



SERVICES INFRASTRUCTURE REPORT

MINARAH COLLEGE CAMPUS

268-278 CATHERINE FIELDS ROAD, CATHERINE FIELDS

HYDRAULIC & ELECTRICAL SERVICES

DOCUMENT CONTROL SHEET

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1. EXECUTIVE SUMMARY

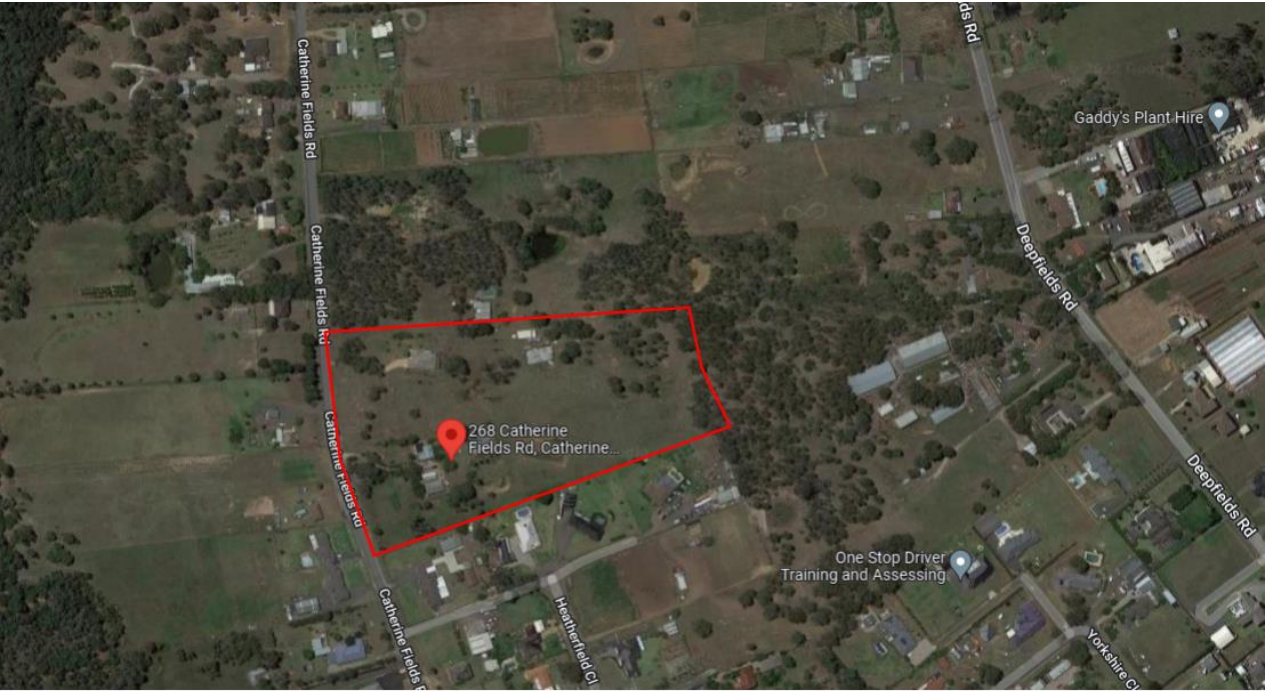
This Services Infrastructure report is submitted to the Department of Planning, Industry and Environment (DPIE) in support of a State Significant Development Application (SSD-13619238) for the development of Minarah College Campus, a new co-education K-12 school to be located on 268 & 278 Catherine Fields Road in Catherine Field (the site). The extent of the site is shown below.

This Services Infrastructure Report has been prepared by JHA Consulting Engineers on behalf of the Green Valley Islamic College Ltd (**the Applicant**). It accompanies an Environmental Impact Statement (EIS) in support of State Significant Development Application (**SSD-30759158**) for Minarah College at 268 and 278 Catherine Fields Road, Catherine Field (**the site**).

Minarah College will be a co-educational K-12 school accommodating 1,580 students, 840 in primary school and 660 in high school. There will also be an Early Learning Centre (ELC) for 60 students and a School for Specific Purpose (SSP) for 20 students. The new school will be constructed in stages, growing in line with growth in the local population.

The proposal seeks consent for:

- Demolition of the existing dwellings and ancillary structures on-site;
- The construction of the following:
 - One-storey early learning centre with attached two-storey administration building to service the high school and early learning centre;
 - Two-storey primary school building comprising of primary school classrooms, SPP classrooms, primary school hall which attached outside school hours care (OSHC);
 - Two-storey high school building comprising high school classrooms;
 - Two-storey high school hall;
 - Shared one-storey canteen adjoining the high school building; and
 - Shared library located on the second storey above administration building below.
- Site access from Catherine Fields Road at two points with a bus zone, 30 kiss and drop car parking spaces, and car parking;
- Consolidation of the allotments;
- Associated site landscaping and public domain improvements;
- An on-site car park for 123 parking spaces; and
- Construction of ancillary infrastructure and utilities as required.



The Site

NOT TO SCALE

The purpose of this report it to identify the existing infrastructure (Utilities) on the site and identify the associated requirements and cumulative impacts as outlined within the SSD guidelines for these utilities to service the proposed development. This shall include details around demolition and the staged construction works.

In accordance with section 4.39 of the Environmental Planning & Assessment Act 1979 (EP&A Act), the Secretary's Environmental Assessment Requirements (SEARs) for SSD-30759158 were issued on 29th October 2021. This report has been prepared to respond to the following SEARs:

ITEM	COMMENT / REFERENCE	SECTION REFERENCE
14 – Utilities	Assess the impacts of the development on existing utility infrastructure and service provider assets surrounding the site.	Section 2, Page 4
14 – Utilities	Identify any infrastructure upgrades required off-site to facilitate the development and any arrangements to ensure that the upgrades will be implemented on time and be maintained.	Section 3, Page 5
14 – Utilities	Provide an infrastructure delivery and staging plan, including a description of how infrastructure requirements would be co-ordinated, funded and delivered to facilitate the development.	Section 3.1, Page 5 Section 3.2, Page 8

2. EXISTING INFRASTRUCTURE

2.1 HYDRAULIC INFRASTRUCTURE

2.1.1 SEWER DRAINAGE

Currently there is no existing authority sewer infrastructure available for the site. It is assumed that the previous Class 1 dwellings situated on lots 268 and 278 are serviced by on-site septic tanks.

2.1.2 POTABLE WATER

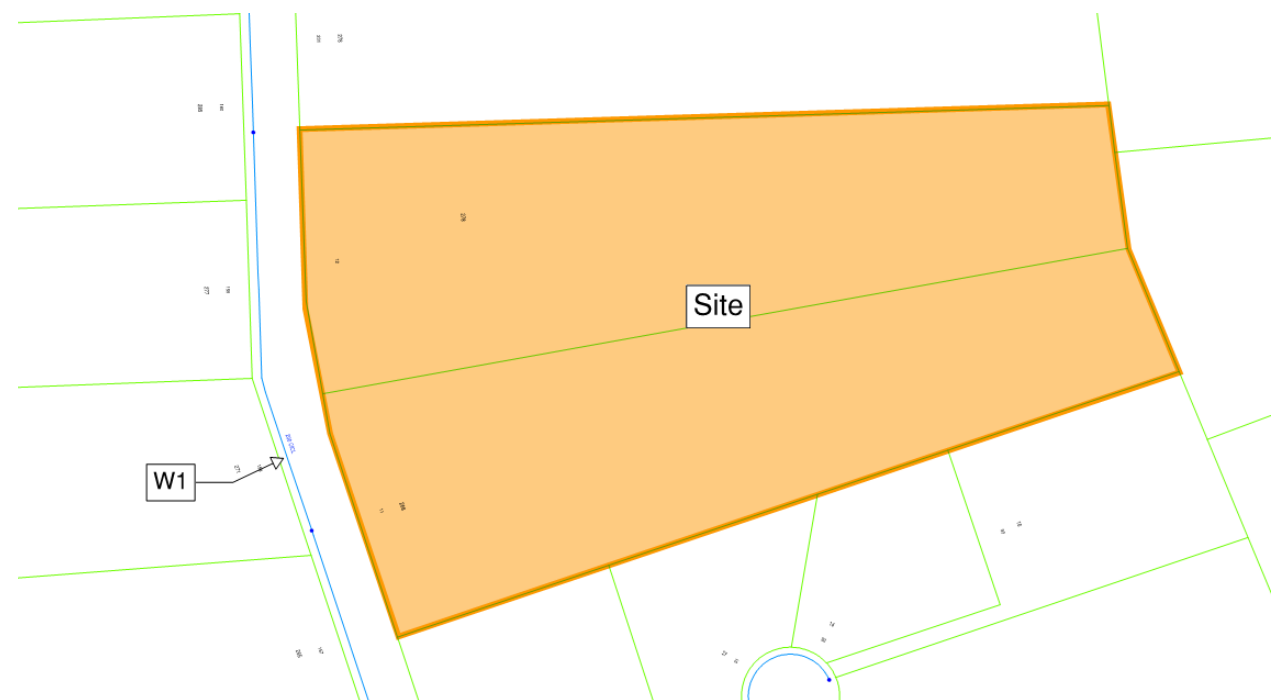
The existing site has frontage to the following authority water main:

- Ø200mm CACL main in Catherine Fields Road

There is no existing incoming site connection.

JHA have engaged a Water Servicing Coordinator (WSC) to apply for a feasibility study with Sydney Water, this study will suggest suitability for connection to the potable water main listed above and act as an 'anticipated' Notice of Requirements. This will also inform of any infrastructure requirements nominated by Sydney Water, where this can be 'locked-in' through the Notice of requirements (NOR)

The diagram below illustrates the surrounding authority water mains:



DBYD – Sydney Water - Water infrastructure map

A) GAS SERVICES

Currently there is no natural gas infrastructure available for the site.

2.2 ELECTRICAL AND COMMUNICATIONS INFRASTRUCTURE

2.2.1 EXISTING ENDEAVOUR ENERGY INFRASTRUCTURE

The proposed development site spans two (2) existing properties for a consolidated lot, being:

- 268 Catherine Fields Road
- 278 Catherine Fields Road

These two sites are currently supplied directly from the existing Low Voltage (LV) network the reticulates along the western side of Catherine Fields Road. These supplies are by the way of existing LV overhead service connections utilising Endeavour Energy poles.

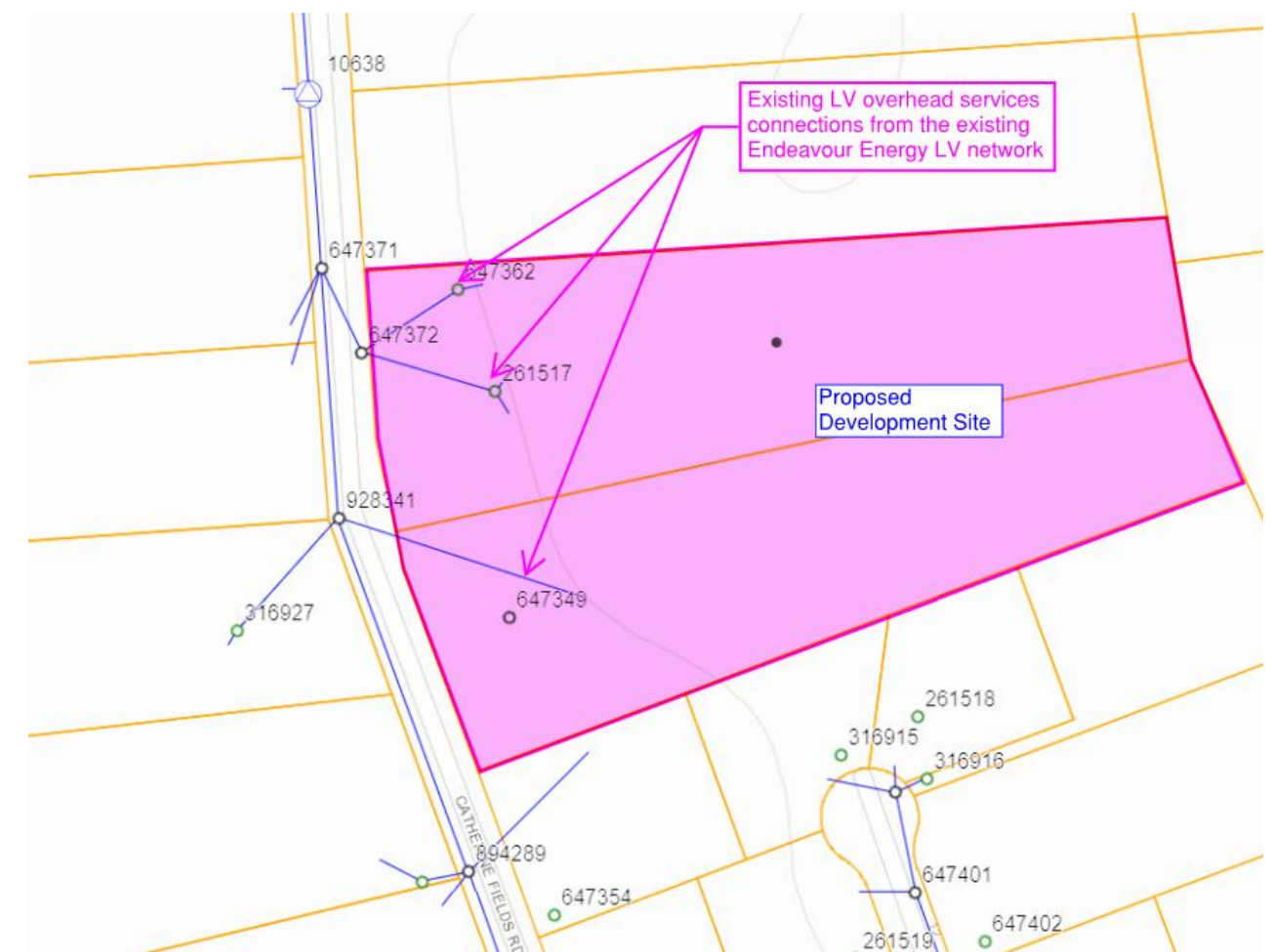


Figure 2.2 – Extract from Endeavour Energy Network Map (LV, 07/03/2022)

These supplies are proposed to be removed from site to ensure the development site is free of all authority electrical services to enable construction.

In addition to the Endeavour Energy LV network, there is an existing High Voltage (HV) network that reticulates on the western side of Catherine Fields Road in concert with the existing LV network as per the below network extract.

Figure 2.3 – Existing Overhead Telstra Assets

3. PROPOSED INFRASTRUCTURE AND REQUIRED STAGING

3.1 HYDRAULIC INFRASTRUCTURE

3.1.1 SEWER DRAINAGE

Currently there is no Sydney Water sewer infrastructure available for this site. JHA have engaged a Water Servicing Coordinator (WSC) to apply for a feasibility study with Sydney Water.

This feasibility study is expected to touch base on the Sydney Water growth servicing plan, to determine if a new authority sewer network is expected to come ‘online’ within area and service the site. Note that a Section 73, and Notice of requirements will be a requirement of the SSDA checklist.

JHA is anticipating receipt of feasibility study and will update infrastructure report accordingly prior to lodgement of the SSD.

Concurrently, Martens (waste water consultant) is to provide a report outlining scenarios where the site is not serviced by authority sewer infrastructure.

Martens report shall outline strategies including by not limited to on-site septic tank and aerated waste water treatment. It is understood that these are not the preferred solutions to service the site, and that these solutions may be used as an ‘interim’ solution where the school can be ‘switched over’ to the Sydney Water sewer network as detailed in Sydney Water urban growth servicing program below.

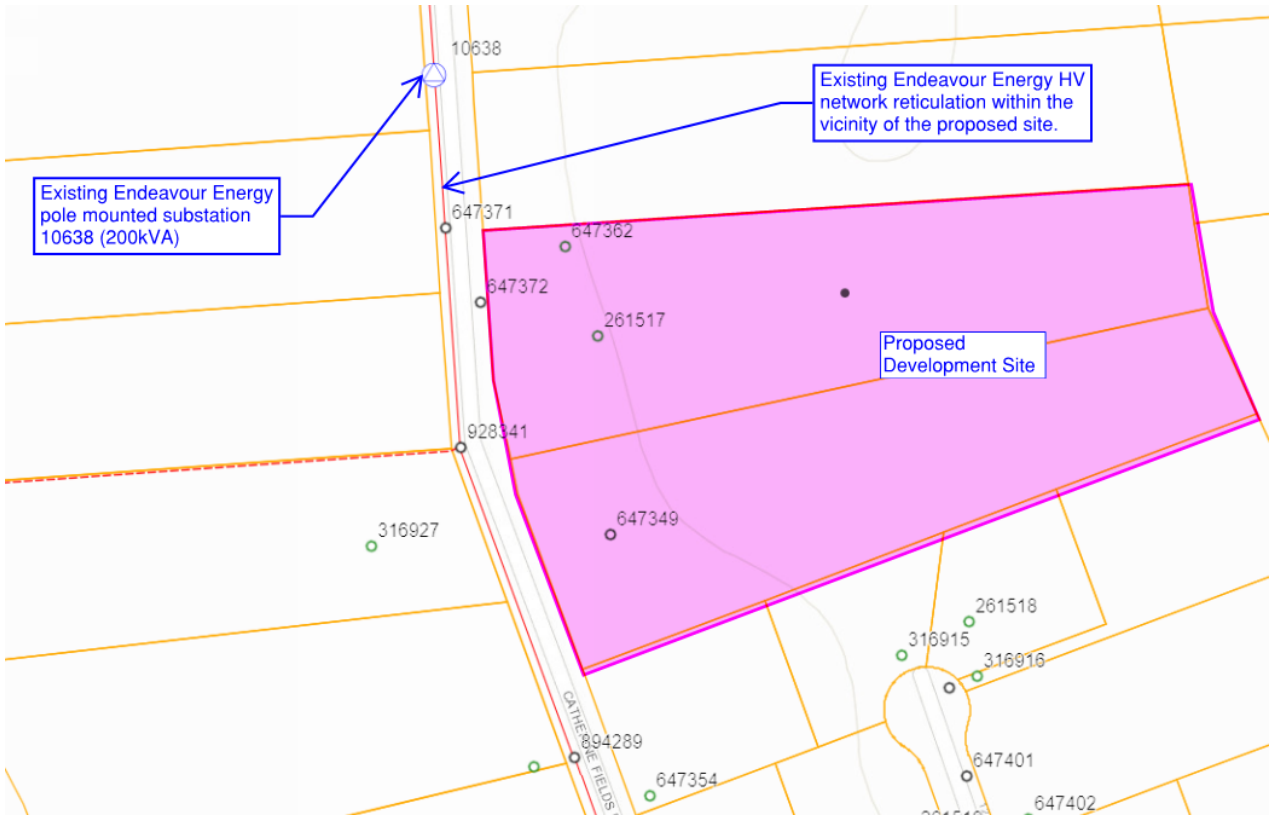
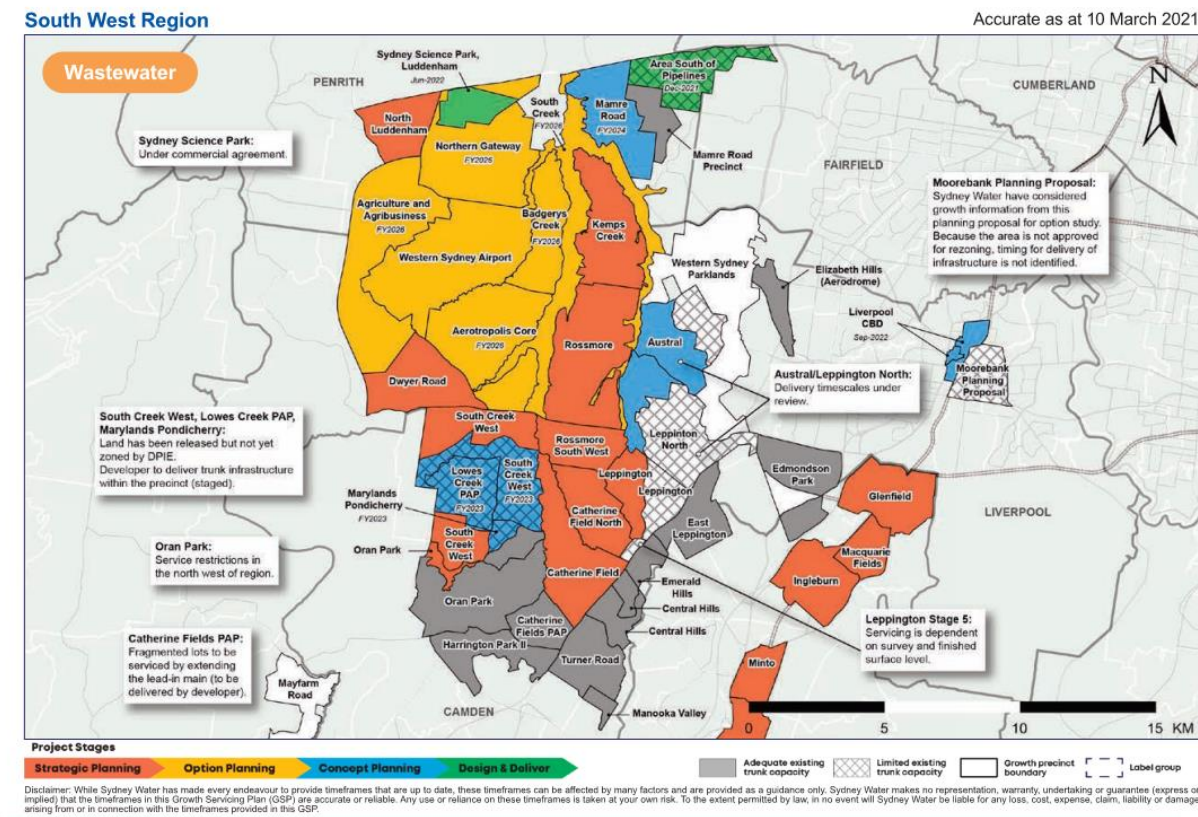


Figure 2.3 – Extract from Endeavour Energy Network Map (HV, 07/03/2022)

2.2.2 EXISTING TELECOMMUNICATIONS

Existing Telstra overhead fibre networks reticulate along the proposed site frontage on the eastern side of Catherine Fields Road. These assets are proposed to be relocated from the proposed site frontage.





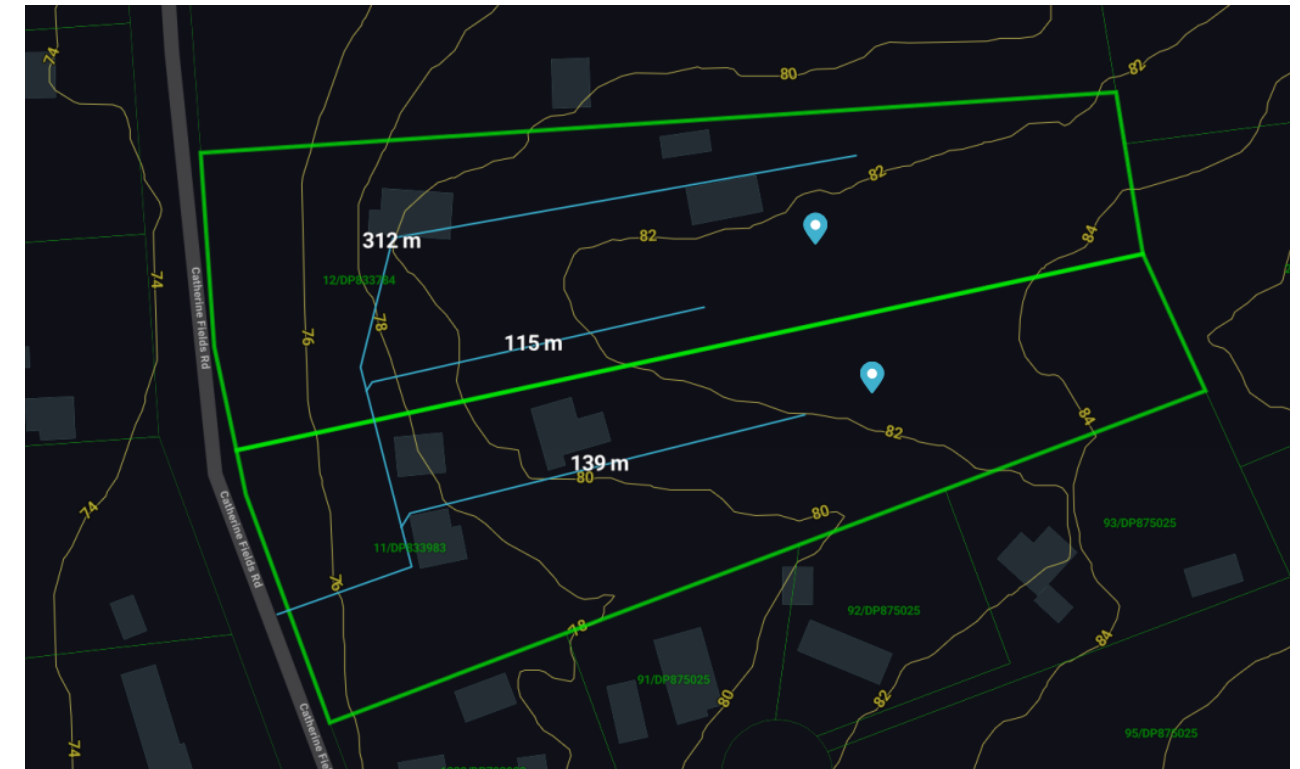
21 | Growth Servicing Plan 2020 – 2025

Sydney Water Waste-water growth servicing plan 2020-2025

As denoted in the figure above, the Sydney Water Waste-water growth servicing plan denotes that Catherine Fields waste water network is currently in the 'strategic planning' stage. It is envisaged that sanitary drainage shall gravitate toward the west of the site toward frontage/ Catherine Fields Road for change over to this system when online.



Site frontage from Catherine Fields Road (green field) - Google maps image



Greenfield site with elevation contours & (mAHD) sanitary drainage indicative route and length

Sanitary drainage shall gravitate toward west of the site toward frontage/ Catherine Fields Road, toward presumed authority sewer network. Private sanitary drainage system is traverses with natural ground levels, and shall be laid at 1.65%/ 1% pending fixture loading or to maintain min depth of cover with slope of land. Approx. authority sewer connection: IL: 75.500

3.1.2 LOAD ESTIMATION - SEWER

A preliminary wastewater discharge analysis has been undertaken and the following estimated loads have been calculated:

Element	Unit	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Year	-	2025	2031	2035	2038	2040
Total number of Students and Staff	person	350.0	716.0	1078.0	1400.0	1720
On site	Generation rate based on Sydney Water bill [1]	13.2	13.2	13.2	13.2	13.2
	Average daily wastewater load	4.7	9.5	14.3	18.5	22.8
	EP per student [2]	0.2	0.2	0.2	0.2	0.2
	EP	70.0	143.2	215.6	280.0	344.0
ADWF [3]	kL/day	10.28	21.03	31.67	41.13	50.53
A	-	4.7	4.7	4.7	4.7	4.7
d [4]	-	8.30	6.11	5.23	4.76	4.45
PDWF [5]	L/s	0.99	1.49	1.92	2.27	2.60
Impervious %	%	3.51%	6.09%	10.30%	20.60%	24.57%
Aeff [6]	ha	4.58	4.49	4.34	3.97	3.83
C [7]	-	0.70	0.70	0.70	0.70	0.70
I1,2 [8]	mm/h	27.80	27.80	27.80	27.80	27.80
Factor - size [9]	-	1.29	1.29	1.29	1.29	1.29
Factor - containment [10]	-	1.0	1.0	1.0	1.0	1.0
I [11]	mm/h	35.95	35.95	35.95	35.95	35.95
RDI [12]	L/s	3.22	3.16	3.06	2.8	2.7
Design Flow	L/s	4.21	4.65	4.98	5.07	5.30

Martens waste water demand – Sydney Water vs on-site

3.1.3 POTABLE WATER

As part of Stage 1 works provide new authority water meter and potable cold water pump-set able to accommodate design flows for future stages. Utilise shared trench with Fire hydrant system and provide capped provisions for future stages/ extension.

JHA have carried out a pressure and flow enquiry on the 200mm water main reticulating Catherine Fields Road and the model can be found below. The Sydney water model suggests there is adequate pressure and flow for the firefighting/ potable water usage requirements of the school. The number of Fire Hydrant outlets required to discharge simultaneously according to building classification and floor area as stipulated in the NCC deem to satisfy provisions from AS2419.1 2005 is as follows;

- 2 x Fire Hydrants discharging simultaneously (20L/s)

Note:

- Design flow/ Authority Water main advice is based on the assumption that no fire sprinklers are envisaged/ required from a NCC Deem to Satisfy perspective, and that Class 9b fire compartments do not exceed 5000m² as outlined in AS2419.1 2005.
- If fire compartments were to exceed 10,000m², as eluded to in the GFA (13,511m²), the required design flow for fire hydrants as stipulated in AS2419.1 2005 would be 4 x Fire hydrants operating simultaneously (40L/s) Fire water storage tanks would need to be introduced. Equal to 4 hours storage or 288,000L. (Including 20L/s automatic inflow) JHA understand this is not desired and that fire compartments should remain under 5000m².

Pressure & Flow Application Number: 1269068

Your Pressure Inquiry Dated: 2021-10-18

Property Address: 268 Catherine Fields Road, Catherine Field 2557

The expected maximum and minimum pressures available in the water main given below relate to modelled existing demand conditions, either with or without extra flows for emergency fire fighting, and are not to be construed as availability for normal domestic supply for any proposed development.

ASSUMED CONNECTION DETAILS

Street Name: Catherine Fields Road	Side of Street: West
Distance & Direction from Nearest Cross Street	450 metres North from Heatherfield Close
Approximate Ground Level (AHD):	75 metres
Nominal Size of Water Main (DN):	200 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	113 metre head
Minimum Pressure	51 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	51
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5 10 15 20	53 51 49 46
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	5 10 15	49 46 43
Maximum Permissible Flow	20	40

3.1.4 LOAD ESTIMATION – WATER

A preliminary water usage analysis has been undertaken and the following estimated loads have been calculated:

Element	Unit	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Year	-	2025	2031	2035	2038	2040
Total Students (including students and staff)	person	350	716	1078	1400	1720
Average Demand [1]	(L/student/day)	20	20	20	20	20
Average Day Demand	kL/day	7.00	14.32	21.56	28.00	34.40
Max Day Demand [2]	kL/day	14.00	28.64	43.12	56.00	68.80
Max Hour Demand [3]	L/s	0.32	0.66	1.00	1.30	1.59
Irrigation Area	ha	2.37	2.37	2.37	2.37	2.37
Max Day Demand rate for parks and ovals [4]	kL/ha/day	7	7	7	7	7
Max Day Irrigation Demand	kL/day	16.59	16.59	16.59	16.59	16.59
Average Day Irrigation Demand [5]	kL/day	9.22	9.22	9.22	9.22	9.22
Max Hour Irrigation Demand [6]	L/s	0.29	0.29	0.29	0.29	0.29
Total Max Hour Demand	L/s	0.61	0.95	1.29	1.59	1.88

Martens water demand – Potable and Irrigation – Sydney Water

3.1.5 GAS SERVICES

Currently there is no natural gas infrastructure available for the site.

It is understood that the principle hot water fuel source is electric hot water storage or/ if required electric heat pump to satisfy ESD requirements.

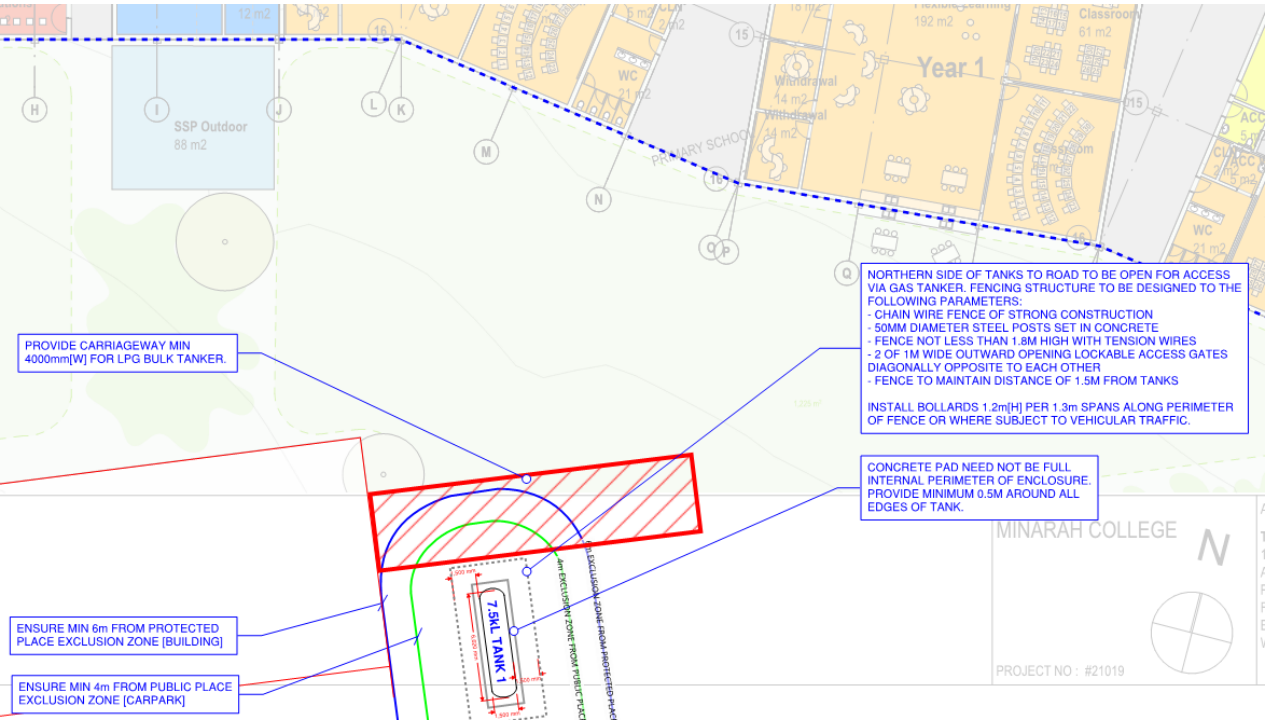
For other gas appliances yet to be confirmed, JHA have proposed on-site LPG gas storage. LPG (Liquid Petroleum Gas) is stored in vessels in liquid form. Liquid draws heat from the steel walls of the LPG cylinder which, in turn works by drawing in heat from the ambient air. The LPG liquid boils and turns into vapour as it is withdrawn from the cylinder.



LPG on-site storage tank (reference photo) – 2 x 7.5kL

Utilising Educational Facilities Standards & Guidelines ESFG requirements as a guide only, the on-site storage tank shall be no less than 7.5kL and not be accessible by students. This on-site LPG storage tank would be filled by LPG bulk tanker.

Pending anticipated gas loading and usage, JHA can liaise with gas supplier and reduce on-site storage if desired. From an ESFG perspective, this would be a guideline departure/ alternative solution.



LPG on-site storage tank – JHA spatial

3.2 ELECTRICAL & TELECOMMUNICATIONS INFRASTRUCTURE

3.2.1 ELECTRICAL DEMAND LOADINGS

A maximum demand has been completed for the new proposed works on the site. The total expected maximum demand is 2360 A/phase.

3.2.2 SUBSTATIONS

The proposed Minarah College Campus falls within the Endeavour Energy operational area for power. In consideration of the development's expected power requirements as indicated above in the calculated maximum demand loadings, JHA expect the development site to require the installation of two (2) new padmount substations; each being a rating of 1000kVA.

To facility the proposed staging of the College, the substations are proposed to be installed at separate times:

- Stage 1 early works to the south (Proposed to be commissioned in 2025)
- Future (Stage 4) works to the north (Proposed to be commissioned in 2038)

Both substations are proposed to be located within the development site abutting the lot boundary facing Catherine Fields Road.

JHA has already submitted an application to Endeavour Energy for the Stage 1 early works substation and have attached the received Endeavour Energy Supply Offer for reference.

JHA has Accredited Level 3 ASP designers that will be carrying out the design works in co-ordination with Endeavour Energy for this project.

3.2.3 HV FEEDER CONNECTIONS & RETICULATION

To provide suitable electrical supply connections to the new development, it is proposed the existing Endeavour Energy high voltage overhead network located along the western side of Catherine Fields Road will be utilised to connect the new Endeavour Energy padmount substations proposed along the Catherine Fields Road frontage. This arrangement is subject to suitable spare capacity in the existing HV feeders and Endeavour Energy design acceptance.

The High Voltage connection arrangements to each substation will include the following:

- High voltage Underground-to-Overhead connections on two (2) existing poles across Catherine Field Road
- New HV cables will be extended from these poles, underground and across Catherine Fields Road to the proposed development site and padmount substation

3.2.4 ENDEAVOUR ENERGY PADMOUNT SUBSTATION ARRANGEMENTS

The design team has considered a number of options for substation locations and have developed a suitable location for a new padmount substations along the Catherine Fields Road site frontage as below.

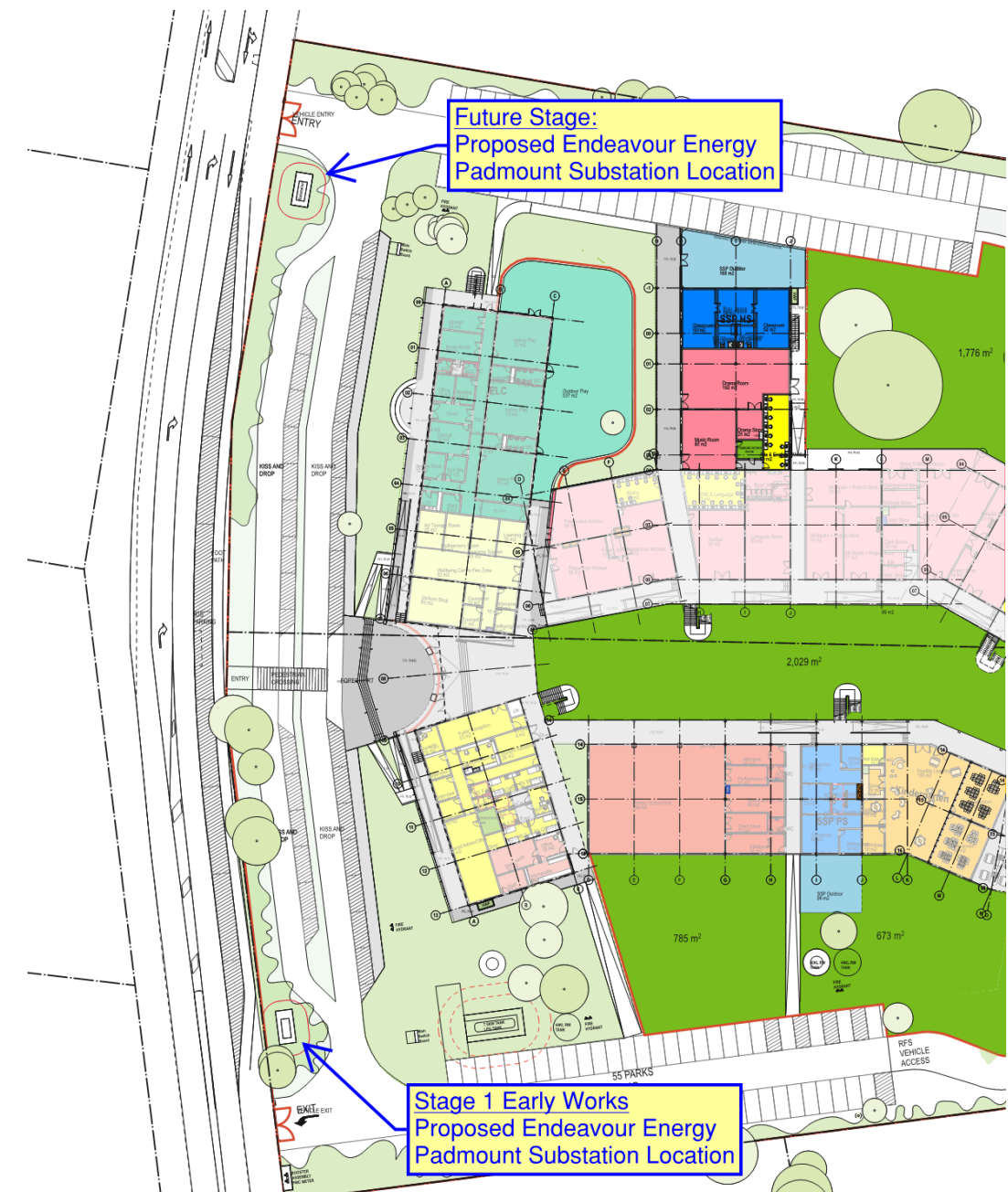


Figure 3.2 – Proposed Endeavour Energy Padmount Substation Location

The following are general spatial requirements/principles adopted for the proposed padmount substations:

- The padmount substations must have unimpeded access for Endeavour Energy personnel and vehicles, directly from a public street. Access from the public road to the substations must not be fenced or enclosed.
- The substation easement areas are to be made flat at a single RL
- 24hr/7day week access is to be provided from river road to the substations from the boundary for heavy vehicle movement and personnel access
- All works are to be in accordance with the site-specific Endeavour Energy Supply Offers and the still to be received Endeavour Energy Design Briefs, Endeavour Energy Network Standards, and certified Level 3 designs

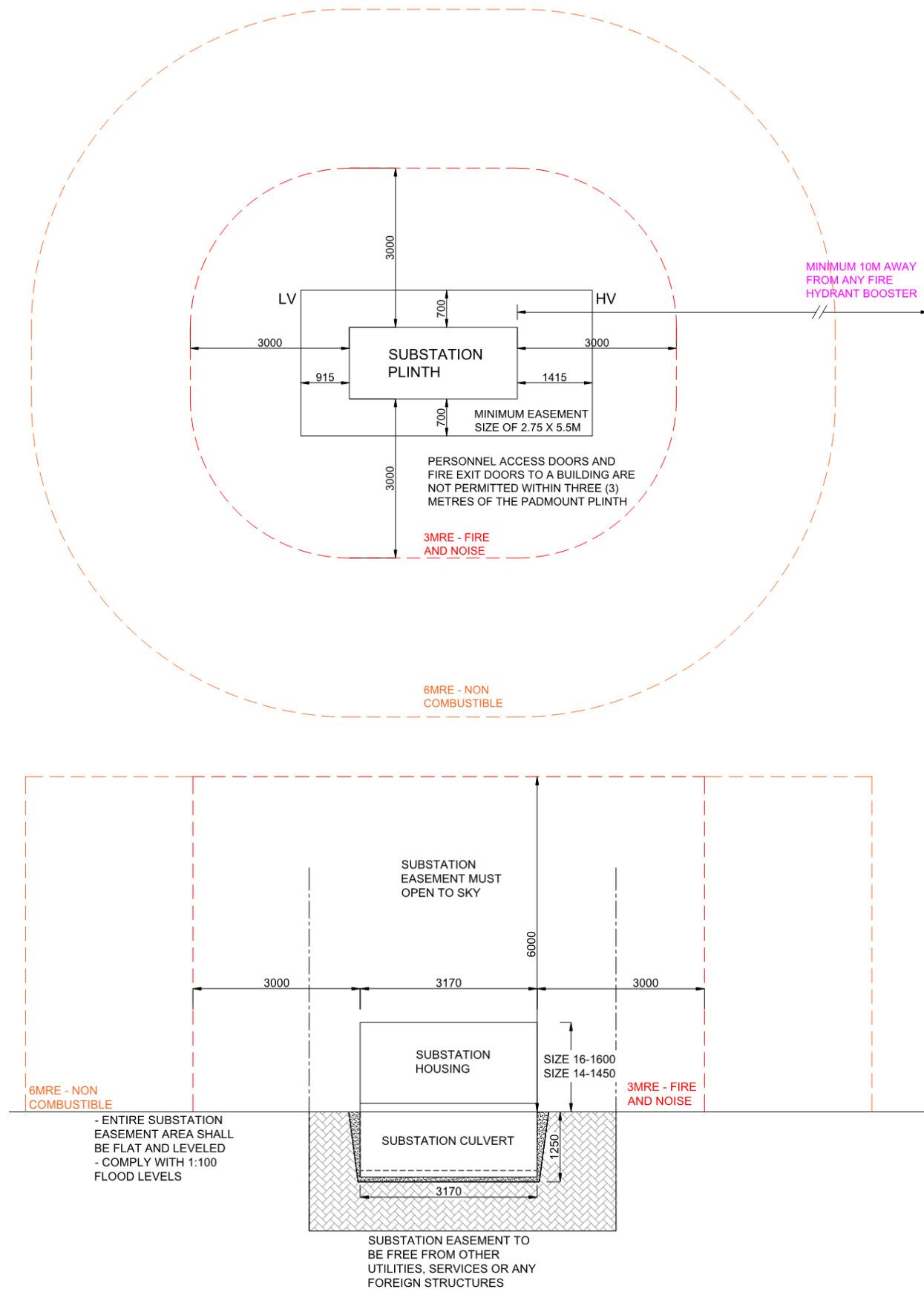


Figure 3.3 – Typical Endeavour Energy Padmount Substation Spatial Details

3.2.5 PROPOSED TELECOMMUNICATIONS INCOMING SERVICES

A DBYD (Dial Before You Dig) application shows existing NBN infrastructure along Catherine Fields Road. An application to NBN is being made to install a lead-in cable to provide telecommunications services to the campus. A separate application for a Telstra fibre connection to the site is being made to allow contingency with two carriers to reduce the chance both connections are lost at one given time.

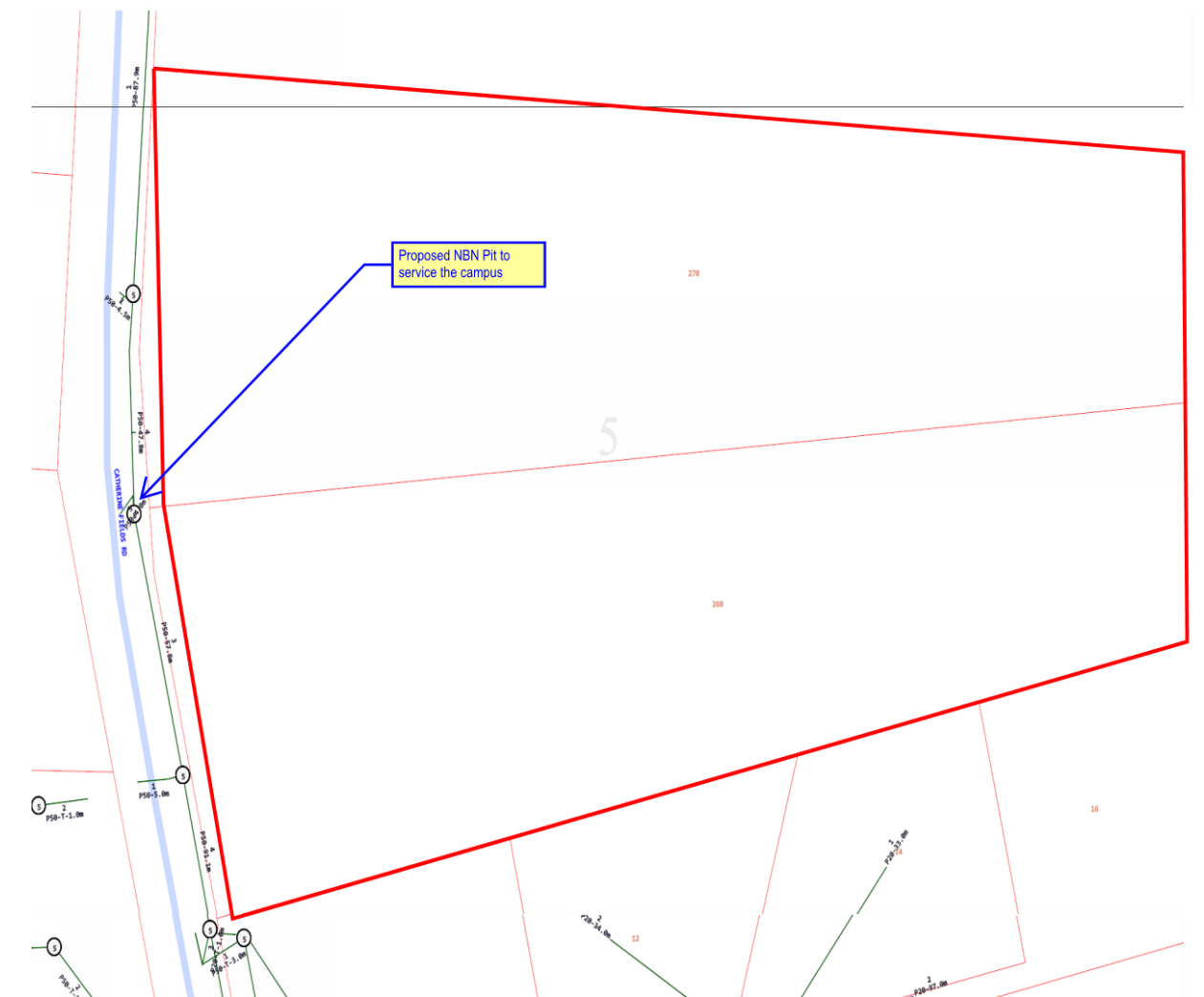


Figure 3.4 – DBYD NBN Existing Infrastructure

In addition to the propose site lead in communication arrangements, the existing overhead Telstra fibres reticulating along the Catherine Fields Road site frontage are proposed to be relocated underground to facilitate suitable access to the site and for aesthetic arrangements.

Below is an indicative sketch indicating the extent of existing Telstra to be undergrounded as part of this project. An application to Telstra has been undertaken and further coordination is currently underway to finalise the required scope.



Figure 3.5 – Proposed Extent to Underground Existing Overhead Telstra Assets

The school will consist of four communications rooms to support the site. Each room will house the communications racks, NBN and security. The location of the rooms have been coordinated with the architect and the school to ensure a maximum fibre cable run of 90m.

3.2.6 CONCLUSION

In association with the proposed development project, JHA will be undertaking Electrical and Telecommunication Authority infrastructure augmentation works. These processes and works are generally outside of the development site to facilitate:

- New permanent network electrical connections to two (2) new padmount substations installed on the site; to be staged as per the client's construction program as power requirements arise for the site:
 - South construction phase and buildings
 - North construction phase and buildings

Contact with Endeavour Energy has already been undertaken to progress the electrical authority works and ensure installations are coordinated to limit the impact to the surrounding community and site kerb appeal.

- Aesthetic and accessibility to the site by relocating the existing overhead Telecommunication assets on the site side of Catherine Fields Road underground along the proposed site frontage.

With the authority Telecommunication works wholly external to the site, these works can be undertaken at any stage during the new development construction.

4. APPENDIX A – ENDEAVOUR ENERGY SUPPLY OFFER

5 November 2021

Endeavour Energy Ref: UCL11170

JHA Consulting Engineers
PO Box 3
NORTH SYDNEY NSW 2059



Attention:

CONNECTION OFFER – STANDARD CONNECTION SERVICE

**UCL11170– LOT 12,11, DP 833784,833983, Connection of Load Application: 268-278
Catherine Fields Rd, CATHERINE FIELDS**

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

This connection offer is made in accordance with the Terms and Conditions of the Model Standing Offer for a Standard Connection Service available on our website. To accept this offer, please complete the enclosed Notice of Advice form and obtain your Level 3 Accredited Service Provider (ASP) signature on the form prior to returning it to Endeavour Energy.

Endeavour Energy has completed a preliminary desk top assessment of the information provided in your application and issued an enclosed Supply Offer. Your next step is to obtain the services of a Level 3 ASP to prepare and provide an electrical design to Endeavour Energy in the form of a Proposed Method of Supply. This activity is customer funded contestable work and you will need to pay for it. An estimate of fees related to review of your design is attached.

A list of the Accredited Service Providers is available at the NSW Trade and Investment website: <https://energysaver.nsw.gov.au/households/you-and-energy-providers/installing-or-altering-your-electricity-service> or can be obtained via phone 13 77 88.

Please note under the National Electricity Rules (NER) customer may choose to enter into a negotiated agreement. A negotiation framework describing this process is available on our website.

Should you have any enquiries regarding your application please contact the undersigned.

Yours faithfully,
Tri
Tri Minh Truong
Contestable Works Engineer
Ph: 02 9853 7922
Email: cwtech@endeavourenergy.com.au

51 Huntingwood Drive, Huntingwood, NSW 2148
PO Box 811, Seven Hills, NSW 1730
T: 133 718

endeavourenergy.com.au
ABN 11 247 365 823

5. APPENDIX B – PRESSURE AND FLOW INQUIRY RESULTS

Pressure & Flow Application Number: 1269068

Your Pressure Inquiry Dated: 2021-10-18

Property Address: 268 Catherine Fields Road, Catherine Field 2557

The expected maximum and minimum pressures available in the water main given below relate to modelled existing demand conditions, either with or without extra flows for emergency fire fighting, and are not to be construed as availability for normal domestic supply for any proposed development.

ASSUMED CONNECTION DETAILS

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EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

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Minimum Pressure	51 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	51
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5	53
	10	51
	15	49
	20	46
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	5	49
	10	46
	15	43
Maximum Permissible Flow	20	40