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To: **FRASERS PROPERTY INDUSTRIAL**

Project: **ALDINGTON ROAD, KEMPS CREEK – SERVICE INFRASTRUCTURE ASSESSMENT**

Our Ref: **SY075192.000**

Date: **JUNE 2021**

ABN 19 118 146 008 | sydney@landpartners.com.au | www.landpartners.com.au

Table of Contents

Revision:

Issue	Date	Comment
A	3/2021	Issue for comment
B	4/2021	Endeavour Energy Technical Review
C	5/2021	Sears comments
D	6/2021	Updated masterplan
E	6/2021	Updated masterplan

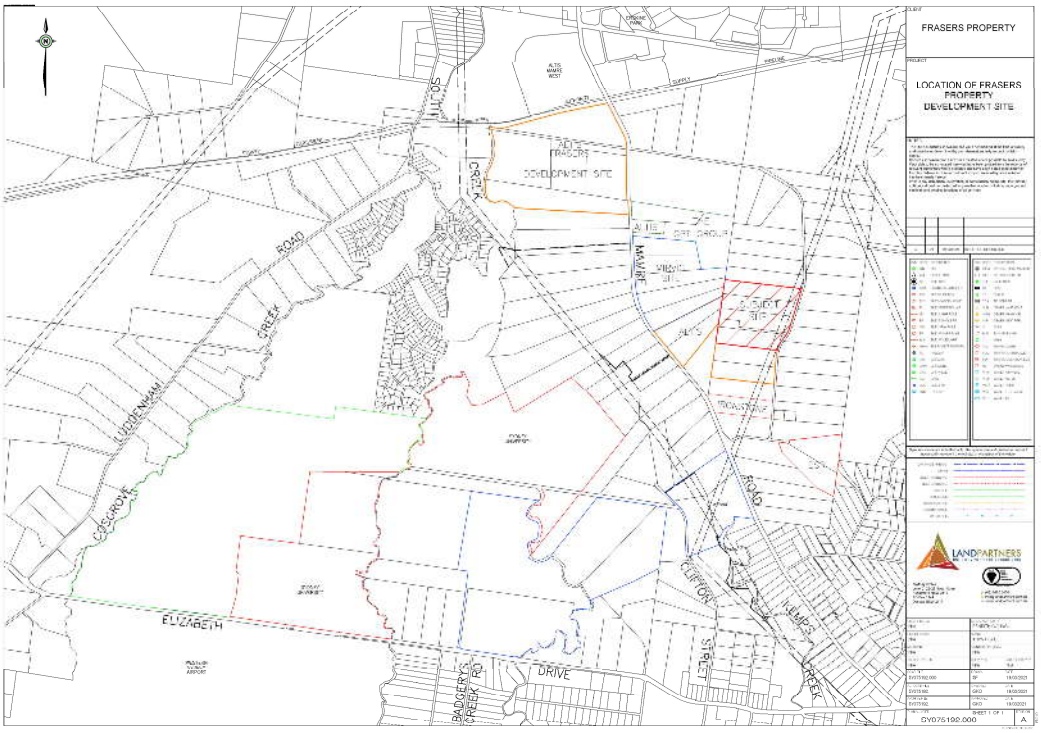
EXECUTIVE SUMMARY

Servicing Capability

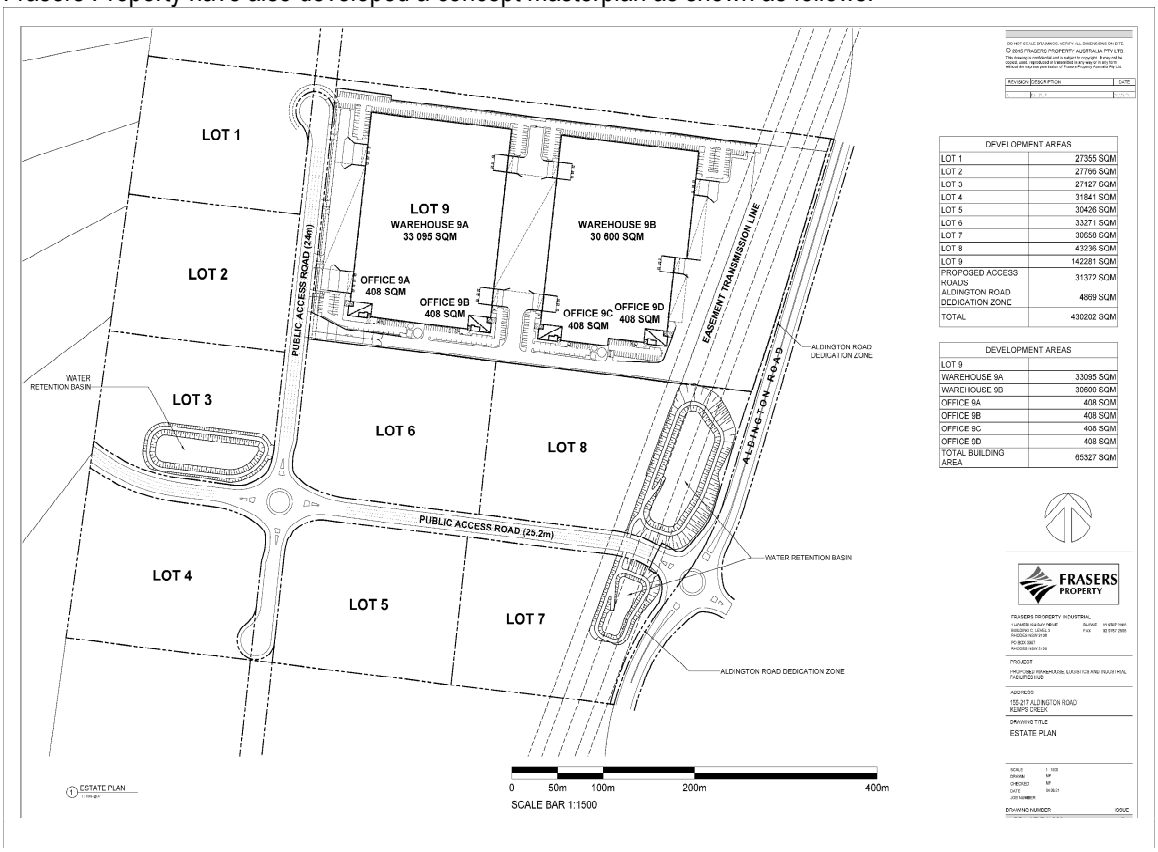
- Potable Water
  - Estimated Potable Water Demand
    - Average Day Demand 84kl/day
    - Max Day Demand 134kl/day
  - Initial supply from Erskine Park Elevated Minchinbury Elevated system until the Cecil Park system is augmented and trunk water mains are constructed along Mamre Road from Elizabeth Drive.
- Recycled Water
  - Development of the Upper South Creek Advanced Water Recycling facility (delivered by 2026) will create highly treated recycled water. Sydney Waters' intention is to develop a recycled water reticulation system to serve the Mamre Rd precinct.
  - To facilitate future supply from this proposed recycled water system a recycled water reticulation pipe (a "purple" pipe) will be installed across the frontage of the site.
- Waste Water
  - Estimated Waste Water Demand 76kl/day
  - Sydney Water servicing to provide Sewer Pump Station by 2024 to service the southern catchment of the Mamre Road precinct.
  - The subject site falls within the southern catchment.
- Electricity
  - Endeavour Energy will have operational a new zone substation (the South Erskine Park Zone Substation) within the Oakdale West precinct which will supply this site.
  - Endeavour Energy will re-energise the existing overhead 11KV feeder outside the site to 22KV in Q3 2022. This will provide supply to the development.
- Telco
  - New fibre-optic systems will need to be provided to serve the development. Other developments within the Mamre Road precinct which will precede this development will provide lead-in capacity for this site.

1.0 INTRODUCTION

The Department of Planning, Industry and Environment has issued the Planning Secretary's Environmental Assessment Requirements (SEARS) on 12th May, 2021 for the development of a proposed warehouse/logistics hub at 155-217 Aldington Road Kemps Creek within the Mamre Road precinct of the Western Sydney Employment Area. This report has been prepared in accordance with infrastructure requirements outlined in the SEARS (refer to page 3 of the SEARS). The location of the site is shown on the following plan:



Frasers Property have also developed a concept masterplan as shown as follows:



1.1 SEARS REQUIREMENTS

Sears requirements from the Department of Planning, Industry & Environment have been used. Those requirements outline key issues one of which is the following:

SEARS ITEM	Section in Report
Infrastructure requirements - including: - a detailed written and/or graphical description of infrastructure required on the site, including any electrical substation/s and on-site switch yard/s. - identification of any infrastructure upgrades required off-site to facilitate the development, and describe any arrangements to ensure that the upgrades will be implemented in a timely manner and maintained. - an infrastructure delivery and staging plan, including a description of how infrastructure on and off-site will be co-ordinated and funded to ensure it is in place prior to the commencement of construction. - an assessment of the development's impacts on existing utilities and services and service providers' asset surrounding the site.	Refer to Section 3.1, 3.2, 4.0, 5.0 & 6.0 of the report and Appendix C of the report.

2.0 SERVICE AUTHORITIES:

The service authorities who provide infrastructure services to this area are:

(a)	Sydney Water:	Potable Water & Waste Water Infrastructure
(b)	Endeavour Energy:	Electrical Infrastructure
(c)	NBN Co:	Telecommunications Infrastructure
(d)	Jemena:	Gas Infrastructure

3.0 POTABLE WATER AND WASTE WATER

3.1 POTABLE WATER

a) The Site is currently supplied to the site from the Cecil Park reservoir system. Following meetings and discussions with Sydney Water a number of Potable Water (P.W) supply zones will be rezoned to provide greater capacity and a more robust supply for the Cecil Park reservoir system. The Western Sydney Airport (W.S.A) is serviced by the Cecil Park reservoir system and due to the initial construction and then an ongoing operational demand the supply from Cecil Park system is to be strengthened by:

i. System area rezoning
ii. Construction of a new 60ML reservoir within the Liverpool supply system together with a new trunk transfer main from the reservoir to Cecil Park reservoir.

This site may be affected by that rezoning process.

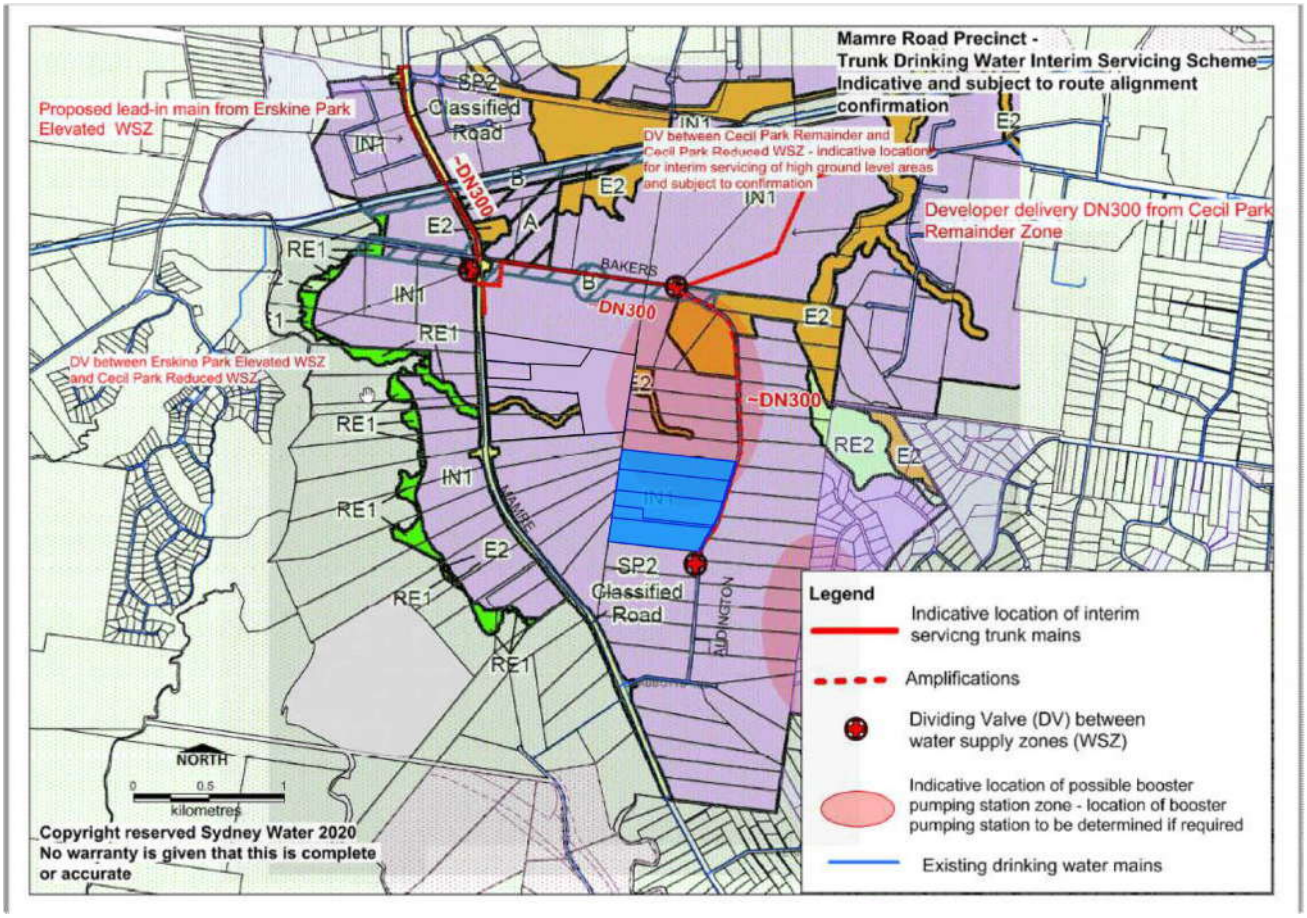
b) Major outlet mains from the Cecil Park system will be constructed along Elizabeth Drive by 2022, however the issue of an amplified lead in main from Elizabeth Drive to the Mamre Road precinct is unclear in its scope, planning or timing.

c) It is likely that the site could be supplied from the Erskine Park Elevated system as an interim measure.

d) A new developer funded lead 300mm water main has been designed from the current Sydney Water reticulation system at the intersection of James Erskine Drive and Mamre Road Erskine Park. This main is supplied from the Erskine Park Elevated system. The main is to be constructed along Mamre Road to the intersection of Mamre Road and Bakers Lane. The main then extends in a westerly direction to serve Sydney Science Park.

e) This main will be operational by end 2021. Other property developers are currently active in the area and will be supplied from this lead in water main. Altis has projects either currently under assessment with Penrith Council or being prepared for applications to consent authority. Mirvac are preparing documents for submission to consent authorities. Fraser Property, ESR and Ironstone are active in the southern area of the Mamre Road precinct.

f) Substantial developer activity will impact on the current supply system from the Cecil Park reservoir. The only interim solution until a larger lead in water main is constructed from Elizabeth Drive is utilising the Erskine Park Elevated system – see following Sydney Water plan for interim servicing:



g) Calculations of potable water demand indicate 84kl/day (Average Day Demand) would be required to service the whole development of a warehouse/logistics facility (Refer to Appendix A).

h) A feasibility application has been lodged with Sydney Water.

3.2 RECYCLED WATER

a) Sydney Water have a proposal to reticulate recycled water from the Upper South Creek Advanced Water Recycling Centre (see comments in 2.3 below).

b) It is expected that recycled water mains ("purple pipes") will be required to be constructed as a component of service delivery for developments within the Mamre Rd precinct.

c) Sydney Water would provide trunk lead-in recycled water mains to allow connection to those reticulation mains.

3.3 WASTE WATER

No existing Waste Water (W.W) reticulation systems service the Mamre Road precinct. Sydney Water has developed a strategic plan to service the Mamre Road precinct based on an interim procedure and then an ultimate solution to service the precinct.

3.3.1 INTERIM PROCEDURE

a) The subject site based on current topography falls within the southern catchment of the Mamre Road precinct.

b) Sydney Water has developed a proposal, in conjunction with developers who are part of a landowners group, for an Interim Operating Procedure (I.O.P).

c) The initial I.O.P will service a number of developments in the northern catchment of the precinct.

d) The I.O.P assets constructed as part of this initial process will have limited capacity and it is unlikely that this site would be serviced by that facility.

e) Initially Sydney Water had a concept for another I.O.P asset to service the southern catchment of the Mamre Road precinct however this part of the proposal is not proceeding as the same timeframe for the northern catchment due to the development pressures in that catchment area.

3.3.2 ULTIMATE WASTE WATER SUPPLY

The ultimate solution for the waste water supply for the Mamre Road precinct occurs in 2 phases.

3.3.2.1 PHASE 1

a) Sydney Water propose to have a Sewer Pump Station (SPS) constructed and operational by 2023. The I.O.P serving the northern catchment will become redundant and the I.O.P will be terminated.

b) The SPS will collect waste water from the northern catchment and discharge the waste water via a rising main to the St Marys Waste Water Treatment Plant (WWTP).

c) Sydney Water also propose that another SPS will be constructed and operational by 2024 to serve the southern catchment of the Mamre Road precinct. This southern SPS will discharge via a rising main to the northern SPS which will continue to discharge waste water to the St Marys WWTP.

3.3.2.2 PHASE 2

a) Sydney Water will construct and have operational by 2025 – 2026 a major WWTP known as the Upper South Creek Advanced Water Recycling Centre which is located south west of the subject site along South Creek near the junction with Badgerys Creek.

b) It is critical that this facility be operational by 2025 – 2026 to support the operation of the Western Sydney Airport as well as a number of precincts within the South West Growth Centre.

c) Discharge from the SPS established within Phase 1 will be redirected to the new Upper South Creek treatment facility.

4.0 ELECTRICITY

a) The Kemps Creek Zone Substation currently supplies this site however this facility has limited capacity and is unlikely to provide service to this site.

b) Endeavor Energy are providing a new zone substation (known as the South Erskine Park Zone Substation) within the Oakdale West precinct. This zone substation will be operational by 2022 and will provide substantial electrical capacity for the Mamre Road precinct.

c) Calculations of expected electrical demand for this site indicate a demand of 5MVa is required to serve the ultimate development of the site (Refer Appendix B).

d) Endeavour Energy in their Technical Review response noted that the existing overhead 11KV feeder immediately adjacent to the site will be re-energised to a 22KV feeder in Q3 2022. This will provide adequate capacity to service the site – see Appendix B.

e) Delivery of internal infrastructure will be undertaken under Endeavour Energy standard requirements outlined in Endeavour Energy's connection policy.

5.0 GAS

a) Jemena are the gas supply utility providers for this area. Jemena has no reticulation assets with frontage to this site. The nearest gas reticulation is adjacent to the Mamre Road – Bakers Lane intersection. This is a distribution

main which is connected to a secondary main servicing the Erskine Park industrial precinct to the north of the Mamre Road precinct.

b) Jemena will not extend its system based on speculation. Jemena requires firm commitments from end-users for the quantity of gas to be supplied to end-users before it will commit to deliver substantial infrastructure to an area.

c) Jemena, like other service authorities, needs to consider servicing land on an area wide (i.e., the precinct) basis. Servicing individual sites on an ad-hoc basis is not viable, both from a financial viewpoint as well as a technical basis. Locations of secondary gas mains and associated infrastructure such as pressure reduction facilities need to be considered on a precinct wide basis.

d) I refer to Jemena response of 17/12/2019 to the Department of Planning regarding the release of the Mamre Road precinct included in Appendix "D" of this report.

6.0 TELCO

a) The area is located within the NBN area of operations.

b) Currently the site is serviced by copper pair telco cables established by Telstra.

c) Significant upgrade by extension of optic fibre systems will occur driven by the requirements of other developers active in the area. Extension of this network will be undertaken along Mamre Road from the fibre optic network at Distribution Drive, north of the subject site or from the Oakdale West precinct.

7.0 TRANSGRID

a) Transgrid have an easement corridor allocated through the site for a future transmission feeder system to connect to the Transgrid Sydney West Bulk Supply Centre (B.S.C).

b) Discussions with Transgrid indicate they will not release this easement as long term planning indicates further transmission capacity is required to service the Sydney West B.S.C.

c) Transgrid have strict requirements regarding protection of their easement rights and associated assets which are outlined in Appendix D.

8.0 EXPECTED IMPACTS ON ADJACENT INFRASTRUCTURE

a) Potable Water – a 100mm water main exists in Aldington Road on the eastern side of the road. No impact will occur to this main due to development activity on the subject site.

b) Waste Water – there are no waste water assets within this area

c) Electrical Infrastructure – the existing electrical infrastructure consist of overhead electrical supply. These assets will be reconstructed underground in conjunction with the expected road reconstruction Aldington Road and located within the normal Endeavour Energy corridor allocated within the road reserve. A pole mounted substation will be replaced by a padmount substation within the development site.

d) Telco – the existing Telco services are located on the opposite side of Aldington Road of the subject site. Undergrounding of the assets will occur across the frontage of the subject site in conjunction with road reconstruction of Aldington Road. The existing telco services on the opposite side of Aldington Road will remain in place until developers on the east side of Aldington Road undertake road reconstruction.

e) Gas – no Jemena assets exist in this area.

APPENDIX A
POTABLE WATER & WASTE WATER DEMAND

1. Frasers Property have provided a concept masterplan as outlined in the report.

2. Based on this masterplan I have made the following assumptions:

   a) Developable Area = 39.4ha

   b) A Gross Floor Area (G.F.A) yield of 60% is assumed = 39.4 x 0.6 = 23.64ha

   c) A split of the G.F.A based on 95% warehouse and 5% office is assumed to produce
      (i) Warehouse floor area 224,500m^2
      (ii) Office area 11,900m^2

   d) An assumption of Potable Water usage of 80litres/day per EP is also utilised to assess an approximate demand.

Potable Water

Development Type	Floor Area	EP/m^2	EP	P.W Demand/EP	P.W Demand
Warehouse	224,500	1EP/500m^2	450	80litres/day	36kl/day
Office	11,900	1EP/20m^2	595	80litres/day	48kl/day
				Total	**84kl/day**

So: Average Day Demand 84klday
Max Day Demand 134kl/day

Waste Water

An estimate of 90% of Potable Water for Waste Water discharge:

84kl/day x 0.9 = 76kl/day

APPENDIX B
ELECTRICAL DEMAND & ENDEAVOUR ENERGY TECHNICAL REVIEW RESPONSE

3. Frasers Property have provided a concept masterplan as outlined in the report.

4. Based on this masterplan I have made the following assumptions:

   a) Developable Area = 39.4ha

   b) A Gross Floor Area (G.F.A) yield of 60% is assumed = 39.4 x 0.6 = 23.64

   c) A split of the G.F.A based on 95% warehouse and 5% office is assumed to produce
      (iii) Warehouse floor area 224,500m^2
      (iv) Office area 11,900m^2

   d) An assumption of Potable Water usage of 80litres/day per EP is also utilised to assess an approximate demand.

Development Type	Floor Area	Demand/m^2	Demand
Warehouse	224,500	17/VAm^2	3.8MVa
Office	11,900	100VA/m^2	1.2MVa
		Total	**5MVa**

9 April 2021

Endeavour Energy Ref: ENL3998

Landpartners
PO Box 1144
DUNDAS NSW 2117

Attention: Greg Oxley

ENL3998 – Technical Review | 155-217 Aldington Road, KEMPS CREEK

Thank you for your enquiry regarding proposed development at the above location. Your enquiry has been registered under the above reference number. Please quote this reference number on all future correspondence.

Endeavour Energy acknowledges that the proposed development by Frasers Property Group is for a logistics park development comprising of warehouses and offices with potential developable area of 34.35ha as per the concept masterplan in Figure 1. The estimated Gross Floor Area (GFA) yield and maximum demand by the proponent is shown in table 1 below.

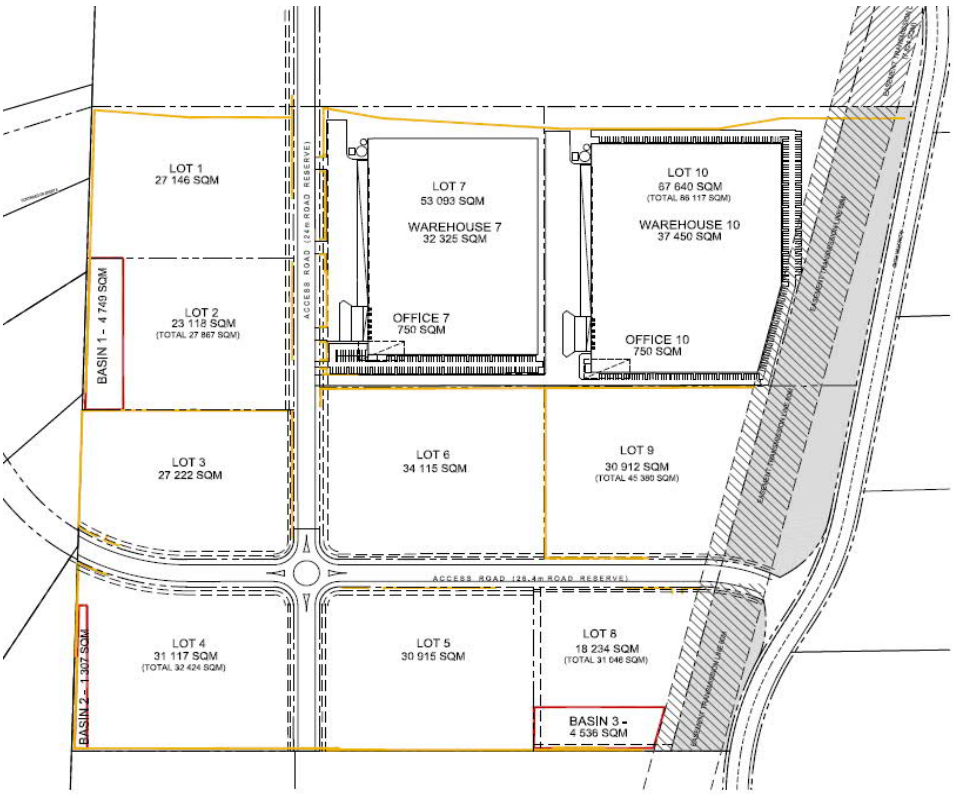


Figure 1

Type	Floor Area	Demand/m²	Demand
Warehouse	196,000	17VA/m²	3.3MVa
Office	10,000	100VA/m²	1.7MVa
		Total	**4.3MVa**

Table 1

Based on the occupancy date of Mid 2023 for the first two Warehouses No.7 and No.10 with a combined load of 1.34MVA (as assessed by Endeavour Energy), it is advised there will be capacity along Aldington Rd provided by the new South Erskine Park Zone Substation (SEPKZS) which will be commissioned in Q3 2022 to supply the first two Warehouses development. The existing 11kV overhead network along Aldington Rd will be re-energised to 22kV by Endeavour Energy as part of the commissioning works for SEPKZS. Refer to Figure 2 for more information. The proposed warehouse estate by the Frasers Property Group will be able to extend from the existing 22kV network and reticulate within the estate.

It is to be noted that above advice is based on the information and data available at the present time, which is subject to change depending on all development activities in Mamre Precinct and nearby areas. Endeavour Energy is committed to making provisions for proponents to connect to its network in a fair and equitable manner. This is in line with reasonable legislated user pays principles for connection works and in a manner, which will ensure an acceptable quality of supply for all existing and future customers.

Specific method of supply conditions, including the supply arrangement for the rest of the estate development will be determined at the time of firm connection of load applications are received and once more finite plan of the estate and surrounding area become available. Please note that Endeavour Energy does not reserve capacity for a technical review request and other load applications for surrounding development may be received and take up feeder capacity which may result in the need to establish a new 22kV feeder from SEPKZS when the new feeder is necessarily required.

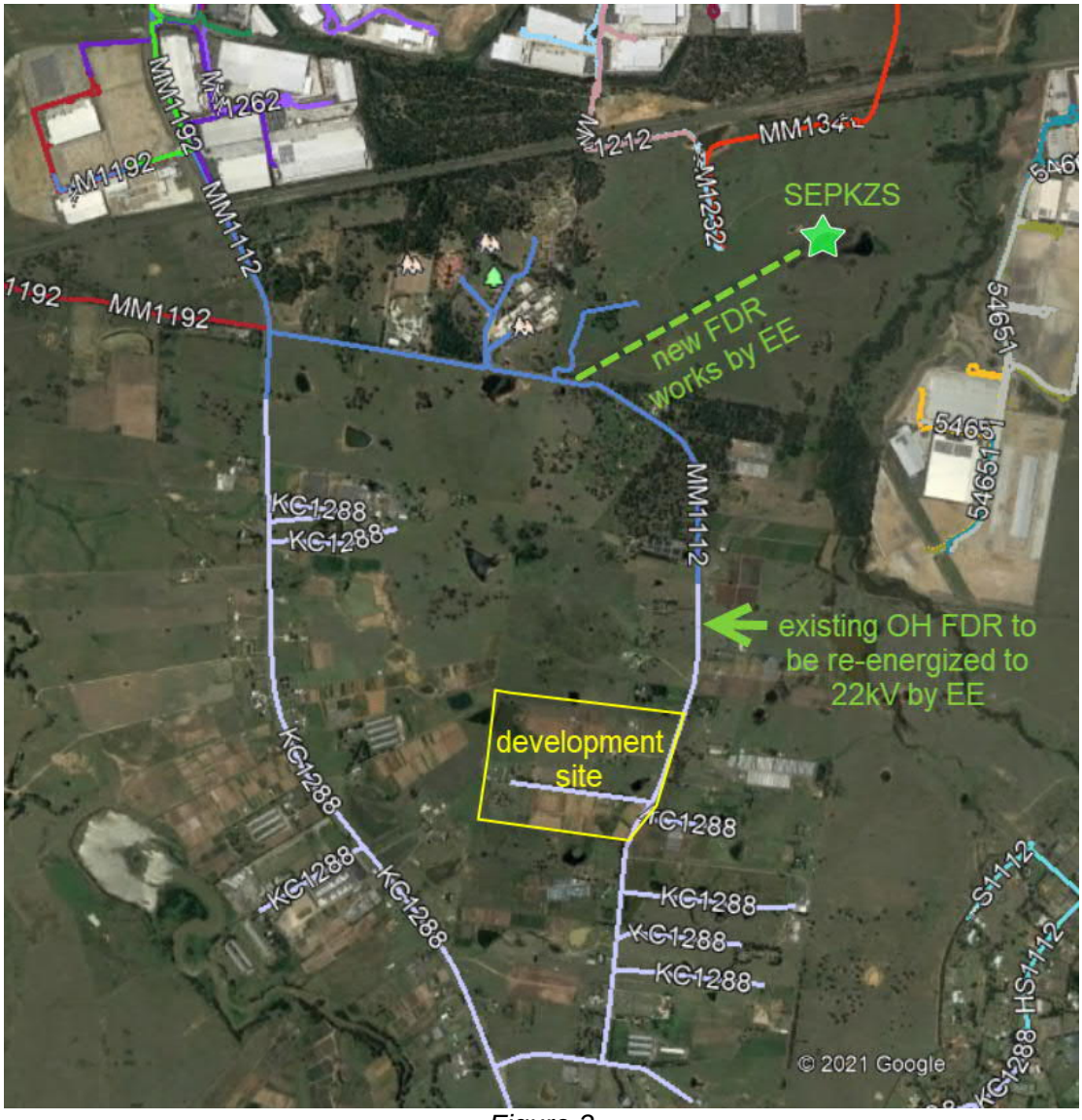


Figure 2

Hope above information and response assist for the meantime. An application for connection of load must be submitted and subsequent designs have been certified or approvals granted will Endeavour Energy reserve capacity on the network.

Feel free to contact below should you have any questions regarding this response to your technical review request.

Regards,

J. Lei

Jonathan Lei
Contestable Works Project Manager
Ph: 02 9853 7905
Email: Jonathan.Lei@endeavourenergy.com.au

APPENDIX C
PLAN OF ADJACENT UTILITY INFRASTRUCTURE

M.G.A

ERSKINE PARK RESERVOIR

MAMRE RD SEWER CARRIER

1000mm DIAMETER SEWER

ERSKINE PARK ROAD

LENORE

ENDEAVOUR ENERGY ZONE SUBSTATION

EXISTING WATER MAIN

FEED IN WATER MAIN FROM MINCHIBURY ELEVATED SYSTEM

DRIVE

RETICULATION SEWERS 600 DIAMETER SEWER

LOCKWOOD ROAD

LINK ROAD TO OAKDALE WEST

EXTENSION OF H.V. FEEDER SYSTEM FROM ZONE SUBSTATION

CREEK

ERSKINE DRIVE

EXISTING 200mm WATER MAIN

525mm SEWER

OAKDALE CENTRAL

FIRST ESTATE DEVELOPMENT

EXISTING ELECTRICAL DUCT

WATER MAIN EXTENSION FROM ERSKINE PARK RESERVOIR ZONE TO OAKDALE WEST

PROPOSED

EXTENSION OF EXISTING NBN F/O FROM FIRST ESTATE TO SITE

AUTHORITY WATER SUPPLY PIPELINES

WEST

450mm SEWER

CATCHMENT

PROPOSED EXTENSION 300mm WATER MAIN & SUBJECT SITE

375mm SEWER

SOUTH ERSKINE PARK PARK ZONE SUBSTATION

ROPES

OAKDALE SOUTH

SYDNEY

FIRST STAGE EXTENSION OF PRESSURE SEWER

RL34

300mm WATER MAIN DELIVERED TO THIS INTERSECTION 2021

SEWER TO OAKDALE WEST SYSTEM

BAKERS LANE

OAKDALE

300mm SEWER

PROPOSED ALTIS/FRASER DEVELOPMENT SITE

EXISTING 200mm WATER MAIN FROM CECIL HILL RESERVOIR

JACFIN

SOUTH

PUMP FLOWS TO MAMRE ROAD CARRIER

RL42

RL84

RL00+

POSSIBLE EXTENSION OF PORTABLE WATER FROM PARKDALE WEST

ALDINGTON

ALTIS

RL75+

375mm SEWER

PROPOSED I.O.P. FACILITY

POSSIBLE EXTENSION OF PORTABLE WATER MAIN FROM ALTIS/FRASER DEVELOPMENT

MIRVAC

SEWER TO OAKDALE SOUTH SYSTEM

RL83+

SUBJECT SITE

ALTIS

RL52

RL51+

SOUTH CREEK

MAMRE ROAD

POSSIBLE SEWER TO WWTP 2025 COMMISSIONING

SEWER TO WWTP

RL37+

AREA FOR LOCATION OF FUTURE SEWER PUMP STATION TO SERVE SOUTHERN CATCHMENT OF MAMRE ROAD PRECINCT

BADGERYS

SOUTH CREEK ROAD

PROPOSED SYDNEY WATER WASTE WATER TREATMENT PLANT DELIVERY BE 2025

1. EXISTING CECIL HILLS RESERVOIR SUPPLY AREA TO BE RE-ZONED EXPECT WATER SUPPLY FROM ERSKINE PARK ELEVATED SYSTEM

CLIENT

FRASERS PROPERTY

PROJECT

PLAN OF SERVICE ASSETS ADJACENT TO SUBJECT SITE KEMPS CREEK

NOTES

The title boundaries shown hereon were not marked at the time of survey and have been determined by plan dimensions only and not by field survey.

Services shown hereon have been located where possible by field survey. If not able to be so located, services have been plotted from the records of relevant authorities where available and have been noted accordingly on the plan. Where such records do not exist or are inadequate a notation has been made hereon.

Prior to any demolition, excavation or construction on the site, the relevant authority should be contacted for possible location of further underground services and detailed locations of all services.

A	GKO	19/03/2021	CLIENT ISSUE

DRAINAGE PIPE U/G
DRAIN
ELECT. CABLE A/G
ELEC. CABLE U/G
GAS PIPE
FENCE LINE
SEWERAGE PIPE
TELSTRA CABLE
WATER PIPE

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w: www.landpartners.com.au

ISO 9001 Quality Management

HEIGHT DATUM: AHD	LOCAL AUTHORITY: PENRITH COUNCIL
HEIGHT ORIGIN: N/A	SCALE: 1:20,000 (A2)
MERIDIAN: N/A	CONTOUR INTERVAL: N/A
CO-ORD SYSTEM: N/A	SURVEYOR: N/A — DATE OF SURVEY: N/A
FIELD FILE: SY075192.000	DRAWN: SF — DATE: 19/03/2021
AUTOCAD FILE: SY075192.00DCDB	CHECKED: GKO — DATE: 19/03/2021
ARCHIVE FILE: SY075192.00DCDB	APPROVED: GKO — DATE: 19/03/2021
PLAN NUMBER: SY075192.000_SERVICES	Sheet 1 of 1 — REV: A

PD.GKO

APPENDIX D
JEMENA RESPONSE TO MAMRE ROAD PRECINCT RELEASE

17 December 2019

Attn: Sarah Waterworth
Senior Planning Officer
Department of Planning and Environment
PO Box 39
NSW 2000

Jemena Gas Networks
(NSW) Ltd
ABN 87 003 004 322

Level 14
99 Walker St
North Sydney NSW 2060
PO Box 1220
North Sydney NSW 2060
T +61 2 9867 7000
F +61 2 9867 7010
www.jemena.com.au

Dear Sarah,

Reference SF19/106113 – Memre Road Precinct

Re: Jemena Submission for consideration into the Mamre Road Precinct in the Western Sydney Employment Area

Jemena is pleased to make the following submission for consideration by the Department of Planning, Infrastructure and Environment after reviewing the rezoning package which amends the State Environmental Planning Policy (Western Sydney Employment Area) 2009 and contemplates the rezoning of land to accommodate industrial land uses within the Mamre Road Precinct.

Jemena High Pressure Gas Pipelines

Jemena owns and operates numerous high pressure gas transmission pipelines throughout Australia, including Jemena Gas Network (**JGN**) Licence 1 and the Eastern Gas Pipeline (**EGP**) Licence 26.

Jemena can confirm that the Memre Road Precinct is located approximately 4.34 kilometres from the JGN pipeline and 3.63 kilometres from the EGP. The change in land uses proposed in the Precinct plan does not change the risk matrix impacting the pipelines as the land classification changes does not introduce any further threats to the operation of the pipelines.

Jemena has consider the implications of the Precinct adjacent to high pressure pipelines transporting dangerous goods in NSW as communicated in the ISEPP clause 66C and more recently the Planning Circular PS 18-010. As the location of the Precinct is considered well outside the Notification Zone which is based on the Measured Length of the pipelines as defined in AS2885. Jemena is of the view that the 66C ISEPP does not apply in this instance.

Jemena has no objection to the Memre Road Precinct is not seeking any addition mitigations to protect its pipeline.

Gas Capacity Planning – Distribution Network

Jemena continues to look for opportunity to grow the existing gas distribution network in NSW. Currently the immediate area adjoining the Mamre Road Precinct is serviced with gas mains east of the Westlink M7 Motorway and centred around the residential estates at Edensor Park and Bossley Park. A distribution main services the northern portion of the Memre Road Precinct which is connected to a secondary main servicing the Erskine Park industrial estate to the north of the Precinct.

Jemena's ability to augment the network is limited to the capacity of the existing network in the adjoining areas and being a regulated network. Typically, Jemena looks to grow the network upon receipt and processing of customer initiated requests. Jemena suggests that the gas network will expand into the Memre Road Precinct in a similar fashion.

If you have any questions or quires, please do not hesitate to contact the undersigned.

Kind Regards

Luke Duncan
Land Management
Gas Distribution

APPENDIX E
TRANSGRID EASEMENT REQUIREMENTS

Easement guidelines

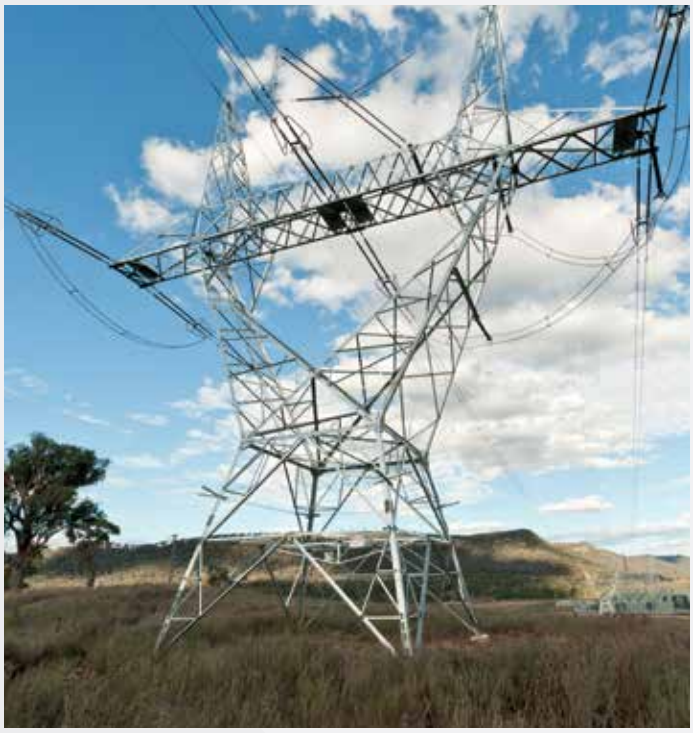
Living and working with electricity transmission lines

We all rely on electricity to power our homes and businesses, however coming into contact with high voltage electricity can cause serious injury or death.

To protect your safety and provide a safe, reliable network, TransGrid has easements over its transmission lines, which restrict the activities that can be carried out. Easements are also “rights of way”, which allow our staff and contractors access to construct, operate and maintain TransGrid’s infrastructure.

TransGrid’s primary concern is the **safety of people and the environment**, and we are committed (and required by legislation) to providing a safe and reliable transmission network.

For more information on potential electrical safety risks, please see our **Electrical safety risks fact sheet**. You can learn more about electricity infrastructure by reading our **High voltage transmission line fact sheet**.



What activities may be carried out within or adjacent to transmission line easements?

High voltage transmission lines have different safety risks from urban powerlines, and this is why TransGrid encourages the principle of "prudent avoidance"[1]. When planning houses, schools, sensitive land uses and other types of new development, proximity to existing or planned high voltage transmission lines should always be considered.

Where developments cannot avoid transmission line easements, open space uses – that do not encourage people to congregate under the transmission lines or close to electricity infrastructure – should be given preference over other land uses, such as residential or commercial.

These guidelines will assist you to work out:

> whether your proposed activity or development within (or adjacent to) an electricity easement is **permitted**; **requires TransGrid's permission**; or is **prohibited**; and

> the process for seeking TransGrid's permission prior to carrying out the activity or lodging your development application with a consent authority.

TransGrid can only give its permission to your proposal as holder of the easement. TransGrid's permission is not a development consent.

Councils are required to refer development applications that affect TransGrid's transmission line easements to TransGrid. Seeking TransGrid's permission prior to lodging your development application will help expedite this process.

If you undertake an activity or development that is not in accordance with the Easement guidelines, you may be required to remove it or relocate it at your expense.

Please note that if you have received TransGrid's written permission under previous guidelines, this permission remains valid.

Is your proposal located within or adjacent to a TransGrid easement?

Transmission line easements vary in width depending on the operating voltage and design of the infrastructure. Generally, the higher the voltage, the wider the easement. Figure 1 below shows the typical widths of transmission line easements.

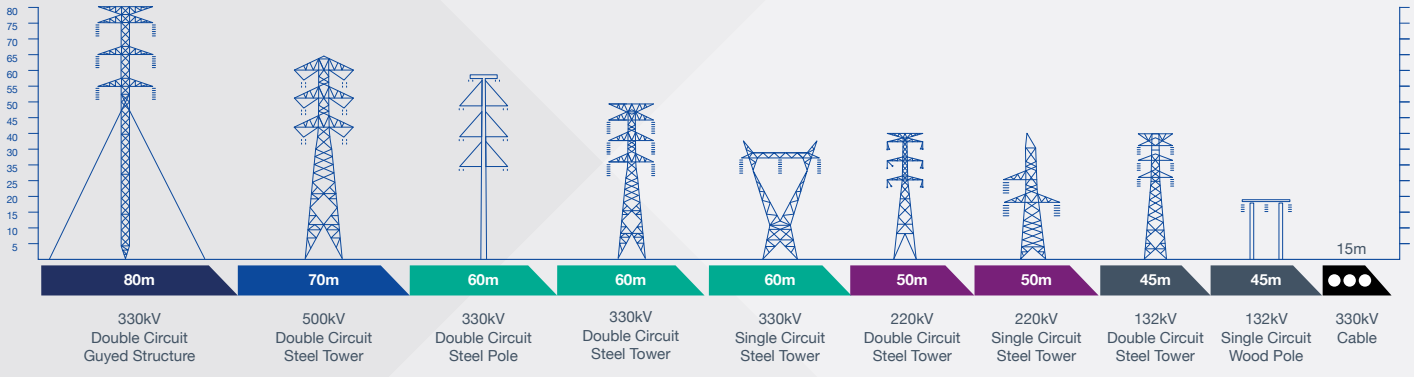


Figure not to scale. Typical widths only, may vary on a case by case basis.

Figure 1: Typical Easement Widths

[1] As identified by The Right Honourable Harry Gibbs Report, Inquiry into Community Needs and High Voltage Transmission Line Development, 1991.

The distances in the Easement guidelines are based on the typical easement widths shown in Figure 1. However, because there are some variations to easement widths, you will need to know the width of the easement near your proposal.

To work out whether there is a TransGrid easement on your property and how wide it is, you can contact the New South Wales Land Registry Services for a detailed survey plan.

NSW Land Registry Services can be contacted on 1300 052 637 or via their website at **www.nswlrs.com.au**.

Is your proposal outside the exclusion zone?

TransGrid has developed an **exclusion zone** to enable suitable activities within easements, while providing a safe clearance area around TransGrid transmission lines and structures to protect public safety and the network.

Please check the criteria and diagrams below to ensure that your proposal is outside the exclusion zone.

If your proposal is located within the **exclusion zone**, you will need to relocate it or seek permission from TransGrid. Most activities are prohibited within the **exclusion zone**, to meet TransGrid's public safety obligations.

Exclusion zone criteria activities/developments/structures must:

1. not impede TransGrid's access to its transmission infrastructure;
2. where transmission lines are **132kV and below:**
   - be located at least 20 metres away from any part of a transmission structure or guy wire;
   - for metallic structures, be located at least 22 metres away from any part of a transmission structure or guy wire;
   - be located at least 10 metres from the centre of the transmission line;
3. where transmission lines are **220kV and above:**
   - be located at least 30 metres away from any part of a transmission line structure or guy wire;
   - be located at least 17 metres from the centre of the transmission line.

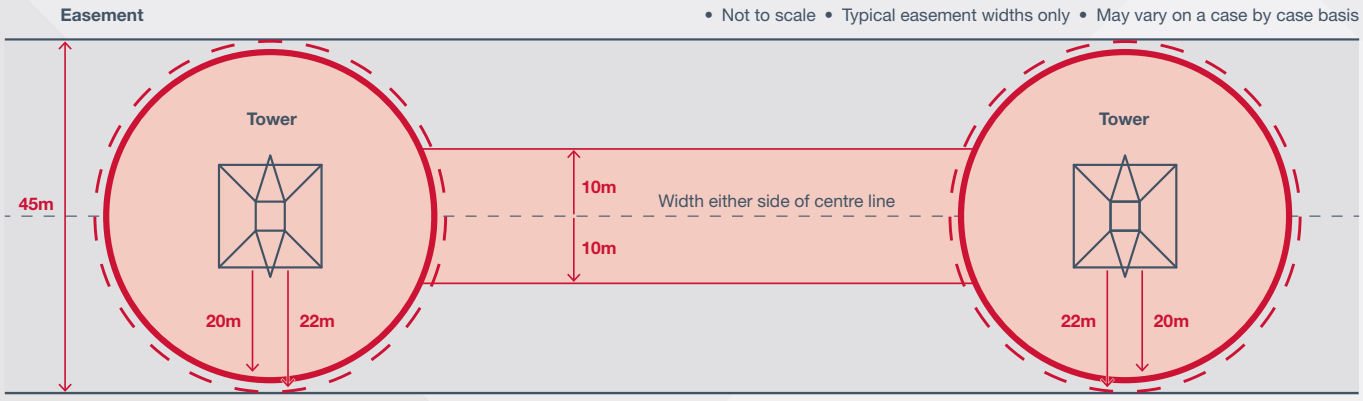


Figure 2: 132kV and below Exclusion Zone

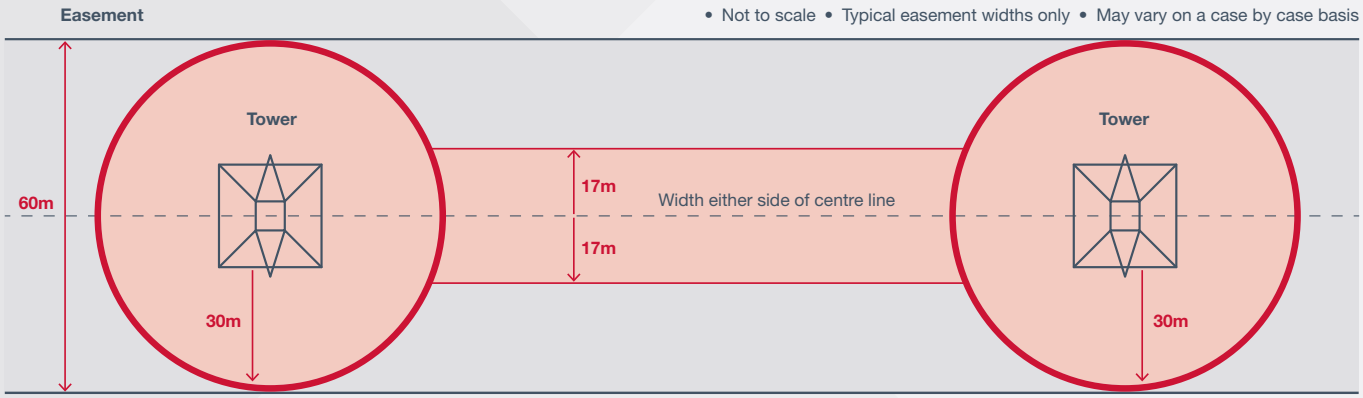


Figure 3: 220kV and above Exclusion Zone

If you are uncertain whether your proposal is within the exclusion zone, please contact TransGrid by submitting an enquiry via our online Easement Enquiries Portal: https://www.transgrid.com.au/being-responsible/public-safety/Living-and-working-with-electricity-transmission-lines

Is your proposal permitted within TransGrid easements?

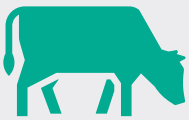
If your proposal is described below and is outside the **exclusion zone,** no further permission from TransGrid is required.

Where your proposal within a transmission line easement will require development consent, the consent authority must still refer the development application to TransGrid. For this reason, we recommend you seek TransGrid's confirmation that your proposal is permitted within the easement **before** you lodge your development application with Council, by submitting an enquiry via TransGrid's online Easement Enquiries Portal.

Please note: TransGrid reserves the right to review each activity individually and apply controls on a case-by-case basis. TransGrid will take into account public safety risks, and the safe operation, access and maintenance of TransGrid's electricity infrastructure.

If you are unsure whether your proposal is **permitted,** please contact TransGrid by submitting an enquiry via our online Easement Enquiries Portal.

The following activities where located outside the **exclusion zone** are **permitted** within TransGrid's easements:



Cropping and grazing, provided:

1. Machinery cannot extend more than 4.3 metres above ground level

Note: Exclusion zone requirements to be at least 10/17 metres from the centre of transmission lines do not apply to cropping and grazing, however all other exclusion zone requirements apply. TransGrid's Fencing guidelines must be complied with.

All other agricultural activities including irrigation, provided:

1. Machinery cannot extend more than 4.3 metres above ground level
2. All fixed metallic objects are earthed
3. Machinery, including irrigation, must remain outside the exclusion zone
4. No solid jet of water is to be within 4 metres of overhead conductors
5. Must use non-metallic piping
6. No fuel storage
7. No transmission line outages are required to undertake agricultural activities

Note: TransGrid's Fencing guidelines must be complied with.

Planting or cultivation of trees and shrubs, provided:

1. Mature plant / tree height is less than 4 metres

Short flag poles, weather vanes, single post signs, provided:

1. Height above ground is no greater than 4.3 metres
2. Non-climbable
3. All fixed metallic parts are earthed

Vehicle parking provided:

1. Height of vehicles no greater than 4.3 metres
2. No flammable liquid containers or carriers

3. Caravans are not occupied or connected (ie, temporary parking only)
4. All fixed metallic parts are earthed

*Note: **Lighting** requires TransGrid's permission to meet height and electrical safety constraints.*

Public open spaces, such as fields, cycle ways, walkways or fenced dog parks, provided:

1. No unmanned aerial vehicles (drones), kite flying or model aircrafts, and "warning signs" are installed
2. Any structures, obstructions, seating or features (such as picnic areas) are located outside the exclusion zone and do not block access tracks to transmission line structures or guy wires
3. Parallel roads, walking tracks, footpaths, cycleways and fenced dog parks are located outside the exclusion zone

Note: Roads, tracks, footpaths, cycleways and fences which propose to cross the transmission line as a thoroughfare, require TransGrid's permission.

Storage, provided:

1. No greater than 2.5 metres height
2. Stored material is non-flammable and non-combustible
3. Non-corrosive or explosive materials
4. No garbage, refuse or fallen timber or other material which could pose a bush fire risk
5. Metallic objects earthed

Operation of mobile plant and equipment, provided:

1. It cannot be extended more than 4.3 metres in height within easement
2. Equipment or plant do not encroach into Ordinary Persons Zone - please refer to the WorkCover *NSW Work Near Overhead Power Lines Code of Practice 2006 (https://www.safework.nsw.gov.au/__data/assets/pdf_file/0020/52832/Work-near-overhead-power-lines-code-of-practice.pdf)*
3. Work is carried out by accredited persons in accordance with WorkCover NSW *Work Near Overhead Power Lines Code of Practice 2006 (https://www.safework.nsw.gov.au/__data/assets/pdf_file/0020/52832/Work-near-overhead-power-lines-code-of-practice.pdf)*

Non-electric fencing and yards, provided:

1. No greater than 2.5 metre height
2. Fencing does not restrict access to TransGrid assets
3. Metallic fencing is earthed
4. TransGrid's Fencing Guidelines are complied with

Note: Parallel metallic fencing has specific safety risks and requirements under the Fencing Guidelines.

Domestic recreational activities including structures, provided:

1. Structures must not be identified as requiring **TransGrid's permission** or **prohibited**
2. Structures must be non-metallic and no greater than 2.5 metre height
3. Floor area no greter than $20m^2$, where any portion is within easement
4. Not connected to electricity supply
5. Structures (including play equipment and BBQs) must remain outside the exclusion zone
6. No unmanned aerial vehicles (drones), kite flying or model aircrafts

What if my activity does not meet the permitted criteria or is not listed above?

You will need to seek TransGrid's permission so that we can assess potential risks to your safety and the electricity transmission infrastructure.

Does your proposal require TransGrid's permission?

If your proposal does not meet the **permitted** criteria, it may fall within the following categories which **require TransGrid's permission**. Further information about the process for seeking TransGrid's permission is provided below, under "How can I seek TransGrid's Permission?"

TransGrid reserves the right to assess each request for permission on a case-by-case basis, taking into account public safety risks, and the safe operation, access and maintenance of TransGrid's electricity infrastructure.

TransGrid may grant permission with conditions, or may refuse permission where the activity could put public safety or the operation of the transmission network at risk.

If your proposal is described below and is **outside the exclusion zone,** you will **require TransGrid's permission:**

Any proposal which falls within a "permitted" catgegory but does not meet the listed criteria

Detached garages, carports, sheds, stables, pergolas and unroofed verandahs where no practicable alternative exists, provided:

1. Structures are no greater than 4.3 metres height
2. Non-habitable
3. Metallic structures are earthed
4. Floor area no greater than 20m^2, where any position is within easement
5. Power connection only permitted if electrically isolated in accordance with *AS/NZS 3000:2018 Electrical installations* outside easement

Sporting and recreational facilities, including tennis courts, basketball courts, playgrounds, exercise equipment provided:

1. Structures are no greater than 4.3 metres height
2. Metallic structures are earthed

Native plant or other nurseries, community gardens, provided:

1. Mature plant / tree height is less than 4 metres
2. Structures are no greater than 4.3 metres height
3. Any fixed structures, including pumps, are located outside the exclusion zone
4. Metallic structures must be earthed

Mobile plant with a height greater than 4.3m, provided:

1. It is operated by accredited persons in accordance with WorkCover *NSW Work Near Overhead Power Lines Code of Practice 2006 (https://www.safework.nsw.gov.au/__data/assets/pdf_file/0020/52832/Work-near-overhead-power-lines-code-of-practice.pdf)*

In-ground swimming pools including coping, provided:

1. It is located at least 30 metres from transmission line structures or supporting guy wires
2. Must be located at least 15 metres from transmission line centre (132kV or below) OR 25 metres from transmission line centre (220kV or above)

3. Power connection only permitted if electrically isolated in accordance with AS/*NZS 3000:2018 Electrical installations* outside easement
4. Site specific assessment will be required by TransGrid

Lighting/external sources of power no greater than 4.3m height:

1. Non-climbable
2. Must be electrically isolated in accordance with AS 3000 outside easement

Note: Exclusion zone requirements to be at least 10 metres from centre of 132kV and below transmission lines or 17m from centre of above 132kV lines do not apply to lighting and external sources of power, however all other exclusion zone requirements apply.

Electric fencing, where:

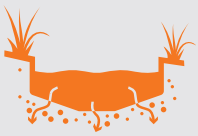
1. Height is no greater than 2.5 metres
2. Must be located at least 30 metres from transmission structures or supporting guy wires
3. TransGrid Fencing Guidelines are complied with

Roads and pathways that cross the transmission line as a thoroughfare:

1. Where it is proposed that a road passes within 30 metres of a transmission structure or supporting guy wires:
   - TransGrid may refuse consent or impose additional restrictions and other conditions
   - The structure's earthing system may require modification to prevent fault currents from entering other utility services in the road. The option of raising conductors or relocation of structures, at the full cost to the proponent, may be considered
2. TransGrid may require additional protection (such as safety barriers) where there is a risk of vehicle impact
3. Intersections shall not be located within the exclusion zone

Low voltage utilities and services such as electricity, gas, telephone and water:

1. Not located within the exclusion zone (additional clearances apply to metallic services)
2. Parallel metallic services will require specific safety assessment
3. Additional design and safety requirements will apply



Excavation, quarrying and earth works, including dam and artificial lake construction, basins, swales, drains and dispersion channels, provided:

1. No more than 3 metres in depth
2. No generation of significant amounts of dust or smoke that can compromise the transmission line high voltage insulation
3. Must not raise ground level, or reduce clearances below that required in *AS 7000:2010 Overhead line design*
4. No ponding or water retention around TransGrid's structures
5. Batter no steeper than 1 in 6 where access is required by TransGrid vehicles

Any other change in ground levels that reduce clearances below that required in AS 7000:2010 Overhead line design:

1. Criteria assessed on a case by case basis

Use of explosives:

1. Criteria assessed on a case by case basis

Mining:

1. Criteria assessed on a case by case basis

Subdivisions (see Subdivision and Development Guidelines):

1. Criteria assessed on a case by case basis
2. Subdivisions that encourage unauthorised encroachments (for example, where the majority of usable outdoor space in a proposed lot is located within a transmission line easement), will not be permitted, due to public safety risks

Is your proposal prohibited within a TransGrid easement?

If your proposal is described below, it is **prohibited** from being carried out within any part of a transmission line easement. This is due to the inherent risk to people, public safety, and to ensure the safe, reliable operation of the network.

Buildings, accommodation and structures:

1. Buildings or structures which are not listed as **permitted** or **require TransGrid's permission**
2. Construction of houses
3. Site construction offices or workshops
4. Camping or occupied caravans or other camping vehicles
5. Above ground pools

Fixed plant or equipments

Interference with transmission lines:

1. The placing of obstructions within 20 metres of any part of a transmission line structure or supporting guy wires
2. Placing any obstructions on access tracks or within the easement area that restricts access
3. Any structure whatsoever that during its construction or future maintenance will require an Accredited Person to access as per the WorkCover *NSW Work Near Overhead Power Lines Code of Practice 2006 (https://www.safework.nsw.gov.au/__data/assets/pdf_file/0020/52832/Work-near-overhead-power-lines-code-of-practice.pdf)*
4. The attachment of any fence, any signage, posters, or anything else, to a transmission line structure or guy wire
5. Any work that generates significant amounts of dust or smoke that can compromise the transmission line high voltage insulation
6. Movement of any vehicle or plant between tower legs, within 5 metres of a transmission line structure, guy wire or between a guy wire and the transmission pole
7. Kite flying or model aircraft within the easement, flying of remote controlled or unmanned aerial vehicles (such as drones), any manned aircraft or balloon within 60 metres of any transmission line structure, guy wire or conductor
8. Structures or objects that encourage or facilitate climbing (including working from vehicles)

Note: The final structure may meet AS7000 clearances, but may be accessible by Ordinary Persons within the Ordinary Persons Zone.

Storage of flammable, combustible, corrosive or explosive materials, garbage, refuse or fallen timber

Burning off or the lighting of fires

Unsafe work practices under Work Near Overhead Power Lines Code of Practice:

1. Any vegetation maintenance (such as felling tall trees) where the vegetation could come within the Ordinary Persons Zone as per the *WorkCover NSW Work Near Overhead Power Lines Code of Practice 2006*
2. Any activity (including operation of mobile plant or equipment having a height when fully extended exceeding 4.3 metres) by persons not Accredited or not in accordance with the requirements of the *WorkCover NSW Work Near Overhead Power Lines Code of Practice 2006*.

What about underground cable easements

Different risks and requirements apply near TransGrid transmission cables. For further guidance, please see the **Working near TransGrid cables guidelines**.

Underground cables are not obvious, and you may not know there is one located on your property. A **Dial Before You Dig (DBYD)** search is essential prior to any excavation works.

Given the nature of underground cables, all proposals within cable easements require TransGrid's permission.

Please note: TransGrid reserves the right to review each activity and apply controls on a case-by-case basis, taking into account public safety risks, and the safe operation, access and maintenance of TransGrid's electricity infrastructure.

How can I seek TransGrid's permission?

You can seek TransGrid's permission to carry out proposals within or adjacent to an easement via TransGrid's online Easement Enquiries Portal: https://www.transgrid.com.au/being-responsible/public-safety/Living-and-working-with-electricity-transmission-lines

This should be done **prior** to lodging your development application or planning agreement application with your consent authority. TransGrid's permission is given as holder of the easement only, and does not constitute approval to carry out the activity or development.

Please check that your proposal is consistent with these Easement Guidelines before you seek TransGrid's permission, so that we can respond as efficiently as possible.

Your request for permission should include the following information:

Name of applicant and/or company or Council	✓
Street address and Lot-DP	✓
Description of proposal with height, depth and location of proposed activities/ structures/ development and assessment of impact on transmission infrastructure	✓
Contact information including phone number, address and email address	✓
A detailed, legible and to-scale plan showing property boundaries, proposal and distance of proposal to TransGrid's easement and transmission line structures and guy wires (if applicable) For large scale subdivisions, a Site Plan showing all new access points and access ways to the easement and transmission line structures	✓
A three dimensional CAD drawing in 3D-DXF format	Only if proposal changes ground levels ✓

If we do not receive this information we may need to request further details from you, and this will delay your request for permission.

TransGrid has also prepared supplementary Technical Guidelines and Fact Sheets to provide additional information for specific activities:

> High voltage transmissions network fact sheet

> Electrical safety risks fact sheet

> Work near TransGrid cables

> Subdivision and development guidelines

> Fencing guidelines

> Working near TransGrid cables information brochure

These are available on the TransGrid website at **www.transgrid.com.au/being-responsible/public-safety/living-and-working-with-transmission lines**.

If your proposal is complex (for example, master-planned subdivision), we recommend a meeting with TransGrid before you submit your application for permission. You can arrange this via our online Easement Enquiries Portal.

Can I use TransGrid's permission as part of my development application to Council?

Your consent authority is required to consult with TransGrid before granting development consent for proposals that impact transmission line easements, or where the proposal might adversely affect electricity infrastructure.

Consent authorities must take into consideration any comments made by TransGrid within 21 days of written notification of a development application.

If you have received TransGrid's permission, this should be included as part of the development application. This will enable the referral process to be as efficient as possible.

If you have changed your proposal, you will need to lodge another request for TransGrid's permission via our online Easement Enquiries Portal, as your original permission will no longer be valid. This may delay the development application process.

Seeking TransGrid's permission and applying for development consent are two separate processes. TransGrid's permission does not allow you to carry out an activity nor does it guarantee development consent.

What if I build something without TransGrid's permission?

Please contact TransGrid to discuss on:

Phone: (02) 9620 0515

Email: Easements&Development@transgrid.com.au

Relocating or modifying infrastructure and interruption to transmission

Some proposals require modifications to existing electricity infrastructure or easements.

A contract may be needed with TransGrid where you will be required to pay TransGrid's costs, such as design and construction works.

You can make a modification enquiry with TransGrid's Infrastructure team at **infrastructure@transgrid.com.au** or find further information on our website: **https://www.transgrid.com.au/what-we-do/our-network/connections-and-modifications/network-modifications/Pages/default.aspx**

You will also be responsible for any costs incurred as a consequence of interruptions to TransGrid's transmission operations arising from the development.

Contact TransGrid

If you are uncertain or require further information regarding works around or in TransGrid easements, please contact us via our online Easement Enquiries Portal: https://www.transgrid.com.au/being-responsible/public-safety/Living-and-working-with-electricity-transmission-lines

You can also reach us by contacting:

Phone: (02) 9620 0515

Email: Easements&Development@transgrid.com.au