Part of the Energy Queensland Group

Operational Update

Energex Contestable Works
Energex Padmount Transformer Clearance Zone Requirements

Issue # C-0020 v2 – 16/11/2020

Target Audience:

Energex Accredited Design Consultants

Padmount Transformer Clearance Zone

The Energex Underground Distribution Construction Manual (6229-A4) Section C3 Sub-Sect 1 Sheet 1 states that the edge of all Padmounted substation (PMT) enclosures shall be located a minimum of 4m from the edge of a permissible residential dwelling construction area (to address noise, EMF and fire and explosion risk).

It is important that everything possible is done to achieve this outcome at the design phase of the project. Energex requires that all Accredited Design Consultants must check for clashes and verify compliance with their design when selecting a PMT site. This means building envelopes, set backs, and side and boundary clearances must be determined as part of the site location process. It has been identified that the clearance requirements are typically hard to achieve on lots that include built to boundary (zero lot alignment lots), narrow frontage lots and lots adjoining land that is not part of the development.

It is equally important that the Accredited Design Consultant advises the developer or their representatives of this requirement. If this requirement is not achieved it can cause significant problems such as relocation of the PMT at the developers expense.

If it is identified that these requirements are not achievable, Energex Contestable Works team will consider the application of the ERGON Underground Distribution Standard site requirements applicable to fire risk zone (see attached).

For managing fire risk, ERGON drawing 5000 sheet 1 states the minimum distances required for the separation of padmount substations and buildings being:

- Residential buildings (BCA class 1 or 10) - 3.0m
- All other buildings - 6.0m

ERGON Drawing 5335 Sheets 1 & 2 show the fire risk zone around a padmount substation.

The separations provided are the minimum and any additional separation required by the building owner or local authority shall apply.

Where the separation distance cannot be met between padmount substations and buildings, a barrier with FRL 120/120/120 shall be provided. Where a building or building surface within the fire risk zone has a minimum FRL 120/120/120 no additional barrier is require. The minimum dimensions for fire barrier is shown on ERGON drawing 5335 sheet 3.

The separation required between the PMT and a barrier of fire rated building is 1.0m.

Note: ONLY NON-PERMANENTLY HABITABLE rooms such as garages located in proximity to the PMT will be considered in association with the application of this approach for managing fire risk. Compliance with the ENERGEX clearance requirements of 4m to areas for which human occupation can be expected for significant times such as bedrooms/living areas is still required for managing audible nosise and EMF.

Should the ERGON Standards need to be applied, Energex Contestable Works team will require supporting documentation to enable the approval required.

In addition, Energex will not permit a PMT to be positioned in a location that is adjoining an allotment that is already owned by a 3rd party. It is only possible if the site is already dedicated road reserve prior to the adjoining lot being sold.

Building envelopes

To ensure due dillegence has been taken to ensure Energex and future customers do not have clearance issues in the future, Energex Contestable Works team require the proposed building envelopes adjacent to the proposed transformer sites to be shown on the works plan or provided as separate documentation when a design check or Subdivision Electricity Supply Agreement is being requested.

Easements

Where it has been identified that there is a conflict with the proposed transformer site and the building envelope, Energex's preference is for you to find another transformer site that does not have a clearance issue. Should this not be achievable, and the clearance is reduced to less than 3 metres, Energex will require an easement, dedicated in favour of Energex. The easement must provide an exclusion zone that is a minimum of 3 metres from the transformer enclosure as per ERGON Drawing 5335 Sheets 1. The easement is to be clearly idenfied on the worksplan submitted to Energex for a Subdivision Electricity Supply Agreement.

As per existing practices, where an easement is required the following items shall be provided before switching or issueing a Certificate of Supply,

- A copy of the surveyor signed survey plan showing the proposed easement, and
- The relevant easement documentation, Department of Natural Resources and Mines Form 9 – Easements signed by the Grantor.

The Land Registry Form 9 shall show the following:

- Item 5 - Grantee as “Energex Limited (ACN 078 849 055)”
- Item 7 – Purpose of Easement as the “Supply of Electricity”.
- Item 8 - and shall refer to one of the following relevant memorandum number:

The standard easement conditions used by Energex are:

- Dealing No 708346714 – Freehold tenure - Underground and overhead conditions

Implementation Date

Effective immediately for all projects that do not have a Subdivision Electricity Supply Agreement in place.

For more information please contact
E-mail: contestable@energex.com.au

PADMOUNTED SUBSTATION INSTALLATION

1. Site

Padmounted substation sites shall be recessed in the property alignment and shall be surveyed and dedicated as part of the road reservation. The required recessed area (clearance zone) is defined below.

PADMOUNT TYPE	All estate clear road reserve (width & depth)
SQUARE TYPE COMMON EARTH	4.8m x 5.0m for flat site & sloping site with retaining wall
SQUARE TYPE SEPARATE EARTH	12.6m x 8.9m
RECTANGULAR TYPE COMMON EARTH	4.6m x 6.7m for flat site & sloping site with retaining wall
RECTANGULAR TYPE SEPARATE EARTH	11.7m x 9.9m

All dimensions are clear internal dimensions.
Square Padmounts are preferred.

Provision for separate earthing is always required unless the developer / consultant can prove (via test certificates) that common earthing requirements are satisfied.

Square padmount substations shall be centrally positioned and;
- recessed so that the concrete plinth is 1300mm from the R.P. street alignment or,
- have 2000mm dedicated clear area directly in front of the plinth.

The site shall be a location with:
- Stable soil conditions
- Level topography
- Where possible free from steep batters
- 4 metres minimum from edge of permissible residential dwelling construction area to edge of padmounted substation enclosure (to address audible noise, EMF requirement, and fire and explosion risk).

All new distribution network padmounted transformers, ground mounted transformers, and ring main units shall be installed above the 1:100 year or the Defined Flood Level (DFL), whatever is higher.

For coastal areas, substation site must be located as far as possible from the shoreline and sheltered from salt spray.

Landlocked padmount sites shall also have appropriate easements for electric cables and conduits. They should also allow an additional 700mm in front of the HV end to allow for 2m clear operating zone. Note the clearance zone in this case is not dedicated as part of the road reserve.

Guidelines for locating padmount and ground transformers with oil volumes above 500L but less than 2000L in sensitive areas, refer Supply & Planning Manual - Sect 3.2 - clause 3.2.6.1

TRUNCATED STREET ALIGNMENT

For substation site on a truncated section of the street alignment;
The front edge of the substation plinth shall be 1300 mm from and as near to parallel as possible to the real property street alignment.

A minimum of 900 mm clear access around the substation sides and back shall be maintained to the real property boundary.

HAZARDOUS AREAS AND HYDRANTS

The siting of padmount transformers in the vicinity of public swimming pools, service stations, flammable gas or liquid storage tanks shall be avoided. Designers must refer to the following standards:
AS/NZS 1596 - LP Gas - Storage & Handling
AS 1940 - Storage & handling of flammable and combustible liquids
AS/NZS 2229.2 - Fuel Dispensing Equipment for Explosive Atmospheres.
AS 2430 - Classification of hazardous areas

Note also for the requirement in AS2419.1 - Fire Hydrant Installation that an external fire hydrant or Fire Booster Station shall not be installed within 10m from a distribution transformer (eg padmount or ground transformer), ring main unit, HV metering unit or other ground mounted HV equipment.

A	ORIGINAL ISSUE					
H	DATE	22.01.19	APPD	A. BLETCHLY	CKD	B. BRUNSMANN	DRN	T. BORG	Notes amended around 4m minimum requirements

energex

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UNDERGROUND DISTRIBUTION CONSTRUCTION MANUAL

CIVIL WORKS
PADMOUNT TRANSFORMER SITES
GENERAL SITE REQUIREMENTS

APP'D	R. ENGLISH		CAD
DATE	10/10/08	6229-A4	H
RECD		SECTION C3	SUB-SECT. 1
CKD	P.BARNEY	SHT 1	OF 9
DWN	F.AMANPOOR	FILE UDC-C3-1-1H.DWG	

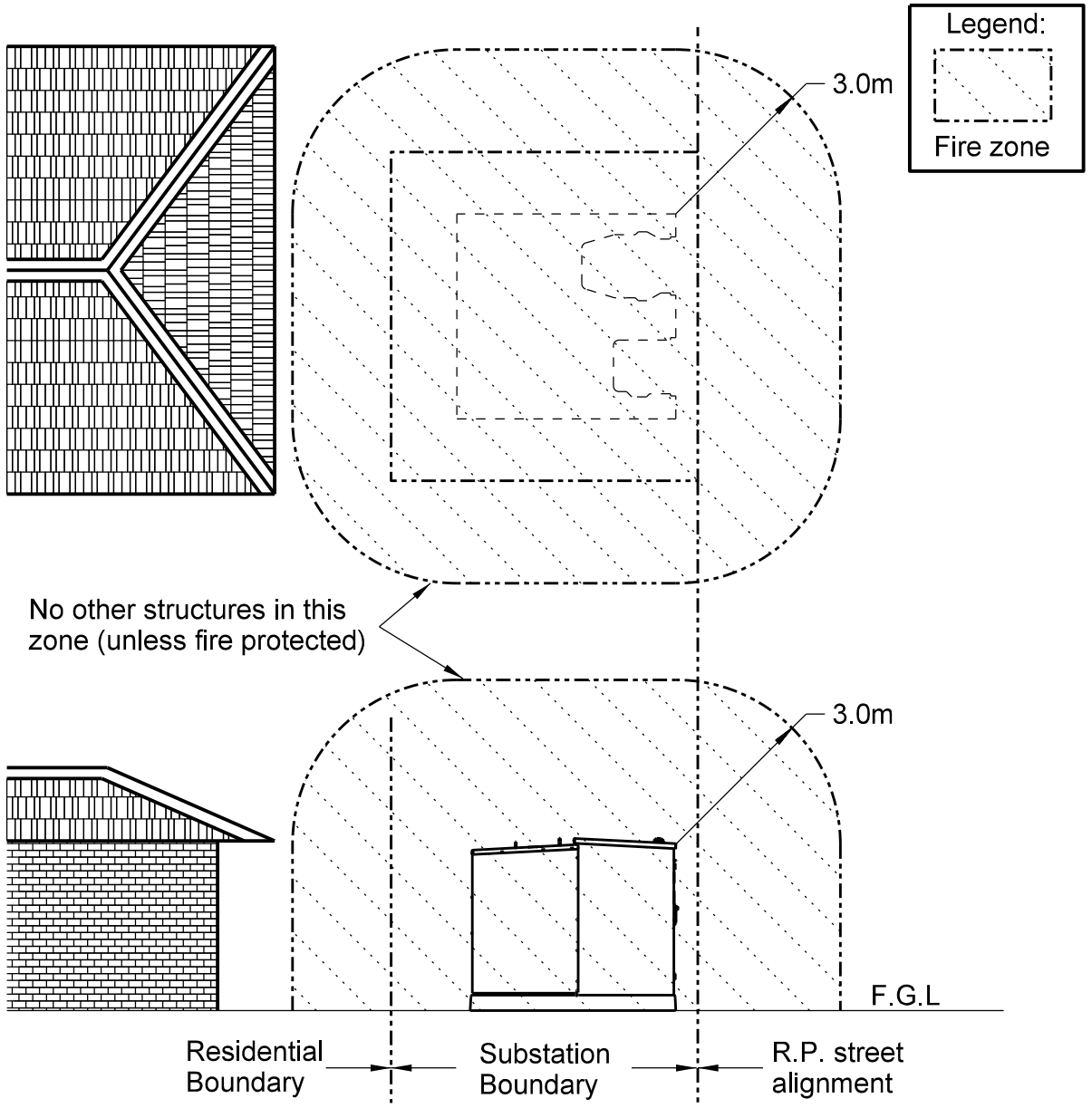
NOTES:

1. The fire risk zone shown applies to the following padmount substation constructions:
   - 315 kVA
   - 500 kVA
   - 750 kVA
   - 1000 kVA

2. The fire risk zone shown applies to Building Code of Australia (BCA) class 1 & 10 buildings.

3. This drawing is indicative only. The fire risk zone extends 3.0m from the outer point of the padmount substation.

4. Easement details shown on this drawing are indicative only, actual easement size will depend on earthing arrangement and padmount substation location.



A	ORIGINAL ISSUE	HARD COPY UNCONTROLLED	Ergon Energy Corporation Ltd ABN 50 087 646 062	APPROVED	C. Noel
				DATE	20/08/15
				PASSED	A. Bletchly
				DRAWN	T. Borg

UNDERGROUND DISTRIBUTION
11kV PADMOUNTED SUBSTATIONS
FRONT ENTRY TYPE
FIRE RISK ZONE - RESIDENTIAL

FILE: 5 55 5335 1

Dwg 5335 Sh 1

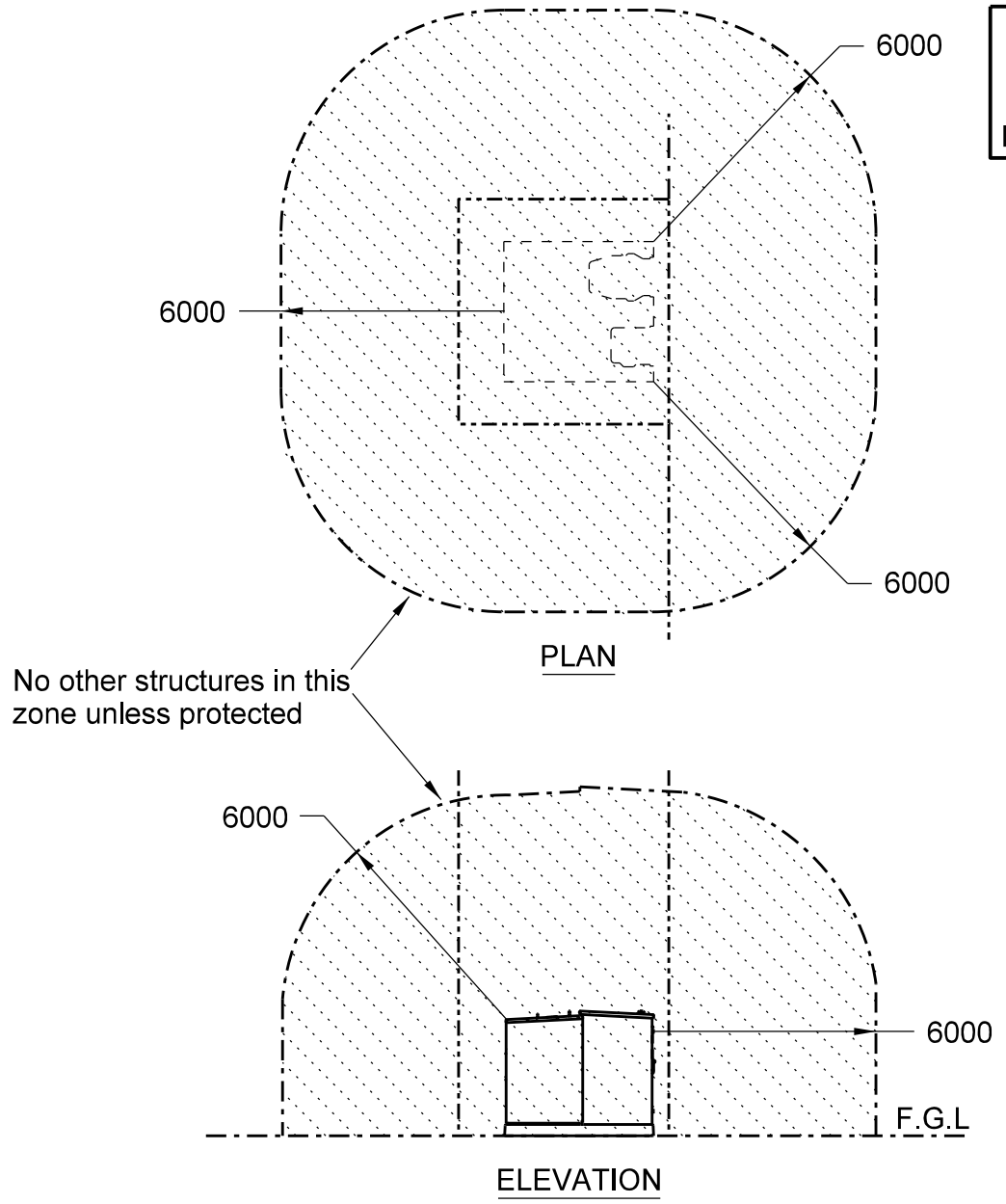
NOTES:

1. The fire risk zone shown applies to the following padmount substation constructions:
   - 315 kVA
   - 500 kVA
   - 750 kVA
   - 1000 kVA

2. This drawing is indicative only.
   The fire risk zone extends 6.0m from the outer point of the padmount substation.

3. No buildings shall be in the fire risk zone unless they meet the requirements of a fire resistance surface. Refer sheet 3 for details.

4. Easement details shown on this drawing are indicative only, actual easement size will depend on earthing arrangement and padmount substation location.



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				PASSED	A. Bletchly
				DRAWN	L. Burton

UNDERGROUND DISTRIBUTION
11kV PADMOUNTED SUBSTATIONS
FRONT ENTRY TYPE - FIRE RISK ZONE

FILE: 5 55 5335 2

Dwg 5335 Sh 2

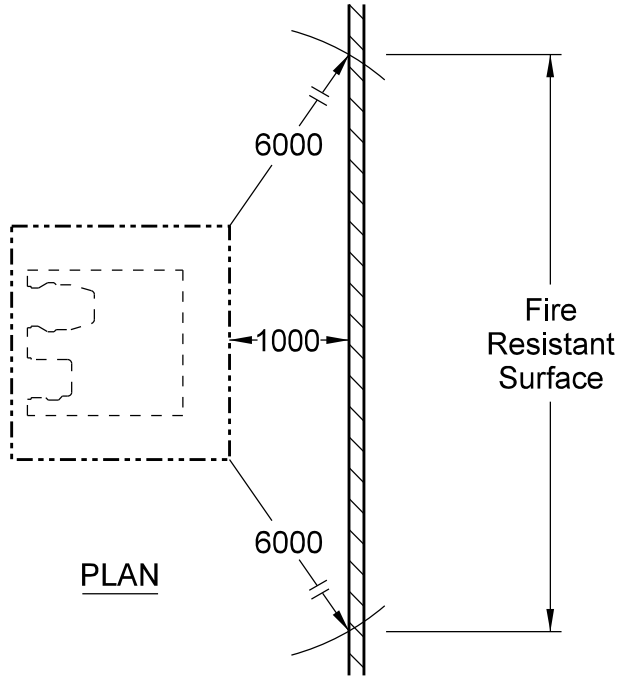
NOTES:

1. The fire risk zone shown and barrier requirements apply to the following padmount substation constructions:
   - 315 kVA
   - 500 kVA
   - 750 kVA
   - 1000 kVA

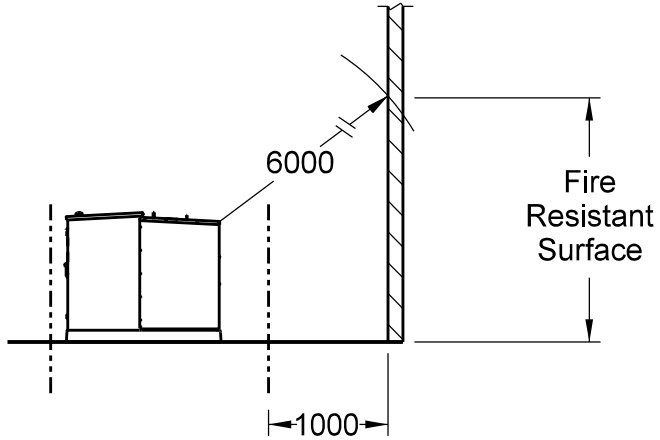
2. Fire resistance surface is a barrier or building surface having a minimum FRL 120/120/120.

3. This drawing is indicative only.
   The minimum size required for the fire resistant surface shall extend 6.0m from the outer point of the padmount.

4. Easement details shown on this drawing are indicative only, actual easement size will depend on earthing arrangement and padmount substation location.



PLAN



ELEVATION

A	ORIGINAL ISSUE		

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APPROVED	C. Noel
DATE	20/08/15
PASSED	A. Bletchly
DRAWN	L. Burton

UNDERGROUND DISTRIBUTION
11kV PADMOUNTED SUBSTATIONS
FIRE PROTECTION BETWEEN PADMOUNT AND BUILDING - FIRE RISK ZONE

FILE: 5 55 5335 3

Dwg 5335 Sh 3