Quick Reference Guide:

Working near Essential Energy assets

01 July 2024

Essential Energy

Contents

Disclaimer

Essential Energy is both a Distribution Network Provider and Transmission Network provider.

This document does not purport to contain all of the information that a prospective customer/third party would need to complete work within clearances of Essential Energy assets.

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1. Introduction

1.1 Important information on safe distances

Essential Energy has prepared this guide to inform anyone working on and/or around buildings or sites that are connected to or in the vicinity of electricity assets of the safe distances that must be maintained from electricity assets, overhead or underground. This guide also applies to developers, designers and certifiers who are planning new work near Essential Energy assets.

Awareness of the required safety clearances could mean the difference between a safe, successful project and a potentially fatal accident. It may also save time and money by ensuring the design of a home or building complies with the safety requirements without additional measures being taken.

The drawings in this brochure specify the minimum safety clearances for working or living near electrical assets.

Note: Full details about safe work practices, including penalties for non-compliance, are set out in:

- The SafeWork NSW document *Work Near Overhead Power lines: Code of Practice 2006* – (safework.nsw.gov.au/__data/assets/pdf_file/0020/52832/Work-near-overhead-power-lines-code-of-practice.pdf)
- The SafeWork NSW document *Work Near Underground Assets - Guide, 2007* - (safework.nsw.gov.au/__data/assets/pdf_file/0009/54378/SW08773-Work-near-underground-assets-guide.pdf)
- Essential Energy *Company Procedure: Work Near Essential Energy's Underground Assets – CEOP8041* (essentialenergy.com.au/-/media/Project/EssentialEnergy/Website/Files/Safety/CEOP8041.pdf)

The requirements for maintaining safe distances from electricity assets are also set out in the *State Environmental Planning Policy (Infrastructure) Regulation, 2007* (Division 5 - Electricity transmission or distribution, Subdivision 2 - Development likely to affect an electricity transmission or distribution network).

This requires local councils to seek comments from Essential Energy before approving any development application where an electricity infrastructure is present.

Because of the critical nature of electrical distribution safety, please follow this Guide and be aware that Essential Energy is within its rights to seek compensation from companies building within clearance distances; and / or asset owners will be required to relocate their assets at their own expense. Please contact Essential Energy on 13 20 80 for assistance.

1.2 Essential Energy's network

Essential Energy operates and maintain one of Australia's largest electricity networks, delivering essential electricity network services to more than 890,000 homes and businesses across 95 percent of NSW and parts of southern Queensland.

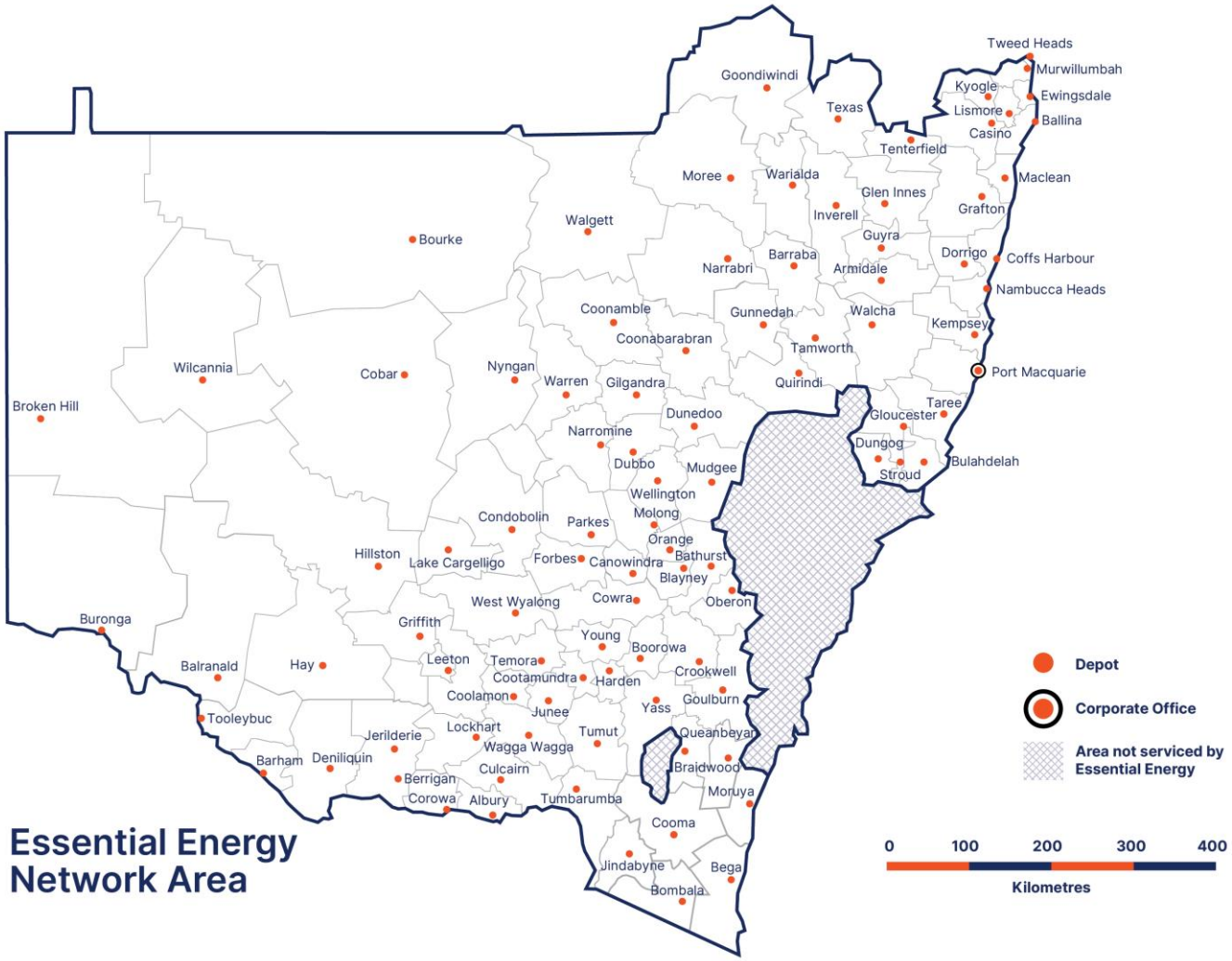


Figure 1: Essential Energy Network Area

1.3 Essential Energy's electrical network assets

The following illustrations show typical Essential Energy electrical network assets that may be found in residential, rural and commercial areas, for example overhead powerlines and poles, underground cables (in conduits), pillars, streetlights, or a padmount substation.

Figure 2: Essential Energy electrical network assets

2. Ensuring you are in the clear

2.1 Before you start work

There are two considerations prior to starting work near electrical infrastructure.

1. What clearances need to be maintained for structures, activities or objects within electricity easements or clearance zones in accordance with SafeWork NSW's *Work Near Overhead Power lines: Code of Practice 2006, and*
2. Any Essential Energy approvals that may be required prior to construction work near electrical infrastructure.

DEVELOPMENT CONSIDERATIONS AND STATUTORY CLEARANCES

Regardless of whether local council approval is required e.g. Exempt, Complying or Development Application and any NSW State approved projects, it is essential to confirm that the proposed work will not encroach on any statutory safety clearances.

You can find out more about development considerations near Essential Energy's infrastructure on our website at essentialenergy.com.au/partners/development-applications.

2.2 Request safety advice online enquiry

If you are working or operating equipment near overhead powerlines, electricity network equipment, or underground electrical infrastructure, you will need to assess the risk of inadvertent contact with the electricity network.

Before work you commence any work, you should submit an online Request for Safety Advice enquiry (essentialenergy.com.au/safety/request-for-safety-advice). We will assess your request and provide safety services where required to ensure that working near electrical equipment can be done safely.

Whenever possible, Essential Energy will need at least two (2) weeks' notice before any work commences.

The following may be considered as part of the recommendation.

- De-energising Electrical Assets or Construction Work - essentialenergy.com.au/partners/de-energisation-and-construction-work.
- Tiger Tails - essentialenergy.com.au/safety/tiger-tails, and/or
- Warning Markers including aerial markers - essentialenergy.com.au/safety/aerial-markers.
- High Load Permits and Escorts - essentialenergy.com.au/partners/high-load-permits-and-escorts.
- Any requirements for Traffic Control.

Figure 3: Damage of underground electrical network assets during construction work

3. Overhead service cables

Overhead service cables (sometimes referred to as service mains) are the overhead cable/s (there may be more than one) from Essential Energy pole to point of attachment on a building or house.

3.1 Working safely near service cables and point of attachment

The point of attachment (POA) is where the electrical service cable attaches to a home or building.

When work is being carried out near the point of attachment, special care must be taken to avoid contact with these electrical wires to avoid damaging them.

Care must be taken with activities such as:

- Painting gutters, fascias and eaves
- Cleaning leaves and debris from guttering
- Replacing guttering fascia's
- Attaching aluminium cladding to the fascias and the eaves
- Pruning trees and shrubs

3.2 Keeping your distance

The minimum safety clearances for service cables are shown in the following table.

MINIMUM SAFETY CLEARANCES FOR OVERHEAD SERVICES

APPROACH DISTANCES FOR WORK NEAR LOW VOLTAGE OVERHEAD SERVICE LINES				
Ordinary Persons (m)				
Hand held tools	Operation of crane or mobile plant	Handling of metal materials (scaffolding, roofing, guttering, pipes, etc.)	Handling of non-conductive materials (timber, plywood, PVC pipes and guttering, etc.)	Driving or operating a vehicle
0.5	3.0	4.0	1.5	0.6

Figure 4: Minimum safety clearances for overhead services

Remember – In some cases the required distances may be increased by Essential Energy to ensure public safety.

3.3 Minimum ground clearances to insulated overhead services

The following Figures 5-7 show the required clearances from overhead services. Additional clearance diagrams and information can be found at the NSW Government's Service and Installation Rules at energy.nsw.gov.au/nsw-plans-and-progress/regulation-and-policy/service-and-installation-rules.

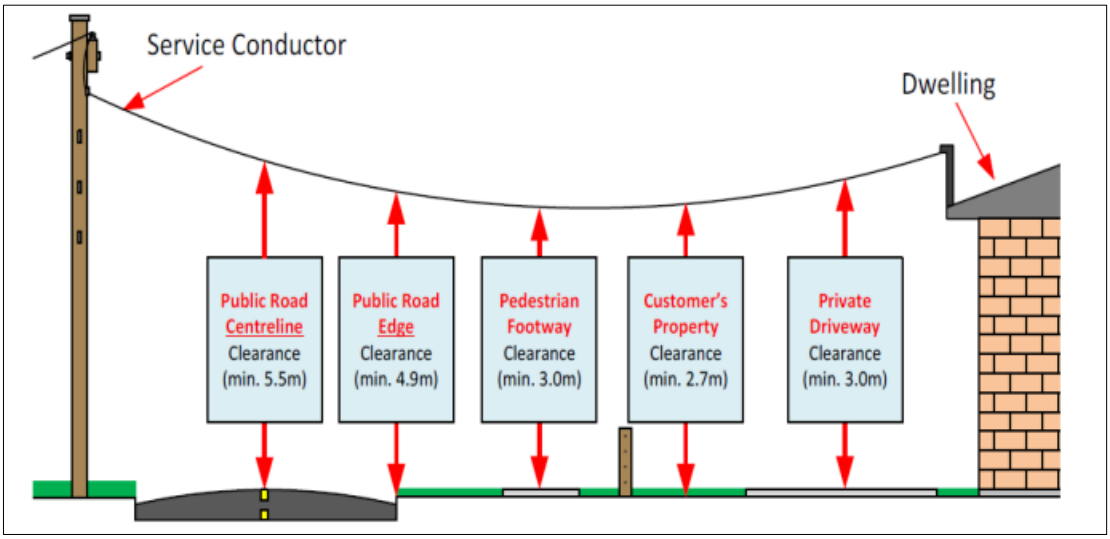


Figure 5: Side view of clearances

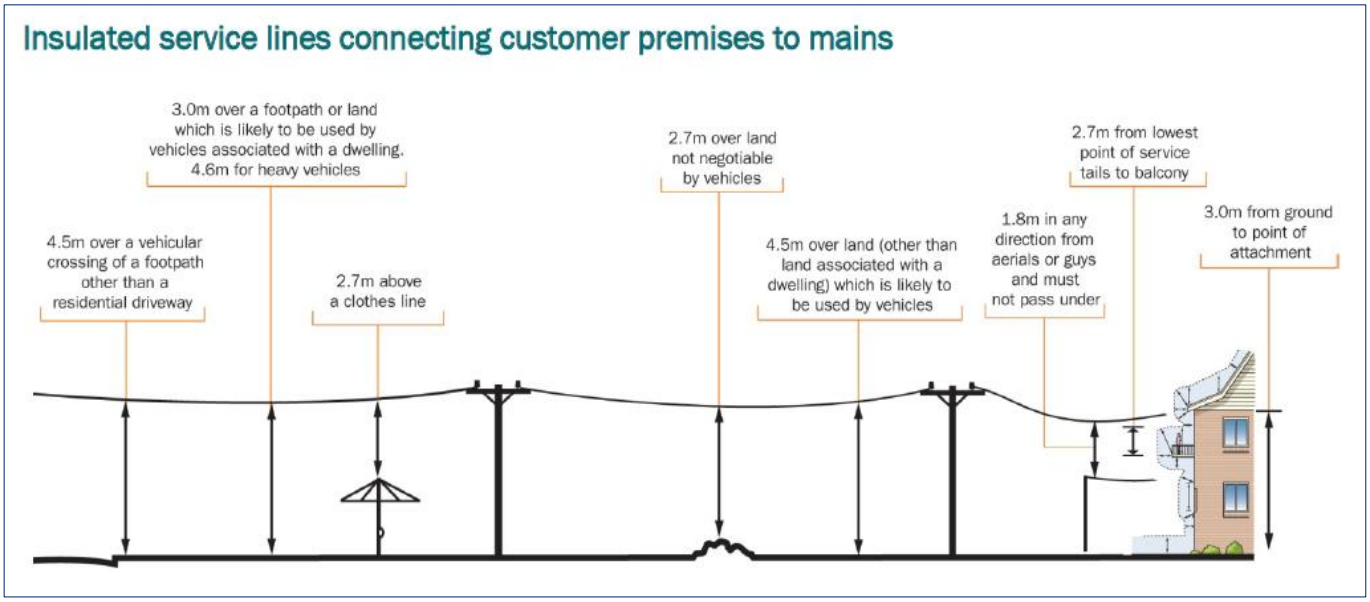


Figure 6: Low voltage insulated service conductors clearances – connecting customer premises to mains

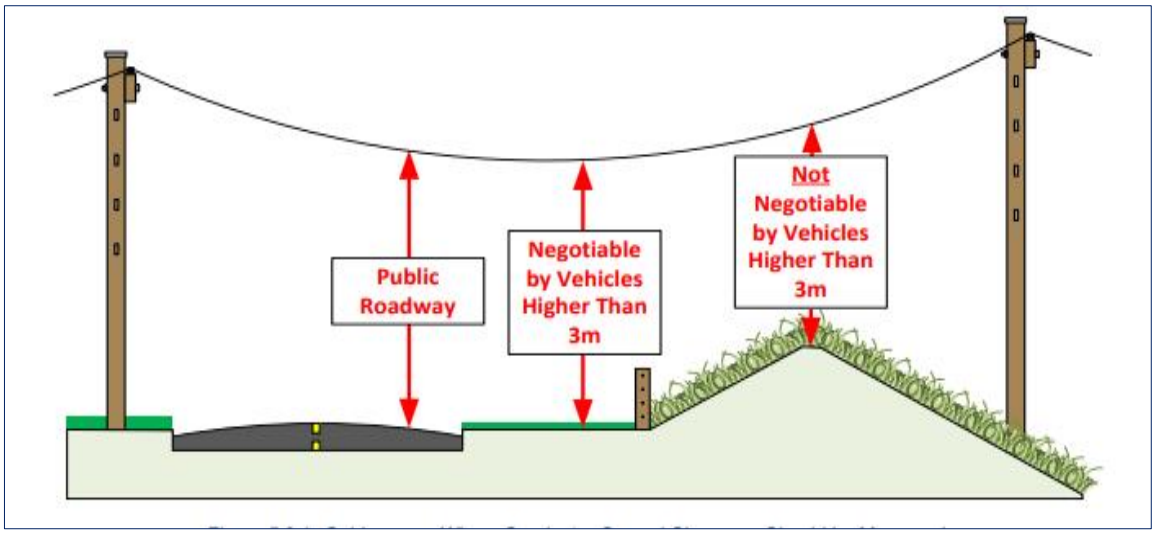


Figure 7: Low voltage insulated service conductors clearances

4. Overhead distribution cables

4.1 Keeping your distance

Overhead distribution cables (sometimes referred to as distribution mains) are the overhead cables that generally run from an Essential Energy pole to another Essential Energy pole, or Essential Energy electricity asset such as a substation. These are generally rated at 240, 415, 11,000 or 33,000 (sub transmission) volts.

The minimum safety clearances of completed structures to distribution cables are shown in the following diagrams and table.

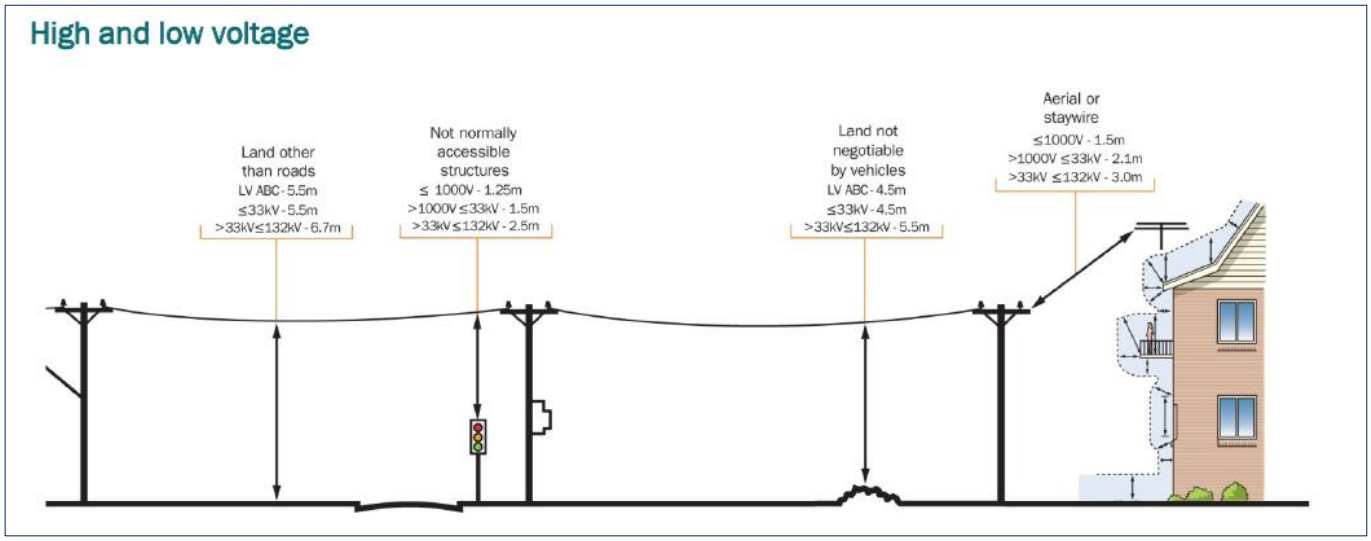


Figure 8: High and low voltage connections between infrastructure and dwellings

Remember – In some cases the required distances may be increased by Essential Energy to ensure public safety.

These requirements are for powerlines near completed structures or land. They do not represent safe working distances while building or operating machinery near powerlines.

4.2 Minimum safety clearances for distribution overhead powerlines

The below diagram and corresponding table show the required minimum safe distances between parts of buildings or structures and overhead powerlines, after allowing for any swing or sag in accordance with the design of the powerline.

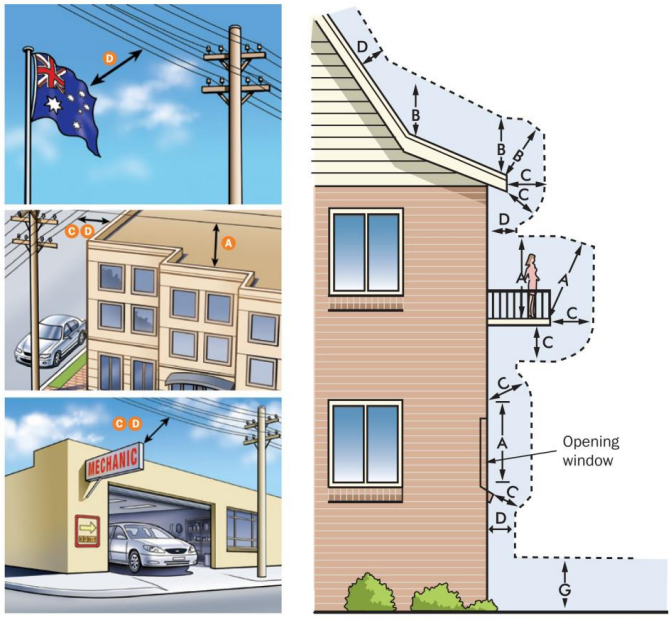


Figure 10: Illustration of safety minimum safety clearances for distribution overhead powerlines

CLEARANCE U=System voltage	U</= 1000V			U >/= 1000V		1000V <U </=33KV	33KV <U </=132KV
	Insulated m	Bare neutral m	Bare active m	Insulated with earthed screen m	Insulated without earthed screen m	Bare m	Bare m
A Vertically[1] above those parts of any structure normally accessible to persons.	2.7	2.7	3.7	2.7	3.7	4.5	5.0
B Vertically[1] above those parts of any structure not normally accessible to persons but on which a person can stand.	1.25	2.7	.27	2.7	2.7	3.7	4.5
C In any direction (other than vertically above) from those parts of any structure normally accessible to persons, or from any part not normally accessible to persons but on which a person can stand.	1.25	1.25	1.5	1.5	1.5	2.1	3.0
D In any direction from those parts of any structure not normally accessible to persons.	0.1[2]	0.3[2]	0.6[2]	0.1	0.6	1.5	2.5
G In any direction from ground.	Please refer to image above, and 'Minimum clearance requirements for completed structures or land (NSW)' image for clearance details.						
1 This should not be taken as meaning the literal vertical. The actual clearance may also extend outwards in an arc until it intersects with the relevant (C) dimension clearance. **2** This clearance can be further reduced to allow for the termination at the point of attachment.							

Figure 9: Table – Minimum safety clearances for distribution overhead powerlines

These requirements are for powerlines near completed structures or land. They do not represent safe working distances while building or operating machinery near powerlines.

4.3 Horizontal clearance between conductors

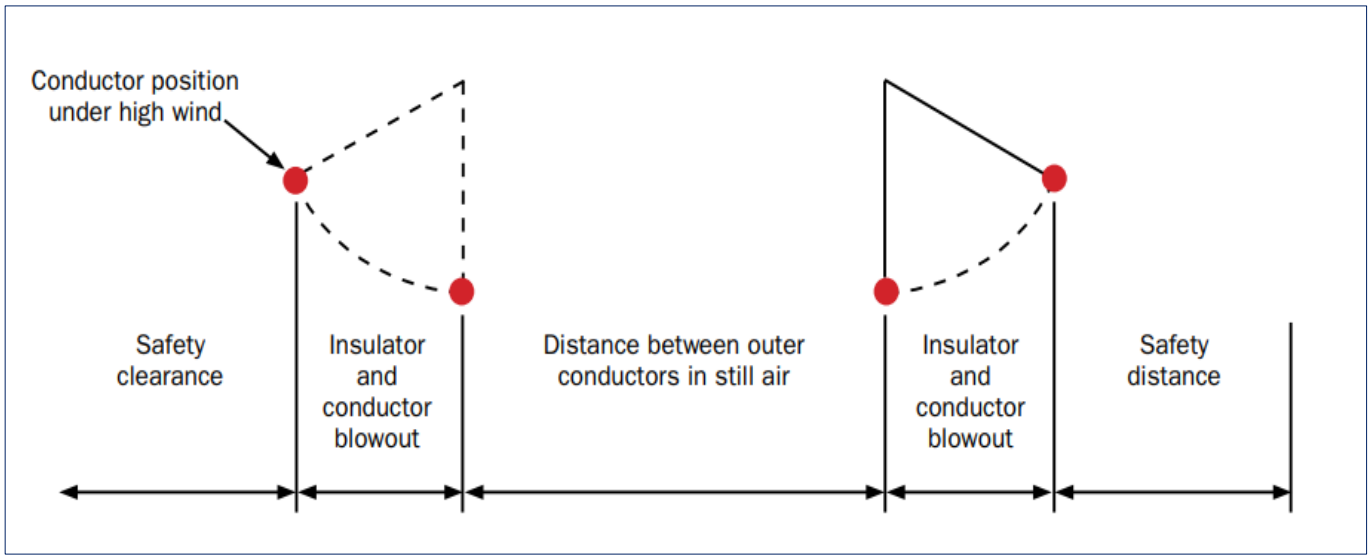


Figure 11: Diagram – Horizontal clearance between conductors

Note – Overhead powerline easements may be in place on private property. Please check the 'Title' of the land or visit the Lands and Registry Office at nswlrs.com.au to complete a Title Search.

For overhead powerlines located within a council or Transport for NSW's roadway footpath, easements are not required.

4.4 Look Up and Live

The Look up and Live app available at lookupandlive.com.au can help you plan work near powerlines. By using this tool, it may help increase awareness of overhead electrical assets and infrastructure and in turn minimise contact with the network, including reducing the risk of injury or death from electrocution and damage to equipment and our electricity network.

Essential Energy have partnered with the creators of 'Look Up And Live' (Energy Queensland) and other Electricity Utilities by providing access to our network data for customers to be able to utilise the Powerline Safety Planning Tool.

5. Working near overhead powerlines

5.1 Minimum safety clearances and seeking safety advice

It's important to adhere to minimum safety clearances at all times when working near overhead powerlines, or adjacent to power poles.



Figure 12: working near overhead powerlines

5.2 Approach distances for work performed by 'Ordinary Persons'

An 'Ordinary Person' is someone who does not hold the accreditation *UETDREL006 -Working safely in the vicinity of live electrical apparatus as a non-electrical worker* (or equivalent).

NOMINAL PHASE TO PHASE AC VOLTAGE (VOLTS)	APPROACH DISTANCE (M)
Up to and including 132,000	3.0
Above 132,000 up to and including 330,000	6.0
Above 330,000	8.0
NOMINAL POLE TO EARTH DC VOLTAGE (VOLTS)	**APPROACH DISTANCE (M)**
Up to and including +/- 1,500 volts	3.0

Figure 13: Table – Approach distances for work performed by Ordinary Persons

Note: Special approach distances apply for scaffolding work and work near low voltage overhead service lines referred to in the *Work Near Overhead Power lines: Code of Practice 2006.*

5.3 Minimum safety clearances and scaffolding

When erecting and dismantling scaffolding near overhead powerlines, you are required to adhere to the minimum safety clearances.

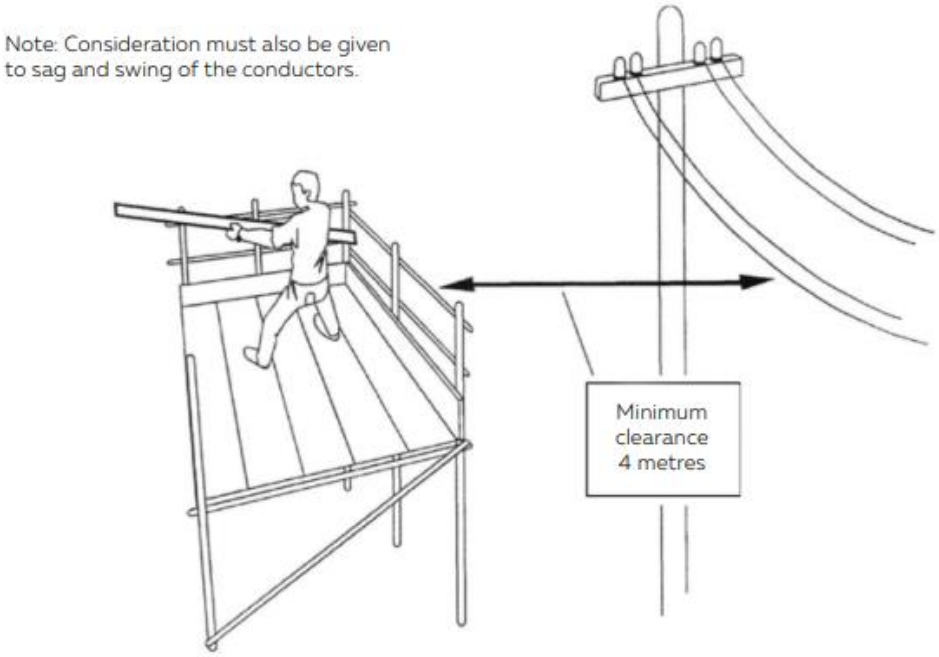


Figure 14: Diagram of minimum clearances for scaffolding and examples of building scaffolding

5.4 Minimum safety clearances operating plant and equipment

When operating cranes or mobile plant near overhead powerlines, you are required to adhere to the minimum safety clearances.

As shown in Figure 15, a Zone 1 Network Operator may give consent for load, boom pump, hammer head crane boom. No other plant, equipment and persons are allowed. A Network Operator must obtain acknowledgement from the Third Party that their system of work addresses the following controls:

- All relevant information has been provided to the Network Operator;
- Crane Operator and Safety Observer have current accreditation *in UETDREL006 Working safely in the vicinity of live electrical apparatus as a non-electrical worker* (or equivalent);

- A Safety Observer is used for all work encroaching on and within the relevant Accredited Person approach distances;
- Undertake an appropriate written risk assessment including a site specific safe work method statement for the task(s) to be completed. The safe work method statement must include the controls to prevent the crane or load coming within the NO GO Zone
- Confirmation of safe approach distances that must be maintained;
- Any additional requirements identified by the Network Operator.
- Any additional requirements identified by the Network Operator

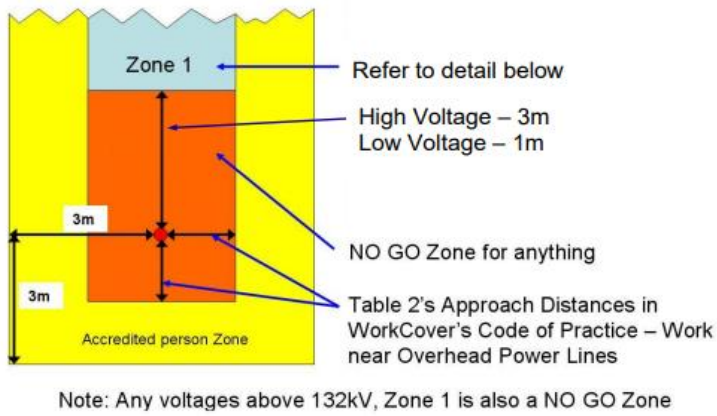


Figure 15: Zone 1 Network Operator and required minimum safety clearances

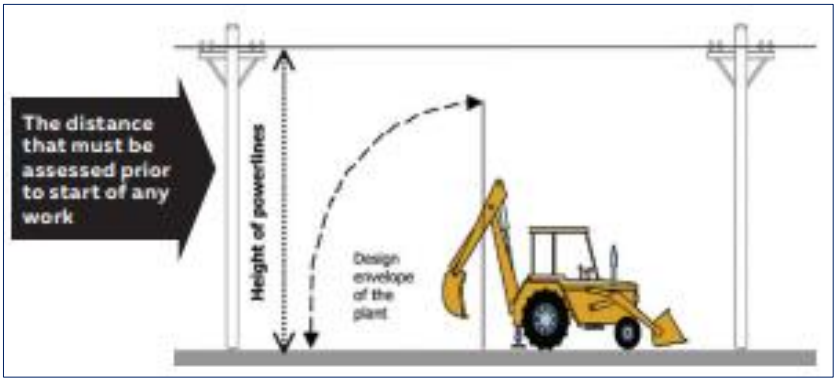


Figure 16: Overhead powerline clearances must be adhered to when operating any mobile plant or equipment, including cranes.

5.5 Minimum safety clearances for tree trimming and vegetation clearing

When trimming trees or clearing vegetation near overhead powerlines, you are required to adhere to the minimum safety clearances.

When carrying out vegetation management an Ordinary Person must not:

- Climb a tree or cut any branch that is or may come within the relevant safe approach distances to live overhead powerlines shown below.
- Allow any part of their body or anything they are holding or that is attached to their body or anything they are using come closer than the approach distances shown below.

If you would like to know more about suitable species of trees to plant in proximity to Essential Energy powerlines, refer to the Vegetation Management section on Essential Energy's website - essentialenergy.com.au/our-network/managing-the-network/vegetation.

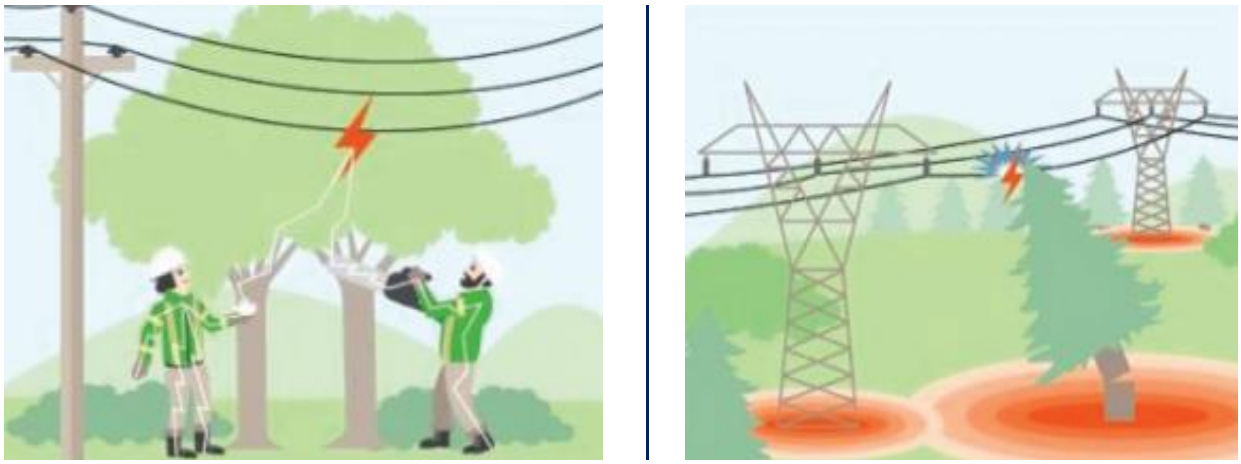


Figure 17: Potential risks of tree trimming near overhead powerlines

NOMINAL PHASE TO PHASE AC VOLTAGE (VOLTS)	APPROACH DISTANCE (M)
Up to and including 132,000	3.0
Above 132,000 up to and including 330,000	6.0
Above 330,000	8.0
NOMINAL POLE TO EARTH DC VOLTAGE (VOLTS)	**APPROACH DISTANCE (M)**
Up to and including +/- 1,500 volts	3.0

Figure 18: Table – Approach distances for work performed by Ordinary Persons

5.6 Minimum safety clearances and agricultural netting

Essential Energy may allow agricultural netting to be erected provided safety and access requirements are met. Landowners must meet certain criteria before Essential Energy can grant approval to erect agricultural netting that impacts on the safe to approach distances to the electricity network.

When installing agricultural netting near overhead powerlines, you are required to adhere to the minimum safety clearances and obtain written approval from Essential Energy prior to installing any netting near the electricity network.

IMPORTANT CONSIDERATIONS FOR INSTALLING AGRICULTURAL NETTING

Catenaries and netting SHOULD NOT:

- Be supported by power poles or stay wires
- Restrict access to Essential Energy's electrical infrastructure
- Be placed within a registered easement
- Allow the netting structure to be accessible by any person
- Enable the worker to attempt to directly measure the height of the overhead powerlines; it may cause serious injury and be potentially fatal

Catenaries and netting SHOULD:

- Have a minimum clearance of 10 metres from a power pole
- Maintain minimum clearances of powerline easement widths (refer to Figure XX for minimum clearances)
- Ensure Essential Energy provides any measurements to the height of the overhead powerlines

Figure 19: An example of netting and catenaries which are illegally encroaching on the power pole and powerlines

More information about agricultural netting is available on Essential Energy's website (essentialenergy.com.au/-/media/Project/EssentialEnergy/Website/Files/Safety/Agriculturalnetting.pdf)

5.7 Aerial marker installation process

Aerial markers may help with powerline visibility on agricultural properties or on construction sites. It's important to adhere to minimum safety clearances and obtain support from Essential Energy when working near electrical assets such as power poles or powerlines.

WHAT IS AN AERIAL MARKER?

Aerial markers have a 3D, rotating design that can be seen from any angle, providing an excellent visual warning of an overhead power line.

Aerial markers improve powerline visibility. By using aerial markers on your property or worksite, you can improve safety and reduce the risk of contacting the powerlines and avoid serious injury or death and damage to network assets.

Figure 20: An example of an aerial marker used by Essential Energy

HOW TO ORDER AERIAL MARKERS

You can order Aerial Markers by visiting the Essential Energy website and submitting an online Request for Safety Advice form.

When completing the form:

- Select Aerial/Powerline marker enquiry from the 'Work or Request type' tick box,
- Provide your contact details including the details of your workplace or property where you need the markers installed, and
- Attach any images of the specific site and surrounding area on your property relevant to the enquiry.

More information about aerial markers is available on Essential Energy's website (essentialenergy.com.au/safety/aerial-markers)

5.8 Swimming Pools Near Overhead Conductors

When planning for swimming pools, you are required to adhere to the minimum safety clearances.

SWIMMING POOLS ARE CONSIDERED A PROHIBITED ACTIVITY:

Above ground pools are prohibited where no alternative space clear of the clearance zone is available. In ground pools may be approved provided that:

1. The pool shall not hinder access to the line structures.
2. The pool is no closer than 5 metres to the nearest outside phase conductor.
3. The pool should be of reinforced concrete construction, with reinforcing bonded together to form an effective electromagnetic shield around the water. The installation of fibreglass pools will require detailed electrical engineering analysis and site investigations.

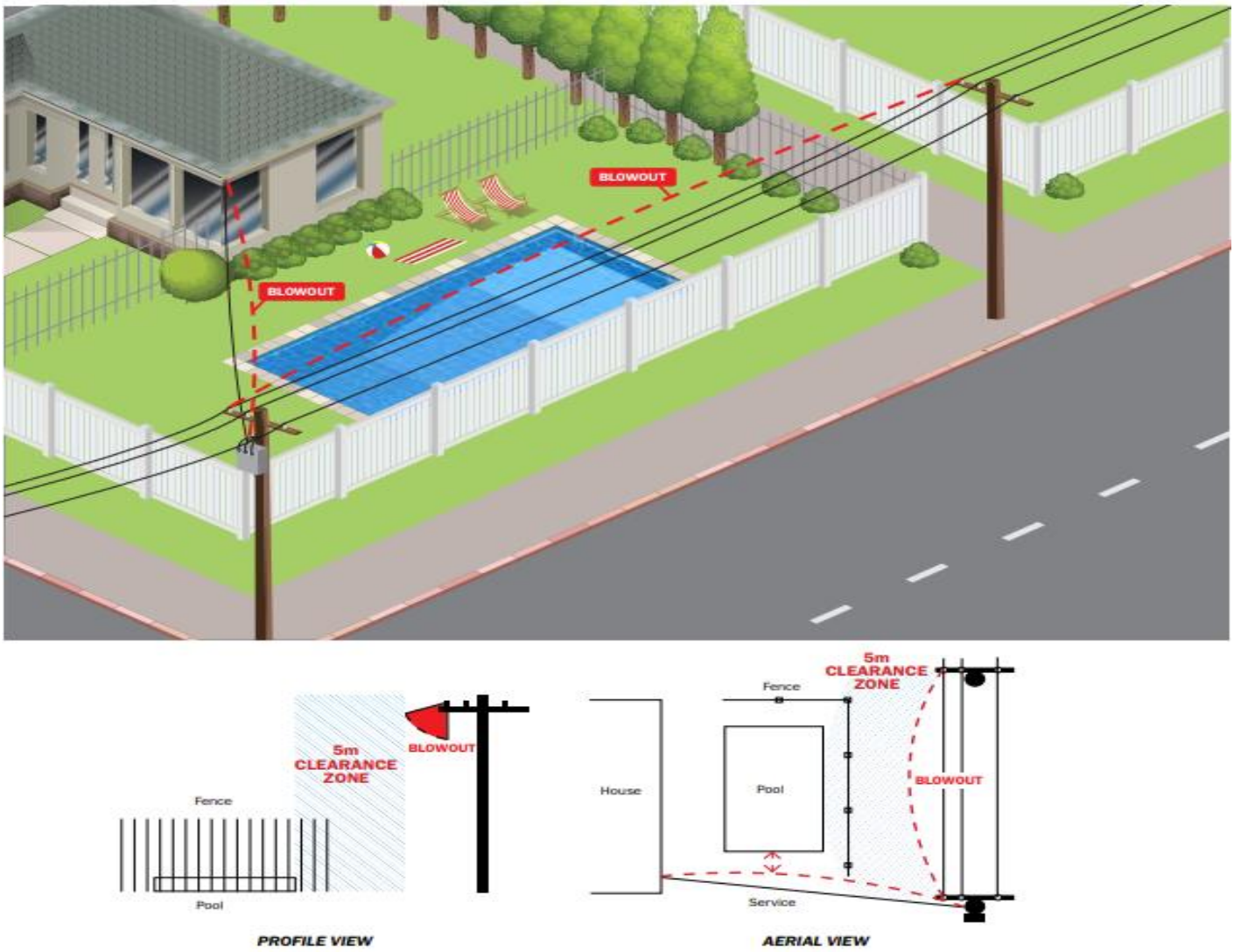


Figure 21: Minimum clearances and clearance zones for in ground swimming pools

More information about development considerations for swimming pools is available on Essential Energy's website (essentialenergy.com.au/-/media/Project/EssentialEnergy/Website/Files/Partners/DA-guide.pdf)

6. Underground substations and assets

6.1 Access and clearance requirements for Substations

Substation sites must have unimpeded access for Essential Energy personnel and vehicles, directly from a public street, 24 hours per day, 7 days per week.

A heavy truck with a vehicle-mounted crane is needed to install or remove the kiosk and equipment. Access/egress routes, where required, must be suitable under all weather conditions and constructed to withstand the required loading. The access route should be a minimum of 4 metres wide, have a minimum of 4 metres headroom and be continuous from the property boundary to the underground substation site.

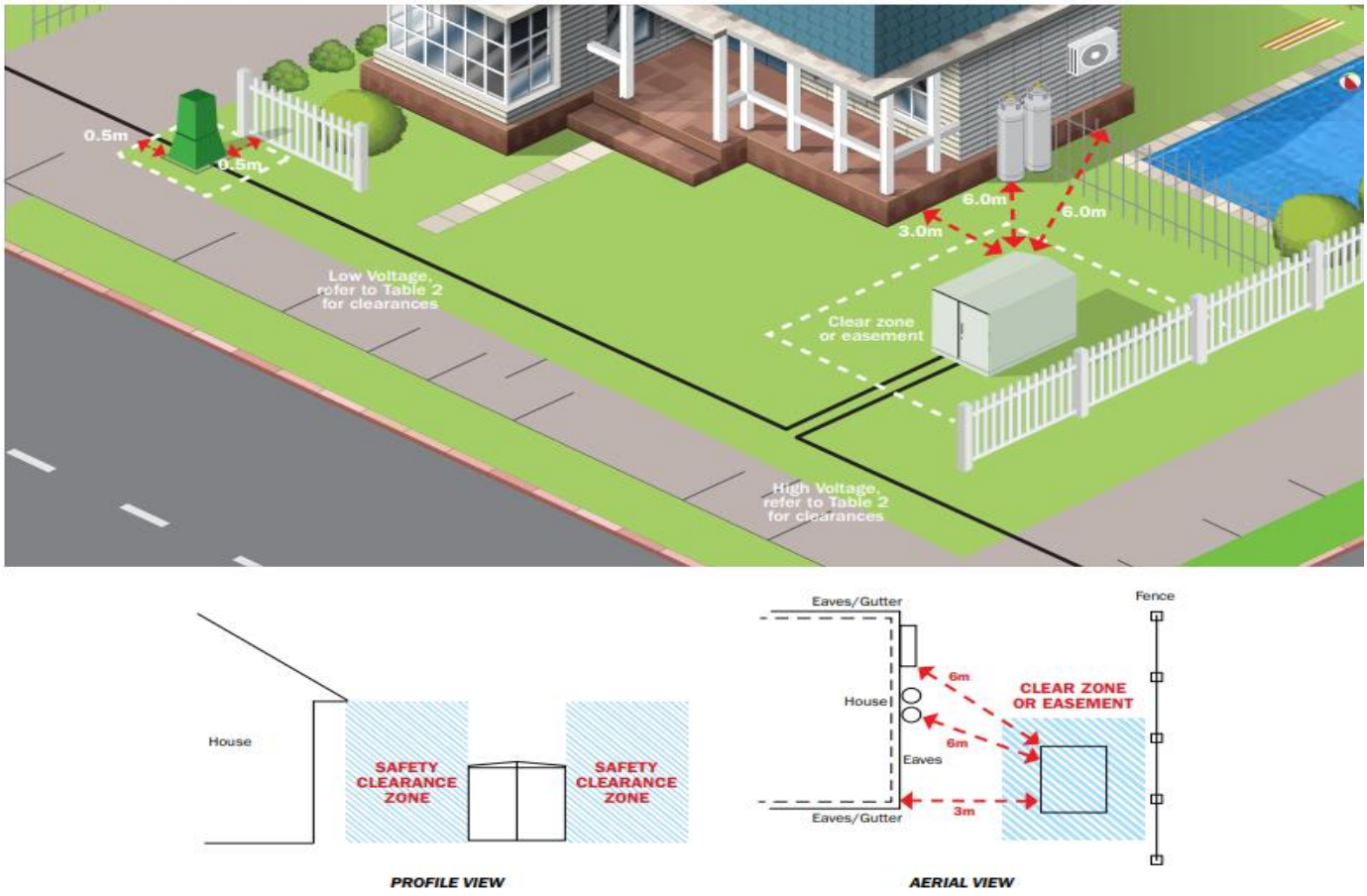


Figure 22: Minimum clearances and clearance zones for electrical substations

Access from the street to the substation site must not be fenced or enclosed, unless approval is given in writing by Essential Energy and the conditions listed in the approval are complied with on an ongoing basis by the site owner/customer.

Fences or bollards on the boundary of a padmount substation must comply with the following:

- The fence is segregated by an insulating panel to prevent transfer of earth voltage rise under fault conditions,
- That portion of the fence or bollards adjacent to the substation must be earthed to Essential Energy standards,
- Any fence posts or bollards must be clear of cable routes, and

- Access is always maintained.

More information regarding development considerations adjacent to substations is available on Essential Energy's website (essentialenergy.com.au/-/media/Project/EssentialEnergy/Website/Files/Partners/DA-guide.pdf)

6.2 Safety advice for underground cables and conduits

Essential Energy has a large network of underground cables and for safety reasons it is extremely important that you check for electrical cables and other utility assets (including telecommunications, gas, water and sewerage) before you start to dig or excavate the site.

WHEN EXCAVATING ALWAYS VISIT BEFORE YOU DIG AUSTRALIA AT BYDA.COM.AU

Before You Dig Australia is a free, not for profit service that aims to protect Australia's underground pipes and networks.

Did you know that you could be held responsible for any damage caused to underground networks? The *Electricity Supply Act* requires you to obtain certain information before carrying out some excavation work.

So next time you are planning to do some digging or excavating you should contact '**Before You Dig Australia**' to determine if there are any underground pipes and/or cables present.

This service is important for Essential Energy's regional customers as damage can be caused by equipment typically used by farmers and fencing contractors.

7. Streetlights

Public lighting plays an important role in providing safe, secure and attractive public areas for both pedestrians and vehicles. It also represents between 25 and 70 per cent of any individual local government's corporate energy consumption and greenhouse gas emissions.

Public lighting has three main purposes:

- improved pedestrian and vehicle safety,
- reduced street crime, and
- providing night amenity in community spaces.

Essential Energy is responsible for the maintenance and billing of around 170,000 streetlights for 86 Councils across NSW and southern Queensland, from Bega Valley in the south to Tweed Heads in the north and Broken Hill in the west.

Customers who would like a new streetlight installed should contact their local council in the first instance, who will consider the request and if approved, will work with Essential Energy to improve lighting.

Requests for glare shields and vandal guards from members of the public should be submitted to your local council. Council will consider the request and contact Essential Energy if necessary. Unfortunately glare shields are not available for all streetlight types.

For more information about streetlights (essentialenergy.com.au/our-network/streetlights), or to report a streetlight that is not working, visit Essential Energy's website (essentialenergy.com.au/outages-and-faults/streetlight).

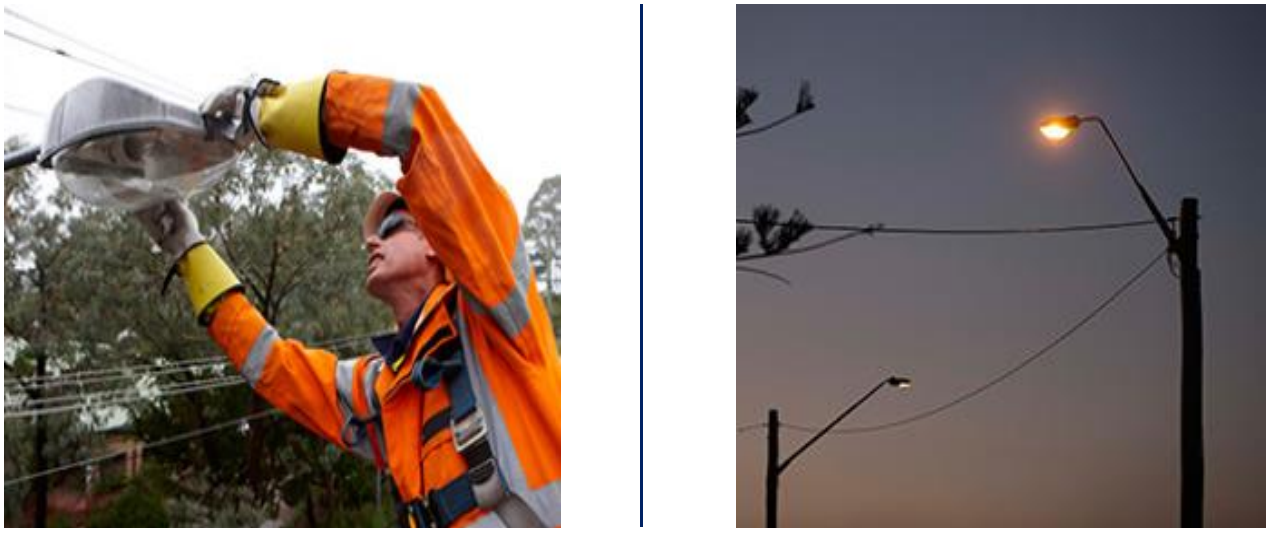


Figure 23: Essential Energy maintains streetlights on behalf of the local administering council

8. Excavating or digging near Essential Energy poles or assets

When working near power poles, powerlines, or underground assets, it's important to adhere to minimum safety clearances.

Pole support is a monopoly function that can only be performed by Essential Energy.

An assessment by a 'competent person' is not required for excavation depths up to 250mm.

For excavation depths greater than 250mm near power poles and stays it is mandatory to arrange for an Essential Energy representative to attend the worksite two (2) weeks prior to work commencing. Contact Essential Energy on 13 23 91 or submit online Request for Safety Advice enquiry.

A written assessment and safety management plan must be carried out by a competent person to indicate how the pole will be supported to prevent falling during excavation within the "Do Not Disturb Zone" (zone of influence) as depicted below.

The competent person must determine the depth of trench "D", the pole depth "Y" and ensure the excavation (including benching) is no closer to the pole than distance "X" which is equal to "D". Example: If the trench depth "D" is 1.5 metres then distance "X" is 1.5 metres.

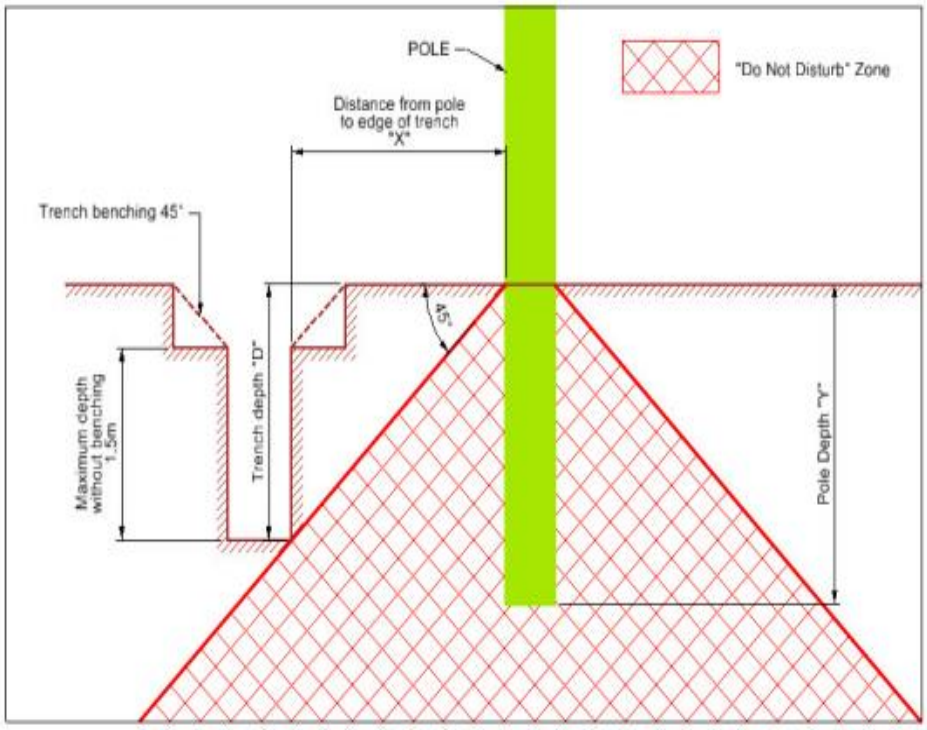


Figure 24: Clearance requirements for digging near underground electrical assets

9. Easements

9.1 What is an Easement?

Distributors of electricity, such as Essential Energy, require electricity easements to maintain and safely operate their infrastructure.

An easement is a registered legal right applying to land. Put simply, an easement allows a person to enter someone else's property so they can install and maintain facilities like powerlines and cables.

Easements can vary in size and width, further information on electricity easements can be found in Essential Energy's Company Policy *Easement Requirements - CEOP8046*.

Contact Essential Energy on 13 23 91 to obtain a copy of the Requirements.

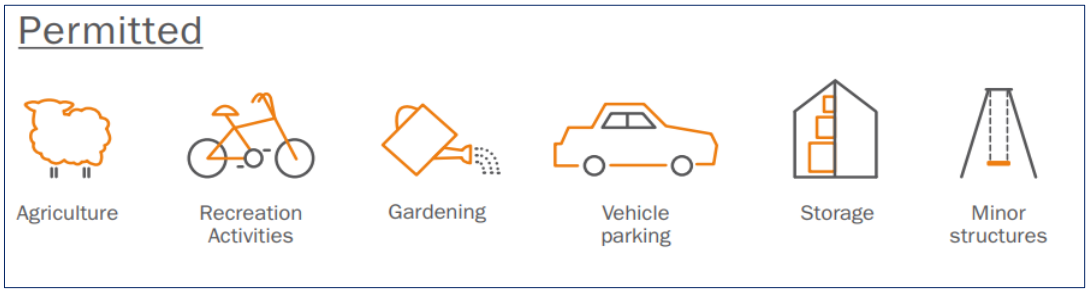
9.2 Why are Easements necessary?

Easements ensure the safety of residents living, working, and playing near powerlines. They help prevent incidents occurring that could cause serious injury or even death.

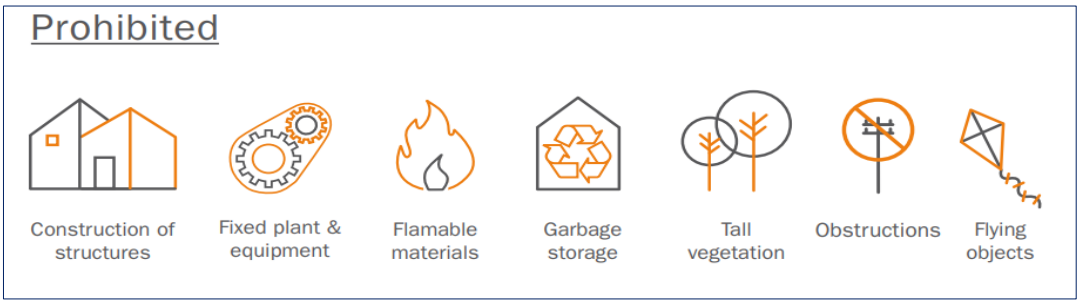
Easements are also created to give Essential Energy clear, 24-hour access to its infrastructure.

It is important to keep easements clear at all times so regular maintenance, line upgrades, damage or technical faults can be attended to immediately.

ACTIVITIES PERMITTED IN AN EASEMENT



ACTIVITIES NOT PERMITTED IN AN EASEMENT



More information regarding living with easements is available on Essential Energy's website (essentialenergy.com.au/our-network/easements).

10. Contact Us

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