

# Developments near Essential Energy's infrastructure

Why it's important for Development Applications to be referred to Essential Energy

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# Developments near Essential Energy's infrastructure



This document has been developed to help consent authorities and landowners understand:

- Why it is important for Development Applications to be referred to Essential Energy
- When Development Applications should be referred to Essential Energy and
- The appropriate supporting documentation required for Essential Energy to comment on Development Applications.

## Why is it important for Development Applications to be referred to Essential Energy?

As outlined in *ISSC 20 Guideline for the Management of Activities within Electricity Easements and Close to Electricity Infrastructure* ("ISSC-20") Essential Energy needs to:

- Ensure the safety of the public from harm from our network
- Protect our assets from damage
- Minimise the likely impact of structures or other impediments on electricity easements and infrastructure and
- Maintain unimpeded access to electricity easements and infrastructure.

It is essential that buildings, structures, or other objects are not placed, and that activities are not undertaken, within an easement area or close to electrical infrastructure if doing so may affect the safe and continuous operation of the electricity infrastructure or prevent its maintenance, repair, replacement, or upgrade. Public safety risks can arise from induction, step or touch voltages under fault conditions, infringement of safety clearances to conductors and the failure of line materials or structures, uncovering an underground cable or interference with the earthing systems of electrical works, such as power line structures and distribution substations. The consequences of these risks materialising can be catastrophic, including permanent disability or death.

Referrals of Development Applications by Council to Essential Energy form a key control in managing these risks. Hence, Clause 45 of the *State Environmental Planning Policy (Infrastructure) 2007* (NSW) requires that, prior to determining any Development Application (or an application for modification), Councils (acting as consent authorities) give notice to Essential Energy inviting comment as to potential safety risks.

## When should a consent authority refer Development Applications to Essential Energy?

Discussions between Essential Energy and Councils have highlighted a misalignment between planning legislation, the *Electricity Supply Act 1995* (NSW) ("ESA"), *ISSC-20* and industry practice when it comes to Development Application referrals and encroachments on electricity assets. This misalignment is creating some confusion for Councils in determining when to refer Development Applications.

Landowners/developers are required to comply with all building codes and legislation (including the *ESA*) i.e. their obligations extend beyond the planning legislation. This is the case for complying developments as well. The *ESA* gives Essential Energy the powers to control activities within an electricity easement or close to electricity infrastructure. Section 49 allows Essential Energy to require a landowner, at their cost, to remove structures that create safety or fire risks.

As a result, whilst clause 45 of the *State Environmental Planning Policy (Infrastructure) 2007* ("SEPP") includes references to distances within which Councils must refer Development Applications to Essential Energy, the actual easement width contained within *CEOP8046 – Easement Requirements* (Table 1, 2, 3 and 4 below) are applied by Essential Energy when judging whether a development has encroached on Essential Energy's network. The easement widths contained in *CEOP8046* are based on industry standards and range depending on voltage and other factors.

Note that the widths outlined in *CEOP8046* are generally more conservative than those found in *AS/NZS 7000* to take into account factors like sag and blow out. Depending on the activity being carried out, Essential Energy may not have safety concerns with certain activities being carried out within the widths outlined in *CEOP8046*. Essential Energy may require a report be provided by a suitably qualified consultant (Level 3 Accredited Service Provider), even with this report, Essential Energy does not guarantee acceptance of any encroachment.

Please be aware that Padmount substations have an exclusion zone for fire segregation which can be greater than the easement dimensions outlined within *CEOP8046*. As such, any development within 6m of a Padmount substation should be referred to Essential Energy.

Likewise, swimming pools have a greater risk and should be referred to Essential Energy if they are within 30.0 metres of any Essential Energy assets.

When determining whether to refer a Development Application to Essential Energy, councils are encouraged to use the widths found in *CEOP8046* as well as those noted above for Padmount substations and swimming pools, as well as the clauses within section 45 of the *SEPP*. Where Councils only refer Development Applications by applying the clauses within the *SEPP*, and not those in *CEOP8046*, residents may find that Essential Energy subsequently require them to amend their development (sometimes after construction) to meet safety clearances. This is not an ideal outcome for the resident, Council or Essential Energy.

Further information can be found on the Essential Energy website.

# Developments near Essential Energy's infrastructure



## My development is an exempt or complying development, does it need to be referred to Essential Energy?

Yes, Essential Energy encourages referrals of exempt or complying development projects to Essential Energy. Section 49 of the ESA provides Essential Energy with the power to require structures or things that could destroy, damage or interfere with electricity works, or could make those works become a potential cause of bush fire or a risk to public safety, to be modified or removed. This is the case even when development is not triggered by the SEPP. Therefore, it is in the Landowners, Councils and Essential Energy's interest for these developments to be referred where required.

## What information does Essential Energy need to make an assessment?

The following supporting documentation is required to be submitted to Essential Energy:

- > The registered easement terms if an easement exists. You can obtain a copy of the easement terms from your Solicitor /Conveyancer/Surveyor or through a search agent of Land Registry services
- > Design drawings showing the proposed development and the powerlines (whether overhead or underground). Accurate measurements must be provided with drawings showing the plan view along with elevation views
- > Information about the development such as its usage, construction material, will it be connected to a power source, will it be earthed etc.
- > Have you assessed the development against Essential Energy's reference documentation.

## Essential Energy's Reference Documents

- > Essential Energy's Easement Requirements document (CEOP8046) – note: if Essential Energy's standard easement widths fall within or are larger than the range contained in AS/NZS 7000 then Essential Energy's easement width as per CEOP8046 is applied
- > ISSC 20 Guideline for the Management of Activities within Electricity Easements and Close to Infrastructure. A copy of this guideline can be located at: [energy.nsw.gov.au/sites/default/files/2018-09/ISSC-20-Electricity-Easements\\_0.pdf](http://energy.nsw.gov.au/sites/default/files/2018-09/ISSC-20-Electricity-Easements_0.pdf)
- > The Australian Standard AS/NZS 7000 Appendix CC. If the applicant wishes to rely on the distances contained in AS/NZS 7000 a report showing distances under blow out and sag conditions will be required from a Level 3 Accredited Service Provider.

## What will Essential Energy provide in response to a referral?

Where developments have been referred under Clause 45 of the SEPP, Essential Energy will provide comment within 21 days advising if there are any potential safety risks that a development may pose in relation to Essential Energy's electrical infrastructure.

## What happens if Essential Energy raises a safety concern but the Council decides to approve the Development Application?

Clause 49 of the ESA allows Essential Energy to require a landowner, at their cost, to remove structures that create safety or fire risks. Should Council approve a Development Application where Essential Energy has raised a safety concern there is the potential that Essential Energy will require the landowner to amend the development at their cost.

## Will Essential Energy allow certain structures within its easement?

Essential Energy will consider a development within easements where the application is accompanied by a report from a suitably qualified electrical consultant (Level 3 ASP) showing safety compliance and risks can be mitigated appropriately. However, prohibited activities (as per ISSC-20) will generally not be considered acceptable within easements or close to our infrastructure and Essential Energy reserves the right to reject the application based on our assessment of the safety or fire risks or any access issues created by the development.

## Where should referrals be lodged?

Referrals can be lodged with Essential Energy via:

- > Development Applications – via the NSW Planning Portal: [planningportal.nsw.gov.au](http://planningportal.nsw.gov.au); or
- > Complying and Exempt Developments – via e-mail to: [te\\_technical.enquiries@essentialenergy.com.au](mailto:te_technical.enquiries@essentialenergy.com.au)

## Will there be a fee for the referrals of Development Applications to Essential Energy?

There are no fees applied to initial referrals of Development Applications by Councils. However, there may be fees for any requests by applicants to Essential Energy for technical advice related to their development. Please visit the Development Application Referral page on our website for the latest information regarding our fees.



# Developments near Essential Energy's infrastructure



**Table 1**

Overhead powerlines	Width in Metres from CEOP8046
<b>132kV</b> 'H' pole type Single pole	<b>45</b> <b>40</b>
<b>66kV</b> 'H' pole type Single pole	<b>30</b> <b>30</b>
<b>33kV (Inc.19.1kV SWER)</b> 'H' pole type Single pole	<b>30</b> <b>25</b>
<b>22kV (Inc.12.7kV SWER)</b> Bare wire CCT ABC	<b>20</b> <b>20</b> <b>15</b>
<b>11kV</b> Bare wire CCT ABC	<b>20</b> <b>20</b> <b>15</b>
<b>Low voltage</b> Bare wire ABC	<b>15</b> <b>10</b>

**Table 2**

Underground powerlines	Width in Metres
<b>132kV</b>	<b>6</b>
<b>66kV</b>	<b>6</b>
<b>33kV (Subtransmission)</b>	<b>6</b>
<b>33kV (Distribution)</b>	<b>2</b>
<b>22kV</b>	<b>2</b>
<b>11kV</b>	<b>2</b>
<b>Low voltage</b>	<b>1</b>

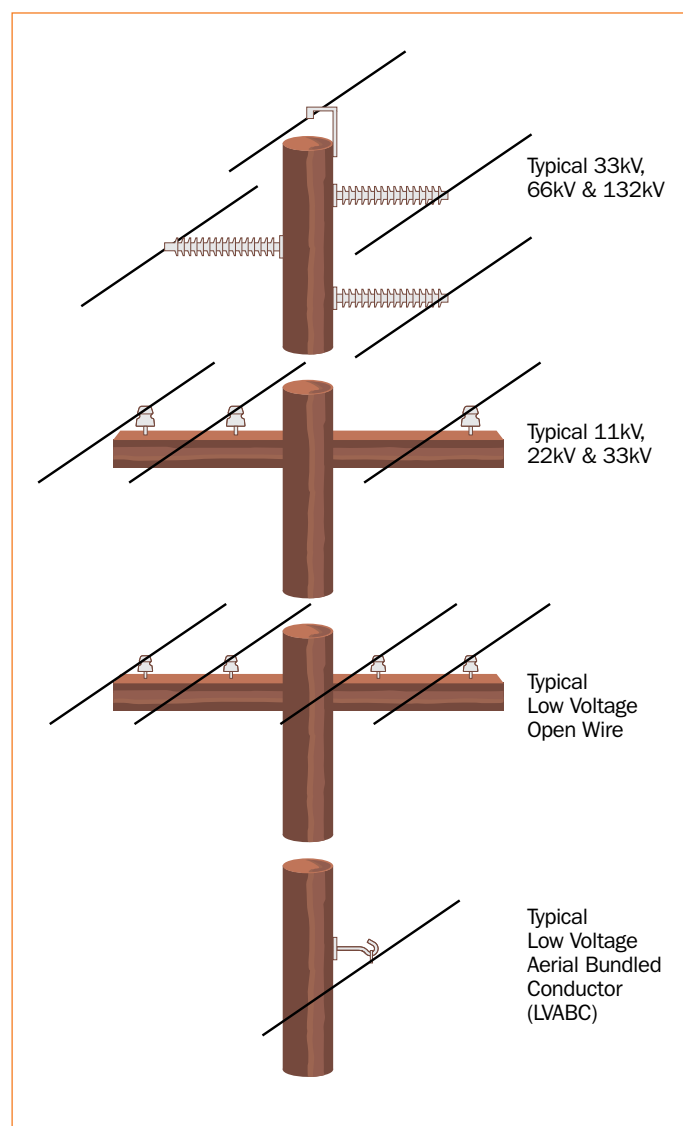
**Table 3**

Service powerlines	Width in Metres
<b>Overhead Insulated</b>	
Long span	<b>10</b>
Short span	<b>5</b>
<b>Underground</b>	<b>1</b>

**Table 4**

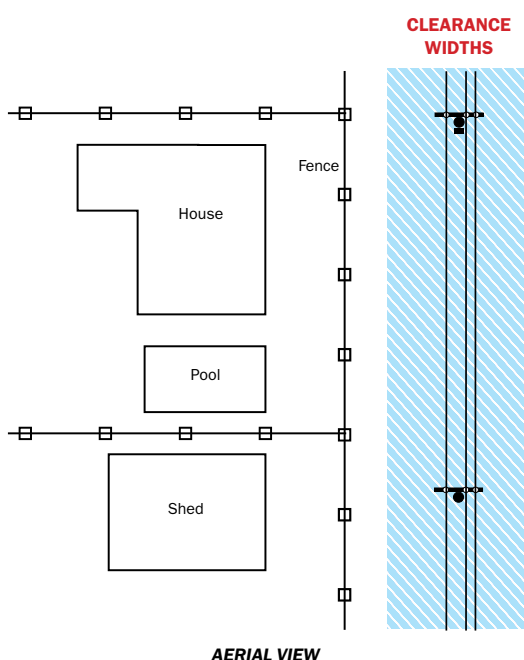
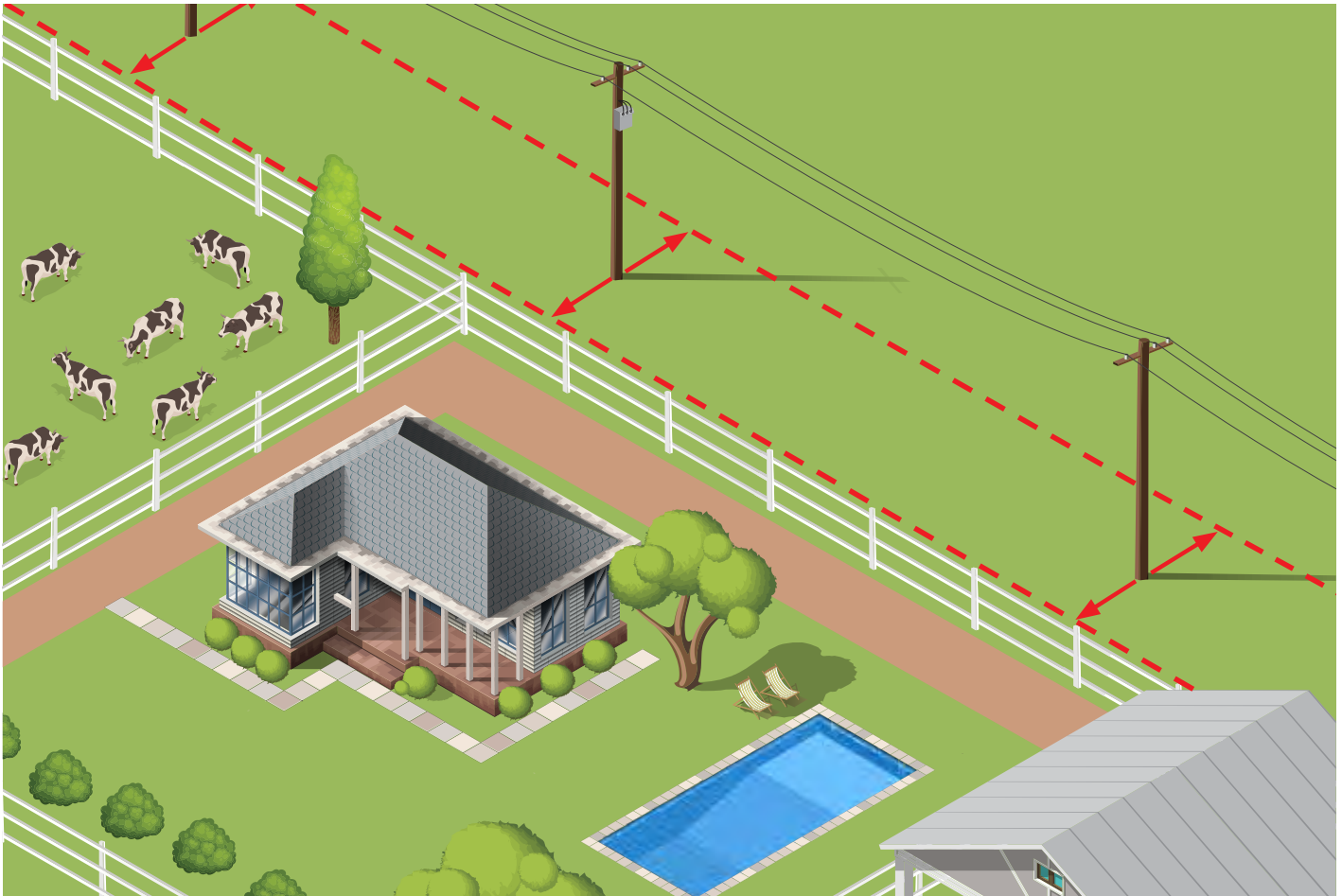
Padmounted substation and Switch pillars	Dimension in Metres
<b>Padmounted substation</b>	
22kV elongated	<b>4.2 x 7.0</b>
11kV elongated	<b>4.2 x 7.0</b>
11kV swat type	<b>5.4 x 4.5</b>
<b>Switch pillar</b>	
22kV	<b>3.0 x 3.0</b>
11kV	<b>3.0 x 3.0</b>
Low voltage	<b>2.0 x 2.0</b>

**Typical powerlines**





## Powerlines with an easement or protected under Section 53 of the Electricity Supply Act 1995



### Powerlines protected by an easement

If a structure, activity, or thing is to encroach; the following must be considered.

- > Do the easement terms allow this activity?
- > Is the activity located within the clearance widths as per Tables 1, 2, 3 and 4?
- > Does the activity comply with ISSC-20 e.g. is it a prohibited, controlled or permitted activity?
- > Is there sufficient information provided for the Network Operator to make an assessment?

### Powerlines protected by section 53 of the Electricity Supply Act 1995

Electricity assets installed before 26 May 2006 are protected for the purposes of repairing, replacing, modifying, and upgrading these assets under section 53 of the *Electricity Supply Act 1995*.

- > Does the activity comply with ISSC-20 and/or CEOP8046 e.g. is it a prohibited, controlled or permitted activity?
- > Is the activity located within the clearance widths as per Tables 1, 2, 3 and 4?



## Safety Clearance Zones for overhead powerlines located in a road reserve

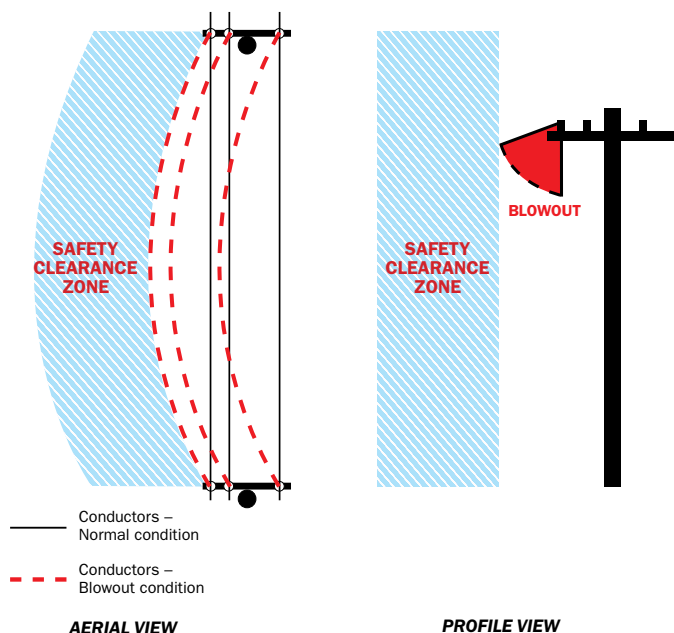


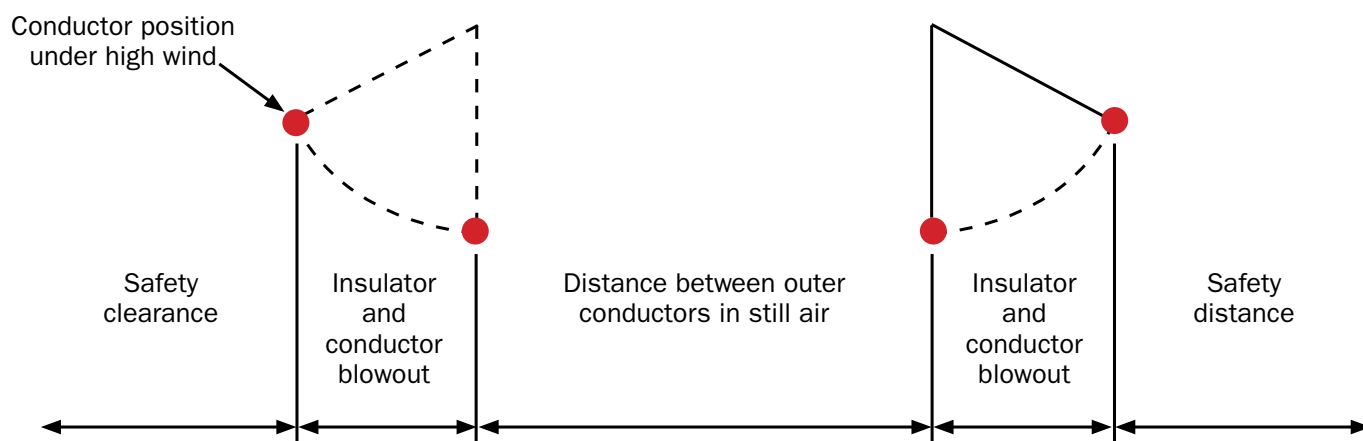
Table 5

Safety Clearances	
Voltage	Clearances (horizontal)
Insulated $\leq 1000$ V	<b>1.0m</b>
Bare Conductor $\leq 1000$ V	<b>1.5m</b>
Insulated $> 1000$ V	<b>1.5m</b>
Bare or covered $1000$ V $< U \leq 33$ kV	<b>2.1m</b>
Bare $33$ kV $< U \leq 132$ kV	<b>3.0m</b>

Conductors and insulators will move in different weather conditions which can impact the safety clearances to structures. This is called conductor “blowout” and must be considered when determining clearances to structures, activities, or things. Clearance zones as per Table 5 and Table 6 start from the point of maximum blowout of the conductor and insulator.

### Development where electrical infrastructure is within road reserves

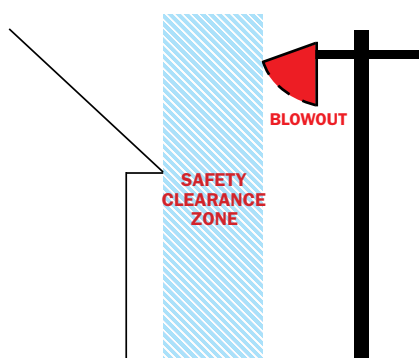
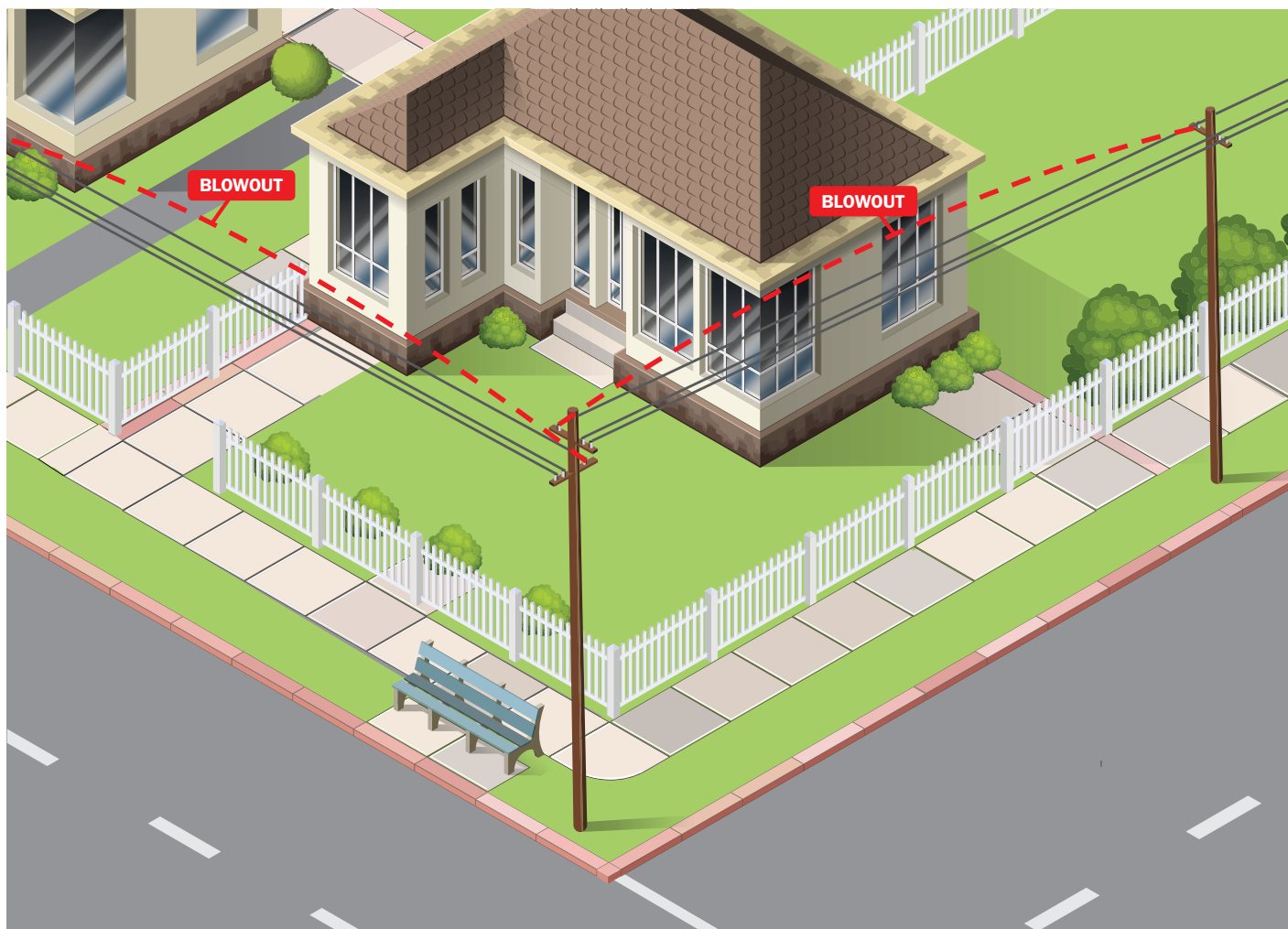
In urban areas typically the required setback zones of structures from the street frontage ensure the required safety clearances to overhead conductors are met. Where urban consolidation strategies have been adopted, or current or proposed setbacks are not sufficient, Essential Energy requires the structure to have the minimum safety clearances as set out in AS/NZS 7000 table 3.7 as the “C” distance for the appropriate voltage as shown in Table 5 of this document. This distance is to be added horizontally after maximum blowout of the conductor is determined.



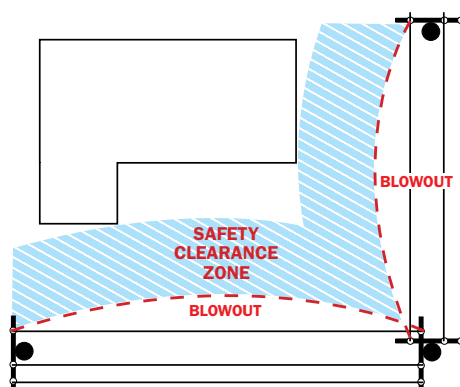
# Developments near Essential Energy's infrastructure



## Domestic overhead situation



PROFILE VIEW



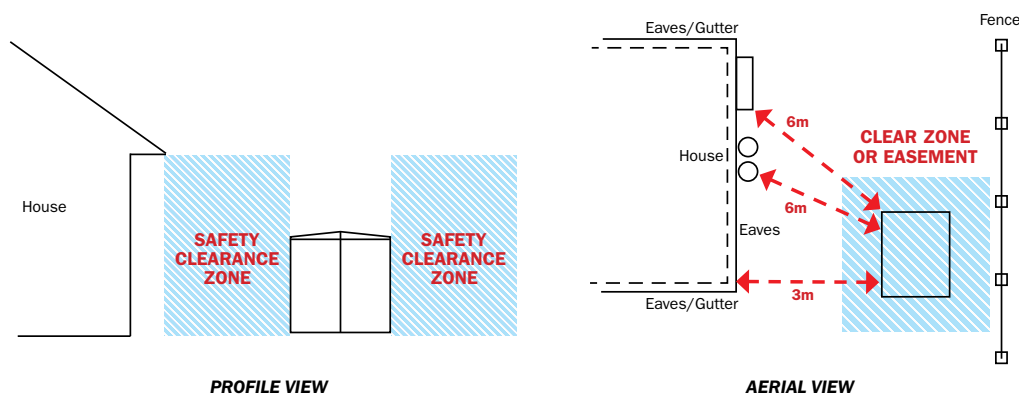
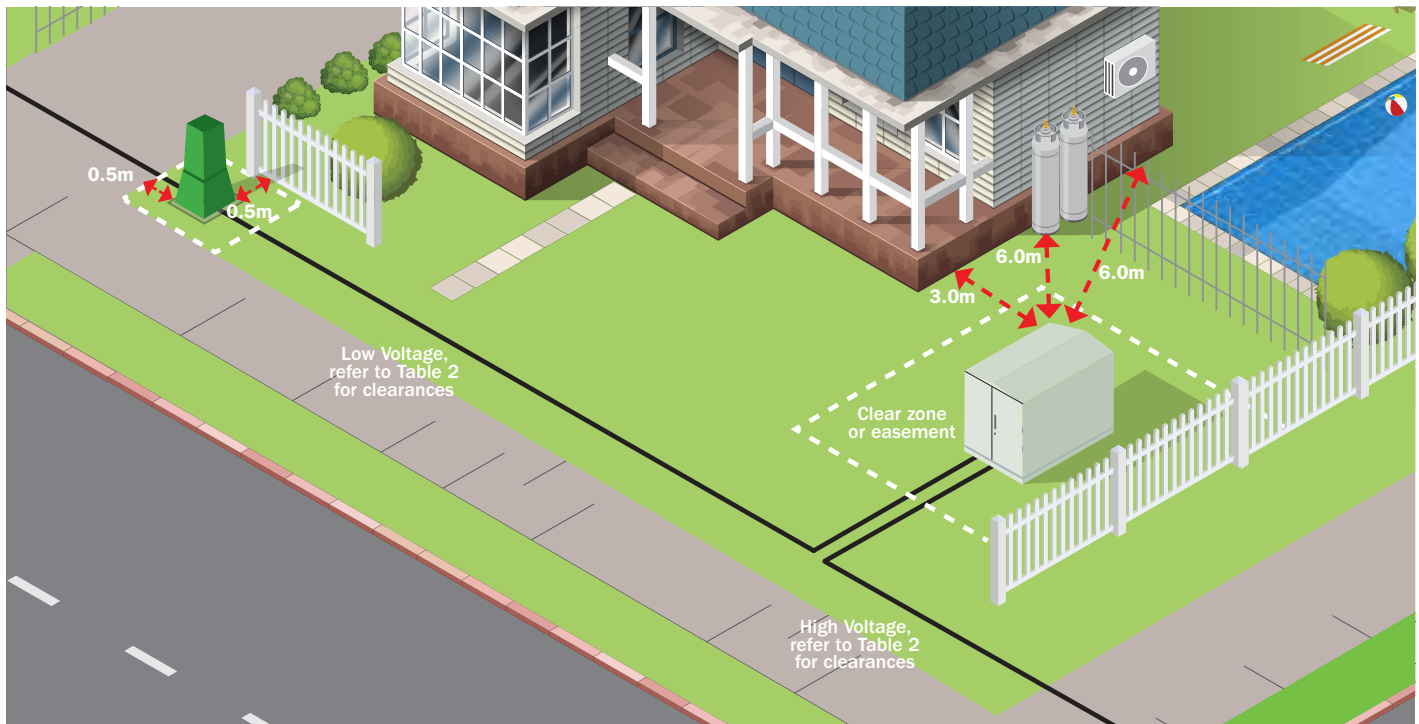
AERIAL VIEW

The construction of houses, buildings, substantial structures, or parts thereof including eaves are prohibited within the safety clearances as per Table 5.

# Developments near Essential Energy's infrastructure



## Domestic underground situation



### 1. Fire segregation

a) This must be considered when constructing structures near padmount substations, AS2067 requirements must be complied with.

### 2. Underground Clearances

- a) Low Voltage cable clearances as per the distances shown in Table 2
- b) High Voltage cable clearances as per the distances shown in Table 2
- c) Pillars/Pits must be clear of any obstruction be a minimum of 500mm, including fences, vegetation, driveways, garden beds etc.
- d) Fences or bollards on the boundary of a padmount substation must comply with the following:
  - i. The fence is segregated by an insulating panel to prevent transfer of earth voltage rise under fault conditions
  - ii. That portion of the fence or bollards adjacent to the substation must be earthed to Essential Energy standards
  - iii. Any fence posts or bollards must be clear of cable routes
  - iv. Access is always maintained.
- e) The ground surface within the clearance zone of a padmount substation must be either grass or woodchip, any other surface treatment must be approved by Essential Energy, this includes any increase of ground levels or excavation
- f) Vegetation must remain clear of clearance zones for underground cables
- g) Structures must not be placed over the top of cables unless approved by Essential Energy.

### 3. Swimming Pools

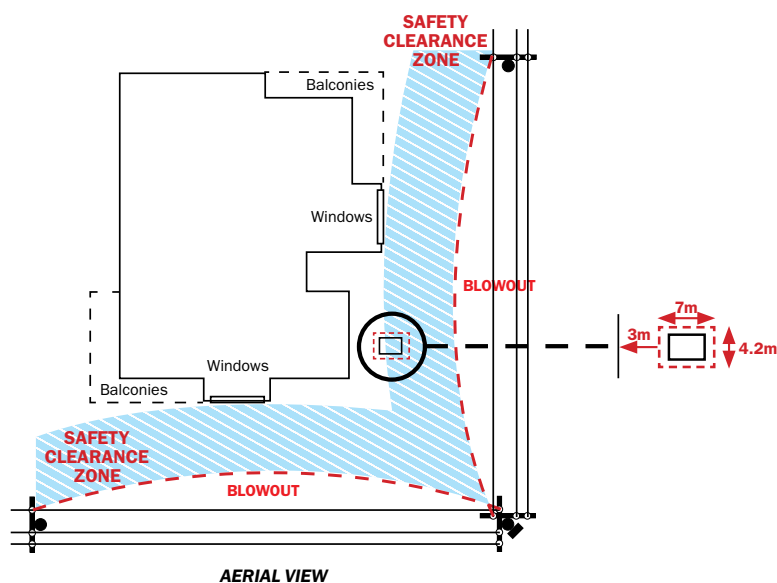
- a) Pools proposed in a location near a padmount substation requires site specific study and risk assessment for earthing and the effects of earth faults
- b) Pool fencing must comply with the requirements of ISSC-20 section 7.2.3



# Developments near Essential Energy's infrastructure



## Multi-story developments







## Multi-story development

### 1. Fire segregation

- a) This must be considered when constructing structures near padmount substations, AS2067 requirements must be complied with.

### 2. Underground Clearances

- a) Low Voltage cable clearances as per the distances shown in Table 2
- b) High Voltage cable clearances as per the distances shown in Table 2
- c) Pillars/Pits must be clear of any obstruction be a minimum of 500mm, including fences, vegetation, driveways, garden beds etc.
- d) Fences or bollards on the boundary of a padmount substation must comply with the following:
  - i. The fence is segregated by an insulating panel to prevent transfer of earth voltage rise under fault conditions
  - ii. That portion of the fence or bollards adjacent to the substation must be earthed to Essential Energy standards
  - iii. Any fence posts or bollards must be clear of cable routes
  - iv. Access is always maintained.
- e) The ground surface within the clearance zone of a padmount substation must be either grass or woodchip, any other surface treatment must be approved by Essential Energy, this includes any increase of ground levels or excavation
- f) Vegetation must remain clear of clearance zones for underground cables
- g) Structures must not be placed over the top of cables unless approved by Essential Energy.

### 3. Swimming Pools

- a) Pools proposed in a location near a padmount substation requires site specific study and risk assessment for earthing and the effects of earth faults
- b) Pool fencing must comply with the requirements of *ISSC-20* section 7.2.

### 4. Overhead Clearances

- a) Where the Powerline is located in the road reserve safety clearances as per Table 5 are required
- b) Where the powerline is located within the property then clearance zones as per Table 1 are required.

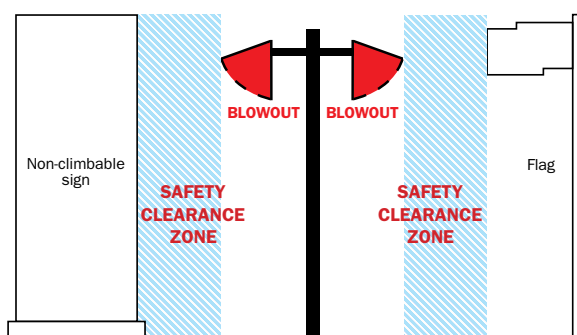
### 5. Vegetation

- a) Vegetation must remain clear of poles and stays by a minimum of 5.0 metres
- b) Vegetation must not exceed 4.0 metres in height (mature height), with no climbable part of the vegetation being over 2.5 metres in height.

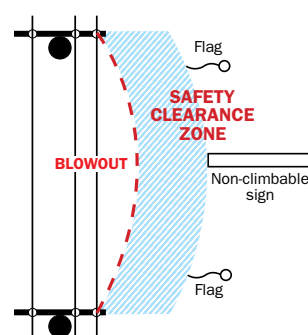
# Developments near Essential Energy's infrastructure



## Non-climbable flag poles, signs, and the like



PROFILE VIEW



AERIAL VIEW

## Non-climbable flag poles, signs, and the like:

- > Greater than 4.6 metres in height must be clear of the safety clearance zone (in Table 6)
- > Metallic parts must be earthed and
- > Any connection to an electricity supply must be suitably protected back to its source.

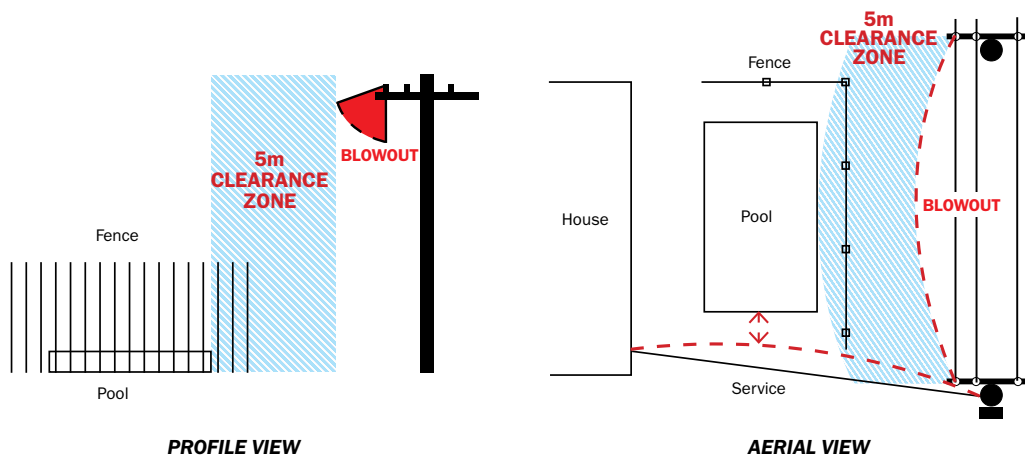
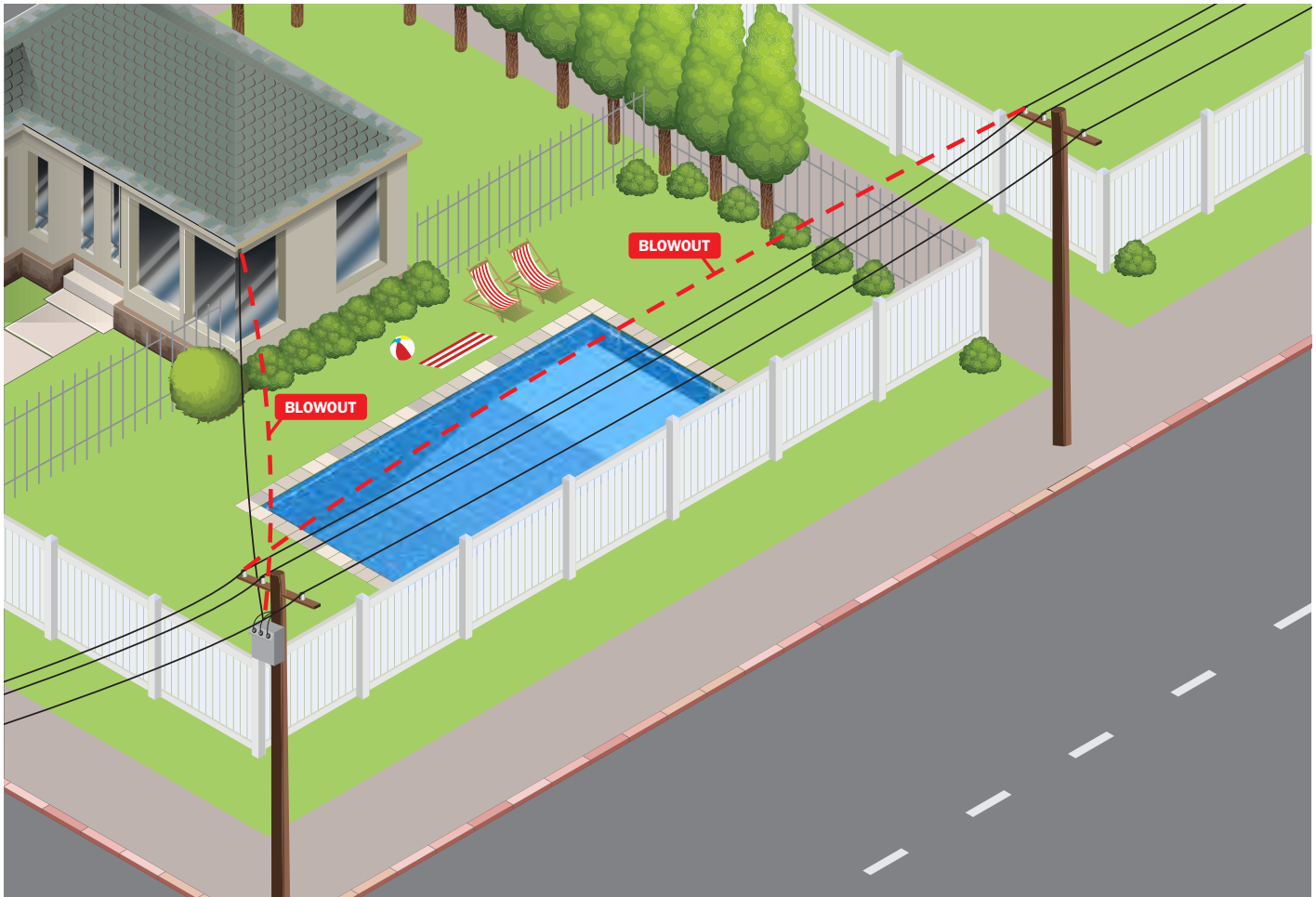
Non-climbable flag poles, weathervanes, signs, and the like up to 4.6 metres in height will be assessed on an individual basis.

Clearances for construction, operation and maintenance of these activities will be considered during the assessment process.

Table 6

Safety Clearances (Non climbable)	
Voltage	Distance (horizontal)
Insulated $\leq 1000$ V	0.1m
Bare Conductor $\leq 1000$ V	0.6m
Insulated $> 1000$ V	0.6m
Bare or covered $1000$ V $< U \leq 33$ kV	1.5m
Bare $33$ kV $< U \leq 132$ kV	2.5m

## Swimming pools near overhead conductors



### Swimming Pools are considered a prohibited activity:

Where no alternative space clear of the clearance zone is available, in ground pools (above ground pools are prohibited) may be approved provided that:

- > The pool shall not hinder access to the line structures
- > The pool is no closer than 5.0 metres of the nearest outside phase conductor, as per illustration (5m clearance zone)
- > 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.



## Swimming Pools near overhead conductors

### Swimming Pools are considered a prohibited activity:

- > The pool must be surrounded by pavers on a sand bed for at least 3.0 metres from the water's edge, and no taps, electrical wiring, phone lines or other conductive objects to be installed in the paved area. If the pool is less than 3.0 metres from the property boundary, paving must extend to the boundary, and a fence at least 1.5 metres high must be erected along this section of the boundary fence. The fence must be non-conducting or bonded to the pool reinforcing, with an insulating section as described below
- > Metallic fences surrounding the pool are to be bonded to the pool reinforcing at all corners, and not to extend away from the pool, unless an insulating section is installed, at least 5.0 metres wide
- > Any taps or other metallic objects within 2.0 metres of the edge of the paved area must have an insulated section installed
- > Wiring to the pool pump, etc. must be via an isolating transformer, with no MEN connections to any wiring in the vicinity of the pool
- > No underwater lighting in the pool unless it is fibre optic construction, and the light source power supply is located outside the easement
- > Pools proposed in a location near an earthed piece of equipment such as a pole mounted substation, gas switch etc will require site specific study and risk assessment for earthing and the effects of earth faults and
- > Pool fencing must comply with the requirements of ISSC-20 section 7.2.3.

Service Lines must meet the requirements of the NSW Service and Installation Rules. A service must not be within Zones 0, 1 or 2 as documented in AS 3000 and the clearances to the Zones must allow for blowout of the conductor.

## State Environmental Planning Policy (Infrastructure) 2007

Current version for 3 April 2018 to date (accessed 6 June 2018 at 10:17)

Part 3 > Division 5 > Subdivision 2 > Clause 45

### 45 Determination of development applications – other development

- (1) This clause applies to a development application (or an application for modification of a consent) for development comprising or involving any of the following:
  - (a) the penetration of ground within 2m of an underground electricity power line or an electricity distribution pole or within 10m of any part of an electricity tower,
  - (b) development carried out:
    - (i) within or immediately adjacent to an easement for electricity purposes (whether or not the electricity infrastructure exists), or
    - (ii) immediately adjacent to an electricity substation, or
    - (iii) within 5m of an exposed overhead electricity power line.
  - (c) installation of a swimming pool any part of which is:
    - (i) within 30m of a structure supporting an overhead electricity transmission line, measured horizontally from the top of the pool to the bottom of the structure at ground level, or
    - (ii) within 5m of an overhead electricity power line, measured vertically upwards from the top of the pool.
  - (d) development involving or requiring the placement of power lines underground, unless an agreement with respect to the placement of underground power lines is in force between the electricity supply authority and the council for the land concerned.
- (2) Before determining a development application (or an application for modification of a consent) for development to which this clause applies, the consent authority must:
  - (a) give written notice to the electricity supply authority for the area in which the development is to be carried out, inviting comments about potential safety risks, and
  - (b) take into consideration any response to the notice that is received within 20 days after the notice is given.

**Network enquiries 13 23 91**

**Power outages 13 20 80**

**[essentialenergy.com.au](http://essentialenergy.com.au)**

