 metres of Aurora Energy poles and stay wires (or 8 metres if creating unstable batter) unless we have issued you a close approach consent.

In accordance with *NZEC* 34 section 5.3.1, you cannot operate mobile plant or carry loads above any overhead electric line (regardless of the distance) unless we have issued you a close approach consent.

MINIMUM SAFE DISTANCE: OVERHEAD LINES

The position of overhead lines can change depending on weather conditions. They may sag more in hot weather or if loaded with snow, or swing out in windy conditions.

For overhead lines, the minimum safe distance is measured from their widest extent.

MINIMUM SAFE DISTANCE: UNDERGROUND CABLES

Underground cable must be assumed to be at any depth until positively identified by potholing as alterations to the ground cover may have reduced or increased the depth.

For underground cables, the minimum safe distance is measured from the outside of the cable or duct to the work activity.

7 REDUCED MINIMUM SAFE DISTANCES WITH A CLOSE APPROACH CONSENT

NZEC 34 allows for reduced minimum approach distances with a close approach consent issued by the network owner (Aurora Energy).

The following tables detail Aurora Energy's reduced minimum safe distances depending on the work activity and voltage.

Workers, tools and machinery must remain outside the reduced minimum safe distances specified on the consent and adhere to all conditions outlined within it.

These reduced minimum safe distances are only permitted when specified on a close approach consent issued by Aurora Energy and when the required safety measures are followed.

TABLE 1: REDUCED MINIMUM SAFE DISTANCES FOR WORKING NEAR OR ABOVE OVERHEAD EQUIPMENT WITH A CLOSE APPROACH CONSENT

VOLTAGE	DISTANCE LIMIT
<1kV	1.0 metre
6.6kV	1.5 metres
11kV	1.5 metres
33kV*	2.5 metres
66kV*	3.0 metres
Fibre*	2.5 metres

*Aurora Energy requires a site assessment for close approach to subtransmission (33 kV or higher) and fibre, or when working above overhead lines. After assessment, we may require stand over by a competent electrical worker (at Aurora Energy's expense). The role of electrical stand over is to protect strategic Aurora Energy network equipment from potential damage by third party activities. Electrical stand over does **not** manage safety at the worksite, it is focused on the integrity and reliability performance of our network. However, electrical stand over is obliged to notify the third party PCBU if they observe unsafe work practices related to the activities they are overseeing within their area of expertise.

FIGURE 1: REDUCED MINIMUM SAFE DISTANCES OVERHEAD WITH A CLOSE APPROACH CONSENT

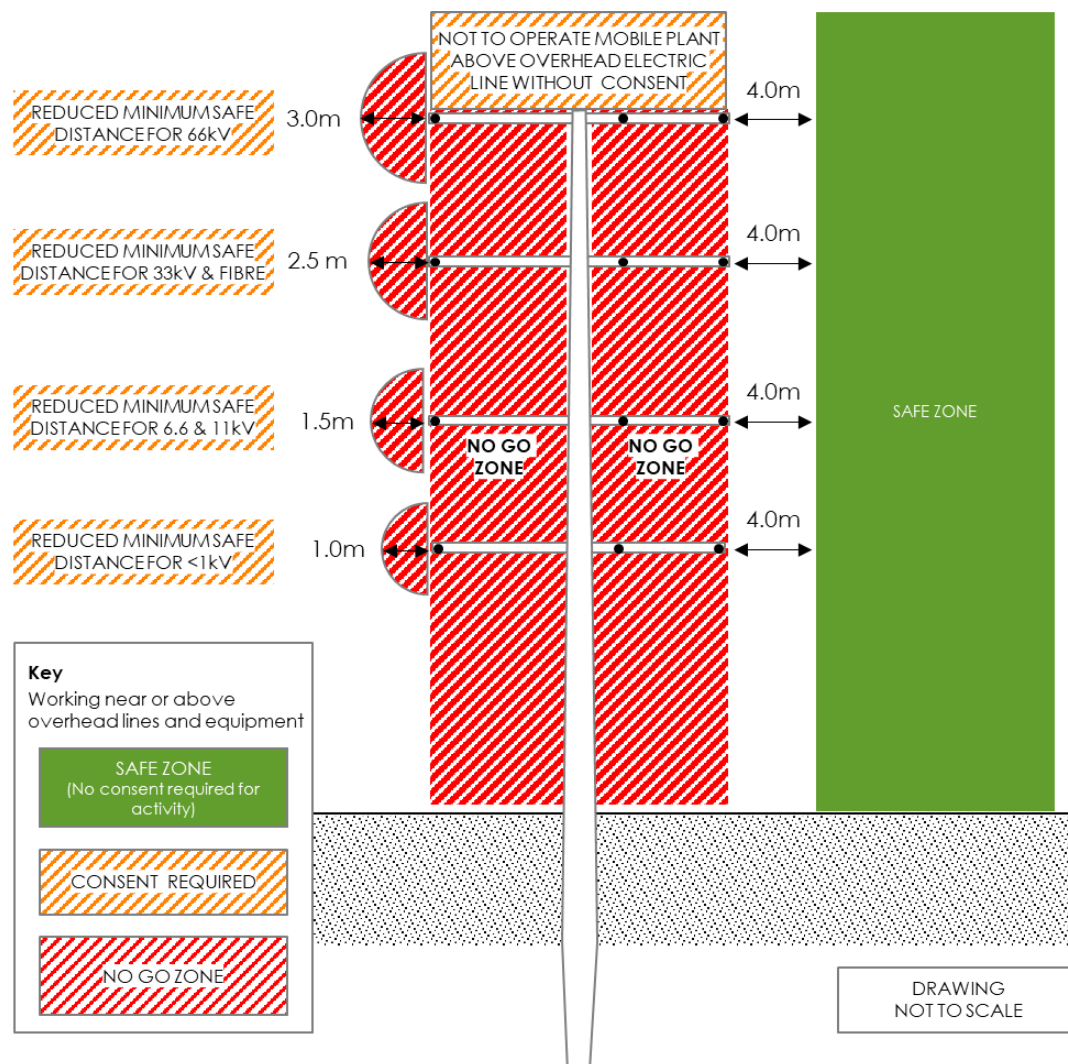


TABLE 2: REDUCED MINIMUM SAFE DISTANCES FOR EXCAVATION NEAR POWER POLES AND STAY WIRES WITH A CLOSE APPROACH CONSENT

PROXIMITY	DISTANCE LIMIT
Excavation within 2.2 metres of a pole or stay wire	0.3 metres depth*
Excavation between 2.2 metres and 5 metres from a pole or stay wire	0.75 metres depth*
Excavation 5 metres or more from a pole or stay wire	No consent required
Vertical holes not exceeding 0.5 metres in diameter, beyond 1.5 metres from a pole or stay wire	No consent required*
Excavation creating unstable batter	8.0 metres*

*Any excavation deeper than the distance limit will require engineering advice and prior approval. Any excavation within 5 metres of a pole or creating an unstable batter within 8 metres of a pole may require mechanical pole support.

FIGURE 2: REDUCED MINIMUM SAFE DISTANCES FOR EXCAVATION NEAR POWER POLES AND STAY WIRES WITH A CLOSE APPROACH CONSENT

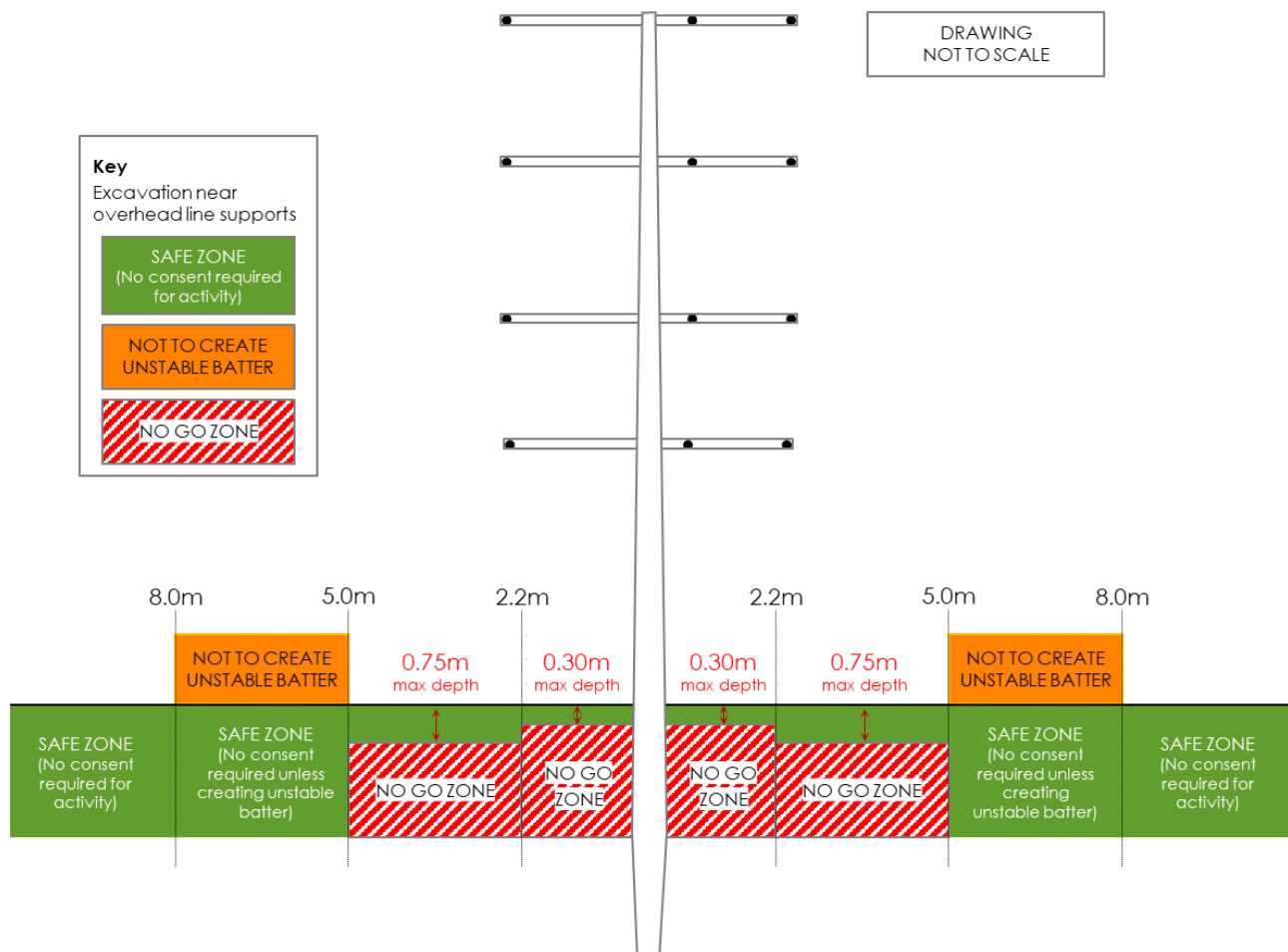


FIGURE 3: REDUCED MINIMUM SAFE DISTANCES: UNDERGROUND CABLES WITH A CLOSE APPROACH CONSENT

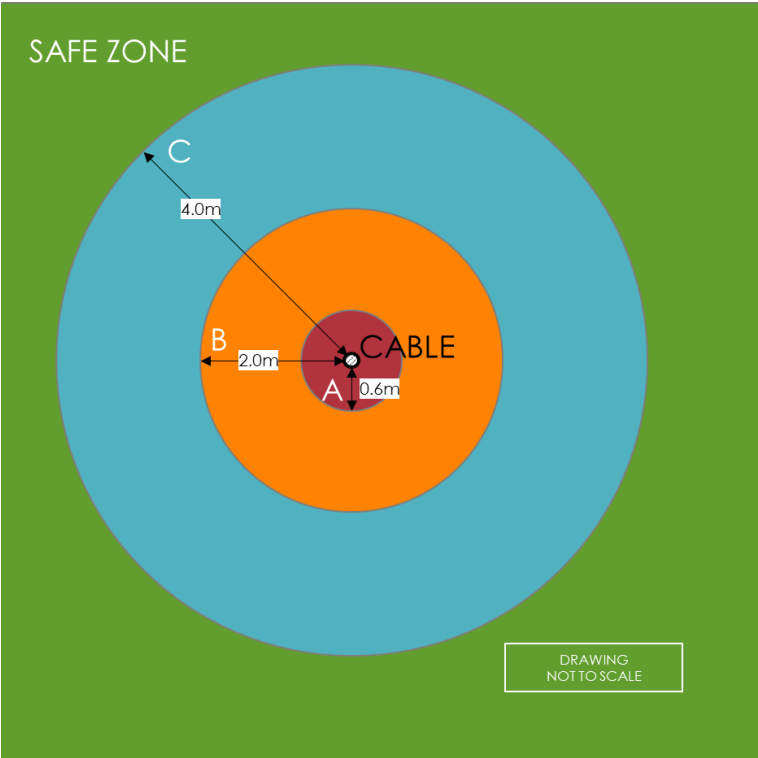


TABLE 3: REDUCED MINIMUM SAFE DISTANCES FOR EXCAVATION NEAR UNDERGROUND CABLES WITH A CLOSE APPROACH CONSENT

PROXIMITY	DISTANCE LIMIT
Zone A*	0.0 – 0.6 metres
Zone B*	>0.6 – 2.0 metres
Zone C*	>2.0 – 4.0 metres
Safe zone	Over 4.0 metres

*Additional safety measures apply, refer to Table 4.

TABLE 4: SAFETY MEASURES FOR EXCAVATION NEAR UNDERGROUND CABLES WITH A CLOSE APPROACH CONSENT

PROXIMITY	VOLTAGE 400V, 6.6KV, 11KV	VOLTAGE 33KV, 66KV, FIBRE
Zone A	Cable location and mark out Potholing Hand dig or hydro vacuum only* Drilling only after potholing and under direct visual control Safety observer mandatory Full PPE recommended	Cable location and mark out Potholing Hand dig or hydro vacuum only* Electrical stand over mandatory† Full PPE recommended
Zone B	Cable location and mark out Potholing All digging types after potholing Drilling permitted only after potholing Safety observer for mechanical digging mandatory	Cable location and mark out Potholing All digging types after potholing Drilling permitted only after potholing Electrical stand over mandatory†
Zone C	Cable location and mark out Potholing All digging types after potholing Drilling permitted only after potholing Safety observer for mechanical digging recommended	Cable location and mark out Potholing All digging types after potholing Drilling permitted only after potholing Safety observer for mechanical digging mandatory
Safe zone	No consent required Cable location and mark out recommended	No consent required Cable location and mark out recommended

*Hand digging or hydro vacuuming is allowed up to the outside of the cable or duct. If you have any concerns (e.g. cable condition) and/or suspect damage then you must cease work and seek advice from the electrical stand over on site or Aurora Energy.

†The role of electrical stand over is to protect strategic Aurora Energy network equipment from potential damage by third party activities and to ensure proper cable reinstatement following excavation. Electrical stand over does **not** manage safety at the worksite, it is focused on the integrity and reliability performance of our network. Worksite safety is and remains the responsibility of the third party PCBU. However, electrical stand over is obliged to notify the third party PCBU if they observe unsafe work practices related to the activities they are overseeing within their area of expertise.

8 YOUR RESPONSIBILITIES

You have safety responsibilities when working near Aurora Energy network equipment.

CLOSE APPROACH CONSENT

If you're planning to work within minimum safe distances, you'll need to apply for a close approach approval for the following activities:

- Work within 4 metres of our network equipment such as overhead lines, ground-mounted transformers or underground cables
- Work anywhere above an overhead power line
- Excavation within 5 metres of a power pole or stay wire (or within 8 metres if creating unstable batter).

Submit a close approach consent application before you start work and allow **at least four working days** for processing. Visit our website to apply.

YOUR RESPONSIBILITIES

As a PCBU, you have primary responsibility for ensuring a safe worksite when working near our network and adhering to any required safety controls specified on the close approach consent.

You must:

- Obtain a close approach consent before starting the work
- Ensure the conditions of the consent are met
- Implement any necessary additional controls to ensure the safety of workers and members of the public
- Ensure the requirements of applicable regulations and legislation are being met.

Please note, being issued a close approach consent does not, and cannot, guarantee worker safety. As a PCBU, you should always check that risks have been identified, assessed and managed before starting work.

Your options for managing risk are:

1. Avoid the electrical risks by redesigning the work activity to remain outside minimum safe distances at all times
2. Apply for a close approach consent and manage your responsibilities as a PCBU
3. Apply for a close approach consent and manage your responsibilities as a PCBU with assistance from an approved contractor
4. Engage an approved contractor to request a planned shutdown so the work can be done with the power turned off.

If you decide you are unable to meet the specified consent conditions, we will refer you to an approved contractor to supervise electrical safety onsite or arrange for a planned shutdown.

OUR RESPONSIBILITIES

When we issue a close approach consent, we will specify the minimum safe distances you can work, identify the electrical hazards near the work activity and specify any mandatory safety measures you will need to follow as conditions of the consent.

Certain safety measures need to be provided by an electrically competent person employed by Aurora Energy or one of our approved contractors.

Note that where we require electrical stand over, its role is to protect strategic Aurora Energy network equipment from potential damage by third party activities and to ensure proper cable reinstatement following excavation.

Electrical stand over does **not** manage safety at the worksite, it is focused on the integrity and reliability performance of our network.

Worksite safety is and remains your responsibility as a PCBU.

Electrical stand over does have responsibility to address health and safety concerns related to the activities they are overseeing within their area of expertise.

If we determine the electrical risks cannot be adequately managed under a close approach consent, we may decline your application. We will then discuss alternatives with you that could include redesigning the proposed work activity or engaging an approved contractor to carry out the work.

PRIVATE PROPERTY

Aurora Energy has no responsibility for, nor authority to give, consent to work near privately-owned electrical equipment such as a consumer service line connecting a house to our power pole.

You must seek the property owner's consent for working near their equipment.

For guidance, refer to WorkSafe's *Working Near Low Voltage Overhead Electric Lines*.

9 PLANNING YOUR WORK

It takes time and care to prepare your work safely. Make sure to check for Aurora Energy network equipment before you start.

You should follow WorkSafe guidance and any industry-specific guidance on how to do the work safely.

Implement a safe system of work before work starts to make sure it happens in the right location with the right plant and equipment on site and with the right workers with relevant competencies.

CHECK IF A CLOSE APPROACH CONSENT IS REQUIRED

If you're planning to:

- Work within 4 metres of overhead lines or underground cables
- Work anywhere above an overhead power line
- Excavate within 5 metres of a power pole.

You'll need to apply for a close approach consent. Contact us before you start work and allow **at least four working days**. Visit our website to apply.

LOOK UP BEFORE YOU WORK

Always check the location of Aurora Energy's overhead and ground-mounted equipment when planning your work.

When on site make a visual check for power poles and overhead lines in the area.

CHECK BEFORE YOU DIG

Aurora Energy has joined beforeUdig, a free national online service that allows contractors to request maps and information from a variety of utilities to check underground cables and pipes before commencing work.

Always check the location of our underground cables and get your free maps before you start digging by using the beforeUdig website (www.beforeudig.co.nz).

Include the reference maps in your close approach application.

APPLYING FOR A CLOSE APPROACH CONSENT

The PCBU controlling the work activity is responsible for obtaining a close approach consent before starting work and adhering to its conditions.

Aurora Energy will normally respond to a close approach consent application within 4 working days. Additional time may be needed if the application has insufficient information, or the work activity is complex.

The minimum safe distances and any safety measures specified on the consent will be based on:

- The proximity of the work activity to network equipment
- The type of work activity and work methods being used
- The type and voltage rating of the network equipment
- The experience and electrical competency of worker/s.

When requesting a close approach consent include as much information as possible on the application form to help the process:

- Description of the work
- Duration of the work (the maximum duration for a close approach consent is **30 calendar days**)
- Specific location of the work, with reference to property addresses, RAPID numbers, Aurora Energy pole numbers, or similar
- Identification of nearby electrical equipment
- Reference maps from beforeUdig
- Site sketch with distances and property boundaries including clearly indicating which side/s of the road the work is being done (to identify whether the adjacent assets are Aurora Energy's or belong to another asset owner)
- Hazard assessment for the work near Aurora Energy's network equipment including type of work and equipment and proposed control measures you will put in place
- Site supervisor contact details.

The earliest you can apply for a close approach consent is **30 calendar days** before the start of the planned work. This is to reduce the risk of changes to your proposed work or our network between applying for and being issued a consent.

The site supervisor must have read and understood this guide and directly supervise at all times when a person, machinery or material being handled is within minimum safe distances.

When applying for a consent, the site supervisor must also agree to the terms and conditions as set out in this guide and the close approach consent and to adhere to the safety measures specified in the issued consent.

If excavating, you'll need to provide additional information:

- Obtain plans from beforeUdig to check for underground cables in the work area
- Include how the ground will be restored on job completion.

Once issued, make sure there is always a copy of the close approach consent on site (in paper or digital form).

10 MANAGING ELECTRICAL HAZARDS

The minimum safe distances (or reduced minimum safe distances specified on a consent) **must not** be breached.

At the worksite, prior to approaching network equipment you **must**:

- **Identify** all electrical hazards
- **Assess** the risk of coming too close to those hazards
- **Control** the risks by taking steps to ensure that your team, tools and vehicles stay outside minimum safe distances.

The PCBU holding the close approach consent is responsible for ensuring all persons are competent for the task at hand, including understanding the risks presented by electrical hazards.

Identify the electrical hazards

To work near live lines or components, you must remain a minimum safe distance from any live part.

Overhead lines are **not** the only live part.

Other live equipment includes switchgear, transformers, cable terminations and drop-out fuses.

Assess the risk

You must manage the risk of accidentally getting too close to live parts. Some work has a higher likelihood of breaching the minimum safe distance and of getting too close to live parts and extra precautions are necessary.

Examples of higher risk activities include:

- Handling roofing iron near power lines on a windy day
- Erecting or working on scaffolding
- Trimming trees
- Mobile or static crane operations
- Excavating underneath overhead power lines or near underground cables
- Excavating near poles, ground-mounted transformers or service pillar boxes.

Control the risks

If there is a risk that minimum safe distances will be breached, you need to take extra steps to control the risk.

Your close approach consent will specify mandatory and recommended safety measures described in this guide.

Aurora Energy approved contractors can help with safety services and advice around electricity.

ON THE WORKDAY

Do not start work until you get the close approach consent.

On the workday the site supervisor and work party must:

- Observe all conditions under the consent during work
- Stop work if there is a risk of breaching the reduced minimum safe distances
- Stop work if the reduced minimum safe distances are breached
- Stop work if any condition/s of the consent are breached
- Immediately stop work if there is a strike (contact with) any underground cable, overhead line, or any other live network equipment
- Comply with instructions from Aurora Energy and/or its approved contractor if they observe unsafe work practices related to the activities they are overseeing within their area of expertise.

On the workday the site supervisor must:

- Have a copy the issued consent
- Always have their phone with them and remain contactable throughout the day in case of emergencies
- Brief all workers on site of the consent conditions and how they shall be applied at all times while working under the consent
- Immediately stop work in the event of any breach of minimum safe distances or any condition/s of the consent and immediately report as an incident to Aurora Energy via the contact number listed on the consent
- Immediately report any overhead line or underground cable contact as an incident to Aurora Energy via the contact number listed on the consent.

Any worker operating mobile plant within minimum safe distances must have received recent and relevant training and be competent to operate mobile plant near live network equipment.

REINSTATEMENT AFTER EXCAVATION

After any excavation near underground cables, you must backfill the cables and reinstate the surface under supervision of an approved contractor in accordance with applicable Aurora Energy standards.

You will need to ensure the correct depth, fill materials and warning indicators are used to prevent faults developing in the future. If you fail to reinstate the cable correctly, you could be liable for the cost of repair.

CANCELLATION OR PAUSE OF CONSENT

We may cancel or pause a consent for operational or safety reasons at any time by notifying the site supervisor. Once a consent is cancelled, or while paused, the site supervisor no longer has permission to work under the consent.

MONITORING

From time to time, Aurora Energy may verify that the safety measures specified in a close approach consent are being followed, without providing prior notice. Should we require access to the worksite for monitoring purposes, we will contact the site supervisor to arrange entry.

11 EMERGENCY PROCEDURES

ELECTRICAL EMERGENCY

In an electrical emergency, what you do next could save your life or someone else's. Whatever the situation, it's important to stay calm and act quickly.

HITTING AN OVERHEAD POWER LINE OR UNDERGROUND CABLE

Here's what to do if contact is made with network equipment or if arcing occurs between live network equipment and an item of plant and or a person.

Stop all work immediately.

If you're inside a vehicle or machine, stay there because the rubber tyres protect from electric shock.

If you're at serious risk from another hazard like fire and need to leave the vehicle, jump well clear with your feet together to avoid being exposed to step potential.

Don't touch the machine and ground at the same time to avoid being exposed to touch potential. Keep your feet together and hop away from the vehicle, avoiding touching the ground in different places at the same time to avoid being exposed to step potential. See video explaining how to move away safely here tinyurl.com/stepandtouch.

Treat a downed power line or struck underground cable as live.

Evacuate the immediate area and get back at least 10 metres.

Warn everyone (including members of the public) to keep at least 10 metres from equipment:

- Do not touch any part of the equipment or load
- Do not attempt to approach or re-enter the vehicle
- Don't cover a broken cable or try to fix it yourself.

Call our control centre to switch off the power and report the incident. The contact number is listed on your close approach consent.

HITTING A FIBRE OPTIC CABLE

Avoid looking directly at the cable as laser light may damage eyesight.

Don't cover a broken cable or try to fix it yourself.

Call our control centre to report the incident. The contact number is listed on your close approach consent.

IF SOMEONE IS INJURED:

Never touch the person if they're in contact with a live electrical source or you may also be shocked or electrocuted.

Call an ambulance immediately.

Call our control centre to switch off the power and report the incident. The contact number is listed on your close approach consent.

12 REPORTING AN INCIDENT

You must report any incident or near miss involving network equipment to the Aurora Energy contact number listed on your close approach consent or 0800 22 00 55.

If you strike a line or cable, we may need to switch the power off for safety, make repairs and check for network or property damage.

A line or cable strike could cause damage to our network, customers' property or equipment, or result in a loss of power supply.

The site supervisor or PCBU must record and provide information to Aurora Energy for the purposes of incident investigation including a record of any damage and photographs.

You must also report any notifiable incident to WorkSafe.



13 CLOSE APPROACH SAFETY MEASURES

When we issue a close approach consent, we will specify safety measures for your and others' safety.

These measures are a **mandatory** condition of the close approach consent and must be adhered to.

NETWORK EQUIPMENT

The following measures may be specified when working near any Aurora Energy network equipment.

13.1 REDUCED MINIMUM SAFE DISTANCE

We may approve a reduced minimum safe distance based on the voltage present, and/or your planned safety measures. You must adhere to the specified reduced distances at all times and any safety measures specified on the consent.

13.2 SAFETY OBSERVER

You must provide a safety observer when operating mobile plant and machinery to the reduced minimum safe distances.

The role of safety observer is critical to working safely around energised lines. All close approach consents shall require a competent safety observer available on the job site. The safety observer shall be operational at all times when minimum safe distances may be approached. The safety observer can perform other duties on the job site but **only** when there is no potential for work to approach minimum safe distances.

The safety observer must have received approved training and be competent to observe mobile plant working near live network equipment.

When filling the role of safety observer the following shall apply:

- The safety observer is identified as being a specific employee whose identity is communicated to all other employees on the job site
- Not perform any other role while acting as a safety observer
- Not be distracted by other employees or external factors (e.g. mobile phones)

- Be in control of the work with the power to stop work immediately should an unsafe situation arise
- Have approved agreed effective communications (visual, voice, signals, radio, other) with other employees
- Locate themselves in a position to safely and effectively monitor all work in proximity to the energised electrical plant
- If one (1) safety observer is not able to do perform these tasks effectively, then additional safety observers are required
- Be documented as a control on applicable risk assessments.

13.3 ELECTRICAL STAND OVER (SUBTRANSMISSION AND FIBRE)

We require stand over by a competent electrical worker when you are working near subtransmission (33kV or greater) or Aurora Energy-owned fibre to the reduced minimum safe distances. This is at Aurora Energy's cost.

The role of electrical stand over is to protect strategic Aurora Energy network equipment from potential damage by third party activities and to ensure proper cable reinstatement following excavation. Electrical stand over does **not** manage safety at the worksite, it is focused on the integrity and reliability performance of Aurora Energy's network. Worksite safety is and remains the responsibility of the third party PCBU. However, electrical stand over is obliged to notify the third party PCBU if they observe unsafe work practices related to the activities they are overseeing within their area of expertise.

You may also decide to engage an approved contractor to provide electrical stand over of work activity near network equipment at other voltages, at your cost.

13.4 SITE ASSESSMENT

We will make a site assessment of electrical hazards when:

- The proposed work activity is within 4 metres of subtransmission network equipment and/or Aurora Energy-owned fibre
- The proposed work activity is above overhead lines

- We are unable to satisfactorily assess electrical risk without an onsite assessment of hazards
- An exposed cable shows signs of deterioration or cracking
- Unexpected or unusual conditions apply outside predefined risk assessment (e.g. nature of worksite, type of work activity, network configuration).

Depending on the electrical hazard assessment, we may specify additional controls as condition of the close approach consent. You may also decide to engage Aurora Energy or one of our approved contractors to provide an electrical site assessment at your cost.

We will also visit to confirm if mechanical support is required if you are:

- Excavating within 5 metres of a pole or stay wire, or
- Creating an unstable batter within 8 metres of a pole or stay wire.

13.5 OBTAIN TECHNICAL GUIDANCE DURING WORK ACTIVITY

When working under a close approach consent and you identify an unforeseen need to breach the reduced minimum safe distances, you must suspend work activity and obtain technical guidance from Aurora Energy before resuming.

13.6 PHYSICAL BARRIERS

We recommend (and in some cases will require) you install physical barriers, according to your PCBU safety obligations, where you can safely operate outside reduced minimum safe distances, for example site fencing or when scaffolding near high voltage equipment. We may require you install physical barriers as a condition of your consent following a site assessment.

13.7 TEMPORARY ASSET REALIGNMENT

When there is insufficient clearance to achieve a reduced minimum safe distance, you may be referred to an approved contractor to arrange temporary asset realignment at your cost. Any realignment works would be carried out under the relevant work authority and outside the close approach consent process.

13.8 SITE SIGNAGE

We recommend (and in some cases will require) you install site signage, according to your PCBU safety obligations. Site signage may only be affixed to power poles or other network assets by an approved contractor. We may require you install site signage as a condition of your consent following a site assessment.

OVERHEAD

The following measures relate to overhead network equipment.

13.9 OVERHEAD WARNING MARKERS

We recommend (and in some cases will require) you install warning markers (e.g. warning signs, flags or safety bunting), according to your PCBU safety obligations. If used, you must securely fix overhead markers, maintain them in good condition and check them weekly. Warning markers must be removed in the event of a MetService severe weather warning for strong wind gusts and/or at the conclusion of the work. Overhead warning flags, signs or safety bunting may only be affixed to power poles or other network assets by an approved contractor. We may require you install overhead warning markers as a condition of your consent following a site assessment.

13.10 WARNING NOTICE ON MOBILE PLANT

When using mobile plant near overhead lines, you must comply with NZECP 34, section 5.6.1 regarding affixing a warning notice with the wording **"WARNING, KEEP CLEAR OF POWER LINES"**.

13.11 SAFE MECHANICAL HEDGE CUTTER OPERATION

When using any mechanically operated hedge cutter near overhead lines, you must comply with NZECP 34, section 5.6.2 to prevent hedge clippings or other material being thrown into contact with the conductors or creating any other hazard.

13.12 LINE COVERS ON AURORA ENERGY NETWORK EQUIPMENT

On request you may engage an approved contractor to install temporary line covers (e.g. tiger tails) to Aurora Energy overhead lines. Line covers may only be installed on, and

removed from, Aurora Energy equipment by an approved contractor.

Note that line covers only provide a visual warning and cannot be relied on to provide electrical insulation.

13.13 NETTING

When working outside the reduced minimum safe distance, you may install netting, provided it is not attached to network equipment, the reduced minimum safe distance is not encroached during installation and the netting is in good condition. Netting is typically used when scaffolding near low voltage network equipment.

13.14 ERECTING AND DISMANTLING SCAFFOLDING

We recommend (and in some cases will require) you use the same team when erecting and dismantling scaffolding within 4 metres of overhead network equipment in accordance with WorkSafe's guidance *Scaffolding in New Zealand*. We may require you use the same team as a condition of your consent following a site assessment.

13.15 WORKING ABOVE OVERHEAD LINES

You cannot operate mobile plant or carry loads above any overhead electric line without a close approach consent.

We will make a site assessment of electrical hazards when the proposed work activity is above overhead lines before issuing a close approach consent.

You must provide a safety observer (see above) when operating mobile plant and machinery or carrying loads above overhead lines.

POLES AND STAY WIRES

The following measures relate to support structures for overhead network equipment, such as poles and stay wires.

13.16 IDENTIFY POLE TAGS

When applying for a consent, you must identify the presence of tags on any Aurora Energy poles in the work area in your application. In processing the application, Aurora Energy will identify adjacent Aurora Energy poles and assess their condition. If an adjacent pole has a red or orange coloured tag attached, Aurora Energy will conduct a pole inspection before approving consent.

13.17 POLE INSPECTION

Aurora Energy will conduct a site inspection before issuing a consent where a pole has a red or orange coloured tag attached.

13.18 MECHANICAL POLE SUPPORT BY MOBILE PLANT

Mechanical pole support may be required when:

- Excavating within 5 metres of a pole or stay wire, or
- Creating an unstable batter within 8 metres of a pole or stay wire.

Aurora Energy will visit site to confirm if mechanical support is required. If support is required, only suitable mobile plant must be used (e.g. concrete block supports are not permitted). Aurora Energy will determine if your mobile plant (e.g. an excavator) is sufficient or if a crane truck provided by an approved contractor is required.

13.19 ENGINEERING ADVICE FOR EXCAVATION OR DRILLING BEYOND DISTANCE LIMITS

You must seek engineering advice from Aurora Energy before any excavation or drilling vertical holes near support structures that will exceed the distance limits, as per Table 2. Aurora Energy or one of its approved contractors will visit the worksite to approve excavation and any required safety measures, considering the duration the excavation will remain open and whether mechanical pole support is required. If required, the work activity will be referred for further engineering advice.

UNDERGROUND

The following measures relate to underground network equipment.

13.20 BEFOREUDIG

Before applying for a close approach consent you must lodge an enquiry with beforeUdig. Attach copies of the reference maps supplied by beforeUdig to the close approach application.

13.21 CABLE LOCATION AND MARK OUT

Cables must be located by an approved contractor using a cable locator before any excavation within 4 metres of underground cables.

The location must be marked out using standard surface marking symbols in accordance with WorkSafe's *Guide for Safety with Underground Services*, section 34.

13.22 POTHOLING

After cable location and mark out, you must pothole before any excavation within 2 metres of underground cables to confirm their exact location and depth. Potholing must be performed by hand digging or hydro vacuuming to expose parts of the underground cable.

13.23 HAND DIG OR HYDRO VACUUM

After cable location and mark out and potholing, you must only hand dig or hydro vacuum within 0.6 metres of underground cables. The use of hydro vacuum near underground cables is acceptable provided that the pressure is lowered to avoid the potential to strip the outer sheath of the cable.

13.24 FULL 8 CAL/CM² PPE BODY COVER

We recommend (and in some cases will require) that full personal protective equipment (PPE) body cover with a rating of 8 Cal/cm² rating is worn when excavating within 0.6 metres of underground cables in accordance with WorkSafe's guidance *Excavation Safety*, section 5.9. We may require full PPE be worn as a condition of your consent following a site assessment.

Full PPE body cover requires fire resistant full body cover with a minimum arc resistance rating of 8 Cal/cm², safety helmet, safety glasses, face protection/shield, safety

footwear, arc-rated outer gloves and removal of exposed metal jewellery.

13.25 CABLE SUPPORT

If any excavation beneath an underground cable results in the cable being unsupported for more than 1 metre in length, we require cable support to be installed by an approved contractor to avoid damage to the cable from slumping or bending. Supporting props shall be fitted at distances not exceeding 1 metre apart.

13.26 TRENCH-SHORING EQUIPMENT

You must avoid any contact with underground cables during installation of trench-shoring equipment. Once installed maintain a buffer (such as air gap or backfill with crusher dust) of at least 100mm from underground cables.

13.27 CABLE REINSTATEMENT

After any excavation where underground cables are exposed, you must backfill cable and reinstate surface under supervision by an approved contractor in accordance with applicable Aurora Energy standards.

14 DEFINITIONS

Approved contractor: a contractor who has been accredited to work on the Aurora Energy network, including our field service providers, that can provide competent electrical workers to assist the third party to meet the requirements of a close approach consent.

Cable: a wire, conductor or form of material designed for carrying electric current or communications signals.

Close approach consent: written approval from Aurora Energy including specific conditions and/or requirements that must be adhered to at all times.

Electrical stand over: a competent electrical worker from an approved contractor who performs the task of observing and providing advice on electrical hazards to the site supervisor. Their role is to protect strategic network equipment from potential damage by third party activities and to ensure proper cable reinstatement following excavation.

Excavation: the movement or placement of soil or other surface materials by removing, boring or forcing objects into the ground or earth surface.

Hazard: a source of potential harm or a situation with a potential to cause loss.

High voltage or HV: a nominal voltage exceeding 1kV for AC (Alternating Current).

Kilovolts or kV: 1,000 volts.

Line: a wire, conductor or form of material designed for carrying electric current or communications signals.

Low voltage or LV: a nominal voltage not exceeding 1kV for AC (Alternating Current).

Network equipment: any Aurora Energy-owned equipment including overhead lines, poles and stay wires, pole-mounted transformers and switchgear, underground cables, ground-mounted transformers or switchgear, and substations.

NZEC 34: NZ Electrical Code of Practice 34:2001 *Electrical Safe Distances*.

PCBU: a person conducting a business or undertaking as defined in the *Health and Safety at Work Act 2015*.

Safety observer: a competent worker employed or engaged by the third party who performs the task of observing and warning against unsafe approach to network equipment.

Site supervisor: the person in charge of the worksite, who is responsible for coordinating worksite health and safety and for ensuring compliance with the close approach consent.

Step potential: the voltage difference between a person's feet when standing near an electrically live object.

Subtransmission: network equipment operating at a voltage of 33kV or 66kV.

Touch potential: the voltage difference between parts of person's body when they are near or touching an electrically live object.

Underground equipment: any Aurora Energy equipment installed underground such as underground cables or substations.

15 LEGISLATION

Health and Safety at Work Act 2015

Electricity Act 1992

Electricity (Safety) Regulations 2010

NZ Electrical Code of Practice 34:2001

Electrical Safe Distances (NZEC 34)

16 MORE INFORMATION

beforeUdig

Electricity Engineers Association

WorkSafe

17 DISCLAIMER

The information presented in this guideline is intended for general use only. It should not be viewed as a definitive guide to your legal obligations and should be read in conjunction with relevant legislation and regulations. While every effort has been made to ensure the accuracy and completeness of this guideline, the advice contained herein may not apply in every circumstance. Accordingly, Aurora Energy cannot be held responsible and extends no warranties as to the suitability of the information for your specific circumstances; or actions taken by third parties as a result of information contained in this guideline.

18 CONTACTS

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A list of Aurora Energy approved contractors can be found on our website.