

From: Cornelis Duba <Cornelis.Duba@endeavourenergy.com.au>

Sent: Friday, 28 September 2018 2:05 PM

To: 'information@planning.nsw.gov.au'

Subject: NSW Department of Planning and Environment Notice of Exhibition Draft Masterplan for West Schofields

The Secretary
NSW Planning & Environment

ATTENTION: George Koshy, Director, North West Land Release

Dear Sir or Madam

I refer to the Department's letter of 31 August 2018 regarding the exhibition of the West Schofields Draft Masterplan, the key features of which are:

- A new local centre with community facilities, shops and cafes
- Twelve double playing fields to support West Schofields and its surrounding communities
- New footpaths and cycleways throughout the community Protection of Eastern Creek and Bells Creek
- A green grid throughout the area, with possible connections to Western Sydney Parklands
- A range of homes to meet the needs of a new, diverse community.
- Appropriate building and design controls to create a more resilient community

Submissions need to be made to the Department by 28 September 2018.

As shown in the below site plan from Endeavour Energy's G/Net master facility model (and extract from Google maps Street View) the existing electricity infrastructure within the Precinct includes:

- Feeder 21J Schofields to South Marsden Park being 132,000 volt / 132 kV high voltage underground cables located in Grange Avenue road verge / roadway.
- Predominantly an older / non-urban network with overhead power lines and pole mounted substations.

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

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

- Network Capacity / Connection

Endeavour Energy has noted the following in the Exhibition Discussion Paper:

2.4.3 Electricity

The ultimate servicing strategy for the precinct will see the western part of the precinct supplied via the South Marsden Park zone substation and the eastern part supplied via the Schofields zone substation. To meet ultimate load requirements, an additional 3-5 feeders will need to be extended from both zone substations.

The northern part of the precinct will require additional feeders to be extended by Endeavour Energy. Endeavour Energy has provided no timeframe for this work.

Endeavour Energy has advised that there will be some initial spare network capacity (approximately 250-500 dwellings) from Schofields zone substation which could serve the southern part of the precinct. However, this spare capacity is on a 'first come, first served' basis so this capacity may be utilised by adjacent development outside the precinct. If the spare capacity is used by initial development within the southern part of the precinct, the initial feeders will be required from the Schofields zone substation by 2021.

The Precinct Infrastructure Planning Report contains the following advice:

3.3 ELECTRICITY

3.3.1 ENDEAVOUR

The Site is currently serviced primarily by two electrical substations. The western part of the West Schofields Precinct is supplied via the South Marsden Park Zone Substation while the eastern part is supplied via the Schofields Zone Substation. Supply is brought into the site via the existing overhead network from the substations. Property connections are generally direct from the overhead network.

4.3 ELECTRICITY

The ultimate strategy for the site will see the South Marsden Park zone substation provide power to the western areas of the Site and the Schofields zone substation provide power to the eastern areas of the site as shown in Figure 4.6. To meet the ultimate load requirements for this site, an additional 3-5 feeders will need to be extended from both the Schofields and South Marsden Park zone substations.

The northern part of the site ("Balance" Precinct) will be serviced via a combination of South Marden Park substation (to supply the western part) and Schofields substation (to supply the eastern part). Both substations will require additional feeders to be extended by Endeavour Energy to the site to service the ultimate loads.

Endeavour Energy has advised (refer to Appendix A) that there will be some initial spare network capacity (approximately 250-500 dwellings) from Schofields feeder FDR SC1238 with high voltage customer (HVC 2064) closing (ie CSR). However, this spare capacity is on a 'first come, first serviced' basis and so this capacity may be utilised by adjacent developments outside of West Schofields Precinct. Assuming that the spare capacity is utilized by the initial development within West Schofields, the initial new feeder/s from the Schofields zone substation will be required by 2021.

Appendix A - Service Provider Correspondence includes Endeavour Energy ENL2831 – Supply Enquiry (Technical Review Request) was completed by Endeavour Energy's Network Connections Branch, Contestable Works Project Manager, David Ho, dated 13 July 2017.

Endeavour Energy's Asset Strategy & Planning Branch have reviewed the Technical Review Request and advised 'No changes to previous comments for ENL2831. Endeavour Energy will extend the network from Schofields Zone Substation (located at 14 Schofields Road Schofields) and South

Marsden Park Zone Substation (located at Hollinsworth Road Marsden Park) into the development area when required’.

In regards to the availability of electricity supply to sites within the Precinct, the availability of supply to a site is based on a wide range of factors eg. the age and design of the network; other development in the locality utilising previously spare capacity within the local network; the progress of nearby / surrounding sites including electricity infrastructure works eg. a smaller and isolated development that may not of its own accord require a padmount substation may require a padmount substation to facilitate the development and from which the spare capacity is made available to subsequent nearby development. Older / above ground areas of the network utilising pole mounted substations have comparatively limited capacity of 25 kilovolt amperes (kVA) up to a maximum of 400 kVA where as a newer padmount substation can accommodate loads from 315 kVA up to 1,500 kVA (typically 500 kVA) ie. there is a significant variation in the number and type of premises able to be connected to a substation.

In due course the applicant for the future proposed development of the sites within the Precinct 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 the method of supply will be determined. 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) and be protected (including any associated cabling) by an easement and associated restrictions benefiting and gifted to Endeavour Energy. Please refer to Endeavour Energy’s Mains Design Instruction MDI 0044 ‘Easements and Property Tenure Rights’. Further details are available by contacting Endeavour Energy’s Network Connections Branch via Head Office enquiries on telephone: 133 718 or (02) 9853 6666 from 8am - 5:30pm or on Endeavour Energy’s website under ‘Home > Residential and business > Connecting to our network’ via the following link:

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

Advice on the electricity infrastructure required to facilitate the proposed development (including asset relocations) can be obtained by submitting a Technical Review Request to Endeavour Energy’s Network Connections Branch, the form for which FPJ6007 is attached and further details (including the applicable charges) are available from Endeavour Energy’s website under ‘Our connection services’. The response to these enquiries is based upon a desktop review of corporate information systems, and as such does not involve the engagement of various internal stakeholders in order to develop a ‘Connection Offer’. It does provide details of preliminary connection requirements which can be considered by the applicant prior to lodging a formal application for connection of load.

Alternatively the applicant should engage a Level 3 Accredited Service Provider (ASP) approved to design distribution network assets, including underground or overhead. The ASP scheme is administered by NSW Planning & Environment and details are available on their website via the following link or telephone 13 77 88:

<https://www.energy.nsw.gov.au/energy-supply-industry/pipelines-electricity-gas-networks/network-connections/contestable-works>

- Urban Residential Subdivision

Urban residential subdivision of a site is subject to Endeavour Energy Underground Residential Distribution (URD) policy. Endeavour Energy’s Company Policy 9.2.5 ‘Network Asset Design’, includes the following requirements for electricity connections to new residential subdivisions:

5.11.1.1 Urban areas

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

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

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

Extensions to the existing overhead 11kV/22kV network must generally be underground. Bare wire will be used for conductor replacements and augmentations except in treed areas where CCT or NMSHVABC must be used.

Extensions to the existing overhead LV network and augmentations must either be underground or ABC. Conductor replacements greater than 100m in route length must utilise aerial bundled cable.

*CCT = Covered conductor thick with insulation fully rated for the voltage on the conductor.
NMSHVABC = Non-metallic Screened High Voltage Aerial Bundled Cable.*

Table 2 – Distribution Network Design Parameters Summary

Limits	Urban	Industrial and commercial	Non-urban
Default HV reticulation	U/G	U/G	O/H
Default LV reticulation	U/G	U/G	O/H – ABC

Non-urban

Any area that is identified as rural land zoning

- Location of Electricity Easements

The incorporation of electricity easements into privately owned lots eg. for padmount substations and associated underground cables likely to be required to facilitate the proposed development, is generally problematic for both Endeavour Energy and the future landowners and requires additional easement management to ensure no uncontrolled activities / encroachments occur within the easement area. Accordingly Endeavour Energy’s recommendation is that whenever reasonably possible, easements be entirely incorporated into public reserves and not burden private lots (except where they are remnant lots or not subject to development). Endeavour Energy’s preference is to have continuity of its easements over the most direct and practicable route affecting the least number of lots as possible. Therefore it generally does not support the incorporation of easements into to multiple / privately owned lots. This is also in keeping with a policy of prudent avoidance (please refer to the below point ‘Prudent Avoidance’).

The future proposed substation locations on a site will require a detailed assessment to consider the suitability of access, safety clearances, fire ratings, flooding (please refer to the below point ‘Flooding and Drainage’) impact on adjoining properties etc. For example, to avoid the creation of restrictions on the adjoining site the development shown in the following extract of Google Maps Street View is of a site in Liverpool required the installation of a fire wall next to the padmount substation. Whilst meeting the fire rating requirements etc. from an aesthetics perspective this is not an attractive outcome. Restricted access to the substation by maintenance workers causes delays in power

restoration and may have severe consequences in the event of an emergency. Delays to accessing electricity infrastructure due to traffic congestion may also have severe consequences in the event of an emergency.



Fire wall constructed for padmount substation in Liverpool. Source: Google Maps Street View.

- Flooding and Drainage

Endeavour Energy has noted that the Exhibition Discussion Paper describes the Precinct as having a 'flood prone nature'.

Distribution substation should not be subject to flood inundation ie. the padmount substation cubicles are weather proof not flood proof. Endeavour Energy's Mains Construction Instruction MCI 0006 'Underground distribution construction standards manual' Section 7 'Substation and switching stations' provides the following details of the requirements for new padmount substation locations in flood prone land.

7.1.6 Flooding and drainage

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

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

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

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

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



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

- Bushfire

Endeavour Energy has noted that the Exhibition Discussion Paper indicates that there is 'potential bushfire hazard across the area'. The accompanying Bushfire Protection Assessment assessing the impacts of the proposal against the NSW Rural Fire Service (RFS) publication Planning for Bushfire Protection 2006 providing the following advice (please also refer to the above point 'Urban Residential Subdivision'):

5.2 Gas and electrical supplies

In accordance with PBP, electricity should be underground wherever practicable. Where overhead electrical transmission lines are installed:

- Lines are to be installed with short pole spacing, unless crossing gullies
- No part of a tree should be closer to a powerline than the distance specified in the *ISSC 3 Guideline for Managing Vegetation Near Power Lines* (Industry Safety Steering Committee, 2016).

Any gas services are to be installed and maintained in accordance with *Australian Standard AS/NZS 1596 'The storage and handling of LP Gas'* (Standards Australia 2014).

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

9.1.1 BUSHFIRE RISK MANAGEMENT

1.0 POLICY STATEMENT

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

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

- Earthing

The construction of any building or structure (including fencing, signage, flag poles etc.) whether temporary or permanent that is connected to or in close proximity to Endeavour Energy's electrical network is required to comply with Australian/New Zealand Standard AS/NZS 3000:2007 'Electrical installations' to ensure that there is adequate connection to the earth. Inadequate connection to the earth places persons, equipment connected to the network and the electricity network itself at risk if there is a leaking/fault current which cannot flow into the grounding system and be properly dissipated.

Any future proposed buildings, structures, etc. must comply with the minimum safe distances / clearances for voltages up to and including 132,000 volts (132kV) as specified in

- Australian/New Zealand Standard AS/NZS 7000 – 2016: 'Overhead line design'
- 'Service and Installation Rules of NSW' which can accessed via the following link to the NSW Planning & Environment website:

<https://www.energy.nsw.gov.au/energy-supply-industry/pipelines-electricity-gas-networks/network-connections/rules>

As a guide please find attached a copy of Endeavour Energy Drawing 'Overhead Lines Minimum Clearances Near Structures'.

With rezonings allowing high and medium density development with increased floor space ratios and building heights combined with reduced building setbacks, it can result in breaches of safety clearances by proposed buildings and structures to the existing overhead power lines. Even if there is no issue with the safety clearances to the building, ordinary persons must maintain a minimum safe approach distance of 3.0 metres to all voltages up to and including 132,000 volts / 132 kV (and a distance of 4.0 metres for the erection and dismantling of scaffolding). For future access and maintenance of buildings and structures, in order to avoid the need to work within the safe approach distances for ordinary persons (which requires an authorised or instructed person with technical knowledge or sufficient experience to perform the work required and a safety observer for operating plant) or possibly an outage request and/or erection of a protective hoarding, the retention of adequate building setbacks and/or suitable building design eg. not having parts of the building normally accessible to persons in close proximity of the overhead power lines, the use of durable / low maintenance finishes to reduce the need to access areas within the safe approach distances, is recommended or alternatively the adoption of an underground solution.

- Prudent Avoidance

The electricity network is operational 24/7/365 ie. all day, every day of the year. The electricity industry has adopted a policy of prudent avoidance by doing what can be done without undue inconvenience and at modest expense to avert the possible risk to health from exposure to emissions from electricity infrastructure such as electric and magnetic fields (EMF) and noise which generally increase the higher the voltage ie. Endeavour Energy's network ranges from low voltage (normally not exceeding 1,000 volts) to high voltage (normally exceeding 1,000 volts but not exceeding 132,000 volts / 132 kV). In practical terms this means that when designing new transmission and distribution facilities, consideration is given to locating them where exposure to the more sensitive uses is reduced and increasing separation distances. These emissions are generally not an issue but with Council's permitting or encouraging development with higher density, reduced setbacks and increased building heights, new development can impact on existing electricity infrastructure. Where development is proposed in the vicinity of electricity infrastructure, Endeavour Energy is not responsible for any amelioration measures for such emissions that may impact on the nearby proposed development. Endeavour Energy believes that likewise Council should also adopt a policy of prudent avoidance by the siting of more sensitive uses away from any electricity infrastructure.

Please find attached a copy of ENA's 'Electric & Magnetic Fields – What We Know, January 2014' which can also be accessed via the ENA's website at <http://www.ena.asn.au/> and provides the following advice:

Localised EMFs may also 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, safety clearances etc. and having a maximum voltage of 132,000 volt / 132 kV, will with the observance of these separation distances not exceed the recommended magnetic field public exposure limits.

- Vegetation Management

The planting of large trees in the vicinity of electricity infrastructure is not supported by Endeavour Energy. Suitable planting needs to be undertaken in proximity of electricity infrastructure. Only low growing shrubs not exceeding 3.0 metres in height, ground covers and smaller shrubs, with non-invasive root systems are the best plants to use. 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 even 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 of bush fire, 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.

In regards to the future padmount substations required to facilitate the proposed development please refer to the attached copy of Endeavour Energy's Guide to Fencing, Retaining Walls and Maintenance Around Padmount Substations.

- Dial Before You Dig

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

- 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 ie. the existing customer service lines will need to be isolated and/or removed during demolition. Appropriate care must be taken to not otherwise interfere with any electrical infrastructure on or in the vicinity of the site eg. streetlight columns, power poles, overhead and underground cables etc.

- Public Safety

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

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

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

- Emergency Contact

In case of an emergency relating to Endeavour Energy's electrical network, the applicant should note the Emergencies Telephone is 131 003 which can be contacted 24 hours/7 days.

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

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

Yours faithfully

Cornelis Duba

Development Application Specialist

Network Environment & Assessment

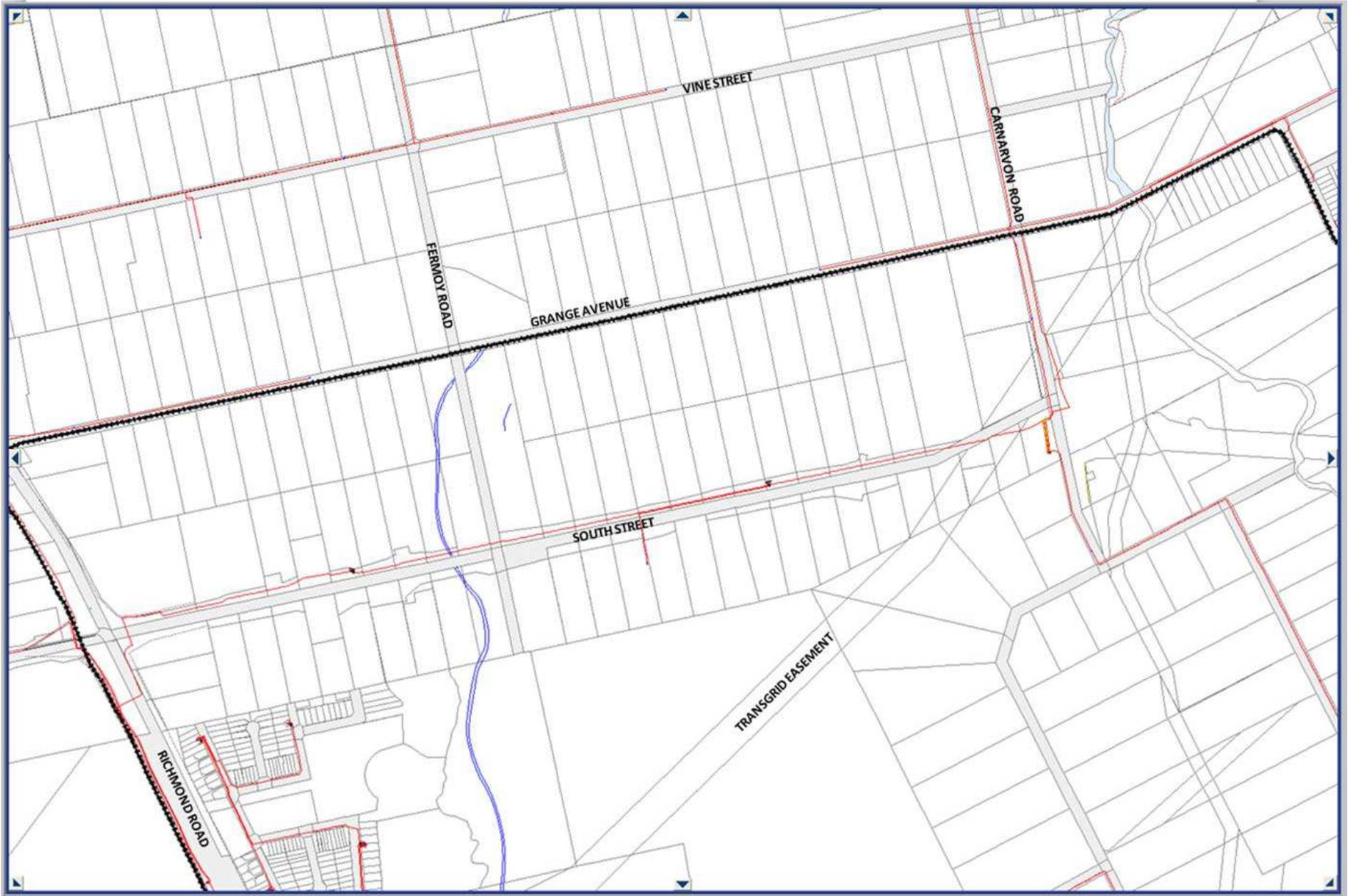
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211 Grange Ave
Marsden Park, New South Wales

Google, Inc.

Street View - Apr 2014



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