

Property and Services / Network Services and Operations

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Our reference: 2014/4134

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Attn: Mr Paul Robilliard
Director, Greenfield Housing

Dear Mr Robilliard,

Re: Leppington Draft Precinct Plan on exhibition

Thank you for your letter dated 10 November, 2014 in respect of the abovementioned matter. TransGrid's *Dapto to Sydney West 330kV* transmission line is situated within a 60.96 metre wide easement that traverses the precinct between Bringelly Road and Camden Valley Way. Please find attached plans that identify the subject area and our infrastructure situated therein.

We note from the land use maps included in the exhibited documents that the majority of the land over which TransGrid's easement is situated is proposed to be zoned low density residential. TransGrid's infrastructure can be situated in any land use zone in NSW, in accordance with the NSW Planning LEP Practice Note (PN 10-001). Therefore, TransGrid has no objection to the proposed changes of land use, however residential subdivided lots will not be permitted on the transmission line easement. Vertical and horizontal clearances apply as do other development restrictions. Attached are the *TransGrid Guidelines for Easement Activities and Restrictions (Guidelines)*. The Guidelines are not an exhaustive list, therefore TransGrid should be consulted for any development proposed near our easements and/or infrastructure.

Any development proposed on or near TransGrid's transmission line easement is subject to our prior written approval. Planning and development approval must comply with regulation 45 of *SEPP (Infrastructure) 2007*. To this end, TransGrid will require formal notification, with such notice to be accompanied by detailed plans in PDF and 3D-DXF format.

Should you have any queries in relation to this matter please feel free to contact me on 0408 192 165.

Yours sincerely



Tim Cowdroy
Land Economist | Property and Services
TransGrid

18 November, 2014

Encl.





Legend

TransGrid Proposal
 TransGrid Easement

		NSW Planning & Environment - Leppington Draft Precinct Plan TL: Dapto - Sydney West 330kV (Fdr 37 Str 129 - 142)	
Property of Transgrid. No warranty is given that information shown is complete or accurate.		PRODUCED FROM TAMIS	Scale: 1:36000
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Legend

○ Structure

▨ TransGrid Proposal

■ TransGrid Easement



NSW Planning & Environment - Leppington Draft
Precinct Plan

TL: Dapto - Sydney West 330kV (Fdr 37 Str 136
- 142)

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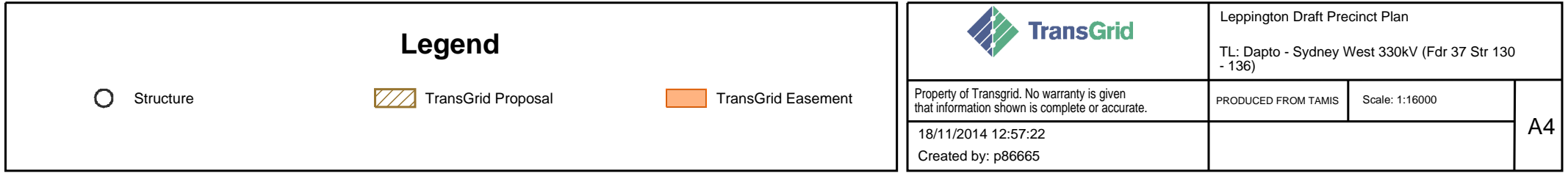
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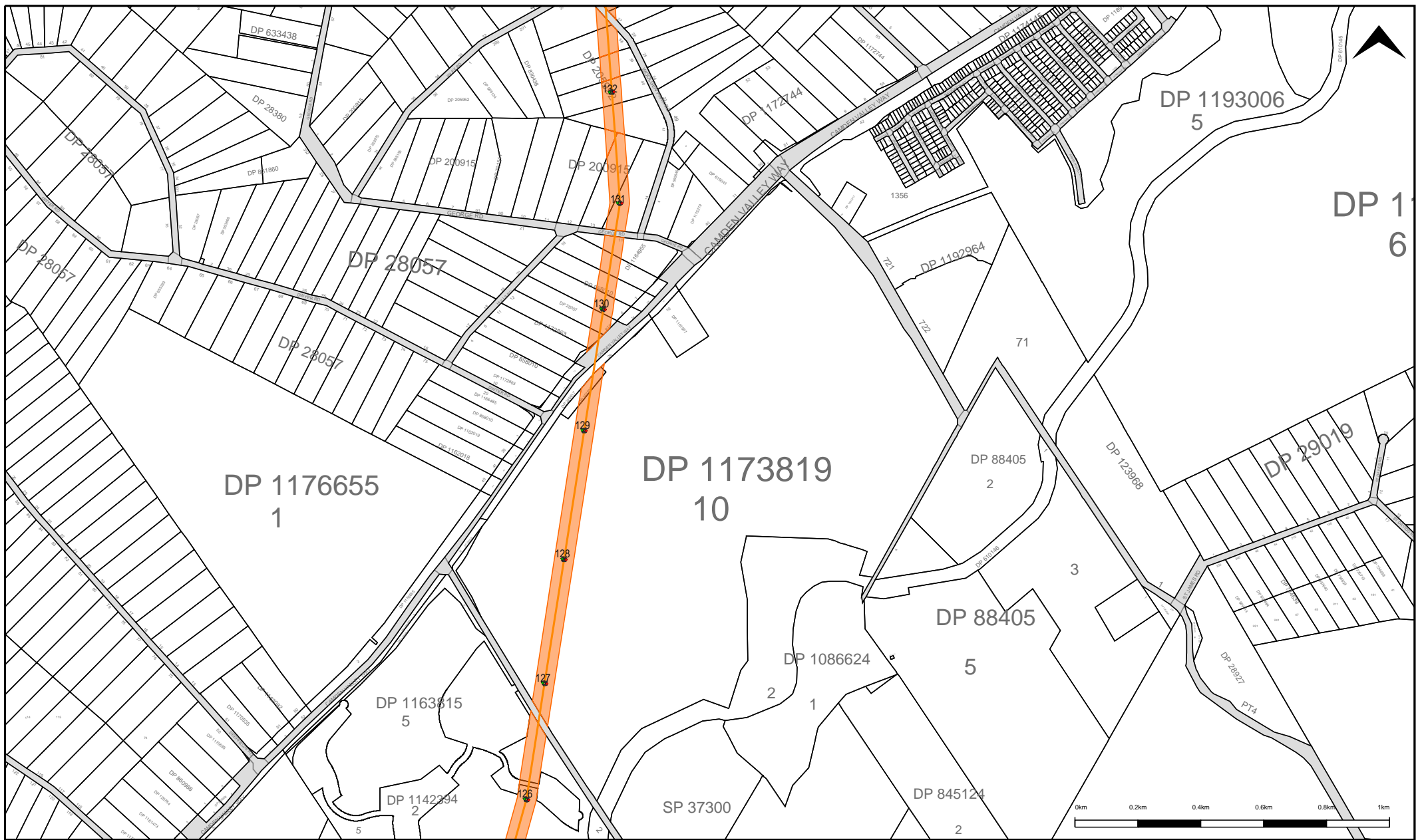
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Structure

TransGrid Proposal

TransGrid Easement

Legend

TransGrid

Leppington Draft Precinct Plan

TL: Dapto - Sydney West 330kV (Fdr 37 Str 126 - 130)

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TransGrid Guidelines for Easement Activities and Restrictions

An easement is an encumbrance on the title of land that confers the right to construct, operate and maintain a transmission line or cable. Easements are acquired by TransGrid to obtain the legal right to have access to its lines or cables for the purposes of construction, operation, maintenance, renewal and replacement and also to enable activities, which could either by accident or otherwise create an unsafe situation, to be controlled. Such easements impose an obligation on affected property owners not to do anything that may interfere with TransGrid's rights.

This document provides guidelines for the management of activities and encroachments on easements for overhead transmission lines and high voltage underground cables.

Because of the varied circumstances that apply to electricity easements, there will be circumstances that will require special attention. The particular circumstances may suggest restrictions over and above those outlined in this document.

1.1 Encroachments Onto Easement Areas

From TransGrid's viewpoint, it is essential that buildings, structures or other objects that could interfere with access along the easement, particularly to any structure or joint bay, not be placed within an easement area and that nothing be done which may affect the safe and continuous operation of the transmission line or cable or prevent its repair, replacement or renewal.

From both TransGrid's and the property owner's viewpoint, it is desirable that the property owner be prevented from doing anything within the easement which, while not necessarily interfering with TransGrid's formal rights, creates a safety risk either to the operation of the transmission line or cable or to persons. Such risks could possibly occur from induction, step or touch potentials under fault conditions, infringement of safety clearances to conductors, failure of line material or structures, or the uncovering of an underground cable.

The most important questions to be considered in the examination of a request for an encroachment within an easement area are the following:

1. Will it affect the safe operation of the line or cable, under normal conditions as well as maximum sag and blowout?
2. Will it unduly restrict access, particularly to overhead line structures, underground cable joint bays or surface installations?
3. What will be the effect on the encroachment of electrostatic induction, electromagnetic induction or an earth fault at the nearest structure of an overhead line or an earth fault on an underground cable?
4. What is likely to happen if there is a line structure collapse or failure of an earth wire, conductor or fitting?
5. What will be the effect if the line is uprated and/or structure positions are changed or the underground cable is relaid?

1.2 Approval For Encroachments Or Activities Affecting Easements

All TransGrid approvals are to be notified in writing, by the duly authorised officer.

All approvals granted should be subject to the encroachments being removed or relocated at the owner's cost in the event that TransGrid requires this for line maintenance, operation or further construction/reconstruction.

It is recognised that this requirement may be difficult to negotiate for *substantial structures* and in-ground swimming pools (for example). This requirement is necessary, however, in case the encroachments need to be removed in the future and serves to confirm the awareness of the land owner to the terms of the approval.

The granting of a local council approval for a given encroachment does not negate TransGrid's rights. It does, however, create confusion for landowners that believe they had done all that is required to obtain the necessary approvals. Landowners should therefore contact TransGrid before proceeding with any development.

An important strategy in avoiding encroachments of significance is to have a good working relationship with constituent councils in respect of building approvals. In particular, the recording of electricity easements on constituent council records is essential for their consideration of such easements in the approval process.

The co-operation of constituent councils should be sought to include a general condition on every approval, referring to electricity easements, such as "subject to approval by the relevant authority where easements are involved".

1.3 Specific Restrictions Within Easement Areas

Property owners and others frequently make inquiries with regard to the restrictions that apply to the use of land affected by easements. Having regard to the type of easement in question and to any special conditions which may apply, the activities listed below have been categorised as being either permitted, controlled or prohibited as applicable.

The list is not necessarily exhaustive and the omission of a particular activity does not relieve those concerned from seeking advice from TransGrid where there is any doubt as to whether its rights are likely to be infringed.

Note that in the following, allowable encroachments are normally given in terms of distances from the edge of the easement. **This is for an easement of standard width.** Standard easement widths are:

132 kV – 45 metres

220 kV – 50 metres

330 kV – 60 metres

500 kV – 70 metres

A reduction in the width of the easement similarly reduces any allowable encroachment. For example, if the easement is 10m narrower than standard (5m off each side) then allowable encroachments are reduced by 5m.

1.3.1 Overhead Transmission Line Easements

A. Permitted Activities

The activities listed below are permitted within easement areas provided that they do not interfere with the maintenance or safe operation of the line. In this regard, access is to be available to all structures at all times and no physical obstructions other than timber boundary fences are to be placed within 15 metres of a transmission line structure or supporting guy. It is desirable, where *practicable*, to retain a continuous and *unobstructed access way* along the entire length of the easement.

- (i) Normal agricultural pursuits subject to restrictions applying to the heights of mobile plant and equipment being observed. Care should be taken when ploughing or operating mobile machinery in the vicinity of structures or supporting guys to ensure that the buried earthing system or the tower is not damaged.
- (ii) Domestic recreational activities, other than the flying of kites, model aircraft etc which are prohibited.
- (iii) Gardening activities involving trees, shrubs or plants that grow to a mature height not exceeding 4 metres.
- (iv) Parking of vehicles subject to adequate precautions being taken to protect structures or supports from accidental damage and a 4.3 metre height limitation on the vehicles to be parked.

Flammable liquid carriers, caravans and other camping vehicles and vehicles with fixed ladders which make it possible for a person to ascend to the top of the vehicle are not permitted.

- (v) The operation of mobile plant and equipment having a height not exceeding 4.3 metres when fully extended, including aerials, subject to adequate precautions being taken to prevent collision or interference with structures or supporting guys.
- (vi) The storage of *non-flammable materials*, subject to a height limitation of 2.5 metres.
- (vii) The erection of *minor structures*, subject to a height limitation of 2.5 metres and the *earthing* of metallic parts.

B. Controlled Activities

The activities listed below are not permitted within transmission line easements without written approval. Each case should be assessed on its merits in accordance with the guidelines indicated below and subject to the general provisions concerning access, maintenance and safe operation as detailed for Permitted Activities.

It is normal that a site inspection would be made for these cases. Note that during the site inspection it should be confirmed that there is not a suitable alternative site within the property where the proposal could be accommodated.

Where the extent of a proposed encroachment by a *substantial structure* exceeds half of the maximum encroachment stipulated in these guidelines, the property owner should be required at their expense to have the structure set out by a registered surveyor, with clear dimensions, distances and measurements specified on the survey plans. On completion of the work, an identification survey is to be carried out. The survey plan is to state the horizontal and vertical clearances from TransGrid's infrastructure and easement. A copy of the survey plan must be forwarded to TransGrid. This requirement should be specifically referenced in the approval.

Many of the activities described are confined to a height of 4.3 metres. In particular cases, where the conductor height above ground is substantially greater than the normal design minimum, approval may be given (after obtaining *engineering advice*), for the 4.3 metre height restriction to be relaxed. This would normally only be done following detailed investigation of the situation.

- (i) Burning off or the lighting of fires within the easement area if there is no other location other than in the easement, provided that structures and supporting guys are not endangered and provided that the activity does not produce flames exceeding 3 metres in height.

Lighting of fires directly under energised conductors would not normally be approved, with the exception of burning of crop stubble.

- (ii) The operation of mobile plant or equipment having a height when fully extended exceeding 4.3 metres. Approval would be based on the need to maintain adequate clearance between the equipment and the line, having regard to the particular situation. Note that plant may require trailing earths and supervision by TransGrid staff.
- (iii) Parking of caravans and other camping vehicles provided that there is no *practicable* alternative site clear of the easement area. Approval will normally be given for temporary parking only, in the outer 3 metres of the easement area, subject to metallic parts being *earthed* and a 4.3 metre height restriction.
- (iv) The erection of flagpoles, weather vanes, single post signs, outdoor lighting and the like provided that adequate clearance is maintained to the overhead conductors, the height does not exceed 4.3 metres and metallic parts are *earthed*.
- (v) The erection of non-electric agricultural fencing, yards and the like, provided that the height of the fencing does not exceed 2.5 metres and that access along the easement is not impeded. In the case of metallic fencing, *earthing* may be required.
- (vi) The erection of electric fencing provided that the height of the fencing does not exceed 2.5 metres and provided that the fence does not pass beneath the overhead conductors.

Approval may be given for a portable electric fence to pass underneath the conductors provided that it is supplied from a portable battery-powered energiser that is located remotely from frequented areas.

Where it is necessary for a permanent electric fence to pass beneath the overhead conductors, or where an extensive permanent electric fencing system is installed in proximity to a transmission line certain additional safety requirements may be required. *Engineering advice* should be obtained prior to approval.

- (vii) The erection of metallic fencing provided that:
 - (a) the height of the fencing does not exceed 2.5 metres;
 - (b) the fence is *earthed*;
 - (c) the fence is not located within 15 metres of any part of a transmission line structure or supporting guy or within 4 metres of the vertical projection of the overhead conductors;
and
 - (d) access to structures is maintained.

Approval may be given for such fencing to be located within 4 metres of the vertical projection of the overhead conductors provided that any section so located is electrically isolated from the remainder of the fence. In the case of swimming pool or tennis court enclosures, it is sufficient to isolate the enclosure fence from other metallic fencing not forming part of the enclosure.

- (viii) The installation or use of irrigation equipment inside the easement provided that:
- (a) no part of the system is permitted to come within 4 metres of the overhead conductors at any time;
 - (b) the height of the equipment does not exceed 4.3 metres;
 - (c) the length of individual sections of rigid or semi-rigid pipe associated with the equipment does not exceed 4.3 metres;
 - (d) the equipment as located is not capable of projecting a solid jet of water to within 3 metres of any overhead conductor up to 330 kV and 4 metres for 500 kV. In the case of gun type irrigators, it is required that the water jet not be directed towards the line;
 - (e) the equipment is suitably *earthed*, if necessary; and
 - (f) the equipment does not interfere with the maintenance or safe operation of the line.

- (ix) The installation of *low voltage* electricity, telephone, communication, water, sewerage, gas, whether overhead, underground or on the surface subject to there being no *practicable* alternative and provided that:
- (a) standard clearances are maintained to the overhead conductors;
 - (b) services are to be at least 15 metres from the centre-line of the easement and 15 metres from any part of a transmission line supporting structure; and
 - (c) services within 30 metres of any part of a structure are to be non-metallic.

Where the service is to be buried, it is understood that heavy vehicles may be driven on the ground above the service. In the case of 330 kV and 500 kV lines, all undercrossings by the above mentioned services are required to be underground. For lower voltage lines the service should preferably be underground where *practicable*.

Where extensive parallels are involved, certain additional safety requirements may be necessary, depending on the particular case and *engineering advice* should be obtained.

In the case of critical services such as optical fibre communications circuits, these should be buried on the edge of the easement (typically within 1 metre of the edge) and must be clearly marked to show the location of the buried cable.

Details specific to each installation should be ascertained and approved to ensure minimal impact on TransGrid operations and to reduce our exposure to liability.

- (x) The installation of high voltage electricity services subject to there being no *practicable* alternative and provided that *standard clearances* are maintained to the supporting structures.

Where extensive parallels are involved certain additional safety requirements may be required, depending on the particular case and *engineering advice* should be obtained.

- (xi) Swimming pools, whether above or in-ground, provided there is no *practicable* alternative site clear of the easement area. Approval may be given for encroachments of not more than 4.5 metres, including coping, subject to the pool being not less than:

- (a) 30 metres from the centre of a transmission line structure for voltage or 132kV and below; or
- (b) 30 metres from any part of a transmission line structure for voltages greater than 132 kV.

These requirements are aimed at minimising step potentials under fault conditions.

- (xii) Detached garages, detached carports, detached sheds, detached stables, detached glass houses, caravans, site containers, portable tool sheds, pergolas and unroofed verandahs attached to residences where there is no *practicable* alternative site clear of the easement area. Approval may be given for encroachments of not more than 3 metres.
- (xiii) Prefabricated metal (garden) sheds not exceeding 2.5 metres in height, where a *practicable* site is not available clear of the easement area. Approval may be given for encroachments of up to 3 metres. Consideration may be given to a further encroachment provided that:
 - (a) the shed's floor area does not exceed 8 m²;
 - (b) the shed is not located within 15 metres of any part of a transmission line structure;
 - (c) the shed is *earthed*;
 - (d) electric power is not connected to the shed;
 - (e) the shed is not to be used for the storage of flammable liquids;
 - (f) in the event of TransGrid requiring the shed to be relocated at some future date, all costs are to be borne by the owner; and
 - (g) the shed is not easily convertible to living quarters.

Brick garages and other similar *substantial structures* should not be approved, as such structures are likely to create additional problems should TransGrid seek to upgrade the use of the easement.

- (xiv) Single tennis courts provided:
 - (a) the tennis court is for private, non-commercial use;
 - (b) there is no alternative space clear of the easement;
 - (c) adequate safety clearances are maintained;
 - (d) the fence is non-conductive or suitably *earthed* on all corners;
 - (e) fence height is restricted to 4 metres;
 - (f) lighting is limited to a maximum height of 4.3 metres and supplied via underground wiring;
 - (g) access to the transmission line is not hindered. This may involve gates and court construction able to withstand large, heavy plant; and changes to ground levels may be associated with the construction of the courts. If required, such changes should not affect access along the easement and should meet the requirements of (xx) below.

- (xv) Sporting facilities and open recreational areas subject to the general restrictions outlined in these guidelines and the displaying of suitable warning notices concerning the flying of kites or model aircraft. Facilities associated with the use of firearms and *public sporting venues* are discouraged.
- (xvi) Subdivisions for domestic or industrial purposes subject to relevant requirements being met such as:
 - (a) *standard clearances* and access being maintained;
 - (b) road intersections being well clear (preferably 30 metres) of line structures;
 - (c) line structures being suitably protected against motor vehicle impact; and
 - (d) the layout of the subdivision not being such as to give rise to numerous utility crossings or later requests for encroachments due to insufficient space being left between the Council's building alignment and TransGrid's easement.

Where a proposed road passes within 30 metres of a line structure or supporting guy, the structure earthing system may require modification in order to prevent fault currents from entering utility services which may be buried in the road.

Boundaries created by subdivisions should not pass, where *practicable*, within 15 metres of a structure to prevent the future erection of metallic fence in violation of these guidelines.

Care is also required to ensure that earthing will be adequate on structures that may be in a location which was regarded as 'remote' at the time of construction (as defined in the Electricity Association of NSW Publication – "Guide to Protective Earthing" – EA5). Development may cause the structures location to become 'frequented' or 'special'. Additional earthing required as a result of the subdivision should be at the cost of the developer.

Advantage should be taken of subdivisional activities to upgrade existing easements, especially "resumed" easements by insisting that they be shown on the new line plans with modern "Restrictions as to User" quoted in the Section 88B Instruments.

Many innovative planning techniques are available to incorporate existing transmission line easements within new subdivisions that do not result in lines straddling backyards and hence ultimately cause encroachment problems. These options should be actively pursued with developers and constituent councils.

- (xvii) Roads (other than access tracks) provided that *standard clearances* are maintained, the proposal is environmentally acceptable and line structures are adequately protected against motor vehicle impact.

Approval will not normally be granted for roads to be located within 15 metres of any part of a transmission line structure.

Where the road passes within 30 metres of a structure or supporting guy, the structure earthing system may require modification as outlined in (xvi) above. The option of raising conductors or relocation of structures, at the full cost of the proponent, may be considered.

- (xviii) Cycleways, walking tracks and footpaths provided that *standard clearances* are maintained and the proposal does not alienate large sections of the easement area.

- (xix) Excavation (not including ploughing) in the case of minor excavations. In the case of substantial excavations, approval will normally be given, provided that the depth of the excavation does not exceed 3 metres, it is not located within 7 metres of a general purpose pole structure or supporting guy, or within 15 metres of any part of a steel tower or major pole structure.

Where there is no *practicable* alternative, consideration may be given to permitting an excavation which does not comply with the above general requirements, subject to *engineering advice* on the proposal confirming that it will not interfere with the maintenance or safe operation of the line. In such cases, TransGrid supervision of the excavation may be required and would normally be charged to the property owner.

- (xx) Quarrying activities, earthworks, dam or artificial lake construction subject to the maintenance of adequate ground clearances and provided that the subsoil stability and surface drainage in the vicinity of structures is not adversely affected and excessive quantities of dust are not generated. *Engineering advice* should be obtained prior to approval being given.

Where artificial lakes or dams are classed as navigable waters then clearances specified by the Maritime Services Board shall be provided.

Where access is compromised by such developments, a condition of approval should be the provision of alternative access – for example with an access easement.

- (xxi) Mining – Approval would be based on the merits of the proposal and any related circumstances involved.
- (xxii) Use of explosives – Although not encouraged, approval may be given for minor blasting involving charges not greater than 2kg/delay and not closer than 30 metres to a supporting structure, provided that satisfactory safety procedures are observed and the safe operation of the line is not jeopardised.
- (xxiii) Blasting procedures in accordance with Australian Standard AS2187 and the use of blasting mats and safety fuses would normally be the minimum requirements. As specified in AS2187 the peak particle velocity should be kept to below 25mm/sec (unless modified in a subsequent issue). In cases where the charge exceeds 2kg/delay and/or blasting is required closer than 30 metres to supporting structures *engineering advice* should be obtained prior to approval.

C. Prohibited Activities

The activities listed below are normally prohibited within transmission line easements. Approval to engage in such activities will not be granted other than in the most exceptional circumstances.

- (i) The construction of houses, buildings, *substantial structures*, or parts thereof including eaves other than those permitted under Sections (A) or (B) above. Where difficulty is experienced in locating a residence between the Council's building alignment and TransGrid's easement or an extension to the residence between the existing building and TransGrid's easement, consideration may be given to permitting the eaves to encroach onto the easement area to a maximum distance of 600mm.

- (ii) Installation of fixed plant or equipment other than that permitted under sections (A) or (B) above.
- (iii) The storage of *flammable materials*, corrosive or explosive material.
- (iv) The placing of garbage, refuse or fallen timber.
- (v) The planting or cultivation of trees or shrubs, which grow to a height exceeding 4 metres.
- (vi) The placing of obstructions other than timber boundary fences within 15 metres of any part of a transmission line structure or supporting guy.
- (vii) Camping or the permanent parking of caravans or other camping vehicles.
- (viii) The parking or storage of *flammable* liquid carriers or containers.

Where an existing encroachment contravenes the requirements of this section, arrangements should generally be made for its removal.

1.3.2 Underground Cable Easements

Underground cables are predominantly installed in gazetted roadways. Easements are not normally obtained in this situation as the legal right to occupy space in a gazetted roadway, by a public utility, is conferred by 'The Roads Act 1993' and TransGrid, as an electricity supply organisation, has further rights conferred by the 'Electricity Supply Act 1995'.

The activities listed below are intended to apply in situations where cables are installed within cable easements outside of gazetted roadways.

A. Permitted Activities

The activities listed below are permitted within cable easements provided that they do not interfere with the maintenance or safe operation of the cable:

- (i) Domestic recreational activities.
- (ii) The temporary storage of non-flammable materials provided that the area of ground surface contact doesn't prevent the free flow of air over the cable trench. The material must be capable of being removed at short notice.
- (iii) The planting of small shrubs and tilling of the soil to a maximum depth of 200mm , except in the vicinity of joint bays, surface installations, cable marker plates and posts, and kiosks.

B. Controlled Activities

The activities listed below are not permitted within cable easements without written approval.

Each case should be assessed on its merits in accordance with these Guidelines and subject to the general provisions concerning maintenance and safe operation as detailed for Permitted Activities.

- (i) Parking of vehicles provided that an adequate surface exists that is capable of supporting the vehicles likely to be parked, thus preventing the crushing of the cable/ducts or ground erosion.
- (ii) The operation of mobile plant and equipment provided that an adequate surface exists which is capable of supporting the mobile plant or equipment. If a suitable surface does not exist, approval may be given subject to the activity being supervised by TransGrid personnel.
- (iii) The erection of structures spanning the easement are discouraged, but approval may be given provided that there is no *practicable* alternative and sufficient clearance is maintained between the ground surface and the underside of the structure to allow cable maintenance and/or repairs to be carried out without inconvenience.
- (iv) Excavation will normally be approved, provided that TransGrid personnel supervise the activity. Excavation within 2 metres of the cables should normally be carried out by hand. Mechanical excavation is not permitted, unless directly supervised by TransGrid personnel.
- (v) Concrete driveways may be approved where cables are in existing continuous ducts and the driveway is capable of supporting the heaviest vehicle likely to traverse the driveway.
- (vi) The installation of metal pipes, metal fences, underground or overhead cables: Approval may be given subject to investigation.
- (vii) Road-boring in the vicinity of a high voltage cable. A trial hole should be dug alongside the cable trench to locate the cable and to verify that the bore does not interfere with the cable. Because the precise location of the cable is unknown, this precaution is required even where equipment is used which can accurately determine the location of the bore-head.

C. Prohibited Activities

The activities listed below are normally prohibited within cable easements. Approval to engage in such activities will not be granted other than in the most exceptional circumstances and only where a detailed investigation proves no impact on the operation or safety of the cable.

- (i) Storage of *flammable* liquids, corrosive or explosive materials.
- (ii) Planting or cultivation of trees or shrubs with extensive root systems.
- (iii) Construction of houses, buildings or *substantial structures* other than those permitted under sections (A) or (B) above.
- (iv) Installation of fixed plant or equipment other than that permitted under sections (A) or (B) above.
- (v) The placing of garbage, refuse or fallen timber.
- (vi) Vertical boring directly over the cable lay (for example, for the installation of fencing or safety railing). These holes must be hand excavated.
- (vii) The raising or lowering of existing ground surface levels. Cable ratings are reduced by increased depth of burial.