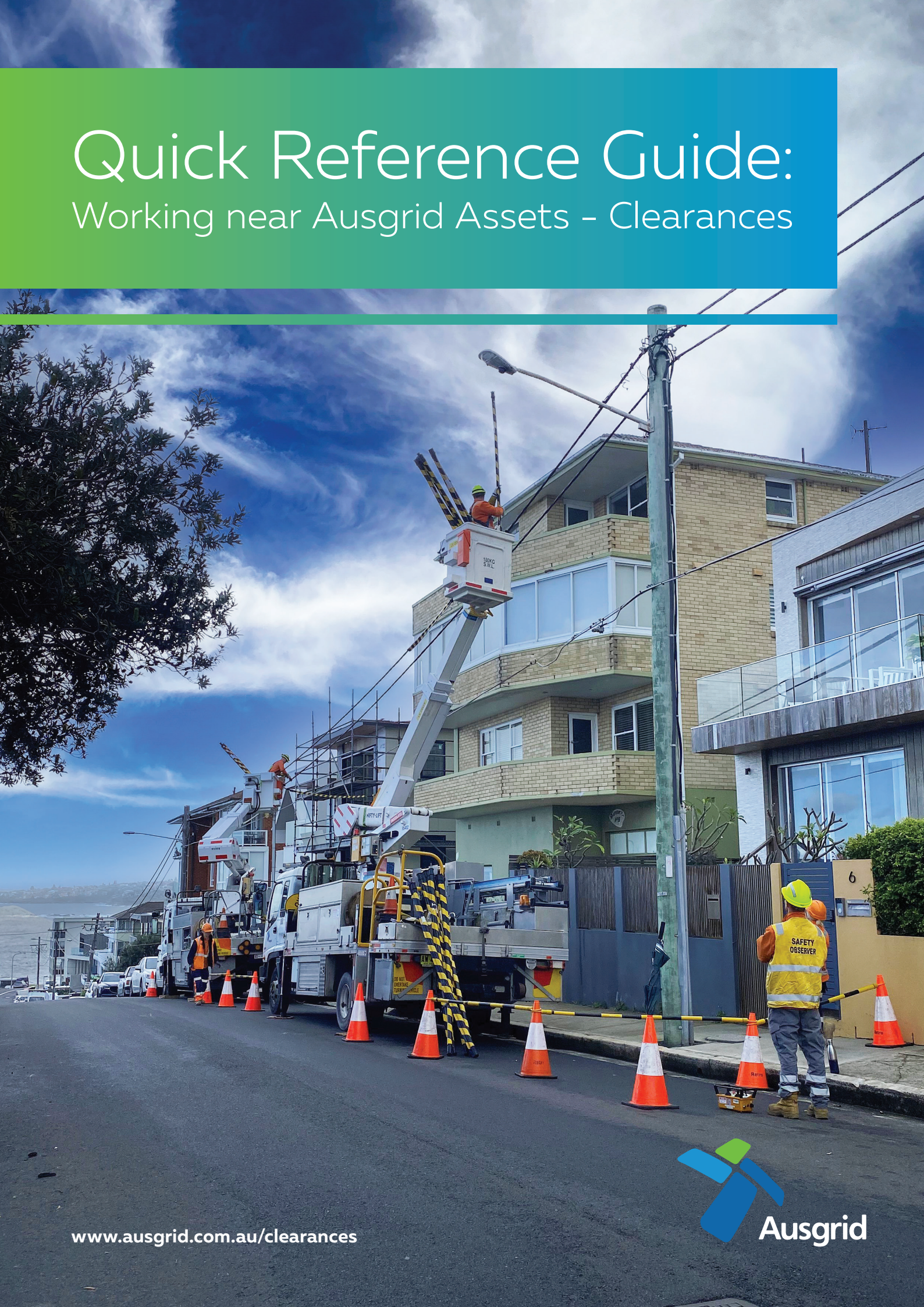
Quick Reference Guide:

Working near Ausgrid Assets - Clearances



www.ausgrid.com.au/clearances

Ausgrid

Disclaimer

Ausgrid is registered as both a Distribution Network Service Provider and a Transmission Network Service Provider.

This document does not purport to contain all of the information that a prospective customer / third party would need to complete work within clearance of Ausgrid Assets.

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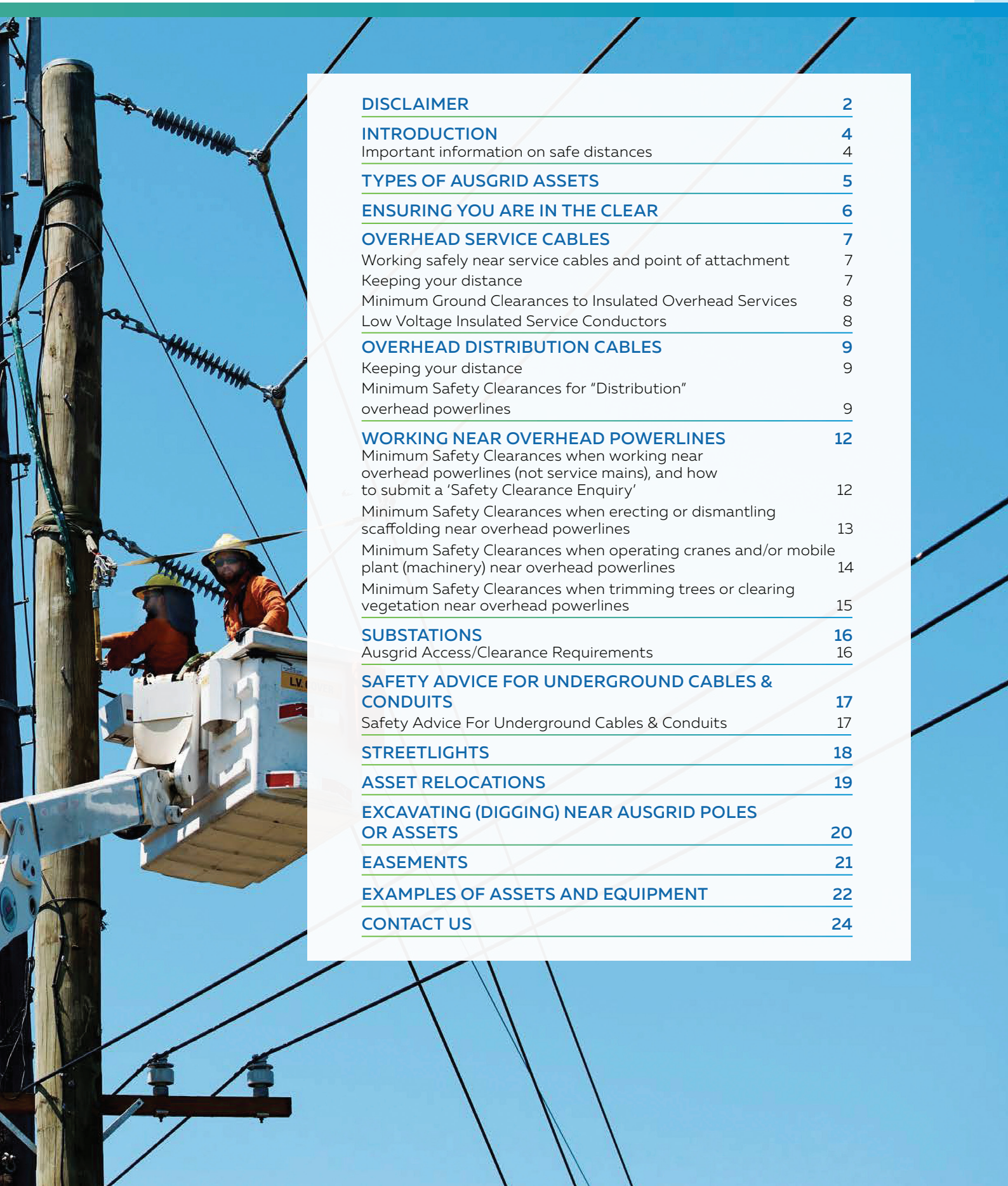

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Introduction

Important information on safe distances

Ausgrid 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 Ausgrid 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 WorkCover NSW document Work near overhead power lines: Code of practice 2006.
- The WorkCover NSW document Work near underground assets - guide.
- The Ausgrid Dial before you dig Work near Ausgrid assets guide.

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).

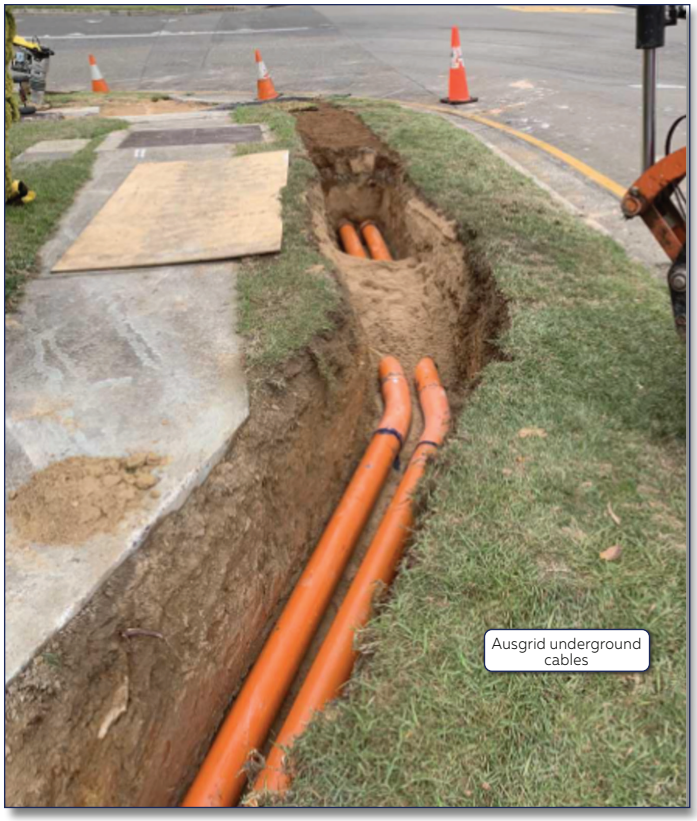
This requires local councils to seek comments from Ausgrid before approving any development application where electricity infrastructure is present.

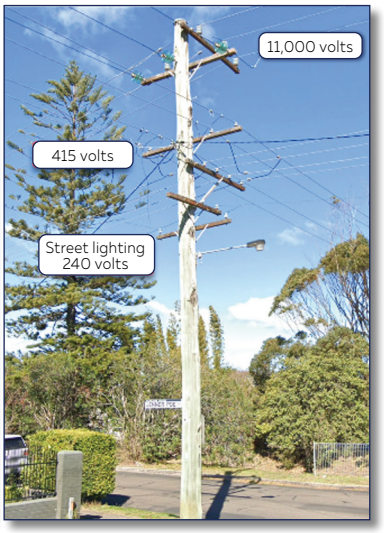
Because of the critical nature of electrical distribution safety, please follow this guide and be aware that Ausgrid is within its rights to seek compensation from companies building within clearance distances; and / or Asset owners will be required to relocate their assets at their own expense. Please contact Ausgrid on 13 13 65 for help.

Types Of Ausgrid Assets

The Ausgrid network is made up of substations, powerlines, underground cables and power poles, spanning 22,275 square kilometres throughout Sydney, the Central Coast and the Hunter Valley regions.

The following illustrations show typical Ausgrid electrical network assets that may be found in residential and commercial areas, for example overhead powerlines & poles, underground cables (in conduits), pillars, streetlight on a pole, or a kiosk substation.





Ensuring You Are In The Clear

All buildings and other structures must comply with the minimum safety clearances from overhead electricity conductors.

The minimum distances from the closest conductor to the building or other structures must be maintained during strong winds or high operating temperatures. Under these conditions, the conductor can swing or sag considerably towards the building or structure.

The minimum safety clearances are shown in the illustrations in this guide taking these factors into account.

If it appears that conductors are closer than the minimum safety clearances shown in the table, visit the Overhead (OH) Clearance Enquiries page on the Ausgrid Website.

Important Considerations for Minimum Safety Clearances

If you are unsure where to start, or Need Help To Plan, contact Ausgrid.

- Knock-down/rebuilds, where a small, single storey home is replaced by a larger or double storey home, or where land is rezoned to allow multi-storey construction, such as apartments or town houses.
- Moving the location of a driveway or building driveways close to pillars or poles.
- Erecting a flagpole.
- Any building work near underground and/or overhead power lines.
- Erecting a cubby house.
- Raising the ground level below existing power lines.
- Erecting metal fences or scaffolding in close proximity to poles and/or lines.
- Excavating near poles or where electricity assets potentially run underground.
- Using a crane in proximity to overhead lines.

Swimming pools are potentially unsuitable for installation near electricity assets, and should be assessed by Ausgrid.

Overhead Service Cables

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

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:

- Cleaning leaves from guttering.
- Painting gutters, fascia's, and eaves.
- Pruning trees and shrubs (particularly around the electrical wires).
- Attaching aluminium cladding to the fascia's and the eaves taking these factors into account.
- Replacing the guttering.

Keeping your distance

The minimum safety clearance for service cables are shown in the following table:

Remember - In some cases the required distances must be increased to ensure public safety.

If you are planning to work near any overhead powerline(s) please visit the Ausgrid website for more information, and for support on how to submit a Safety Clearance Enquiry – if required.

https://www.ausgrid.com.au/Your-safety/Working-Safe/Clearance-enquiries

Additional information can be found in the SafeWork – Work Near Overhead Power Lines Code of Practice.

https://www.safework.nsw.gov.au/__data/assets/pdf_file/0020/52832/Work-near-overheadpower-lines-code-of-practice.pdf

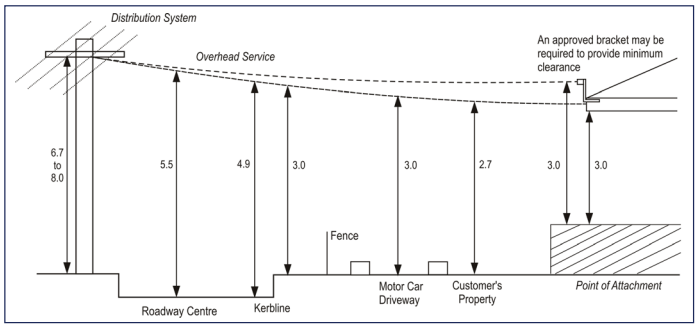
Minimum Safety Clearances for Overhead Service Cables

Approach distances for work near low voltage overhead service cables				
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 vehicle
0. 5	3. 0	4. 0	1 .5	0. 6

Minimum Ground Clearances to Insulated Overhead Services

Side view of clearances

Note: These clearances must be achieved under all conditions (refer to Note 3 of Table 3-4). The Point of Attachment is to be 3m minimum above the ground, floor or platform level.



Additional clearance diagrams and information can be found in:

- Ausgrid Network Standard NS220 Overhead Design Manual
- The NSW Service & Installation Rules

Low Voltage Insulated Service Conductors

	From the insulated service conductors to the surface of:	Minimum clearances (metres)
1	Any part of a freeway or arterial road	5. 5 vertically
2	The centre of a carriageway of a public road	5. 5 vertically
3	Any part of a carriageway of a public road (other than the centre)	4. 9 vertically
4	Vehicular crossing of a footway in a public road (other than a residential drive-way)	4. 5 vertically
5	Vehicular crossing of a footway in a public road for a residential driveway and any other part of a footway	3. 0 vertically
6	Land which is not associated with a dwelling and which is likely to be used by vehicles, including non urban small acreages and hobby farms	4. 5 vertically
7	Land which is, or is likely to be used by vehicles and is associated with a dwelling	3. 0 vertically
8	Land not likely to be used by vehicles	2. 7 vertically
9	Those parts of any structure normally accessible to persons. (See Note 1)	2. 7 vertically
10	Any area above a roof	1. 25 metres
11	Any area around a radio or TV aerial	1. 8 in any direction
12	Those parts of any structure not normally accessible to persons. (See Note 2) (including below a projecting slab, balcony or sign)	0. 1 in any direction
13	The edge of any opening window, balcony, verandah, clothes line or fence etc	Out of normal reach (see Note 4)
14	Point of attachment	3m vertically not normally accessible without a ladder or other device (see Notes 1-4)
15	Farmland where mechanical equipment is used	5. 5 vertically
16	Trees and shrubs	0. 5 in any direction
17	Vicinity of boat ramps, launching areas (avoid if possible)	10. 0 vertically
18	Communications conductors	0. 6 in any direction

Explanatory Notes:

Interpret the requirements set out in the above table as follows:

1. Structure Normally Accessible to Persons includes:
   (a) The whole area of any flat roof accessible without the use of a ladder.
   (b) Any part of a hip or gable roof accessible without a ladder up to the nearest hip or gable.
   (c) Any portion of a balustrade or other structure which will support a person and is accessible without a ladder.
2. Not Normally Accessible to Persons excludes roofs and includes any portion of a fence, balustrade, advertising sign or other structure which will not support a person or is not accessible without a ladder.
3. The minimum clearances in Table 13.1.4 must be achieved under all conditions regardless of:
   (a) Conductor swing due to the influence of wind.
   (b) Conductor sag due to the influence of load current and ambient temperature.

The requirements of Table 13.1.4 may be achieved if the maximum allowable service line sag for a particular conductor size and span is added to the minimum clearance. Refer to Table 3.8 of Reference 57.

4. Out of Normal Reach means 1.25m from any normally accessible position. The requirement that an overhead service must be out of normal reach of persons may be achieved in some cases by the provision of a permanent insulated barrier (consult with the electricity distributor).

Overhead Distribution Cables

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

Keeping your distance

The minimum safety clearances over structures, roads and driveways are shown in the following drawings.

Remember -In some cases the required distances must be increased to ensure public safety.

If you are planning to work near any overhead powerline(s) please visit the Ausgrid website for more information, and for support on how to submit a Safety Clearance Enquiry – if required.

https://www.ausgrid.com.au/Your-safety/Working-Safe/Clearance-enquiries

Additional information can be found in the SafeWork – Work Near Overhead Power Lines Code of Practice.

https://www.safework.nsw.gov.au/__data/assets/pdf_file/0020/52832/Work-near-overheadpower-lines-code-of-practice.pdf

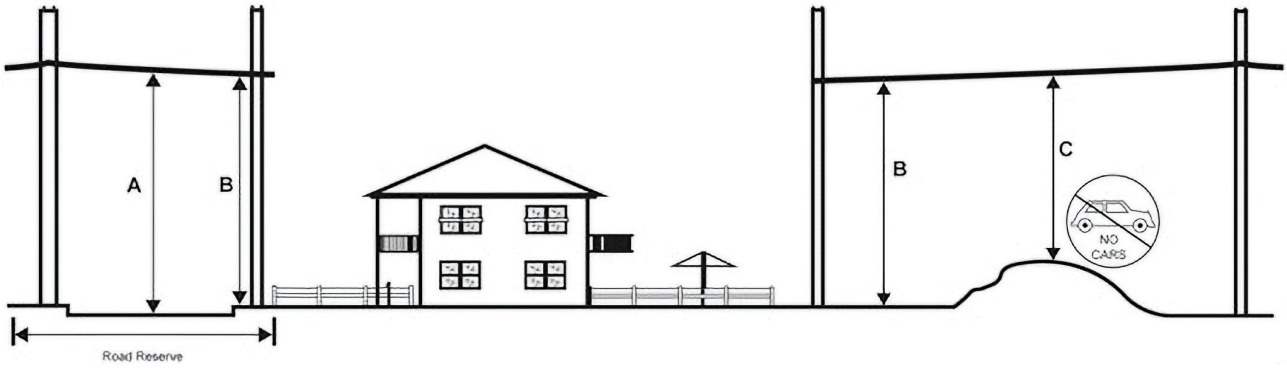
Minimum Safety Clearances for "Distribution" overhead powerlines

Table 2 - Minimum clearances from ground

Note: The required Ausgrid clearances are indicated in the table below with a cross reference to AS7000 clearances for your information only.

DIMENSION	LOCATION	Minimum Clearances in any direction between Conductors					
		Nominal System Voltage					
		LV insulated or bare	11kV, 22kV, and 12. 7kV SWER bare	11kV, 22kV, and 12. 7kV SWER covered	33kV	66kV	132kV
		m	m	m	m	m	m
A	Over the carriageway of roads	6. 0 (5. 5)	7. 5 (6. 7)	6. 0	7. 5 (6. 7)	7. 5 (6. 7)	7. 5 (6. 7)
B	Over land other than the carriageway of roads	6. 0 (5. 5)	6. 0 (5. 5)	6. 0	6. 0 (5. 5)	7. 0 (6. 7)	7. 5 (6. 7)
C	Over land which, due to its steepness or swampiness, is not traversable by vehicles	5. 0 (4. 5)	5. 0 (4. 5)	5. 0	5. 0 (4. 5)	6. 0 (5. 5)	6. 0 (5. 5)

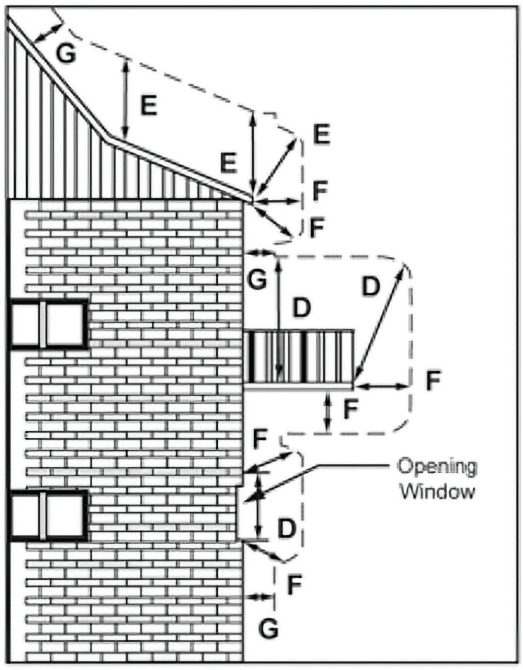
Low Voltage (LV) = 230/400V (single/three phase)

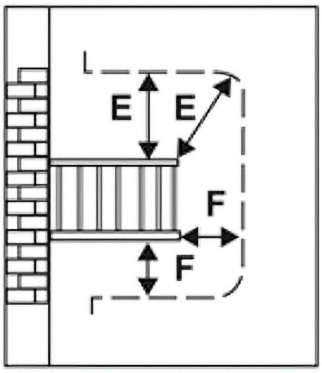


Overhead Distribution Cables

Table 3 - Minimum clearances from structures, buildings and easement boundaries.

DIMENSION	LOCATION	LOW VOLTAGE			11kV – 33kV			66kV to 132kV
		Insulated	Bare neutral	Bare active	Insulated with earthed screen	Insulated without earthed screen	Bare or covered	Bare
		m	m	m	m	m	m	m
D	Vertically above those parts of any structure normally accessible to persons	2. 7	2. 7	3. 7	2. 7	3. 7	4. 5	5. 0
E	Vertically above those parts of any structure not normally accessible to persons but on which a person can stand	2. 0	2. 7	2. 7	2. 7	2. 7	3. 7	4. 5
F	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. 0	0. 9	1. 5	1. 5	1. 5	2. 1	3. 0
G	In any direction from those parts of any structure not normally accessible to persons	0. 1	0. 3	0. 6	0. 1	0. 6	1. 5	2. 5

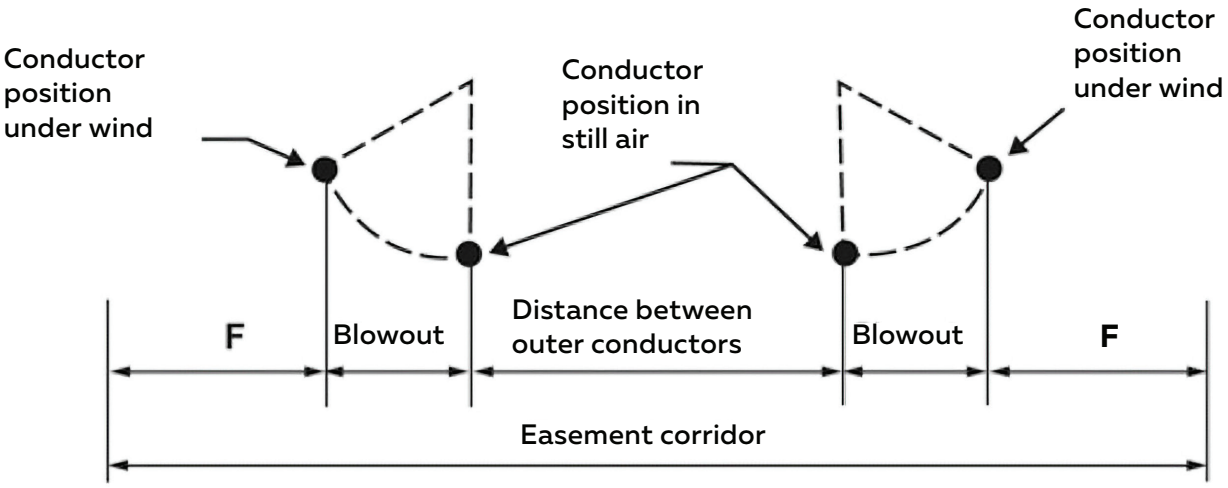




These dimensions apply if the height of the railing (or similar) plus distance E is greater than distance D

Overhead Distribution Cables

Horizontal clearance between conductors



HORIZONTAL CLEARANCE BETWEEN CONDUCTORS AND EASEMENT BOUNDARIES

Note – Overhead powerline easements may be in place on private property. Please check the 'Title' of the land, or visit the Land Registry Office to complete a Title Search Home - NSW Land Registry Services (nswlrs.com.au).

For overhead powerlines located within a council or RMS roadway footpath, easements are not required.

Working Near Overhead Powerlines

Minimum Safety Clearances when working near overhead powerlines (not service mains), and how to submit a 'Safety Clearance Enquiry'

If you are planning to work near any overhead powerline(s) please visit the Ausgrid website for more information, and for support on how to submit a Safety Clearance Enquiry.

Additional information can be found in the SafeWork – Work Near Overhead Power Lines Code of Practice.

Approach distances for work performed by 'Ordinary Persons'

* An 'Ordinary Person' is someone without formal Ausgrid close approach training and authorisation.

Table 4 - Approach distances for work performed by 'Ordinary Persons'

Nominal phase to phase a.c. 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 d.c. voltage (volts)	**Approach distance (m)**
Up to and including +/- 1500 Volts	3. 0

Note: Special approach distances apply for scaffolding work (Chapter 6) and/or work near low voltage overhead service lines (Chapter 8) – refer SafeWork – Work Near Overhead Power Lines Code of Practice.

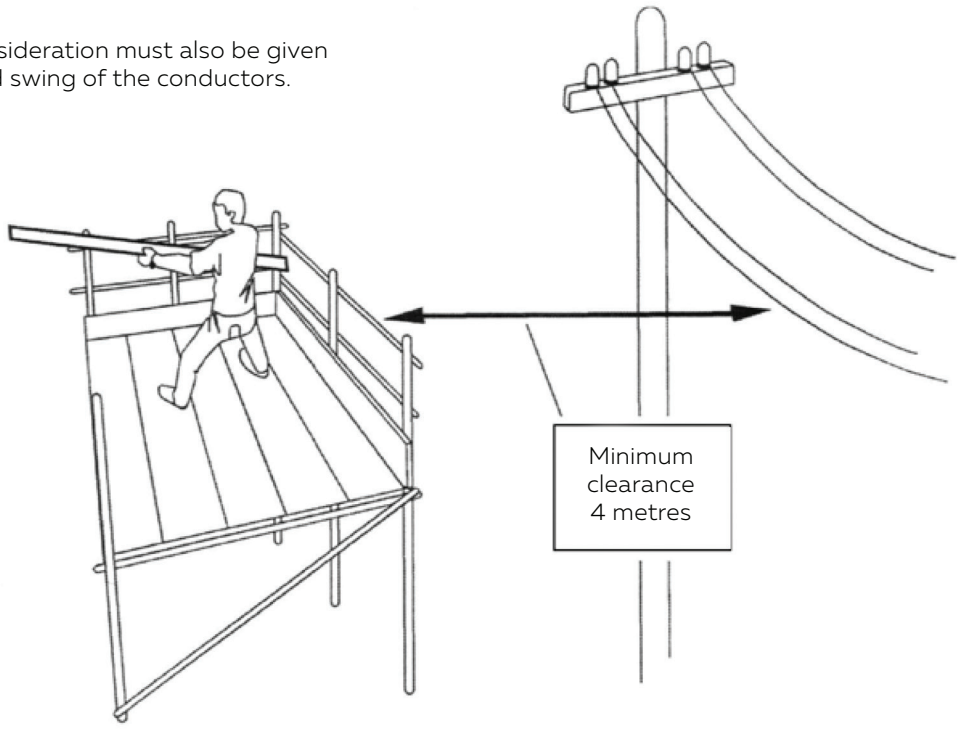
Working Near Overhead Powerlines

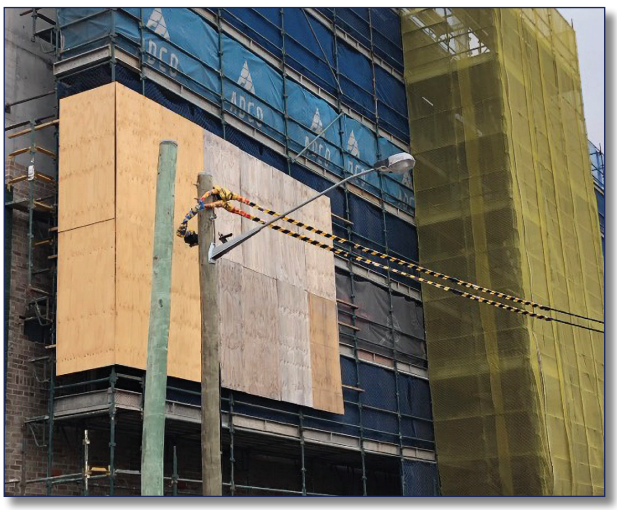
Minimum Safety Clearances when erecting or dismantling scaffolding near overhead powerlines

If you are planning to work near any overhead powerline(s) please visit the Ausgrid website for more information, and for support on how to submit a Safety Clearance Enquiry – if required.

Additional information can be found in the SafeWork – Work Near Overhead Power Lines Code of Practice.

Note: Consideration must also be given to sag and swing of the conductors.





Working Near Overhead Powerlines

Minimum Safety Clearances when operating cranes and/or mobile plant (machinery) near overhead powerlines

If you are planning to work near any overhead powerline(s) please visit the Ausgrid website for more information, and for support on how to submit a Safety Clearance Enquiry – if required.

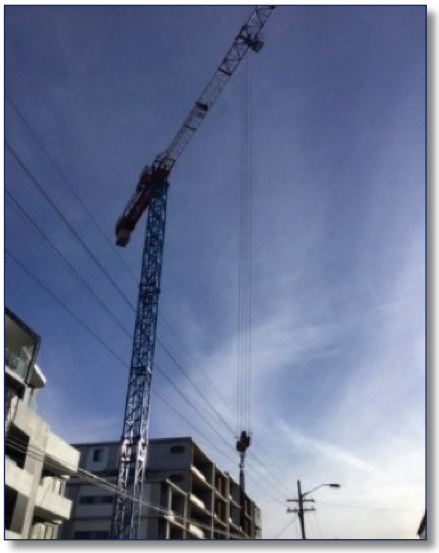
https://www.ausgrid.com.au/Your-safety/Working-Safe/Clearance-enquiries

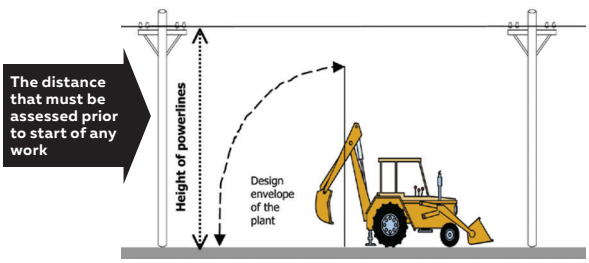
Under no circumstances will Ausgrid permit craning loads over live High Voltage (HV) mains.

You MUST contact Ausgrid to review all 'craning over' activities.

Additional information can be found in the SafeWork – Work Near Overhead Power Lines Code of Practice.

https://www.safework.nsw.gov.au/__data/assets/pdf_file/0020/52832/Work-near-overhead-power-lines-code-of-practice.pdf





Working Near Overhead Powerlines

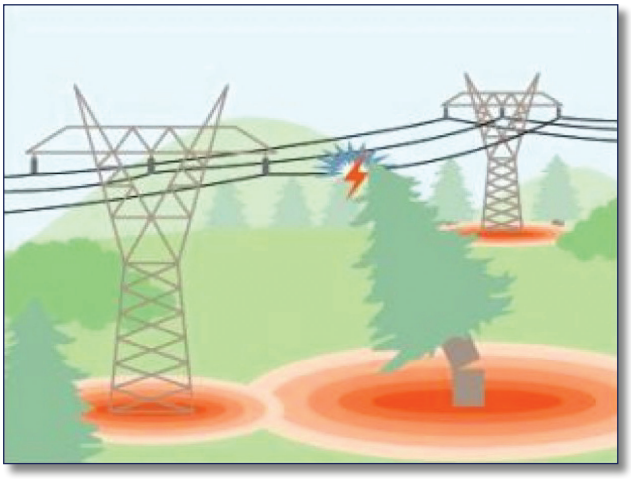
Minimum Safety Clearances when trimming trees or clearing vegetation near overhead powerlines

If you are planning to work near any overhead powerline(s) please visit the Ausgrid website for more information, and for support on how to submit a Safety Clearance Enquiry – **if required.**

https://www.ausgrid.com.au/Your-safety/Working-Safe/Clearance-enquiries

Additional information can be found in the SafeWork – Work Near Overhead Power Lines Code of Practice.

https://www.safework.nsw.gov.au/__data/assets/pdf_file/0020/52832/Work-near-overhead-power-lines-code-of-practice.pdf



If you would like to know more about suitable species of trees to plant in proximity to Ausgrid powerlines please visit the Ausgrid website.

https://www.ausgrid.com.au/-/media/Documents/In-your-community/Councils/Suitable-Planting-Species.pdf

Substations

Ausgrid Access/Clearance Requirements

Substation sites must have unimpeded access/egress for Ausgrid personnel and vehicles, directly from a public street, for 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 kiosk site.

For substation sites other than footpath, reserve or URD sites, the site owner/customer is responsible for providing and maintaining access routes and surface finishes, to the satisfaction of Ausgrid, as specified in the associated easement document.

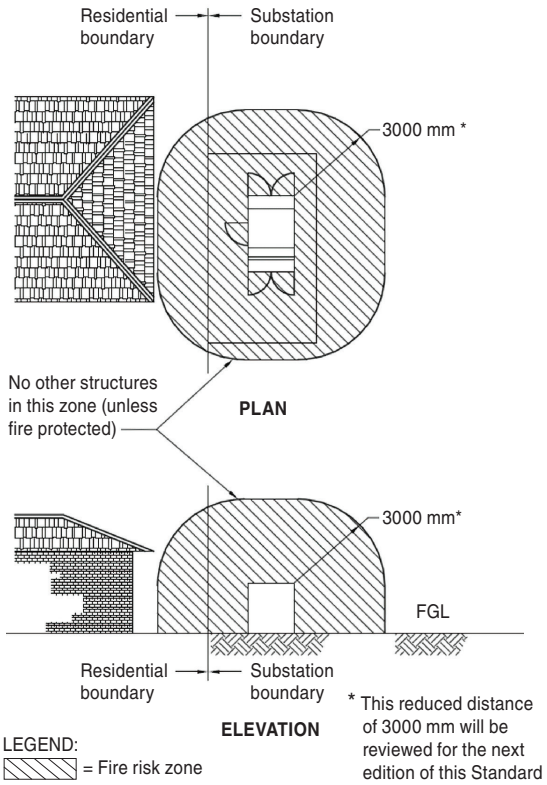
Access from the street to the substation site must not be fenced or enclosed, unless approval is given in writing by Ausgrid and the conditions listed in the approval are complied with on an ongoing basis by the site owner/customer.

Note: - Ausgrid's suite of Network Standards relate to all of our work types. Please refer to Network Standard NS141 (Site selection and site preparation standards for kiosk type substations) on our website for more information on substation/kiosk clearance requirements.

https://www.ausgrid.com.au/-/media/Documents/Technical-Documentation/NS/NS141

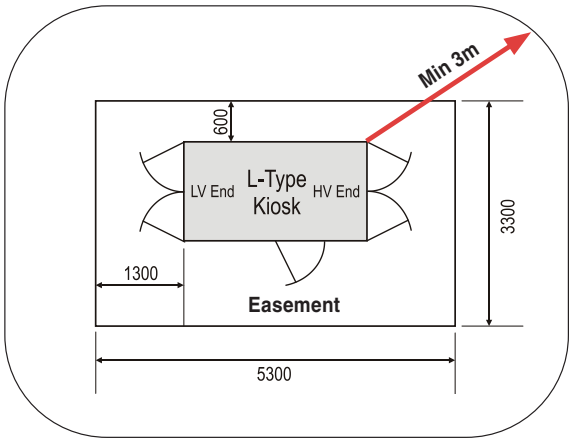
Substations – segregation requirements from residences

NOTE - Minimum 600 mm exit space all round kiosk from edge of open doors. .



Substations - segregation requirements from other structures

NOTE - Ausgrid has varying easement sizes for different Substation types. Easement shown below is only one example. No obstructions shall be placed within the substation easement.
Refer to Ausgrid Network Standard NS143.



Fire & Blast segregation, See NS141. RESTRICTED BUILD AREA

Any proposals to build fences or swimming pools near (pole or ground mounted} substations should be referred to Ausgrid for an Earthing assessment.

Safety Advice For Underground Cables & Conduits

Safety Advice For Underground Cables & Conduits

Ausgrid 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 DBYD AT WWW.1100.COM.AU OR DOWNLOAD THE DBYD APP ON IOS OR ANDROID.

Dial Before You Dig is a FREE national referral service supported by Ausgrid and other major service providers that supplies plans of where electricity, water, gas and telecommunications cables and assets are located, so you know whether it is safe to dig. Check DBYD on 1100 (Free call) for information, and download the DBYB App on iOS or Android, or visit www.1100.com.au and register to get plans sent to your email address.

Note: - Ausgrid's suite of Network Standards relate to all of our work types. Please refer to Network Standard NS156 (Working Near Or Around Underground Cables) on our website for more information on applicable safety requirements.

https://www.ausgrid.com.au/-/media/Documents/Technical-Documentation/NS/NS156

Streetlights

Street lighting is a vital community asset that helps our community feel safer and more secure. Ausgrid maintains 250,000 streetlights within our network area on behalf of local councils across Sydney, the Central Coast and the Hunter.

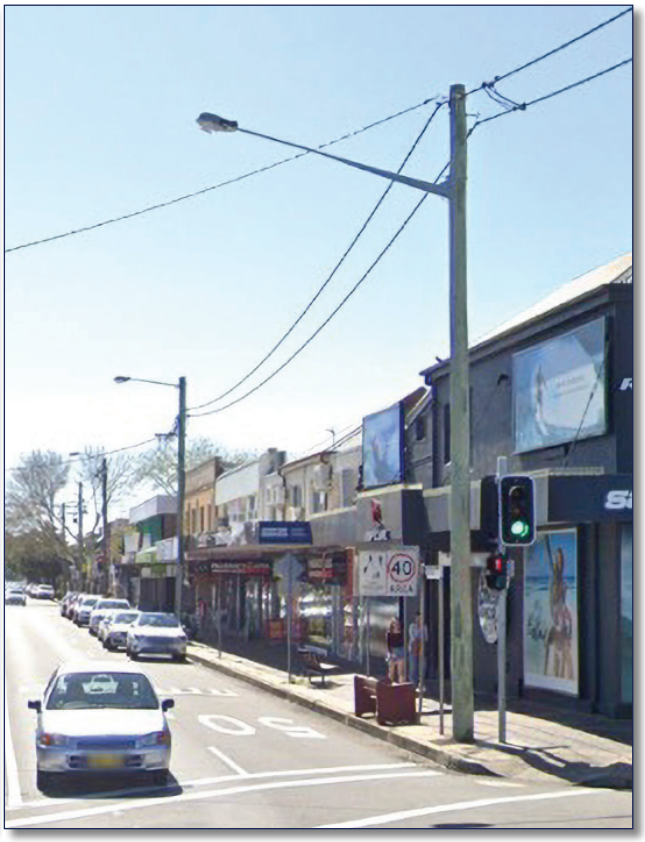
Although streetlights are connected to the Ausgrid network the responsibility for new streetlight approvals or removals resides with the local council, or the NSW Roads & Maritime Services (RMS) depending on the category of road (or bridge etc.).

Ausgrid is responsible for connecting and maintaining street lights – **in our network area.**

If your would like to report a street light that is not working please visit our website and "Report a faulty streetlight" via our online mapping system.

https://www.ausgrid.com.au/In-your-community/Our-services/Streetlights#!/map

If you would like to make a complaint about a streetlight (e.g. obtrusive light etc.) or request a new streetlight to be installed, please contact your local council. The council will assess your request/complaint and refer the matter to Ausgrid for further investigation/action to determine if the complaint is justified.



Asset Relocations

If you would like to apply to relocate an existing Ausgrid asset (i.e. a pole, pillar, substation and/or underground cable etc.) please visit the Ausgrid website and follow the steps to submit a "Network Relocation Request Form".

https://www.ausgrid.com.au/Connections/special-connections/moving-poles-and-assets

Excavating (Digging) Near Ausgrid Poles or Assets

Are you proposing to excavate (dig) near an Ausgrid pole or other asset?

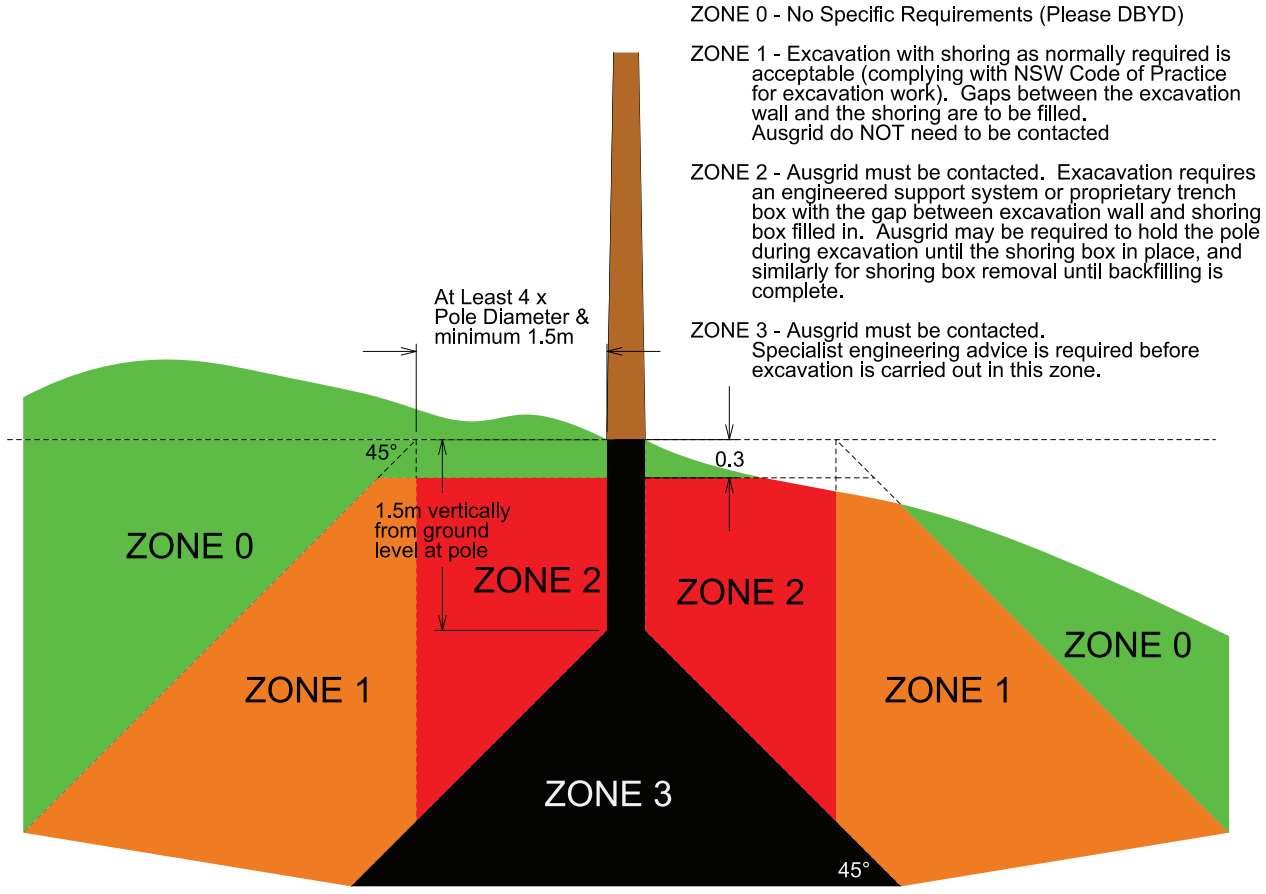
In some situations the local site conditions and Ausgrid pole construction types may necessitate additional pole support measures be put in place, (by Ausgrid) to ensure the structural integrity of the pole during the period of excavation.

Only Ausgrid can implement additional pole support measures (pole holding etc.)
You MUST contact Ausgrid for all excavation work that could impact the structural integrity of a pole or other Ausgrid asset

The 'Zone of Influence' drawing below provides an indication on potential excavation impacts on Ausgrid poles. **Note** that this is a guide only.

If you are excavating near an Ausgrid pole please refer to the Ausgrid website for more information, and to make a Safety Clearance Enquiry.

https://www.ausgrid.com.au/Your-safety/Working-Safe/Clearance-enquiries



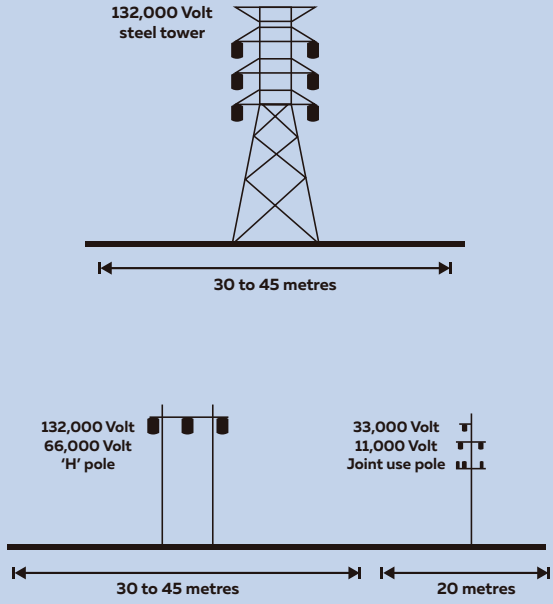
Easements

An electricity easement provides 'right of way' for Ausgrid to access, maintain and repair overhead powerlines, underground cables, and substations on private property. While ownership of the land remains with the property, certain restrictions may apply to how the land can be used. Easements also exist for telephone lines, water and sewage mains and natural gas supply lines.

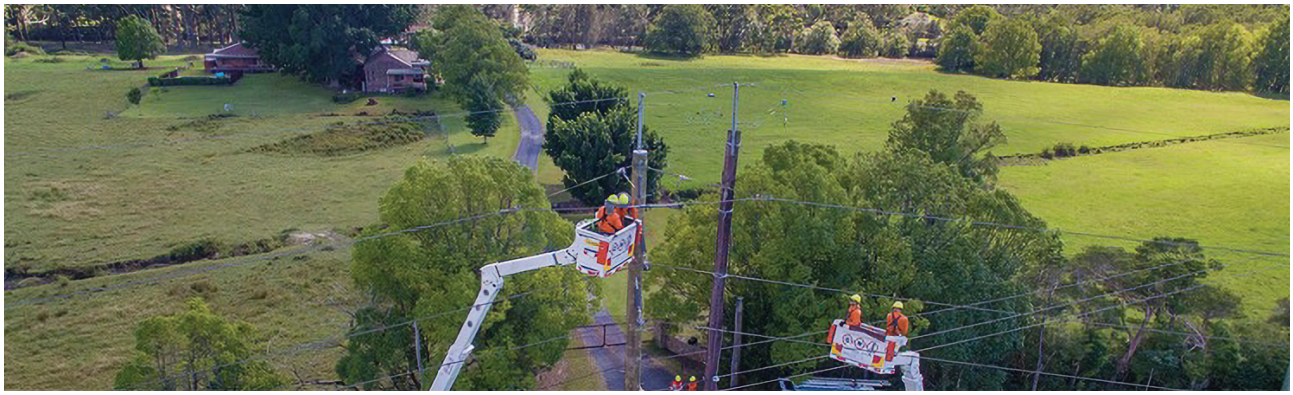
Key information is available in the NS143 standard, Ausgrid Easement Information guide and on the Ausgrid website.

Please refer to the Ausgrid Easement guide for specific guidelines about:

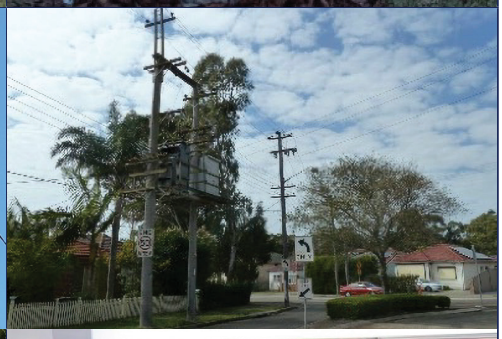
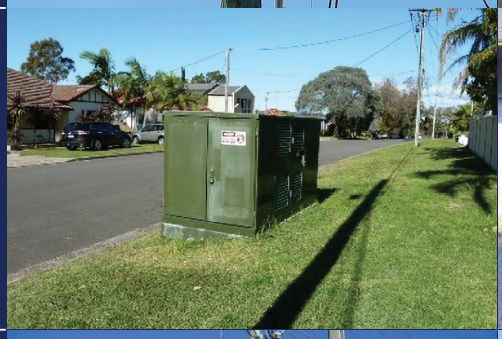
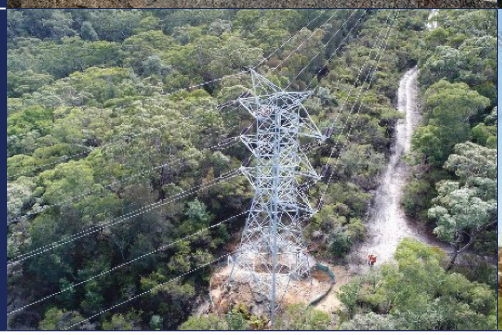
- temporary fencing earthing requirements
- induction risk under lines for anything metallic (i.e. long runs of temp fencing, Colourbond fence replacement etc)
- the risk of transfer potential and need for isolation panels and fence earthing
- dos and don'ts for stockpiling materials on easements, i.e.
  - storage of flammable materials
  - construction materials under our lines
  - parking trucks and trailers that COULD be climbable and in clearance.



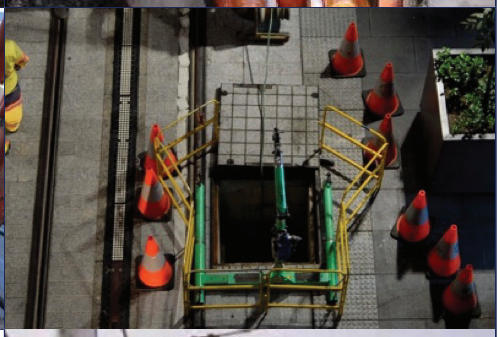
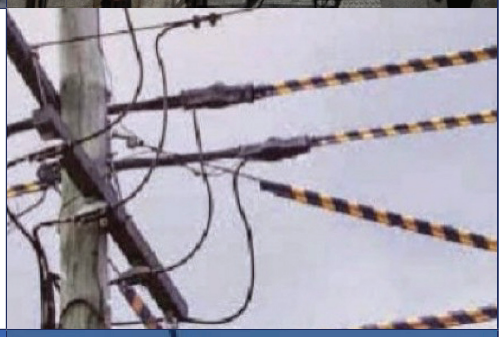
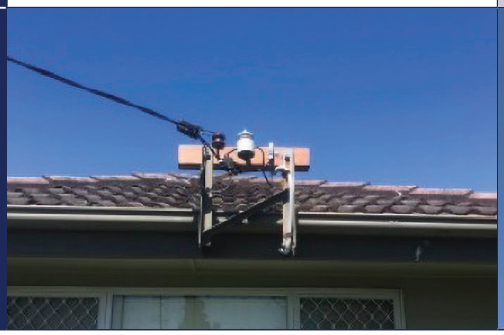
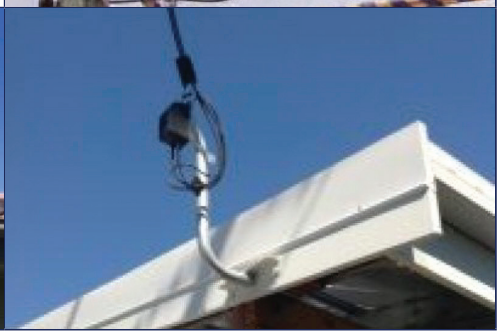
Some typical electricity easements for power lines.



Examples of Assets and Equipment

Underground Pillar		
Pole Transformer (PT)		
Kiosk Substation		
Distribution and Transmission Substations		
Transmission Tower		

Examples of Assets and Equipment

Cable Trench		
Cable Pit		
Torapoli pipe / Tiger tail / Cover or Pipe		
Point of Attachment (PoA)		

Contact Us

Power outage, hazard or emergency

13 13 88

24 hours a day, 7 days a week

General Enquiries

13 13 65

Mon to Fri / 09:00 to 16:30
If you have any questions, comments or need further information, we'd be happy to hear from you.

Correspondence

The Ausgrid postal address for correspondence is:-
GPO Box 4009, Sydney, NSW 2001

Online

For online contact please refer to the Ausgrid website 'Contact Us' page for:-

- Checking or reporting power outages
- Requesting repairs
- Making a claim
- Enquiries and complaints
- Facebook and twitter links
- Frequently Asked Questions