The Secretary
NSW Planning, Industry & Environment

10 December 2019

ATTENTION: David Way, Senior Planning Officer, School Infrastructure Assessments

I refer to the Department's below email of 8 November 2019 regarding State Significant Development SSD-9476 at Corner Commissioners Drive and Elkhorn Street, Denham Court (Lot 9001 DP 1206596) for 'New East Leppington Primary School. Construction of a new public primary school for up to 1,000 students from Kindergarten to Year 6'. Submissions need to be made to the Department by 11 December 2019.

As shown in the below site plans from Endeavour Energy's G/Net master facility model (and extracts from Google Maps Street View and SIX Maps) 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 underground cables to the Willowdale Drive road verge / roadway.
- Low voltage underground cables for streetlighting to the Commissioners Drive road verge / roadway

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 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 Environmental Impact Statement (EIS):

3.8 Site Services

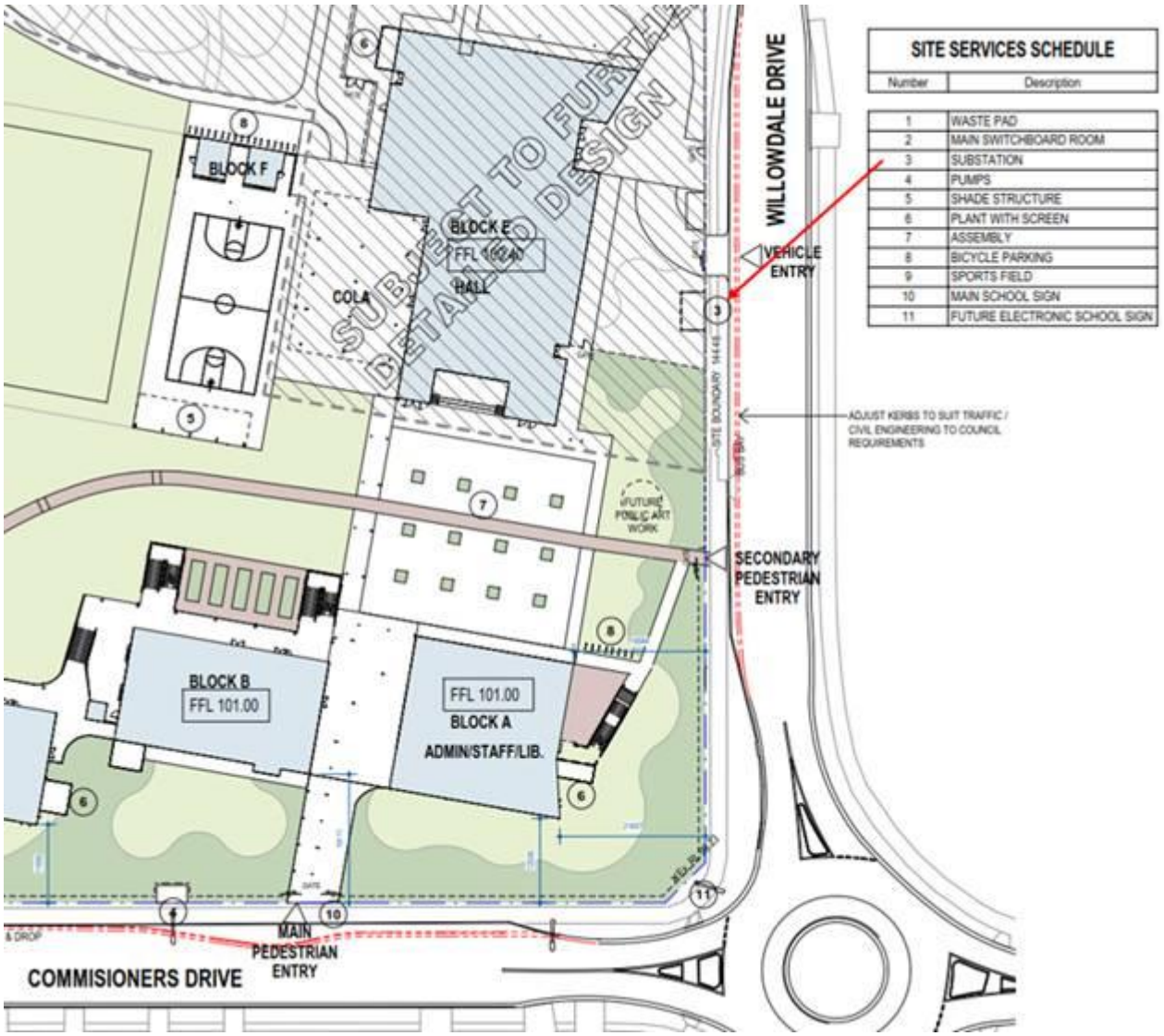
An Infrastructure Management Plan has been prepared by Hansen Yuncken and is attached at Appendix T. The report provides an overview of existing and required infrastructure services.

The report confirms that a new 1000 kVA substation will be provided, although the final substation location and other details are subject to change.

Service and infrastructure upgrades required to the site as part of this proposed development are summarised below:

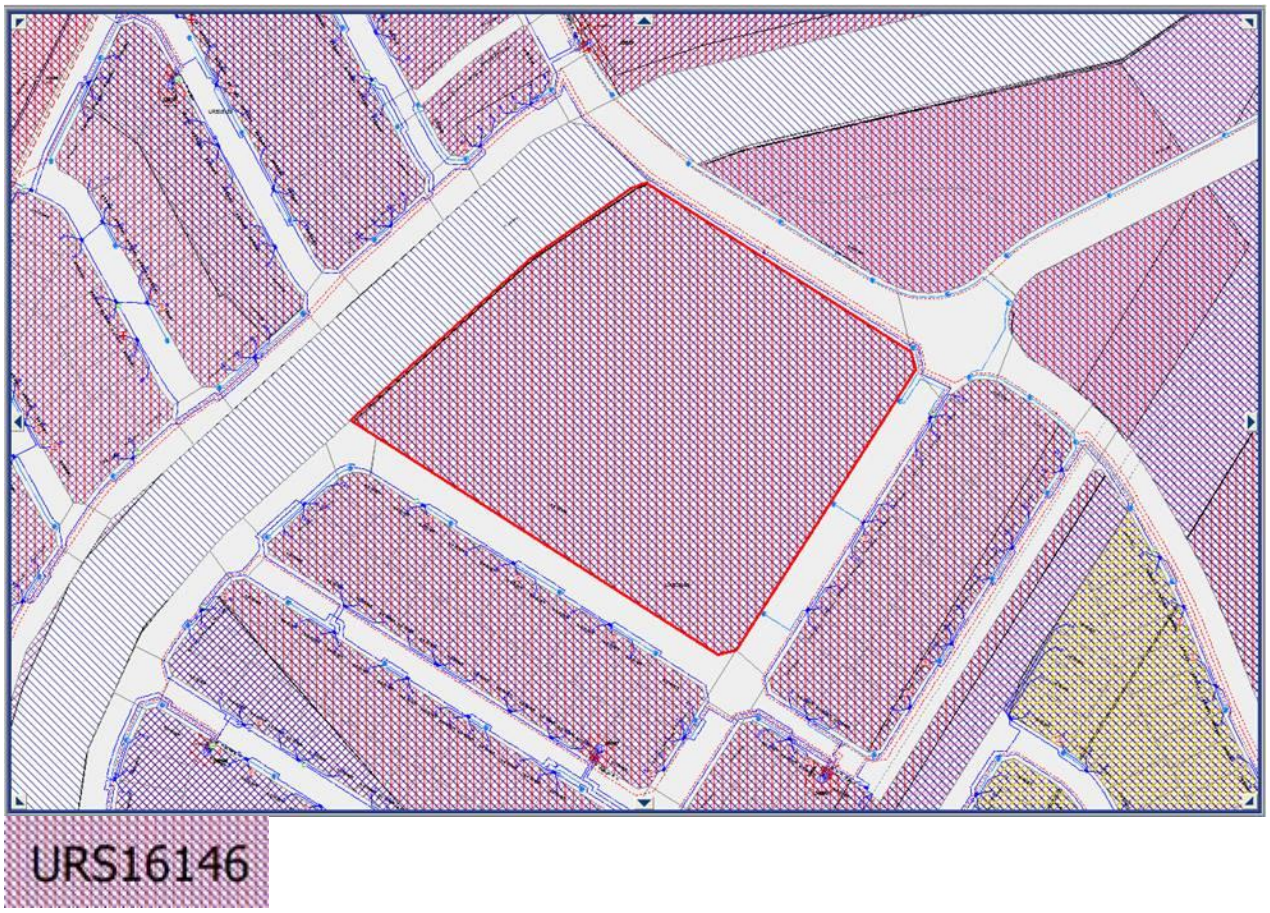
- The new substation will connect to a new main switchboard located within the hall building and distribute power to the buildings.
- The new substation will connect to a new main switchboard located within the Hall building. The main switchboard will supply power to sub-distribution boards located throughout the various buildings on campus. This will consist of submains cable which originate at the main switchboard and are reticulated through either a building or underground to supply power to distribution board, mechanical switchboards and other miscellaneous load centres requiring a power supply.
- The proposed development will incorporate a photovoltaic solar power system. The system will be provided by a separate subcontractor. Provisions have been made within the electrical specifications.

As shown in the following extract of the Proposed Architectural Plans provision has been made for a padmount substation to the Willowdale Drive frontage of the site.



The following site plan from Endeavour Energy's G/Net master facility model shows the site is part of a 'Work Polygon' (depicted by the coloured highlighting and/or hatching of the lot) indicating enquiries and applications for proposed contestable works projects with Endeavour Energy's Network Connections Branch for electricity supply to the development for urban residential subdivision (Endeavour Energy's reference URS16146). As such, Endeavour Energy's Network Connections Branch are managing the conditions of supply with the proponent and their Accredited Service Provider (ASP). However there is no specific 'Work Polygon' for the school site and the applicant will need to contact Endeavour Energy's Network Connections Branch (via Head Office enquiries on telephone: 133 718 or (02) 9853 6666 from 8am - 5:30pm) if this Development Application:

- Includes any contestable works projects that are outside of the existing approved / certified works.
- Results in an electricity load that is outside of the existing Supply / Connection Offer requiring the incorporation of the additional load for consideration. This is due to load being based on a desktop assessment using an After Diversity Maximum Demand (ADMD) where demand is aggregated over a large number of customers providing an ADMD for the site / per lot. Depending on the actual development proposed for the site, the ADMD provided may not be sufficient.

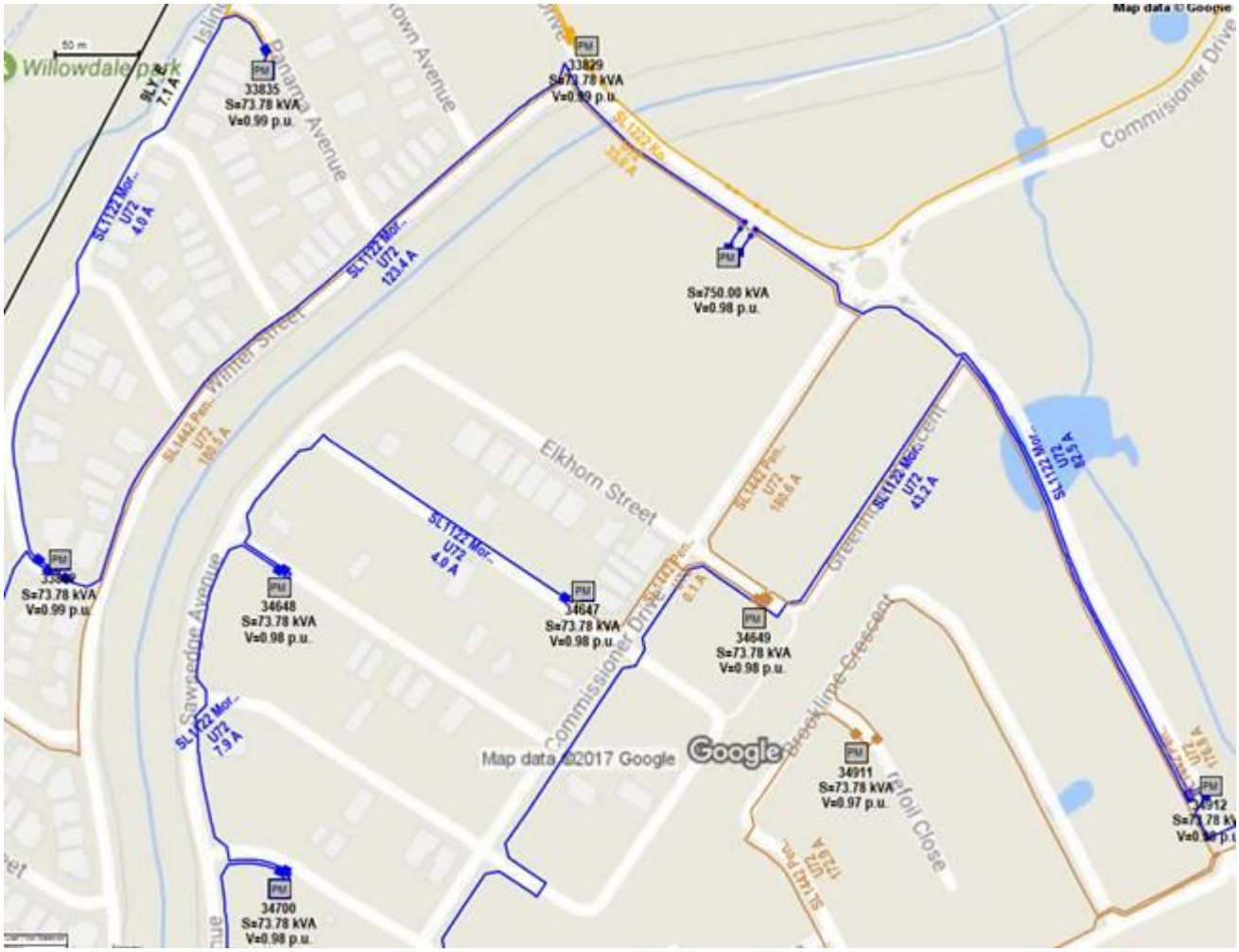


Endeavour Energy's Asset Strategy & Planning Branch whilst not having undertaken a detailed analysis of the Development Application have provided the following advice:

Asset Strategy & Planning Branch are aware of the school site but have not dealt with a specific application for connection of load for the site and will wait for the load application to be received via Network Connections Branch.

It is expected that the electricity load for the proposed new school will be in the order of between 600 to 750 25 kilovolt amperes (kVA).

It is envisaged that a 1000 kVA padmount substation proposed to be located along the Willowdale Drive frontage will be connected to existing 11 kV high voltage underground feeder cable between existing Padmount Substations No. s 33882 and 34912 (shown in the following plan) which shares the trench with another high voltage feeder cable on the same side of the street.



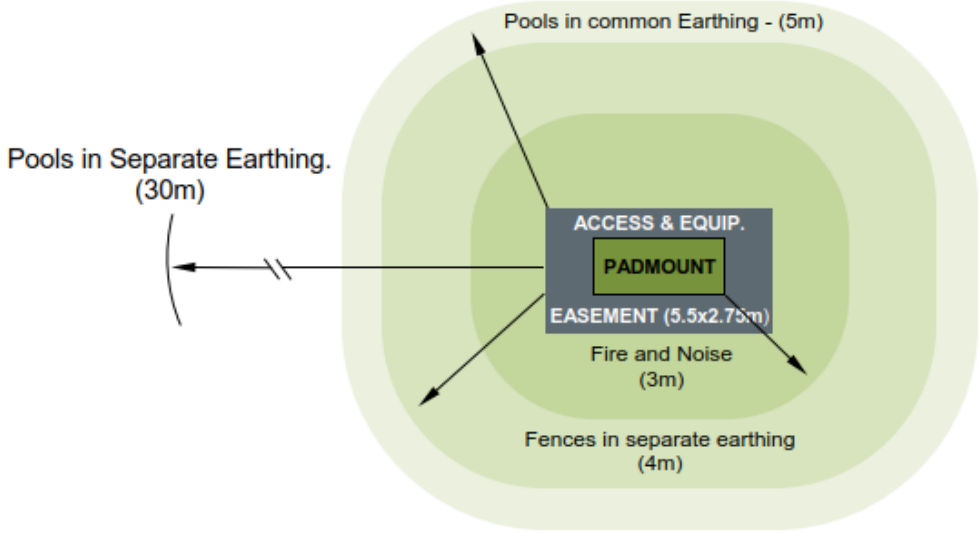
The applicant's Level 3 Accredited Service Provider ASP will be directed to target this specific feeder cable which has the spare capacity for the expected new school load.

From Endeavour Energy's perspective the fact that provision is being made for the substation is a positive. Endeavour Energy's general requirements is for a padmount substation to be at ground level and have direct access from a public street (unless provided with a suitable easement for right of access). It must be protected (including any associated cabling) by an easement and associated restrictions benefiting and gifted to Endeavour Energy as outlined in the attached copy of Endeavour Energy's Mains Design Instruction MDI 0044 'Easements and Property Tenure Rights'.

The padmount substation easement has a minimum size of 2.75 x 5.5 metres and must 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 extents five meters from the easement but in this instance does not appear to be applicable).

These requirements are shown in the following extract of Figure A4.3 'Padmount easements and clearances' from Endeavour Energy's Mains Design Instruction MDI 0044 'Easements and Property Tenure Rights'.

A4.3 - Padmount easements and clearances



The following extracts from Endeavour Energy's Mains Construction Instruction MCI0006 'Underground distribution: Construction standards manual' explains the fire restriction for padmount substations in more detail. The fire restriction for padmount substations is also outlined in Endeavour Energy's Mains Design Instructions MDI0028 'Underground distribution network design' and the Australian Standard AS2067: 2016 'Substations and high voltage.

7.4.1.2 Fire

Padmount substations require separation from neighbouring areas and buildings that are subject to fire risk. Separation may be by means of adequate clearances or building components having minimum fire resistance level (FRL) as set out in Figure 45.

Fire ratings shall be achieved by static means (that is, walls or distance) rather than active system (that is, deluge showers and the like).

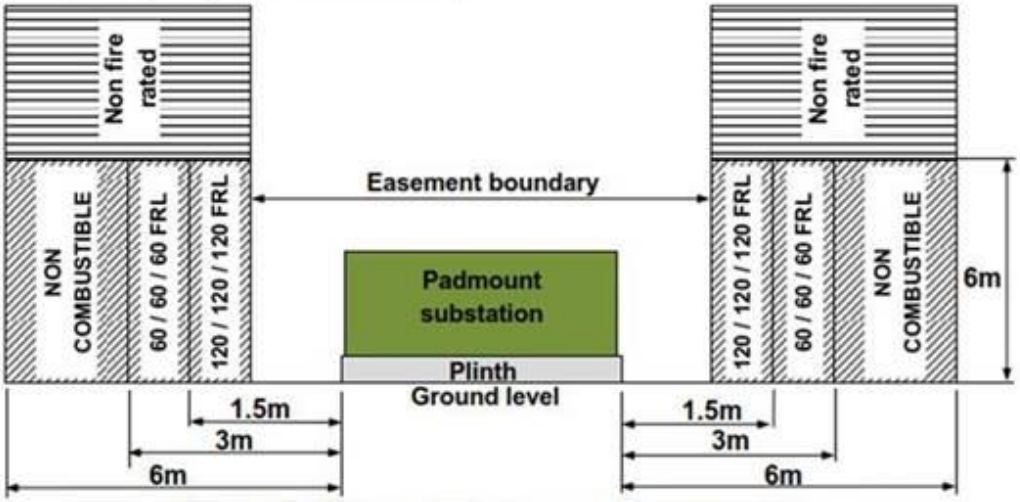


Figure 45 - Minimum FRL clearances for components

Generally it is the Level 3 Accredited Service Provider's (ASP) 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 consent the Department should request the submission of 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.

- Bushfire

Endeavour Energy has noted that the EIS indicates that the site includes bushfire prone land.

NSW Rural Fire Service 'Planning for Bush Fire Protection 2006' as a general bush fire protection measures requires that electricity should be located so as not to contribute to the risk of fire or impede the fire fighting effort and provides the following advice:

Electricity Services • location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings • regular inspection of lines is undertaken to ensure they are not fouled by branches.	• where practicable, electrical transmission lines are underground. • where overhead electrical transmission lines are proposed: - lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and - no part of a tree is closer to a power line than the distance set out in accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia (NS179, April 2002).

The following is an extract of Endeavour Energy's Company Policy 9.1.1 Bushfire Risk Management:

> **9.1.1 BUSHFIRE RISK MANAGEMENT**
>
> **1.0 POLICY STATEMENT**
>
> The company is committed to the application of prudent asset management strategies to reduce the risk of bushfires caused by network assets and aerial consumer mains to as low as reasonably practicable (ALARP) level. The company is also committed to mitigating, the associated risk to network assets and customer supply reliability during times of bushfire whilst achieving practical safety, reliability, quality of supply, efficient investment and environmental outcomes. The company is committed to compliance with relevant acts, regulations and codes.

Accordingly the network required to service the proposed development must be fit for purpose and meet the technical specifications, design, construction and commissioning standards based on Endeavour Energy's risk assessment associated with the implementation and use of the network connection / infrastructure for a bushfire prone site. In assessing bushfire risk, Endeavour Energy has traditionally focused on the likelihood of its network starting a bushfire, which is a function of the condition of the network. Risk control has focused on reducing the likelihood of fire ignition by implementing good design and maintenance practices. However the potential impact of a bushfire on its electricity infrastructure and the safety risks associated with the loss of electricity supply are also considered.

- 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 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 reducing exposure and increasing separation distances to more sensitive uses such as residential or

schools, pre-schools, day care centres or where potentially a greater number of people are regularly exposed for extended periods of time.

These emissions are usually not an issue but with Council's permitting or encouraging development with higher density, reduced setbacks and increased building heights, but as the electricity network operates 24/7/365 (all day, every day of the year), the level of exposure can increase.

Endeavour Energy believes that irrespective of the zoning or land use, applicants (and the Department) should also adopt a policy of prudent avoidance by the siting of more sensitive uses eg. the office component of an industrial building, away from and less susceptible uses such as garages, non-habitable or rooms not regularly occupied eg. storage areas in a commercial building, towards any electricity infrastructure – including any possible future electricity infrastructure required to facilitate the proposed development.

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.

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

> *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.

Endeavour Energy's Network Environment Assessment Section has provided the following general advice in regard to schools, pre-schools, day care centres which are regarded as a 'sensitive use' being in proximity of electricity infrastructure:

> *As far as I know there are no restrictions in legislation that stop schools, pre-schools, day care centres 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 schools, pre-schools, day care centres adjacent to our*

infrastructure in various locations right across our franchise area, it is nonetheless Endeavour Energy's recommendation it that such 'sensitive uses' not be built adjacent to major electricity infrastructure.

Should such a development proceed, the design of the schools, pre-schools, day care centres should also consider prudent avoidance measures such as any rooms which the children will occupy (class rooms, 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 schools, pre-schools, day care centres 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 design 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 near 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.

Regarding 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.

- 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 Risk & Safety Management Plan.

I appreciate that not all the foregoing issues may be directly 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 required electricity infrastructure needed to facilitate the proposed development on or near 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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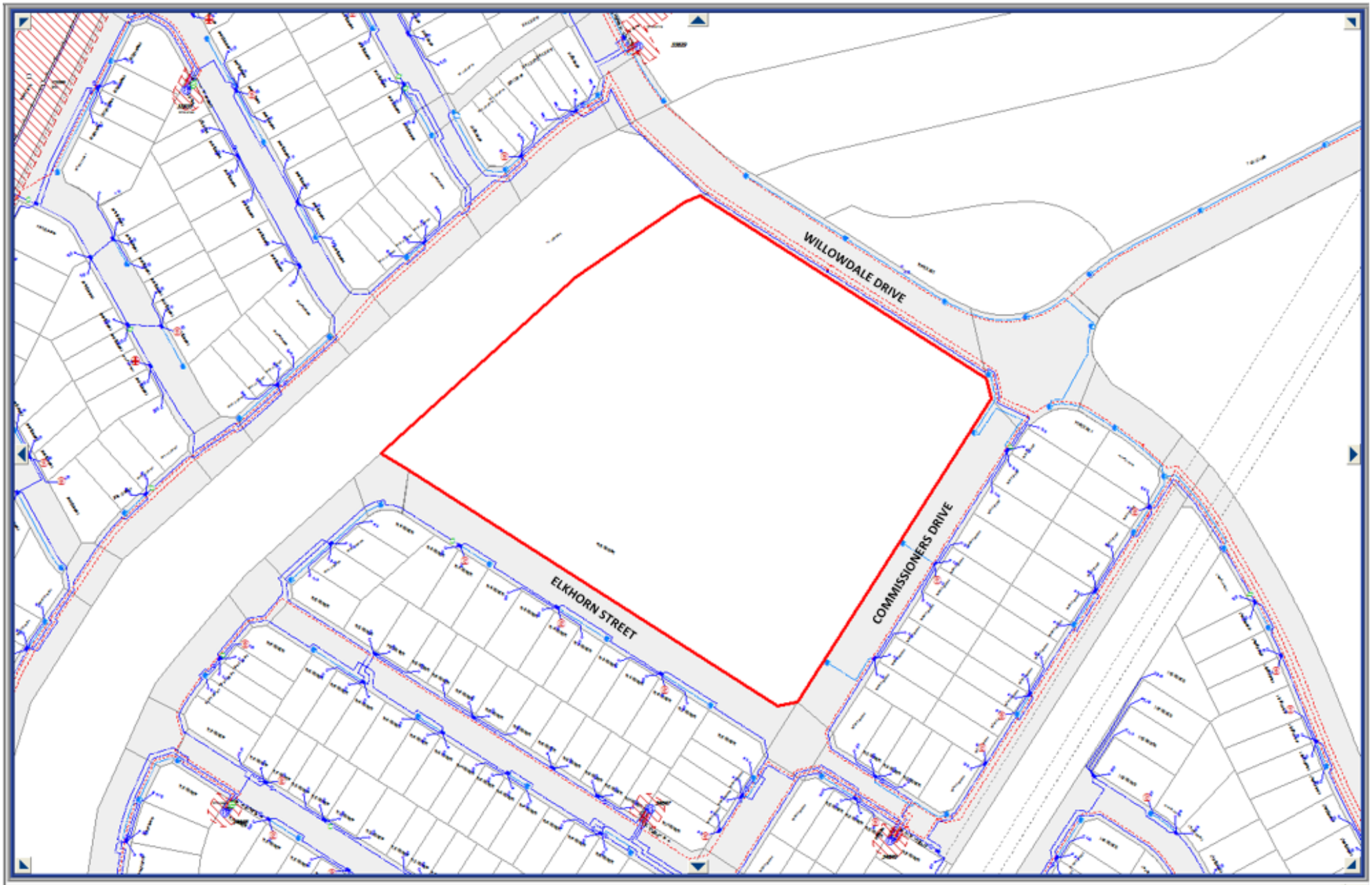
Endeavour Energy



G3E_FID	Feature Name	Component Name	G3E_CID	G3E_ID	LOT	SECTION	DP
80658198	Crown Parcel	Crown Parcel Find	1	2245654	9001		1206596

From: David Way <David.Way@planning.nsw.gov.au>
Sent: Friday, 8 November 2019 10:05 AM
To: Property Development <Property.Development@endeavourenergy.com.au>
Subject: Notice of Exhibition - East Leppington Public School (SSD 9476)

Attention: Network Environmental Assessments Manager – Pat Woodbury
Endeavour Energy
PO Box 811
Seven Hill NSW 1730

-via email-
property.development@endeavourenergy.com.au

Dear Ms Woodbury

The Department of Planning, Industry and Environment has received an Environmental Impact Statement (EIS) for the New East Leppington Primary School (SSD-9476).

The EIS will be publicly exhibited from **Thursday 14 November 2019 to Wednesday 11 December 2019**. All relevant documents may be viewed on the Department's website at: https://www.planningportal.nsw.gov.au/major-projects/project/9686.

The Department invites you to advise on the proposal, including advice on recommended conditions by **Wednesday 11 December 2019**.

If you have any enquiries, please contact David Way on (02) 8275 1324 or via email at David.Way@planning.nsw.gov.au.

Kind regards

David Way
Senior Planning Officer, School Infrastructure Assessments

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