Department of Planning & Environment/Cumberland Council

Development Application No. SSD9273

Wentworthville Public School Redevelopment

Submission due date: 19 December 2018

Endeavour Energy Submission

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Endeavour Energy

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EXECUTIVE SUMMARY

Endeavour Energy has considered the Department of Planning & Environment's referral of Development Application No. SSD9273 for Wentworthville Public School, 70, Fullagar Road, Wentworthville Lot 1 DP1245593.

Endeavour Energy cannot comment on the suitability of the design for the redevelopment of the subject property since Endeavour Energy does not currently have any active electricity easements on or in the vicinity of the property.

Endeavour Energy easements and assets occur on or in the vicinity of the subject property as follows:

- There are no existing easements over the site benefiting Endeavour Energy.
- 33,000 volt (33 kV) high voltage (HV) overhead power lines are located on road reserve along Monash Street (North side), on the South side of the subject property, with a short underground section at the corner of Monash Street and Station Street running from Pole 591488 to underground cables in Station Street.
- 11 kV HV overhead power lines are located on road reserve along Fullagar Road (South side), on the North side of the subject property, with a short underground section at the corner of Fullagar Road and Station Street running from Pole 591456 to underground cables in Station Street.
- 11 kV HV overhead power lines are located on road reserve along Garfield Street (East side) on the West side of the subject property.
- 11 kV HV underground power lines are located under the road reserve along Station Street (West side).
- Low voltage overhead power lines are located on road reserve along Monash Street (South side) and Station Street (East side).
- 11 kV Padmount Distribution Substation DS24106 is located in a fenced compound adjacent to the gate entry from Fullagar Road to the subject property.

Refer to Annexure 1 for relevant Endeavour Energy site plan. Active easements are indicated by red hatching. Google Earth street views are also provided in Annexure 1.

Although Endeavour Energy does not hold any easements over the aforementioned electricity infrastructure, the entire infrastructure is considered as a protected asset under the *Electricity Supply Act 1995* (NSW) Section 53 'Protection of certain electricity works'. This protected asset is managed on the same basis as if easements were in existence.

Endeavour Energy cannot raise objections to the redevelopment since the subject property is not owned by Endeavour Energy and the redevelopment does not encroach on Endeavour Energy property or easements.

Notwithstanding the absence of objections, Endeavour Energy has the following recommendations and advice for the Applicant:

1. That the Applicant seeks guidance from Endeavour Energy's Network Connections Branch regarding electricity supply to the development as early as possible so that the siting of required electricity infrastructure such as a pole or padmount substation and the route of underground cabling can be determined and be part of the design of the development. This will prevent problems in locating a suitable site and route for the electricity infrastructure bearing in mind that the infrastructure will need to be protected by an easement and associated restrictions benefiting and gifted to Endeavour Energy.

   Endeavour Energy's Network Connections Branch can be contacted 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: www.endeavourenergy.com.au.

2. That the Applicant takes into consideration Endeavour Energy's design requirements for minimum easement widths as follows:
   - 3 m for low voltage and 11 kV underground power lines which can be reduced to 1 m if there is concrete protection of minimum 50 mm concrete cover at standard burial depth;
   - 9 m for overhead 11 kV power lines; and
   - 2.75 m x 5.5 m for a padmount substation.

3. That the Applicant takes note of the overhead power lines surrounding the property and complies with the following minimum safety requirements associated with overhead easements during construction (refer diagram in Annexure 2):
   - The minimum separation clearance between Endeavour Energy electricity network and objects or structures must be maintained i.e. 5 m from a pole or guy and 10 m from a steel tower.
   - Any person or part of a person must not be allowed to breach the safety clearance of 4.3 m from the ground within the easement.
   - Access to the assets within the easement must not be impeded or reduced.

Refer to attached Endeavour Energy Drawing 'Overhead Lines Minimum Clearances Near Structures' for guidance.

4. That the Applicant takes into consideration the restrictions and encroachments that are permitted, prohibited or controlled, associated with Endeavour Energy easements. Encroachments into an Endeavour Energy easement, whether permitted, controlled or prohibited, are summarised in the table in Annexure 4.

   The power supply line extension to the redevelopment will most likely be underground. Restrictions associated with underground electrical easements which the Applicant must take into consideration include the following:
   - The underground cables must be positioned in the centre of the easement.
   - Any other services or structures besides the required electricity supply or structures associated with the electricity supply must not be installed within the easement site.
   - The surface level or ground contour of the easement site must not be altered.
   - No mechanical compacting is to occur within the easement.
   - Excavations greater than 300 mm deep are not allowed within the easement.
   - Any activity that restricts access to the easement site must not be carried out without the prior written permission of Endeavour Energy and in accordance with such conditions as Endeavour Energy may reasonably impose.
   - Access to Endeavour Energy joints and joint bays must not be impeded. If Endeavour Energy requires access to the underground assets within the easement but is impeded by easement encroachments such as storage of the owner's assets, Endeavour Energy can direct removal of the encroachments at a given notice; otherwise, removal will be at the expense of the owner. For example, storage of metallic pipes greater than 3 m is allowed provided Endeavour Energy has approved the storage and the pipes can be moved upon request.

   Controlled activities can only be carried out upon approval from Endeavour Energy. The Applicant can obtain this approval via the Regional Easement Officer North by sending an application to the following address:

   Regional Easement Officer- North
   Endeavour Energy
   PO Box 811
   Seven Hills NSW 1730

5. That the Applicant takes into consideration a new padmount substation may be required to supply power to the redeveloped property. The padmount substation can be located within or

external to the property and will require an easement of minimum 2.75 m x 5.5 m, with a suitable size increase to accommodate bollards or retaining walls installed to protect the substation from vehicle impact. The substation may also need to be screened or protected by fencing or retaining walls for security and aesthetic reasons. If screening vegetation is planted, it must be outside the easement and maintained to allow easy access to the substation. The restrictions applicable to underground cabling listed above also apply to padmount substations. Additionally, it is mandatory that there are no building overhangs within the 6 m airspace above a padmount substation site. A pictorial representation of this restriction is given in Annexure 3.

6. That the Applicant takes into consideration permanent surfaces such as asphalt or concrete are allowed for overhead easements but are prohibited for underground and padmount substation easements. However, construction of new roads and concrete driveways are controlled activities for underground easements subject to restrictions as follows:
   - Cables are installed in continuous ducts.
   - The roadway or driveway is capable of supporting the heaviest vehicle likely to traverse the driveway.
   - The thermal rating of the underground cables is not compromised by the installation of the road or driveway.
   - The road or driveway is not installed within a distance that would restrict access to or maintenance of a joint or pit.
   - The road or driveway is not installed over a joint or pit.
   - Spare ducts must be installed for future use.

7. That the Applicant takes into consideration other utilities such as telecommunications, water and gas are as a general rule, not allowed within Endeavour Energy easements, whether in parallel or longitudinally above Endeavour Energy power cables. If the sharing of an Endeavour Energy easement with third party assets is unavoidable, the Applicant must consult Endeavour Energy on the layout of the utilities in relation to Endeavour Energy cables. The cables may need concrete encasement and there will be minimum clearances to be maintained between Endeavour Energy power cables and the utilities.

   Refer Annexure 5 for a typical layout of underground electricity cables adjacent to other utilities in the same easement. The installation of the utilities must be consulted and coordinated with Endeavour Energy Regional Services South via Head Office enquiries on telephone: 133 718 or (02) 9853 6666 from 8am - 5:30pm or alternately email RegionalServices.North@endeavourenergy.com.au.

8. That the Applicant must maintain unimpeded access to Endeavour Energy assets at all times. If impedances are present, they must be removable at any notice; otherwise removal by Endeavour Energy will be charged to the property owner's account.

9. That the Applicant maintains Endeavour Energy's required minimum distance from the centreline of the easement at all times to all buildings and structures including temporary site sheds and plant used during construction. This requirement overrides if any, Council's allowable building setbacks and other building requirements under its development controls.

10. That the Applicant recognises the risks involved in working near overhead power lines and takes guidance from the WorkCover *Code of Practice- Work Near Overhead Power Lines,* paying heed to the approach distances and the need for operators of cranes and mobile plant to take especial care.

    For the HV power lines surrounding the property, approach distances are as follows:

    - For work performed by ordinary persons- 3.0 m
    - For work performed by accredited persons- 1.8 m

- For vehicles (applicable to any part of the vehicle such as the load, exhaust pipe and attachments. Attachments include rotating or flashing lights and radio aerials)- 2.1 m

For LV power lines along Monash Street (South side) and Station Street (East side), approach distances are as follows:

- For work performed by ordinary persons- 3.0 m
- For work performed by accredited persons- 0.5 m
- For vehicles (applicable to any part of the vehicle such as the load, exhaust pipe and attachments. Attachments include rotating or flashing lights and radio aerials)- 0.6 m

All Endeavour Energy overhead power lines must be regarded as live unless an Endeavour Energy access authority has been issued to the plant operator or person-in-charge of the work.

11. That the Applicant carries out a risk assessment and determines whether there will be any areas of work under overhead lines, which will require marking off with rigid or tape barriers. If required, arrangements can be made with Endeavour Energy to mark the limit of approach distances to the overhead power lines with tiger tails or some other high visibility bunting. Cranes or mobile plant may need to be earthed when being operated near power lines and a safety observer may also be required, for example, when it is likely that the moving plant will come closer than the approach distances specified above.

    Endeavour Energy Regional Services North can be consulted for advice via Head Office enquiries on telephone: 133 718 or (02) 9853 6666 from 8am - 5:30pm or alternately email RegionalServices.North@endeavourenergy.com.au.

12. That the Applicant complies with the approach distance of 4 metres specified in AS/NZS- 4576- Guidelines for Scaffolding, in the erection, dismantling and use of fixed scaffolding near overhead power lines. If mobile aluminium scaffolding is used, it is recommended that the rules governing the use of cranes and mobile plant be applied.

    If the minimum approach distance is likely to be breached, a hazard identification and risk assessment must be carried out to determine the risk to persons encroaching within the 4 metre approach distance and to formulate the control measures required to eliminate or mitigate the risks. Control measures include applying to Endeavour Energy to de- energise the affected lines and issue an access authority, having in place a Safe Work Method Statement (SWMS) for the erection, use and dismantling of the scaffolding, requesting Endeavour Energy to install ‘tiger tails’ on the affected lines and erection of hoarding on the external face of the scaffolding. For example, Building G has been designed with a minimum setback of 5.652 metres to Fullagar Road and the use of scaffolding in the construction of this building may breach the minimum approach distance of 4 metres, in which case, the aforementioned actions must be implemented.

    Endeavour Energy Regional Services North can be consulted for advice if required, via Head Office enquiries on telephone: 133 718 or (02) 9853 6666 from 8am - 5:30pm or alternately email RegionalServices.North@endeavourenergy.com.au.

13. That the Applicant carries out demolition work in accordance with Australian Standard AS 2601—2001: ‘The demolition of structures’, and applies to Endeavour Energy to disconnect and remove 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.

14. That the Applicant obtains advice from the ***Dial Before You Dig*** **1100** service prior to any underground work to identify the location of any underground electrical and other utility infrastructure across or in the vicinity of the site and to assist in assessing the risk of the proposed work impacting this infrastructure.

15. That the Applicant takes into consideration electricity infrastructure required to supply power to the site such as a padmount substation must not be subject to flood inundation and drains within or in the vicinity of the area allocated for the infrastructure must be properly maintained to avoid the possibility of water damage to the infrastructure.

16. That the Applicant adopts 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.

17. That the Applicant avoids the planting of large trees in the vicinity of electricity infrastructure. Suitable planting includes low growing shrubs not exceeding 3.0 metres in height and ground covers and/or smaller shrubs with non-invasive root systems.

1.0 Background

1.1 Brief description of proposal

The Department of Planning and Environment has proposed a development application for the redevelopment of Wentworthville Public School located at 70, Fullagar Road, Wentworthville. The proposed redevelopment is a State Significant Development (SSD) with the Minister for Planning being the Consent Authority. The redevelopment is confined within the boundaries of the property and consists of demolition of some existing buildings, removal of existing demountables, construction of a new three-storey building to be used for teaching spaces and a library, alterations and additions to existing buildings, construction of a new hall, landscaping, signage and other associated works.

The new three- storey building will be located at the corner of Fullagar Road and Station Street. The new hall will be located adjacent to the existing covered outdoor learning area.

1.2 Location of Endeavour Energy easements and assets

Refer to Annexure 1 for relevant Endeavour Energy site plan and Google Maps street views. As shown in the site plan and street views, Endeavour Energy easements and assets occur on or in the vicinity of the subject property as follows:

- There are no existing easements over the site benefiting Endeavour Energy.
- 33,000 volt (33 kV) high voltage (HV) overhead power lines are located on road reserve along Monash Street (North side), on the South side of the subject property, with a short underground section at the corner of Monash Street and Station Street running from Pole 591488 to underground cables in Station Street.
- 11 kV HV overhead power lines are located on road reserve along Fullagar Road (South side), on the North side of the subject property, with a short underground section at the corner of Fullagar Road and Station Street running from Pole 591456 to underground cables in Station Street.
- 11 kV HV overhead power lines are located on road reserve along Garfield Street (East side) on the West side of the subject property.
- 11 kV HV underground power lines are located under the road reserve along Station Street (West side).
- Low voltage overhead power lines are located on road reserve along Monash Street (South side) and Station Street (East side).
- 11 kV Padmount Distribution Substation DS24106 is located in a fenced compound adjacent to the gate entry from Fullagar Road to the subject property.

Although all the surrounding power lines and padmount substation are not held under easement, they are protected assets under the *Electricity Supply Act 1995* (NSW) Section 53 'Protection of certain electricity works'. The owner or occupier of the land cannot take any action by reason of the presence or operation of the electricity works in, on or over the land i.e. the owner or occupier of the land cannot remove the electricity infrastructure from the property. These protected assets are managed on the same basis as if an easement was in existence.

2.0 Consideration of proposal

2.1 Network connection for new development

Endeavour Energy advises that the development Applicant should not automatically assume that the presence of existing electricity infrastructure nearby means that adequate supply is immediately available to facilitate their proposed development. In due course, the Applicant will need to submit an application for connection of load via Endeavour Energy's Network Connections Branch to carry out the final load assessment and determination of the method of supply. Depending on the outcome of the assessment, any required padmount or indoor/chamber substation/s will need to be located within the property in a suitable and accessible location. The substation and associated cabling will need to be protected by an easement and associated restrictions benefiting and gifted to Endeavour Energy.

Endeavour Energy's Network Connections Branch can be contacted 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: www.endeavourenergy.com.au.

2.2 Electrical network reticulation in urban areas

Endeavour Energy's network reticulation policy in urban areas specifies that extensions to existing overhead 11 kV network must generally be underground. The property is located in a non- bushfire prone area and new lines within existing overhead areas can be overhead; however, for safety and reliability reasons, line extension reticulation to and/or within the property will most likely be underground.

2.3 Easement management and network access

2.3.1 Overhead easement

As mentioned above, the overhead power lines in the vicinity of the property and the padmount substation within the property are not held under easement; however, are protected assets. This means that the infrastructure must be treated as if easements are in existence and the redevelopment of the property must comply with the following minimum safety requirements associated with overhead easements (refer diagram in Annexure 2):

- The minimum separation clearance between the infrastructure and objects or structures must be maintained i.e. 5 m from a pole or guy.
- Any person or part of a person must not be allowed to breach the safety clearance of 4.3 m from the ground within the easement.
- Access to the assets within the easement must not be impeded or reduced.

Refer Endeavour Energy Drawing 'Overhead Lines Minimum Clearances Near Structures' for guidance.

2.3.2 Underground easement

According to Endeavour Energy design requirements, underground low voltage and 11 kV cables will require a minimum 3 m wide easement, which can be reduced to 1 m if there is concrete protection of minimum 50 mm concrete cover at standard burial depth. New easements within the property may need to be created. Endeavour Energy advises that any electrical easements created within or in the vicinity of the property will be subject to the following restrictions:

- The underground cables must be positioned in the centre of the easement.
- Any other services or structures besides the required electricity supply or structures associated with the electricity supply must not be installed within the easement site.
- The surface level or ground contour of the easement site must not be altered.
- No mechanical compacting is to occur within the easement.
- Excavations greater than 300 mm deep are not allowed within the easement.
- Any activity that restricts access to the easement site must not be carried out without the prior written permission of Endeavour Energy and in accordance with such conditions as Endeavour Energy may reasonably impose.
- Access to Endeavour Energy joints and joint bays must not be impeded.
- If Endeavour Energy requires access to the underground assets within the easement but is impeded by easement encroachments such as storage of the owner's assets, Endeavour Energy can direct removal of the encroachments at a given notice; otherwise, removal will be at the expense of the owner. For example, storage of metallic pipes greater than 3 m is allowed provided Endeavour Energy has approved the storage and the pipes can be moved upon request.

It is imperative that the access to electrical infrastructure adjacent to and on the subject property is maintained at all times. To ensure an uninterrupted electricity supply, access to the electrical infrastructure may be required at any time.

2.3.3 Substation easement

If a new padmount substation is required to supply power to the redeveloped property, whether located within or external to the property, an easement of minimum 2.75 m x 5.5 m will be required, with a suitable size increase to accommodate bollards or retaining walls installed to protect the substation from vehicle impact. The substation may also need to be screened or protected by fencing or retaining walls for security and aesthetic reasons. If screening vegetation is planted, it must be outside the easement and maintained to allow easy access to the substation. The restrictions applicable to underground cabling listed above also apply to padmount substations. Additionally, it is mandatory that there are no building overhangs within the 6 m airspace above a padmount substation site. A pictorial representation of this restriction is given in Annexure 3.

2.3.4 Easement Encroachments

Encroachments into an Endeavour Energy easement, whether permitted, controlled or prohibited, are summarised in the table in Annexure 4. Controlled activities can only be carried out upon approval from Endeavour Energy. The Applicant can obtain this approval via the Regional Easement Officer North by sending an application to the following address:

Regional Easement Officer- North
Endeavour Energy
PO Box 811
Seven Hills NSW 1730

Controlled activities impacting particular Endeavour Energy infrastructure must meet the minimum safety requirements associated with that infrastructure. Additional controls may also be specified by Endeavour Energy and they will be included in the conditions of approval for the controlled activity. For instance, conductive fencing on the boundary of an underground easement is a controlled activity but may be erected once approved by Endeavour Energy and on condition that the fence has a minimum 4.2 m wide opening or gate (with provision to install Endeavour Energy locks) for vehicle access. If the fencing runs through the easement, the posts must be located outside the easement. If the easement is an overhead easement, the fence will also need to be earthed and/or have interval breaks in electrical continuity to prevent electromagnetic induction and transferred voltage hazards.

The Applicant is advised that permanent surfaces such as asphalt or concrete are allowed for overhead easements but are prohibited for underground and padmount substation easements. However, construction of new roads and concrete driveways are controlled activities for underground easements subject to restrictions as follows:

- Cables are installed in continuous ducts.
- The roadway or driveway is capable of supporting the heaviest vehicle likely to traverse the driveway.
- The thermal rating of the underground cables is not compromised by the installation of the road or driveway.
- The road or driveway is not installed within a distance that would restrict access to or maintenance of a joint or pit.
- The road or driveway is not installed over a joint or pit.
- Spare ducts must be installed for future use.

2.4 Safety clearances

Endeavour Energy's design requirement for minimum easement width is as listed in the table below.

	Voltage in thousand volts or kilovolts (kV)	Location of electrical infrastructure	Minimum easement in metres (m)
Overhead	11	Along Fullagar Road and Garfield Street	9

	33	Along Monash Street	18
Underground	11	From Pole 591456 to the corner of Fullagar Road and Station Street	3
		Along Station Street	3
	33	From Pole 591488 to the corner of Monash Street and Station Street	6
Padmount Substation	Any		2.75 x 5.5

For the 11 kV overhead lines along Fullagar Road and Garfield Street, the minimum distance of 4.5 metres from the centreline of the easement must be maintained at all times to all buildings and structures including temporary site sheds and plant such as tower cranes used during construction. This is also applicable to the 33 kV overhead line along Monash Street, for which the minimum distance to be maintained, is 9 metres. These distances must also be maintained regardless of the Council's allowable building setbacks and other building requirements under its development controls. A copy of Endeavour Energy Drawing 'Overhead Lines Minimum Clearances Near Structures' is attached for guidance. Regardless of whether the safety clearances to the proposed buildings or structures are an issue or not, it is recommended that guidance be taken from the WorkCover *Code of Practice- Work Near Overhead Power Lines*, which can be obtained from the SafeWork NSW website www.safework.nsw.gov.au.

2.4.1 Approach distances

Approach distances vary according to the voltage of the overhead power lines and the technical knowledge and experience of the person/s performing the work. Definitions of ordinary persons and accredited persons are given in the aforementioned Code of Practice. For this redevelopment, the electricity lines which surround the property are all high voltage but are not considered as an issue since the work will be carried out within the boundaries of the property. However, care needs to be taken in the bringing of plant and materials to the site and when working near the boundaries of the property, in relation to the height of the lines.

For the HV power lines surrounding the property, approach distances are as follows:

- For work performed by ordinary persons- 3.0 m
- For work performed by accredited persons- 1.8 m
- For vehicles (applicable to any part of the vehicle such as the load, exhaust pipe and attachments. Attachments include rotating or flashing lights and radio aerials)- 2.1 m

For LV power lines along Monash Street (South side) and Station Street (East side), approach distances are as follows:

- For work performed by ordinary persons- 3.0 m
- For work performed by accredited persons- 0.5 m
- For vehicles (applicable to any part of the vehicle such as the load, exhaust pipe and attachments. Attachments include rotating or flashing lights and radio aerials)- 0.6 m

2.4.2 Cranes and mobile plant

Endeavour Energy advises that operators of cranes and mobile plant must take especial care when working near overhead power lines. All Endeavour Energy overhead power lines must be treated as live unless an access authority has been issued to the plant operator or person-in-charge of the work. It is recommended that areas of work under overhead lines be marked off with rigid or tape barriers and arrangements be made with Endeavour Energy to mark the limit of approach distances to the overhead power lines with tiger tails or some other high visibility bunting. The crane or mobile plant may also need to be earthed when being operated near power lines.

A safety observer may also be required when a crane or mobile plant is being operated near overhead power lines, for example, when it is likely that the moving plant will come closer than the approach distances specified above.

2.4.3 Scaffolding

It is recommended that the erection, dismantling and use of fixed scaffolding near overhead power lines be carried out in accordance with AS/NZS- 4576- Guidelines for Scaffolding, which specifies an approach distance of 4 metres for metallic scaffolding. If mobile aluminium scaffolding is used, it is recommended that the rules governing the use of cranes and mobile plant in Section 2.4.2 above be applied.

If the minimum approach distance is likely to be breached, a hazard identification and risk assessment must be carried out to determine the risk to persons encroaching within the 4 metre approach distance and to formulate the control measures required to eliminate or mitigate the risks. Control measures include applying to Endeavour Energy to de- energise the affected lines and issue an access authority, having in place a Safe Work Method Statement (SWMS) for the erection, use and dismantling of the scaffolding, requesting Endeavour Energy to install 'tiger tails' on the affected lines and erection of hoarding on the external face of the scaffolding. For example, Building G has been designed with a minimum setback of 5.652 metres to Fullagar Road and the use of scaffolding in the construction of this building may breach the minimum approach distance of 4 metres, in which case, the aforementioned actions must be implemented.

Endeavour Energy Regional Services North can be consulted for advice if required, via Head Office enquiries on telephone: 133 718 or (02) 9853 6666 from 8am - 5:30pm or alternately email RegionalServices.North@endeavourenergy.com.au.

2.5 Demolition

Demolition work is to be carried out in accordance with Australian Standard AS 2601—2001: 'The demolition of structures'. 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 i.e. 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 e.g. streetlight columns, power poles, overhead power lines and underground cables.

2.6 Excavation and underground works

The development is restricted to the boundaries of the subject property and is not expected to affect existing Endeavour Energy electrical infrastructure external to the property. However, if the Applicant so desires, Endeavour Energy guidance can be sought by contacting Endeavour Energy Regional Services North via Head Office enquiries on telephone: 133 718 or (02) 9853 6666 from 8am - 5:30pm or alternately email RegionalServices.North@endeavourenergy.com.au.

Endeavour Energy also advises that before commencing any underground activity, the Applicant obtains advice from the ***Dial Before You Dig*** **1100** service. This should be obtained by the Applicant to identify the location of any underground electrical and other utility infrastructure across or in the vicinity of the site and to assist in assessing the risk of the proposed work impacting this infrastructure.

2.7 Other utilities or services

As a general rule, other utilities such as telecommunications, water and gas are not allowed within Endeavour Energy easements, whether in parallel or longitudinally above Endeavour Energy power cables. If the sharing of an Endeavour Energy easement with third party assets is unavoidable, the Applicant must consult Endeavour Energy on the layout of the utilities in relation to Endeavour Energy cables. The cables may need concrete encasement and there will be minimum clearances to be maintained between Endeavour Energy power cables and the utilities. Refer Annexure 5 for a typical layout of Endeavour Energy underground assets adjacent to other utilities within the same easement.

The installation of the utilities must be consulted and coordinated with Endeavour Energy Regional Services North via Head Office enquiries on telephone: 133 718 or (02) 9853 6666 from 8am - 5:30pm or alternately email RegionalServices.North@endeavourenergy.com.au.

2.8 Flooding and drainage

Endeavour Energy advises that electricity infrastructure required to supply power to the site such as a padmount substation must not be subject to flood inundation. As such, the Applicant is required to take this into account and allocate an appropriate area for the location of the infrastructure.

Drains within or in the vicinity of the area allocated for the infrastructure must be properly maintained to avoid the possibility of water damage to the infrastructure. In the case where the infrastructure is raised above ground level, all materials used in the construction below the infrastructure must be capable of withstanding prolonged immersion in water without swelling or deterioration.

2.9 Electromotive Force or electromagnetic Field (EMF)

Endeavour Energy recognises that a causal link between EMF exposure and demonstrated health effects has not been established, even after much scientific investigation throughout the world. There are no state or federal exposure standards for 50/60- hertz (Hz) EMF based on demonstrated health effects. Nor are there any such standards world-wide. Endeavour Energy is committed to ensuring that its activities and assets conform to all relevant International and Australian Standards, National Health and Medical Research Council (NH&MRC) Standards, Energy Networks Association (ENA) Standards and NSW legislation. This includes a commitment to a policy of prudent avoidance as endorsed by the ENA with regard to the location of assets and electromagnetic fields.

Localised EMFs may be encountered in specific situations such as near substations, underground cables, specialised electrical equipment, or at elevated locations near lines. Note that the strengths of EMFs decrease rapidly with distance from the source. Typical magnetic field measurements associated with Endeavour Energy's activities and assets given the required easement widths and safety clearances will not exceed the recommended magnetic field public exposure limits. Nevertheless, Endeavour Energy advises that the Applicant adopts 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 development on the site.

2.10 Vegetation management

Endeavour Energy advises that the planting of large trees in the vicinity of electricity infrastructure is not supported by Endeavour Energy. Suitable planting includes low growing shrubs not exceeding 3.0 metres in height and ground covers and/or smaller shrubs with non-invasive root systems. Larger trees should be planted well away from electricity infrastructure (at least the same distance from overhead power lines as their potential full grown height) and with underground cables, be installed with a root barrier around the root ball of the plant. Landscaping that interferes with electricity infrastructure may become a potential safety risk, cause bush fires, restrict access, reduce light levels from streetlights or result in the interruption of supply. Such landscaping may be 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. It is recommended that the Applicant considers this advice when siting the required electricity infrastructure for supply to the subject property.

2.11 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. Endeavour Energy's public safety training resources have been developed to help the general public or workers understand why they may be at risk and what they can do to work safely. The public safety training resources are available on Endeavour Energy's website via the following link:

Endeavour Energy Public Safety Training Resources

If the Applicant has any concerns over the proposed works in proximity to electricity infrastructure, the Applicant may contact the appropriate staff in Endeavour Energy for advice via email Construction.Works@endeavourenergy.com.au.

In case of an emergency relating to Endeavour Energy's electrical network, the Applicant is advised to contact Endeavour Energy via emergency telephone number 131 003. This emergency line is available 24 hours/7 days.

3.0 Conclusion and recommendations

Endeavour Energy cannot comment on the suitability of the design for the redevelopment of the subject property since Endeavour Energy does not currently have any active electricity easements on or in the vicinity of the property. Also, Endeavour Energy cannot raise objections to the redevelopment since the property is not owned by Endeavour Energy and the redevelopment does not encroach on Endeavour Energy property or easements.

Notwithstanding the absence of objections, Endeavour Energy has the following recommendations and advises the Applicant as follows:

- That the Applicant seeks guidance from Endeavour Energy's Network Connections Branch regarding electricity supply to the development as early as possible so that the siting of required electricity infrastructure such as a pole or padmount substation and the route of underground cabling can be determined and be part of the design of the development. This will prevent problems in locating a suitable site and route for the electricity infrastructure bearing in mind that the infrastructure will need to be protected by an easement and associated restrictions benefiting and gifted to Endeavour Energy.

- That the applicant recognises Endeavour Energy's design requirements for minimum easement widths as follows:
  - 3 m for low voltage and 11 kV underground power lines which can be reduced to 1 m if there is concrete protection of minimum 50 mm concrete cover at standard burial depth;
  - 9 m for overhead 11 kV power lines; and
  - 2.75 m x 5.5 m for a padmount substation.

- That the Applicant takes into consideration the restrictions and encroachments that are permitted, prohibited or controlled, associated with Endeavour Energy easements.

- That the Applicant takes into consideration that other utilities such as telecommunications, water and gas are as a general rule, not allowed within Endeavour Energy easements, whether in parallel or longitudinally above Endeavour Energy power cables. If the sharing of an Endeavour Energy easement with third party assets is unavoidable, the Applicant must consult Endeavour Energy on the layout of the utilities in relation to Endeavour Energy cables. The cables may need concrete encasement and there will be minimum clearances to be maintained between Endeavour Energy power cables and the utilities. Refer Annexure 5 for a typical layout of underground electricity cables adjacent to other utilities in the same easement.

- That the Applicant must maintain unimpeded access to Endeavour Energy assets at all times. If impedances are present, they must be removable at any notice; otherwise removal by Endeavour Energy will be charged to the property owner's account.

- That the Applicant maintains Endeavour Energy's required minimum distance from the centreline of the easement at all times to all buildings and structures including temporary site sheds and plant used during construction. This requirement overrides if any, Council's allowable building setbacks and other building requirements under its development controls.

- That the Applicant recognises the risks involved in working near overhead power lines and takes guidance from the WorkCover *Code of Practice- Work Near Overhead Power Lines,* paying heed to the approach distances and the need for operators of cranes and mobile plant to take especial care.

- That the Applicant complies with the approach distance of 4 metres specified in AS/NZS- 4576- Guidelines for Scaffolding, in the erection, dismantling and use of fixed scaffolding near overhead power lines. If mobile aluminium scaffolding is used, it is recommended that the rules governing the use of cranes and mobile plant be applied.

- That the Applicant carries out demolition work in accordance with Australian Standard AS 2601—2001: 'The demolition of structures', and applies to Endeavour Energy to disconnect and remove 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.

- That the Applicant obtains advice from the ***Dial Before You Dig*** **1100** service prior to any underground work to identify the location of any underground electrical and other utility infrastructure across or in the vicinity of the site and to assist in assessing the risk of the proposed work impacting this infrastructure.

- That the Applicant takes into consideration electricity infrastructure required to supply power to the site such as a padmount substation must not be subject to flood inundation and drains within or in the vicinity of the area allocated for the infrastructure must be properly maintained to avoid the possibility of water damage to the infrastructure.

- That the Applicant adopts 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.

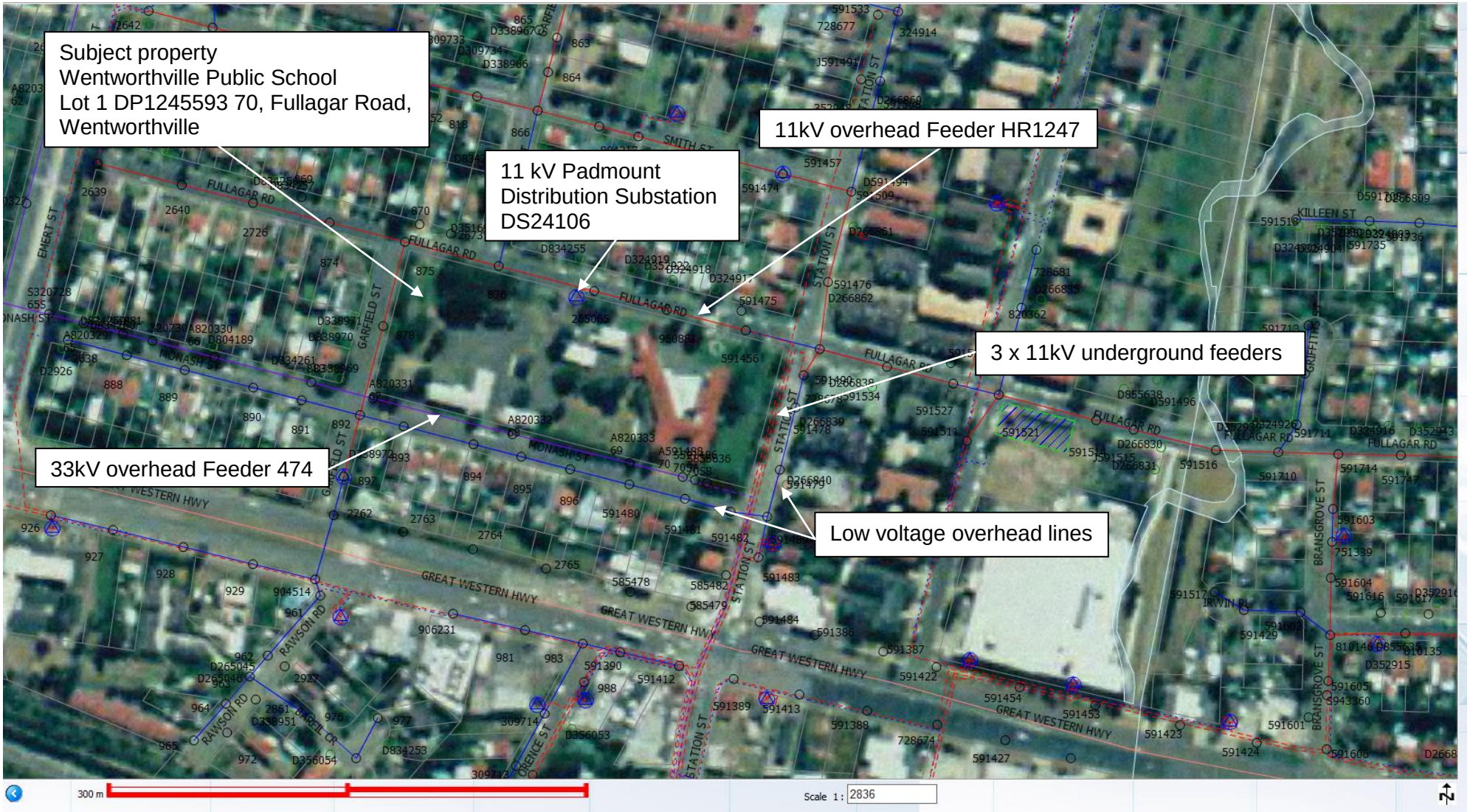
- That the Applicant avoids the planting of large trees in the vicinity of electricity infrastructure. Suitable planting includes low growing shrubs not exceeding 3.0 metres in height and ground covers and/or smaller shrubs with non-invasive root systems.

4.0 ANNEXURES

4.1 Annexure 1- Endeavour Energy GIS plans and Google Maps street views

Notes for Endeavour Energy GIS site plans

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



Caption: Endeavour Energy GIS map showing electricity supply lines (overhead shown as solid and underground shown as dashed lines) with associated poles and distribution substations in and in the vicinity of Wentworthville Public School

Caption: Google Maps street view looking East and showing 11 kV overhead feeder and associated poles on road reserve along Fullagar Road just outside the Wentworthville Public School (North side) and 11 kV Padmount Distribution Substation DS24106 in a fenced compound adjacent to the school entry gate and carpark.

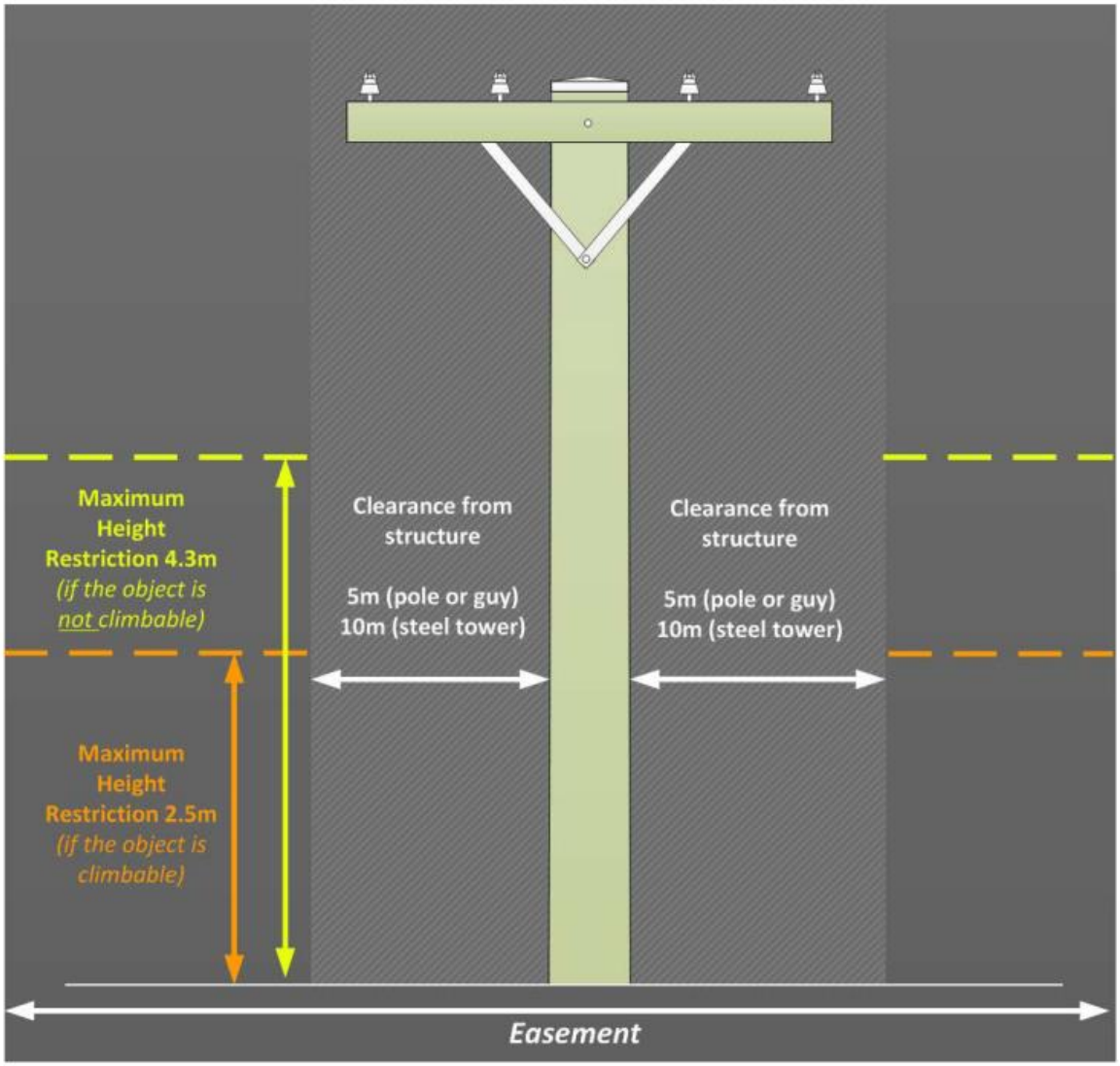
Caption: Google Maps street view looking South-West at the corner of Fullagar Road and Station Street. Underground cables exist from Pole 591456 to the street corner and under the road reserve/pavement along Station Street

Caption: Google Maps street view looking North- west at the corner of Monash Street and Station Street showing 33 kV overhead feeder and associated poles on road reserve along Monash Street just outside the Wentworthville Public School (South side). Underground cables exist from Pole 591488 to the street corner and under the road reserve/pavement along Station Road.

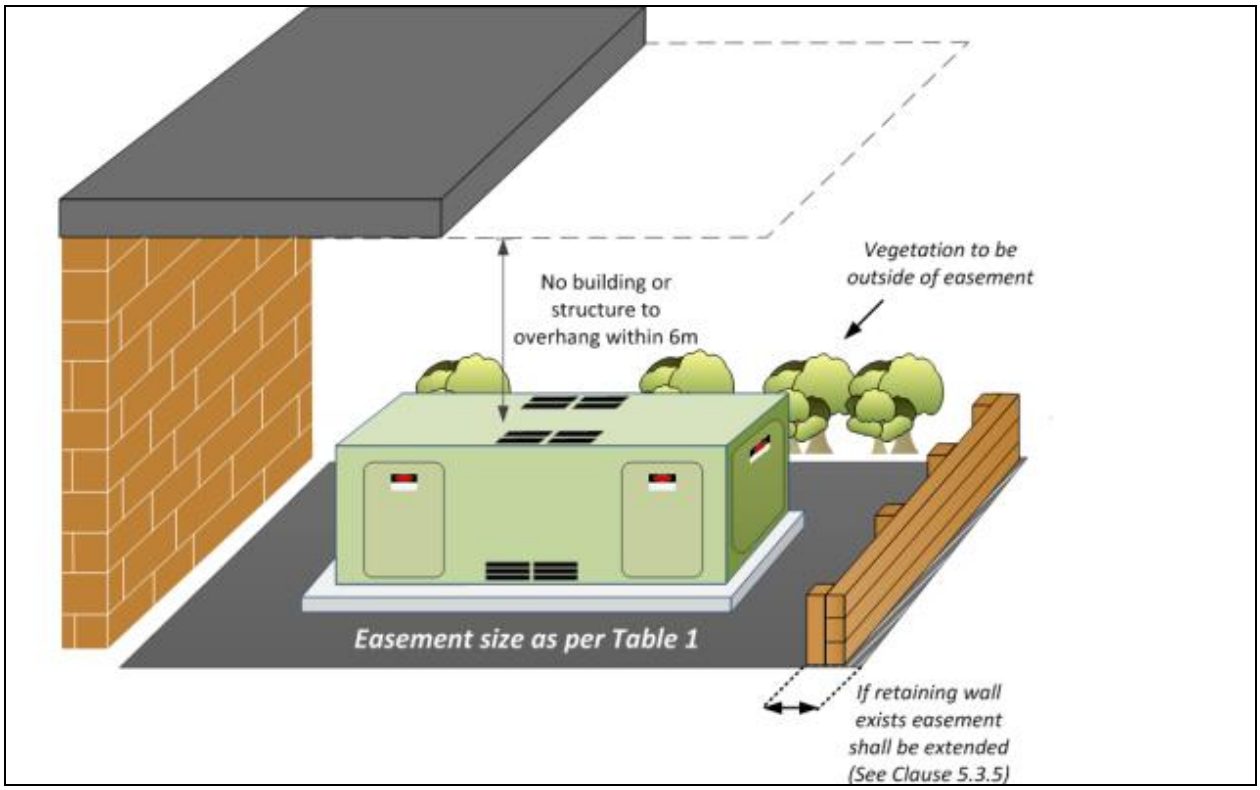
Caption: Google Maps street view looking West along Monash Street showing Endeavour Energy 33kV overhead feeder with associated poles on road reserve outside the Wentworthville Public School (South side) and low voltage distribution feeder with associated poles on opposite side of the road.

Caption: Google Maps street view looking North-East at the corner of Garfield Street and Monash Street showing Endeavour Energy 33kV overhead feeder with associated poles on road reserve along Monash Street outside the Wentworthville Public School (South side) and 11kV overhead feeder with associated poles on road reserve along Garfield Street outside the Wentworthville Public School (West side).

4.2 Annexure 2- Overhead line restriction within easement



4.3 Annexure 3- Padmount substation easement requirements



4.4 Annexure 4- Easement encroachments

Allowed- The activity is allowed within the easement but is subject to Endeavour Energy's minimum easement safety requirements.
Prohibited- The activity is not allowed within the easement under any circumstance.
Controlled- The activity is allowed only if it meets Endeavour Energy's minimum safety requirements specific to the type of easement with additional controls specified by Endeavour Energy. Approval from Endeavour Energy is required for any controlled activity.

Category	Encroachment	Overhead			Underground			Padmount Substation		
		Allowed	Prohibited	Controlled	Allowed	Prohibited	Controlled	Allowed	Prohibited	Controlled
Buildings/ Structures	Buildings (habitable)		✓			✓			✓	
	Tents- Commercial or Recreational		✓		✓				✓	
	Shade Cloths/ Umbrellas			✓		✓			✓	
	Minor structures (clotheslines, playground equipment, non- metallic fences and bbqs)			✓		✓			✓	
	Garages, large sheds and shipping containers (habitable)		✓			✓			✓	
	Non- habitable buildings (carports and metallic sheds), and shipping containers (uninhabited)			✓		✓			✓	
	Flag pole/ weather vane		✓			✓			✓	
Barriers/Walls	Sound walls			✓		✓			✓	
	Conductive fencing through an easement			✓			✓		✓	
	Conductive fencing on boundary of an easement			✓			✓		✓	
	Metal safety barriers			✓		✓			✓	
	Electric fencing		✓			✓			✓	
	Retaining walls			✓			✓			✓
	Metallic pipes in lengths greater than 3 m		✓				✓		✓	
Fixed/ Mobile Plant	Footings of fixed plant		✓			✓			✓	
	Fixed plant or equipment		✓			✓			✓	
	Mobile plant or equipment			✓			✓	✓		
	Parking of tall vehicles, trucks, caravans, campervans		✓				✓		✓	
	Parking of other vehicles			✓	✓				✓	

Category	Encroachment	Overhead			Underground			Padmount Substation		
		Allowed	Prohibited	Controlled	Allowed	Prohibited	Controlled	Allowed	Prohibited	Controlled
Vegetation	Shrubs with roots < 400 mm	✓			✓			✓		
	Planting of trees which grow less than 3 m	✓				✓			✓	
	Planting of trees which exceed 3 m		✓			✓			✓	
	Storage of organic matter (leaves, compost)			✓			✓		✓	
Swimming pools	Spas and swimming pools- above ground		✓			✓			✓	
	Swimming pools- in ground		✓			✓			✓	
Fires	Lighting of fires		✓			✓			✓	
	Back burning			✓		✓			✓	
Agricultural use of the land	Agricultural pursuits such as dusting, harvesting, netting, irrigation			✓			✓			✓
	Ploughing near structures		✓		N/A				✓	
	Ploughing not near structures	✓				✓			✓	
Other	Objects which may hinder access		✓			✓			✓	
	Storage of combustible/ flammable/ corrosive material		✓			✓			✓	
	Storage of non- combustible, non-flammable or non- corrosive material	✓			✓				✓	
	Rainwater tanks			✓		✓			✓	
	Detention basins			✓		✓			✓	
	Earth works- reducing cover or filling			✓		✓			✓	
	Permanent surfaces (asphalt, concrete, etc)	✓				✓			✓	
	Different surfaces (bluemetal, woodchips)	✓			✓			✓		
	New roads			✓			✓			✓
	Concrete driveways			✓			✓			✓
	Installation of utility services- telecoms, water, LV electricity, sewerage			✓			✓		✓	
	Residential/ commercial subdivision lots			✓			✓	N/A		
	Use of explosives		✓				✓		✓	

Category	Encroachment	Overhead			Underground			Padmount Substation		
		Allowed	Prohibited	Controlled	Allowed	Prohibited	Controlled	Allowed	Prohibited	Controlled
Recreational activities	Recreational activities- general (not including activities listed below)	✓			✓				✓	
	Recreational activities- flying kites, model aircraft, balloons		✓		✓				✓	
	Recreational activities- flood lighting, grandstands		✓			✓			✓	
	Recreational activities- firearms		✓		✓				✓	
	Recreational activities- tennis courts			✓		✓			✓	

4.5 Annexure 5- Typical layout of Endeavour Energy underground assets adjacent to other utilities within the same easement