Subject: NSW Planning, Industry & Environment State Significant Development SSD-9227 RE Amity College New School Campus

Attachments: SW08773 Work near underground assets.zip; EE Drawing 86232 OH lines minimum clearances.pdf; EE Fact Sheet Building Conctruction.pdf; EE FPJ 4603 Permission to Remove Service July 2007.pdf; EE Guide for Padmount Substations.pdf; EE MDI0044 Easements and Property Tenure.pdf; EE Safety on the job.pdf; EE Safety Plumbing.pdf; ENA EMF What We Know.pdf; SW Work near overhead power lines.pdf

The Secretary
NSW Planning, Industry & Environment

ATTENTION: Navdeep Shergill, Social and Infrastructure Assessments

Dear Sir or Madam

I refer to the Department's letter of 9 September 2019 regarding the Notice of Exhibition for State Significant Development SSD-9227 for the Amity College New School Campus located at 85 Byron Road and 63 Ingleburn Road, Leppington (LOTS 1 & 2 DP 525996) for the proposed staged delivery of new school and ancillary works comprising a kindergarten, a three-stream primary school and a three-stream secondary school with a maximum capacity of 1,000 students. Submissions needed to be made to the Department by 8 October 2019. I apologise for the late submission but trust that Endeavour Energy's recommendations and comments will still be considered.

As shown in the below site plan from Endeavour Energy's G/Net master facility model (and extract from Google Maps Street View) there are:

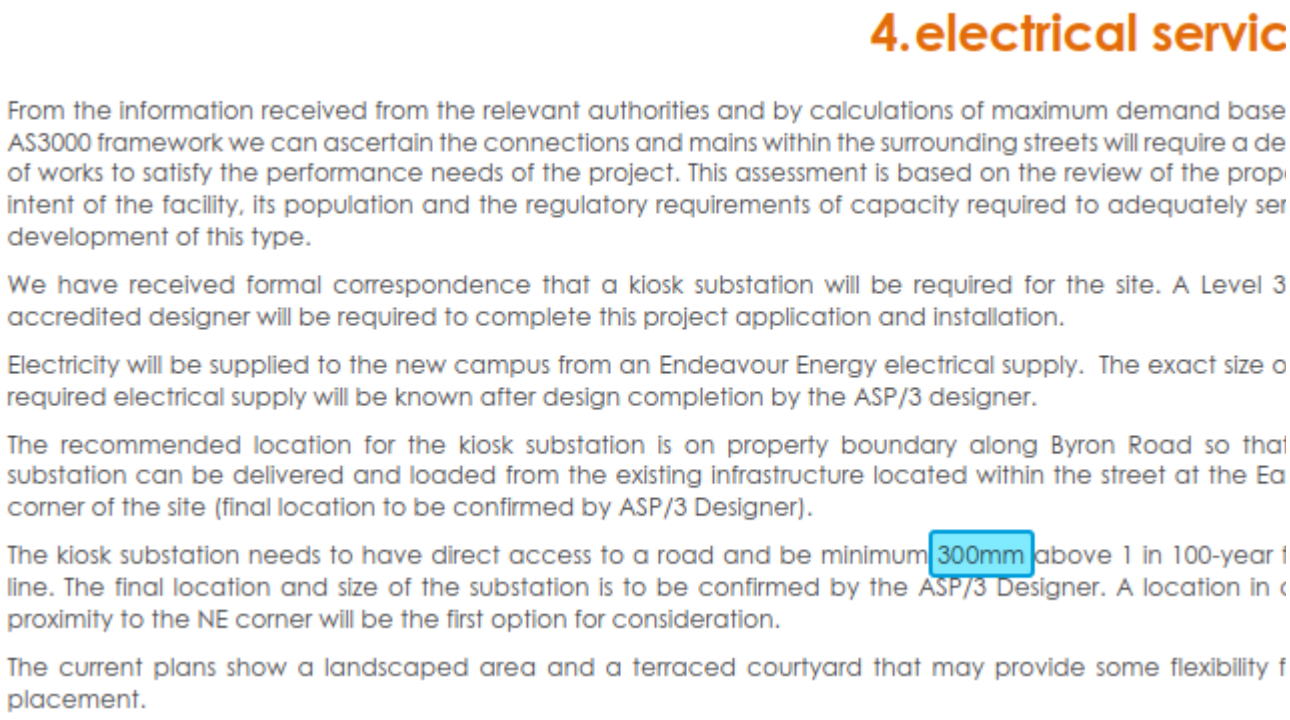
- No easements over the site benefitting Endeavour Energy (active easements are indicated by red hatching).
- Low voltage and 11,000 volt / 11 kilovolt (kV) high voltage overhead power lines to the Ingleburn Road road verge / roadway.
- Low voltage and a section of 11 kV high voltage overhead power lines to the Byron Road road verge / roadway including pole mounted substation no. 10877 (indicated by the symbol).

Please note the location, extent and type of any electricity infrastructure, boundaries etc. shown on the plan is indicative only. Generally (depending on the scale and/or features selected), low voltage (normally not exceeding 1,000 volts) is indicated by blue lines and high voltage [normally exceeding 1,000 volts but for Endeavour Energy's network not exceeding 132,000 volts / 132 kilovolts (kV)] by red lines (these lines can appear as solid or dashed and where there are multiple lines / cables only the higher voltage may be shown). This plan only shows the Endeavour Energy network and does not show electricity infrastructure belonging to other authorities or customers owned electrical equipment beyond the customer connection point / point of supply to the property. This plan is not a 'Dial Before You Dig' plan under the provisions of Part 5E 'Protection of underground electricity power lines' of the *Electricity Supply Act 1995* (NSW).

Subject to the following recommendations and comments Endeavour Energy has no objection to the Development Application.

- Network Capacity / Connection

Endeavour Energy has noted the following in the Infrastructure & Services Plan



4. electrical servic

From the information received from the relevant authorities and by calculations of maximum demand base AS3000 framework we can ascertain the connections and mains within the surrounding streets will require a de of works to satisfy the performance needs of the project. This assessment is based on the review of the prop intent of the facility, its population and the regulatory requirements of capacity required to adequately ser development of this type.

We have received formal correspondence that a kiosk substation will be required for the site. A Level 3 accredited designer will be required to complete this project application and installation.

Electricity will be supplied to the new campus from an Endeavour Energy electrical supply. The exact size o required electrical supply will be known after design completion by the ASP/3 designer.

The recommended location for the kiosk substation is on property boundary along Byron Road so that substation can be delivered and loaded from the existing infrastructure located within the street at the Ea corner of the site (final location to be confirmed by ASP/3 Designer).

The kiosk substation needs to have direct access to a road and be minimum 300mm above 1 in 100-year f line. The final location and size of the substation is to be confirmed by the ASP/3 Designer. A location in c proximity to the NE corner will be the first option for consideration.

The current plans show a landscaped area and a terraced courtyard that may provide some flexibility f placement.

Section 6.4 Endeavour Energy Letter of Offer is dated 21 March 2019 being Endeavour Energy Ref: UCL10007 – 2019/00493/001.

Endeavour Energy's Asset Strategy & Planning Branch whilst not having undertaken a detailed analysis of the Development Application have provided the following advice:

Endeavour Energy Letter of Offer is dated 21 March 2019 being Endeavour Energy Ref: UCL10007 – 2019/00493/001 is valid for 3 months and has lapsed and Asset Strategy & Planning Branch are not aware of the Connection Offer being extended.

As indicated in the Connection Offer the applicant should engage a Level 3 Accredited Service Provider (ASP) and submit a new load application with a concept method of supply (MOS) if able to, otherwise Endeavour Energy will (again) advise as part of our response.

The ASP scheme is administered by NSW Planning, Industry & Environment and details are available on their website via the following link or telephone 13 77 88:

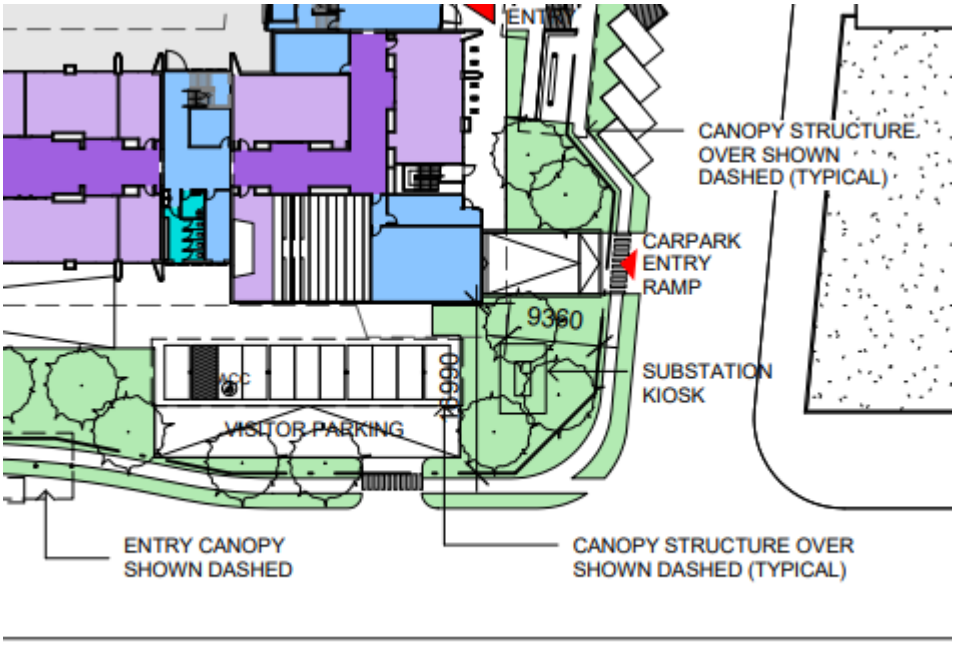
https://energysaver.nsw.gov.au/households/you-and-energy-providers/installing-or-altering-your-electricity-service .

As this is a Underground Residential Development (URD) area it is expected that both frontages will be reticulated with underground network and ducts unless already done so by development on the opposite side to the proposed school.

There are likely to be two options for electricity supply to the site;

1. *Establish new padmount substation in the vicinity of the Primary Drop Off area in side street and loop into the high voltage cable in this street.*

2. *Establish new padmount substation as shown on provided Site Plan D which shows provision for a 'Substation Kiosk' to be positioned in the north-east corner of the school campus fronting Byron Road and the new road and extend the high voltage underground along Byron Road from the side street.*



The availability of electricity supply to a site is based on a wide range of factors eg. the age and design of the network; other development in the locality utilising previously spare capacity within the local network; the progress of nearby / surrounding sites including electricity infrastructure works eg. a smaller and isolated development that may not of its own accord require a distribution substation may require a substation to facilitate the development and from which the spare capacity is made available to subsequent nearby development. Non-urban / above ground areas of the network utilising pole mounted substations have comparatively limited capacity of 25 kilovolt amperes (kVA) up to a maximum of 400 kVA where as a newer padmount substation can accommodate loads from 315 kVA up to 1,500 kVA ie. there is a significant variation in the number and type of premises able to be connected to a substation. In this instance the closest existing substation to the site is pole mounted substation no. 10877 located to the Byron Road road verge near the intersection of Ingleburn Road. It currently has 25 customer connection points servicing 31 premises. It is not intended to or capable of supplying a significant urban development.

As indicated in Endeavour Energy's Connection Offer the applicant should engage an Accredited Service Provider and continue to complete the connection process with Endeavour Energy's Network Connections Branch who are responsible for managing the conditions of supply for the proposed development. Further details are available by contacting Endeavour Energy's Network Connections Branch via Head Office enquiries on telephone: 133 718 or (02) 9853 6666 from 8am - 5:30pm or on Endeavour Energy's website under 'Home > Residential and business > Connecting to our network' via the following link:

http://www.endeavourenergy.com.au/ .

Endeavour Energy's Network Connections Branch will carry out the final load assessment and the method of supply will be determined. Depending on the outcome of the assessment, any required padmount substation will need to be located within the property (in a suitable and accessible location) and be protected (including any associated cabling) by an easement and associated restrictions benefiting and gifted to Endeavour Energy. Please refer to the attached copy of Endeavour Energy's Mains Design Instruction MDI 0044 'Easements and Property Tenure Rights'.

The fact that provision is being made for the padmount substation is from Endeavour Energy's perspective positive. Endeavour Energy's general requirements is for a padmount substation easement to have a minimum size of 2.75 x 5.5 metres and also have the additional restrictions for fire rating (which usually extends 3 metres

horizontally from the base of the substation footing, and 6 metres vertically from the same point and also has regard to any structures etc. attached to the building that may spread a fire) and possibly swimming pools and spas (which in this instance may not be applicable). The easement and restriction/s should not affect any adjoining property (unless supported by an appropriate easement / restriction). The substation should be at ground level and have direct access from a public street (unless provided with a suitable easement for right of access). Generally it is the Level 3 ASP's responsibility (engaged by the developer) to make sure that the substation location and design complies with Endeavour Energy's standards the suitability of access, safety clearances, fire ratings, flooding etc. As a condition of the Development Application the applicant should be required to submit documentary evidence from Endeavour Energy confirming that satisfactory arrangements have been made for the connection of electricity and the design requirements for the substation, prior to the release of the Construction Certificate / commencement of works.

- Urban Network Design

Endeavour Energy's Company Policy 9.2.5 'Network Asset Design', includes the following requirements for electricity connections to new urban subdivision / development:

5.11 Reticulation policy

5.11.1 Distribution reticulation

In order to improve the reliability performance of and to reduce the operating expenditure on the network over the long term the company has adopted the strategy of requiring new lines to be either underground cables or where overhead is permitted, to be predominantly of covered or insulated construction. Notwithstanding this strategy, bare wire overhead construction is appropriate and permitted in some situations as detailed below.

In areas with the potential for significant overhanging foliage, CCT is used to provide increased reliability as it is less susceptible to outages from wind-blown branches and debris than bare conductors. CCT must only be used in treed[2] areas as the probability of a direct lightning strike is low. In open areas where the line is not shielded from a direct lightning strike, bare conductors must generally be used for 11kV and 22kV reticulation.

Non-metallic Screened High Voltage Aerial Bundled Cable (NMSHVABC) must be used in areas which are heavily treed and where it is not practicable to maintain a tree clearing envelope around the conductors.

[2] A "treed" area is one with a substantial number of trees adjacent to the line, in each span. In these situations CCT is used to provide increased reliability as it is less susceptible to outages from wind-blown

5.11.1.1 Urban areas

Reticulation of new residential subdivisions will be underground. In areas of low bushfire consequence, new lines within existing overhead areas can be overhead, unless underground lines are cost justified or required by either environmental or local council requirements.

Where underground reticulation is required on a feeder that supplies a mixture of industrial, commercial and/or residential loads, the standard of underground construction will apply to all types of load within that development.

Where ducting is used, adequate spare ducts and easements must be provided at the outset to cover the final load requirements of the entire development plan.

Extensions to the existing overhead 11kV/22kV network must generally be underground. Bare wire will be used for conductor replacements and augmentations except in treed areas where CCT or NMSHVABC must be used.
Extensions to the existing overhead LV network and augmentations must either be underground or ABC. Conductor replacements greater than 100m in route length must utilise aerial bundled cable.

- Flooding and Drainage

Distribution substations should not be subject to flood inundation or stormwater runoff ie. the padmount substation cubicles are weather proof not flood proof and the cable pits whilst designed to be self draining should not be subject to excessive ingress of water. Section 7 'Substation and switching stations' of Endeavour Energy's Mains Construction Instruction MCI 0006 'Underground distribution construction standards manual' provides the following details of the requirements for flooding and drainage in new padmount substation locations.

7.1.6 Flooding and drainage

Substations are to be located such that the risk of flooding or stormwater damage is minimal.

As a minimum the level at the top of the transformer footing, HV and LV switchgear, shall not be lower than the 1:100 year flood level.

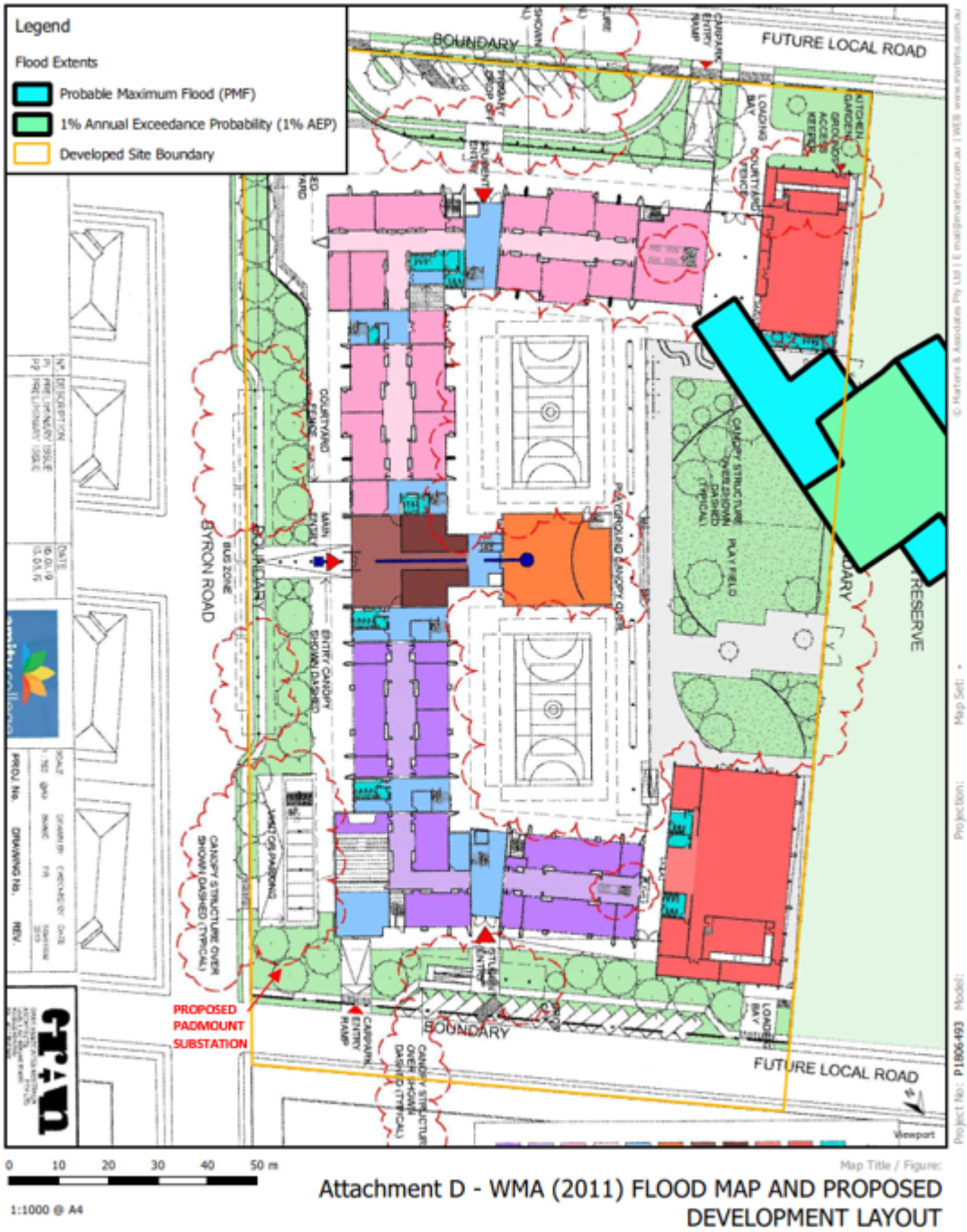
All drains within the substation site area or in the vicinity shall be properly maintained to avoid the possibility of water damage to Endeavour Energy's equipment.

In areas where, as determined by the Network Substation Manager, there is a high water table or a heightened risk of flooding, indoor substations will not be permitted.

All materials used in the construction below the substation (ground level) shall be capable of withstanding prolonged immersion in water without swelling or deterioration.

Figure 51 - Example substation raised above 1:100 flood level

Endeavour Energy has noted that that as shown in the following extract of the Flood Engineering Works Report that the proposed padmount substation location is not flood affected.



Attachment D - WMA (2011) FLOOD MAP AND PROPOSED DEVELOPMENT LAYOUT

- Streetlighting

With redevelopment of urban areas resulting in the significant increase in both vehicular and pedestrian traffic, the streetlighting for the proposed development should be reviewed and if necessary upgraded to comply with the series of standards applying to the lighting of roads and public spaces set out in with Australian/New Zealand Standard AS/NZS 1158: 2010 'Lighting for roads and public spaces' as updated from time to time.

Whilst the determination of the appropriate lighting rests with the road controlling authority, Endeavour Energy as a Public Lighting Service Provider is responsible for operating and maintaining the streetlights on behalf of local councils, Roads and Maritime Services and other utilities in accordance with the NSW Public Lighting Code, January 2006 (Code). Endeavour Energy recognises that well designed, maintained and managed Public Lighting offers a safe, secure and attractive visual environment for pedestrians and drivers during times of inadequate natural light.

For any Code implementation and administration / technical matters please contact Endeavour Energy's Substation Mains Assets Section via Head Office enquiries on telephone: 133 718 or (02) 9853 6666 from 8am - 5:30pm or email mainsenquiry@endeavourenergy.com.au .

- Earthing

The construction of any building or structure (including fencing, signage, flag poles, hoardings etc.) whether temporary or permanent that is connected to or in close proximity to Endeavour Energy's electrical network is required to comply with Australian/New Zealand Standard AS/NZS 3000:2018 'Electrical installations' as updated from time to time. This Standard sets out requirements for the design, construction and verification of electrical installations, including ensuring there is adequate connection to the earth. Inadequate connection to the earth to allow a leaking/fault current to flow into the grounding system and be properly dissipated places persons, equipment connected to the network and the electricity network itself at risk from electric shock, fire and physical injury.

Under Endeavour Energy's 'Design certification checklist for ASP L3' the design of the padmount substation must comply with Endeavour Energy's 'Earthing Design Instruction EDI 001 – Earthing design risk assessment' in which schools are regarded as a 'special location' – please see the following extract of EDI 001.

Special location
The "special" location category implies an area within close proximity to or within a premise where there is a high likelihood that shoes will not be worn and/or the risks associated with the earthing system has the potential to be exposed to a number of people simultaneously through contact with affected metalwork. This includes (but is not limited to) schools, pre-schools, day care centres, aquatic centres, recreational swimming areas and beaches.

As the school will require a padmount substation, the applicant should check with their ASP who responsible for the network connection to the site that any padmount substation earthing has been designed to comply with the 'special location' requirements under EDI 100.

- Prudent Avoidance

The electricity network is operational 24/7/365 ie. all day, every day of the year. The electricity industry has adopted a policy of prudent avoidance by doing what can be done without undue inconvenience and at modest expense to avert the possible risk to health from exposure to emissions form electricity infrastructure such as electric and magnetic fields (EMF) and noise which generally increase the higher the voltage ie. Endeavour Energy's network ranges from low voltage (normally not exceeding 1,000 volts) to high voltage (normally exceeding 1,000 volts but not exceeding 132,000 volts / 132 kV).

In practical terms this means that when designing new transmission and distribution facilities, consideration is given to locating them where exposure to the more sensitive uses is reduced and increasing separation distances. These emissions are generally not an issue but with Council's permitting or encouraging development with higher density, reduced setbacks and increased building heights, new development can impact on existing electricity infrastructure.

Where development is proposed in the vicinity of electricity infrastructure, Endeavour Energy is not responsible for any amelioration measures for such emissions that may impact on the nearby proposed development. Endeavour Energy believes that likewise applicants and determining authorities should also adopt a policy of prudent avoidance by the siting of more sensitive uses away from any electricity infrastructure – including any possible future electricity infrastructure required to facilitate the proposed development.

Please find attached a copy of Energy Networks Association's 'Electric & Magnetic Fields – What We Know' which provides the following advice and can also be accessed via their website at https://www.energynetworks.com.au/electric-and-magnetic-fields .

Electric fields are strongest closest to their source, and their strength diminishes rapidly as we move away from the source.

The level of a magnetic field depends on the amount of the current (measured in amps), and decreases rapidly once we move away from the source.

Typical magnetic field measurements associated with Endeavour Energy's activities and assets given the required easement widths, safety clearances etc. and having a maximum voltage of 132,000 volt / 132 kV, will with the observance of these separation distances not exceed the recommended magnetic field public exposure limits.

In regard to a school which is considered a 'sensitive' use, Endeavour Energy's Network Environment Assessment Section has previously provided the following advice for another child care centre proposed in proximity of Endeavour Energy's electricity network:

As far as I know there are no restrictions in legislation that stop a child care centre being placed next to electricity infrastructure.

Prudent avoidance measures must however be implemented. Prudent avoidance was a policy recommended by former Chief Justice of the High Court of Australia, Sir Harry Gibbs, as a result of an inquiry he conducted into community needs and high voltage transmission lines including issues in relation to EMF back in 1991. The findings in the Gibbs report are consistent with subsequent inquiries and are still relevant today.

Prudent avoidance is defined as doing what can be done without undue inconvenience and at modest expense to avert the possible risk to health from exposure to new high voltage transmission facilities. In practical terms, this means designing new transmission and distribution facilities having regard to their capacity to produce EMFs, and siting them having regard to the proximity of houses, schools and the like.

Although the Gibbs report was particularly aimed at electricity distributers to consider when placing their infrastructure, and bearing in mind that there are childcare centres and schools adjacent to our infrastructure in various locations right across our franchise area, it is nonetheless Endeavour Energy's recommendation it that a child care centre not be built adjacent to electricity infrastructure.

Should such a development proceed, the design of the child care centre should also consider prudent avoidance measures such as any rooms which the children will occupy (play areas, sleeping rooms, eating areas) be arranged such that they are on the side of the site/building which is furthest away from the electricity infrastructure.

There is scientific consensus that health effects have not been established but that the possibility cannot be ruled out. Accordingly, if there are any concerns regarding the location of the child care centre (or any other 'sensitive uses') in proximity to the electricity infrastructure, in order to make an informed conclusion, the applicant may need to commission an independent review to provide an overall assessment including electric and magnetic field measurement and advice. Applying a precautionary approach early on in the development process will hopefully result in the adoption of prudent avoidance principles benefitting the eventual development of the site.

- Vegetation Management

The planting of large trees in the vicinity of electricity infrastructure is not supported by Endeavour Energy. Suitable planting needs to be undertaken in proximity of electricity infrastructure (including any new electricity infrastructure required to facilitate the proposed development). Larger trees should be planted well away from electricity infrastructure and even with underground cables, be installed with a root barrier around the root ball of the plant.

Landscaping that interferes with electricity infrastructure could become a potential safety risk, restrict access, reduce light levels from streetlights or result in the interruption of supply may become subject to Endeavour Energy's Vegetation Management program and/or the provisions of the *Electricity Supply Act 1995* (NSW) Section 48 'Interference with electricity works by trees' by which under certain circumstances the cost of carrying out such work may be recovered.

Endeavour Energy's recommendation is that existing street trees which are of low ecological significance in proximity of overhead power lines be replaced and any proposed planting of new trees within the proximity of overhead power lines be replaced by an alternative smaller planting to ensure appropriate clearances are maintained whilst minimising the need for future pruning.

In regard to the future padmount substation site required to facilitate the proposed development, please find attached for the applicant's reference a copy Endeavour Energy's 'Guide to Fencing, Retaining Walls and Maintenance Around Padmount Substations'.

- Dial Before You Dig

Before commencing any underground activity the applicant is required to obtain advice from the ***Dial before You Dig* 1100** service in accordance with the requirements of the *Electricity Supply Act 1995* (NSW) and associated Regulations. This should be obtained by the applicant not only to identify the location of any underground electrical and other utility infrastructure across the site, but also to identify them as a hazard and to properly assess the risk.

- Removal of Electricity Supply

Approval for the permanent disconnection and removal of supply must be obtained from Endeavour Energy's Network Connections Branch (contact via Head Office enquiries on telephone: 133 718 or (02) 9853 6666 from 8am - 5:30pm) by Accredited Service Providers (ASP) with the relevant class of Authorisation for the type of work being carried out. The work could involve:

  - The disconnection and removal of an underground service cable or overhead service line,
  - Removal of metering equipment.

The written request must be submitted to Endeavour Energy using Form FPJ4603 ' Permission to Remove Service / Metering by Authorised Level 2 Accredited Service Provider' which must be accompanied by Notification of Service Works (NOSW) forms provided as a result of service work activity performed by a Level 2 ASP. The retailer must also provide written agreement for the permanent removal of supply.

The ASP scheme is administered by NSW Planning, Industry & Environment and details are available on their website via the following link or telephone 13 77 88:

https://energysaver.nsw.gov.au/households/you-and-energy-providers/installing-or-altering-your-electricity-service .

- Demolition

Demolition work is to be carried out in accordance with Australian Standard AS 2601—2001: 'The demolition of structures' as updated from time to time. All electric cables or apparatus which are liable to be a source of danger, other than a cable or apparatus used for the demolition works shall be disconnected ie. the existing customer service lines will need to be isolated and/or removed during demolition. Appropriate care must be taken to not otherwise interfere with any electrical infrastructure on or in the vicinity of the site eg. streetlight columns, power poles, overhead power lines and underground cables etc.

- Public Safety

Workers involved in work near electricity infrastructure run the risk of receiving an electric shock and causing substantial damage to plant and equipment. I have attached Endeavour Energy's public safety training resources, which were developed to help general public / workers to understand why you may be at risk and what you can do to work safely. The public safety training resources are also available via Endeavour Energy's website via the following link:

http://www.endeavourenergy.com.au/wps/wcm/connect/ee/nsw/nsw+homepage/communitynav/safety/safety+brochures .

If the applicant has any concerns over the proposed works in proximity of the Endeavour Energy's electricity infrastructure to the road verge / roadway, as part of a public safety initiative Endeavour Energy has set up an email account that is accessible by a range of stakeholders across the company in order to provide more effective lines of communication with the general public who may be undertaking construction activities in proximity of electricity infrastructure such as builders, construction industry workers etc. The email address is Construction.Works@endeavourenergy.com.au .

- Emergency Contact

In case of an emergency relating to Endeavour Energy's electrical network, the applicant should note the Emergencies Telephone is 131 003 which can be contacted 24 hours/7 days. Endeavour Energy's contact details should be included in the any risk or safety management plan. Endeavour Energy's contact details should be included in any relevant risk and safety management plan.

I appreciate that not all the foregoing issues may be directly or immediately relevant or significant to the Development Application. However, Endeavour Energy's preference is to alert proponents / applicants of the potential matters that may arise should development within closer proximity of the existing and/or proposed electricity infrastructure required to facilitate the proposed development on or in the vicinity of the site occur.

Could you please pass on a copy of this submission and the attached resources to the applicant? Should you wish to discuss this matter, or have any questions, please do not hesitate to contact me or the contacts identified above in relation to the various matters. Due to the high number of development application / planning proposal notifications submitted to Endeavour Energy, to ensure a response contact by email to property.development@endeavourenergy.com.au is preferred.

Yours faithfully
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Network Environment & Assessment
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PLUTO AVENUE


91 Byron Rd
Leppington, New South Wales
Google
Street View - Sep 2015
Byron Rd
Google