Epping Town Centre

Electrical & Hydraulic Services Infrastructure Report

30 April 2024

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Revision Schedule

Revision No.	Date	Description	Prepared by	Quality Reviewer	Independent Reviewer	Project Manager Final Approval
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1. Introduction

This Engineering Infrastructure Memorandum for the Electrical & Hydraulic Services has been prepared for CANJS Pty Ltd for the development of the Epping Town Centre project located on the corner of Rawson St & Carlingford, Road Epping NSW 2121. The development consists of three residential towers (413 apartments total), three levels of commercial a retail space and up to six carpark basement levels. The proposed site locality is as per Figure 1 below.

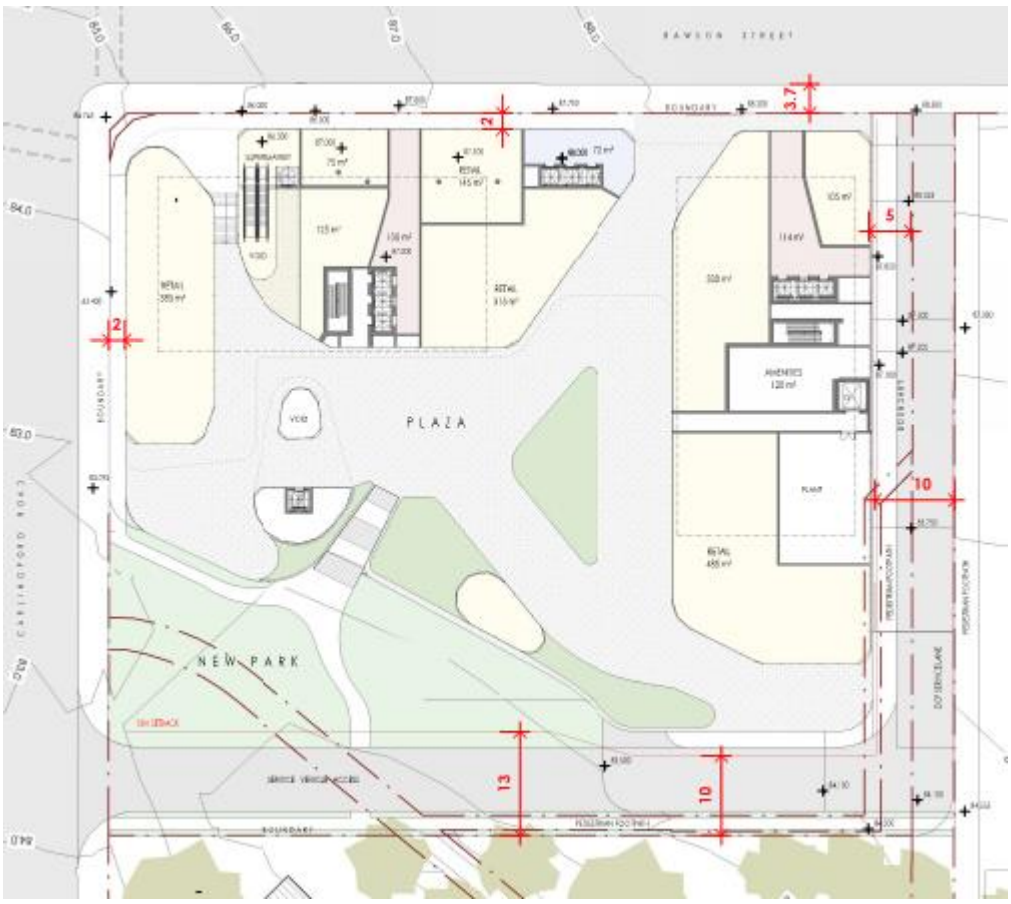


Figure 1 Site Locality Plan

Find our summary below of the electrical and hydraulic infrastructure requirements to service the above-mentioned project. The site yield matrix can be found below upon which this report has been based upon:

	PP Scheme Feb 24	Revised Scheme - 2 Tower Scheme
Land Area	9,089	9,089
Non-Residential Floor Space		
Supermarket	3,100	3,100
LG Specialty Retail	1,330	990
G Retail	2,243	2,157
Subtotal Specialty Retail		*3,147*
Commercial Office - Level 1	2,757	2,670
Commercial Office - Level 2	-	2,380
Commercial Office - Level 3	-	2,380
Subtotal Commercial Office		*7,430*
Non- Residential Floor Space		13,677
Non- Residential FSR	**1:1**	**1.5**
Residential FSR	**4.5:1**	**4.5:1**
No. apartments	420	up to 420
Total FSR	**5.5:1**	**6:1**

Figure 2 Site Yield Table

2. Executive Summary

We have summarized our findings below in regards to the adequacy of authority infrastructure that will be servicing the proposed development, overall there are no significant upgrades or changes to the authority infrastructure other than site connection adjustments to suit the final site detailing.

- Augmentation will be required to provide power to the site, It will be necessary to decommission and remove the 2 off existing substations and replace with new chamber substations (3 x 1500kVA transformers required to service the site.
- The proposed development is well serviced from existing Carrier infrastructure. No carrier diversions are required and it is not expected that there will be any carrier backhaul charges
- The authority sewer infrastructure surrounding the site is of sufficient capacity to service the proposed development. The sewer assets will be subject to alterations and deviations to allow for the construction of the development.
- The authority water infrastructure surrounding the site is of sufficient capacity to service the proposed development. Formal applications will need to be undertaken
- The authority gas infrastructure surrounding the site has sufficient capacity to service the needs of the proposed development. Formal applications will need to be undertaken

3. Electrical Services

3.1 Supply Authorities [Existing Infrastructure]

The existing site is supplied from both Ausgrid and Endeavour Energy.

Ausgrid

A kiosk type substation (S.6227) located on Carlingford Road frontage. Kiosk substation currently supplies the site (3-7 Carlingford) and also has a street feeder which also provides LV link to substation S.7061).

It is noted that if/when substation is demolished, the site would need to manage the existing street supply as part of the decommissioning works.

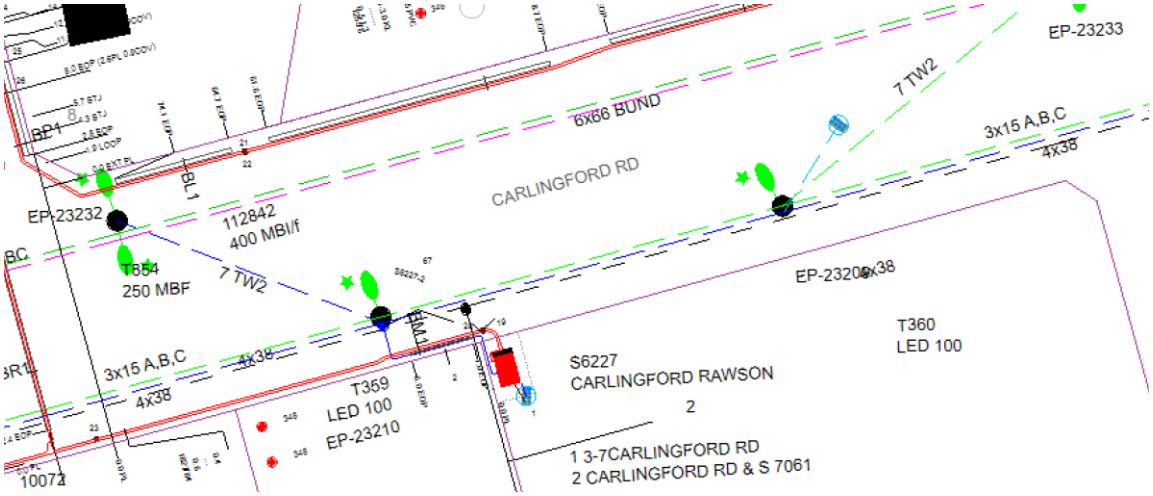


Figure 3 Ausgrid Network Asset

It is noted that there are overhead LV Ausgrid assets and overhead carrier assets (OPTUS) along the Carlingford Road street frontage. These may require undergrounding.

Figure 4 Low Voltage OH (Ausgrid)

Endeavour Energy

There is an Endeavour substation (# 6292) located on the southern portion of the site. It will be necessary to decommission and remove the existing Endeavour Energy substation.

Figure 5 Endeavour Energy Network Assets

Consideration for Temporary Builders Supply prior to decommissioning of assets. May be an opportunity to relocate or work around the kiosk sub. Alternately examine nearby substations and look for possible direct distributor.

3.2 Network Augmentation [Development]

As the proposed development is currently serviced by Ausgrid and Endeavour Energy, agreement with the authorities will be required to determine which supply authority will supply the site.

It is not known whether any Supply Authority network augmentation is required for external to the site to support the proposed development. This would only be determined once an application for connection is lodged with the Supply Authority.

3.3 Calculated Maximum Demand

The calculated maximum demand for the development is 6,472Amps [4.484MVA]. Breakdown is as depicted below.

MAXIMUM DEMAND CALCULATION **DATE** 30.04.2024
PROJECT NO EPPING TOWN CENTRE

AS/NZS 3000:2018 Wiring Rules Appendix C1

TABLE C1

Number of Apartments	420
Number of Units per Phase	140

	1	2	3	4	5	
LOAD GROUP	**DESCRIPTION**	**Single Domestic electrical installation**	**2 to 5 Units per Phase**	**6 to 20 Units per Phase**	**21 or more Units per Phase**	**LOAD (Amps)**
Ai	Lighting	3A for 1 to 20 points + 2A for each additional 20 points or part thereof	6A	5A + 0.25 per unit	0.5 per unit	70
Aii	Outdoor lighting	75% of connected Load	No assessment for purpose			0
Bi	Socket Outlets not exceeding 10A	10A for 1 to 20 points + 5A for each additional 20 points or part thereof	10A + 5A per living unit	15A +3.75A per living unit	50A + 1.9A per living unit	316
Bii	Where the electrical installation includes one or more 15A socket outlets, other than socket outlets provided in C, d, e, f, g and I	10A				10
Biii	Where the electrical installation includes one or more 20A socket outlets, other than socket outlets provided in C, d, e, f, g and I	15A				15
C	Ranges, cooking appliances, Laundry equipment or socket outlet rated more than 10A for the connection thereof	50% of connected load	15A	2.8A per living Unit		392
D	Fixed space heating or air conditioning equipment, saunas or socket outlets rated at more than 10%	75% of connected load				1050
E	Instantaneous water heaters	33.3% of connected load	6A per living Unit		100A + 0.8A per unit	212
F	Storage water heaters	33.3% of connected load	6A per living Unit		100A + 0.8A per unit	
G	Swimming Pools. Spas	75% of largest spa, plus 75% of largest swimming pool, plus 25% of remainder				40
Loading not associated with individual units - connected to each phase (communal lighting, laundry, lifts, motors etc)						
H	Communal Lighting	N/A	Full connected load			60
I	Socket outlets not included in groups J and M below. Permanently connected electrical equipment not exceeding 10A	N/A	2A per point, up to maximum of 15A			0
Ji	Appliances rated at more than 10A : Clothes dryers, water heaters, self heating washing machines	N/A	50% of connected load			0
Jii	Appliances rated at more than 10A : Fixed space heating, air conditioners	N/A	50% of connected load			0
Jiii	Appliances rated at more than 10A : Spa and swimming pool heaters	N/A	75% of largest spa plus 75% of largest swimming pool, plus 25% of remainder			0
Jiv	Electrical Vehicles Charging Equipment	Full Connected Load	100% Connected Load	90% Connected Load	75% Connected Load	1000
K	Lifts	Largest lift motor : 125%, nest largest lift : 75%, Remaining lift motors : 50%				400
L	Motors	Largest motor : 125%, next motor : 75%, Remaining motors : 50%				0
M	Appliances, including socket outlets other than those set out in groups A to L above	Connected load 10A or less : no assessment ; Connected load over 10A : By assessment	Connected load 10A or less : no assessment ; Connected load over 10A : By assessment			0
OTHER						
Supermarket		3,265m2 Supermarket				800
Commercial		7430m2 @90VA/m2				964
Retail		2,578m2 @ 250VA/m2				931
Mall		522m2 @ 60VA/m2				45
Basement		23,224m2 @ 5VA/m2				167
TOTAL						
					TOTAL LOAD IN AMPS	**6472**

	kW	4484
assume PF = 0.9	KVA	4982
site diversity 85%	KVA	**4235**

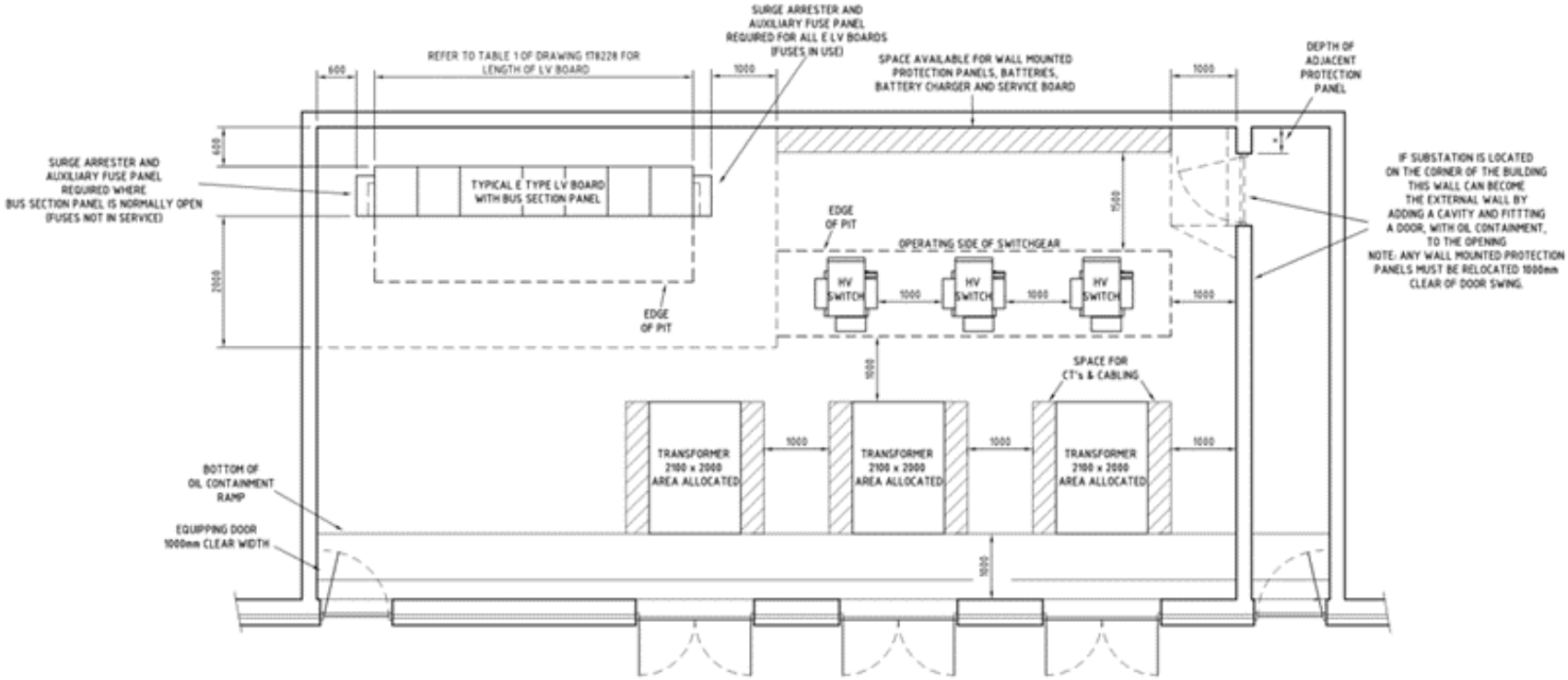
3.4 New Site Substation Requirements

The existing site substations [Ausgrid : S.6227 and Endeavour Energy : 6292] will be decommissioned and removed.

Required Substation options [per Supply Authority] are provided below.

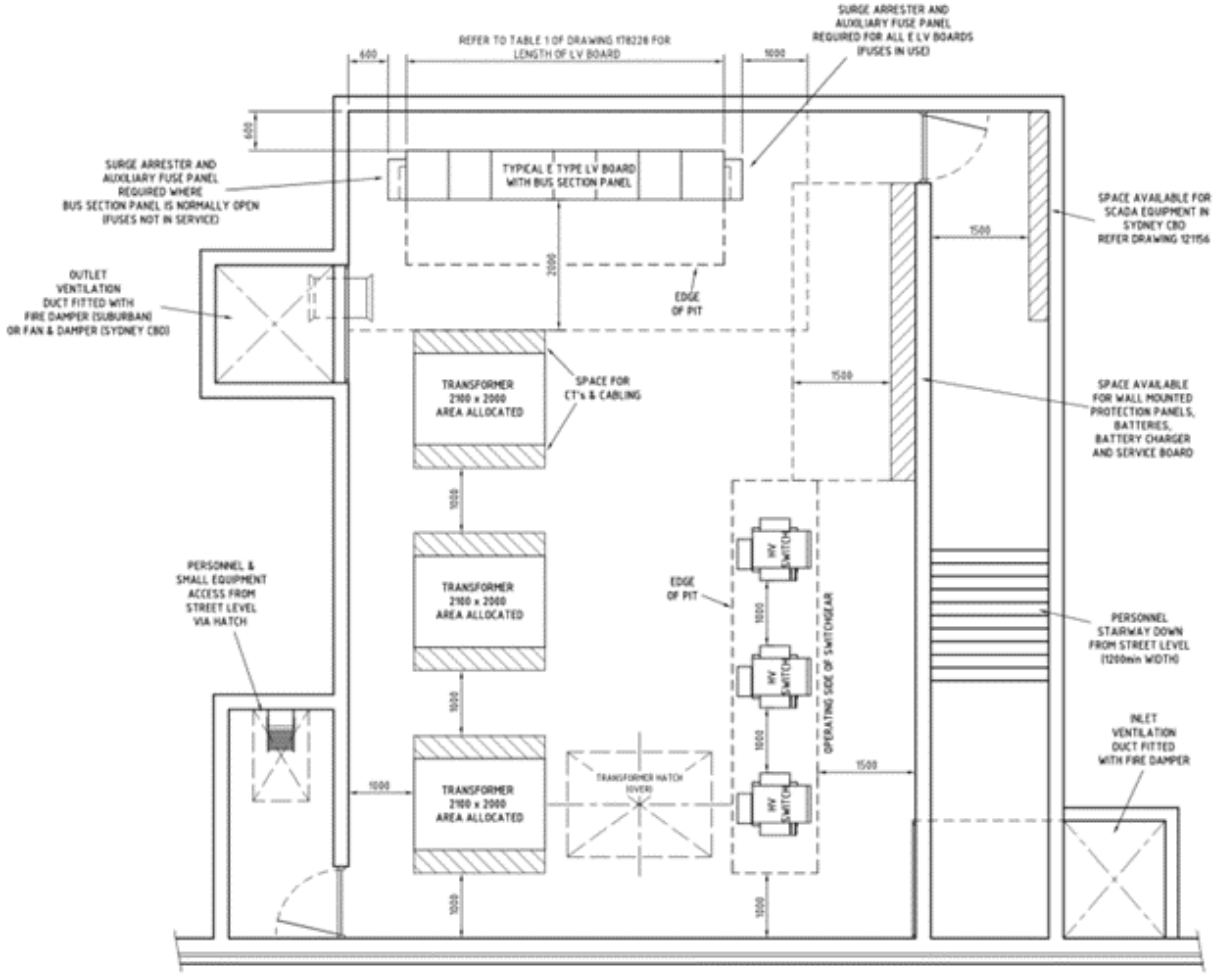
3.4.1 Ausgrid

Option 1: 3 x 1500kVA Surface Chamber



SURFACE CHAMBER SUBSTATIONS
REFER NOTE 4

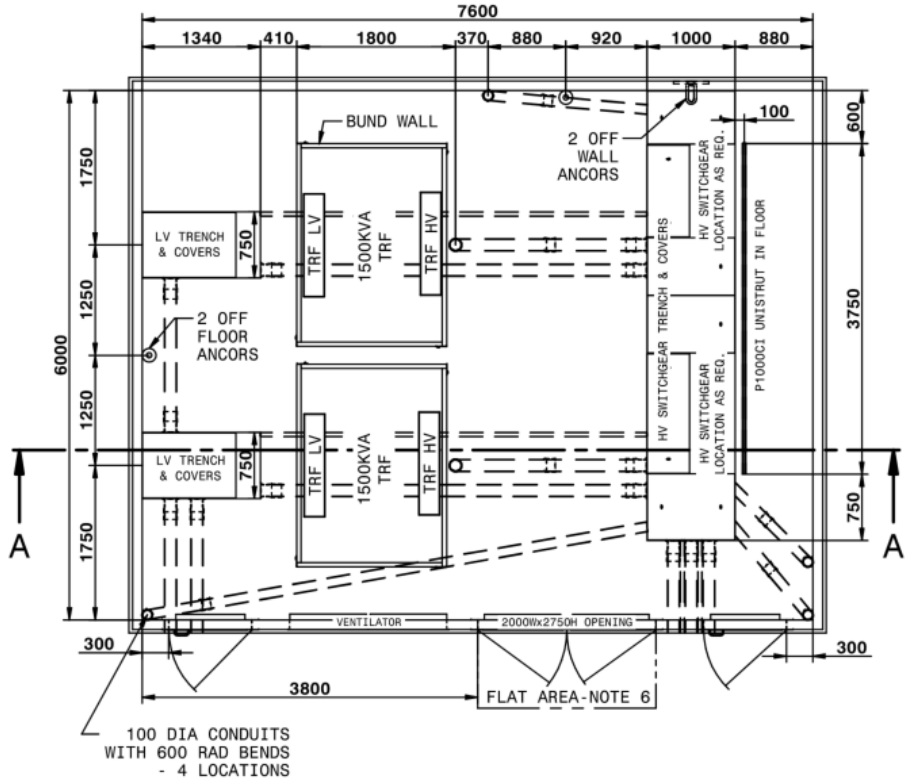
Option 2: 3 x 1,500kVA Basement Chamber

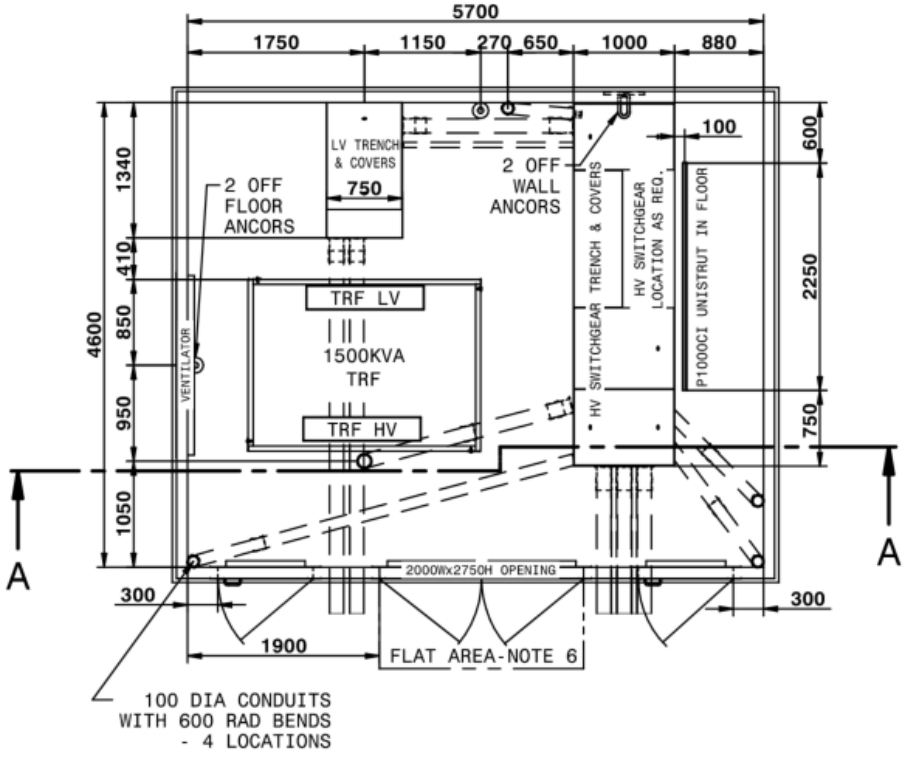


BASEMENT CHAMBER SUBSTATIONS
REFER NOTE 4

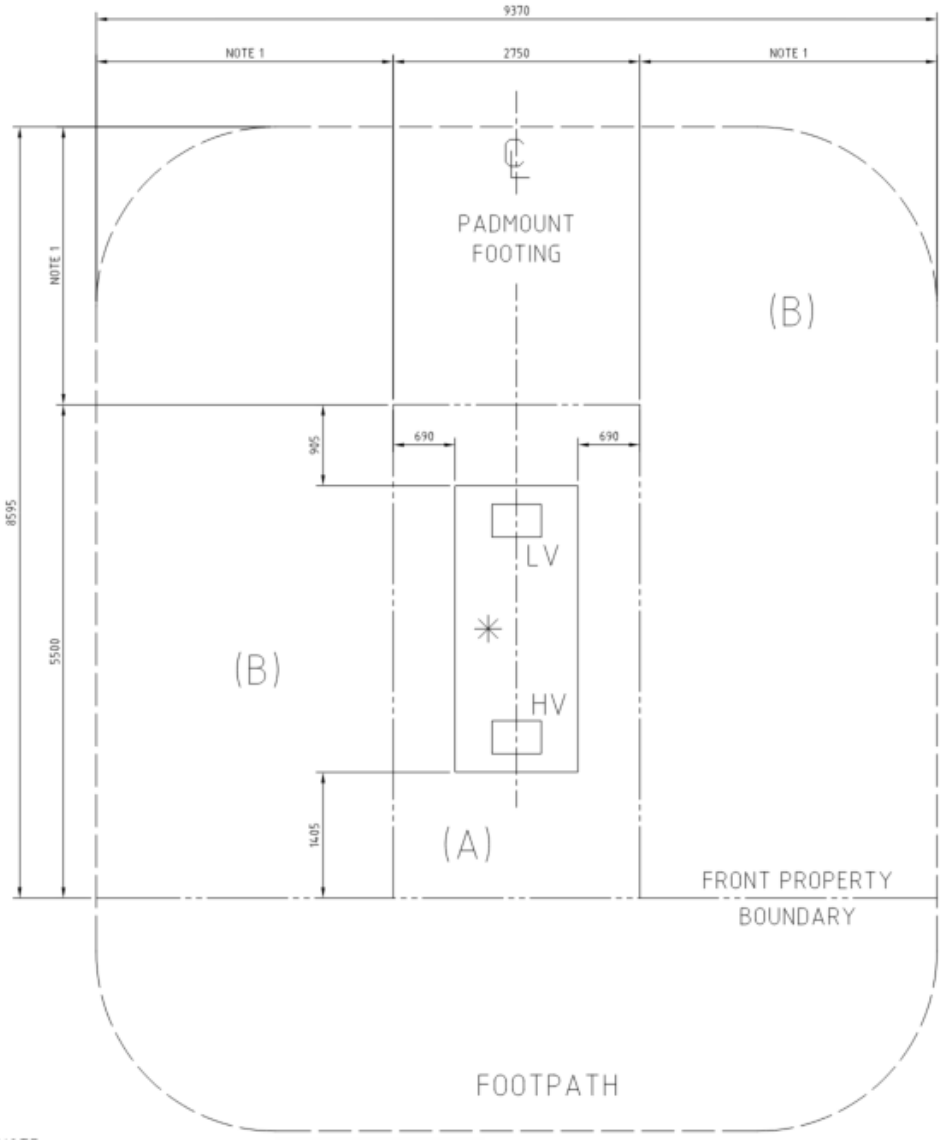
3.4.2 Endeavour Energy

Option 1: 1 off 2 x 1,500kVA Chamber Substation and 1 off 1 x 1500kVA Chamber Substation [total of 3 x 1500kVA Transformers]





Option 2: 3 x 1,500kVA Kiosk Type Substations [Easement of 5,500mm x 2750mm per each]



3.5 Communication Lead-in

3.5.1 GENERAL

Existing Carrier infrastructure is depicted below. The site is well serviced by existing Carrier networks, including NBN. No Carrier relocations are required.

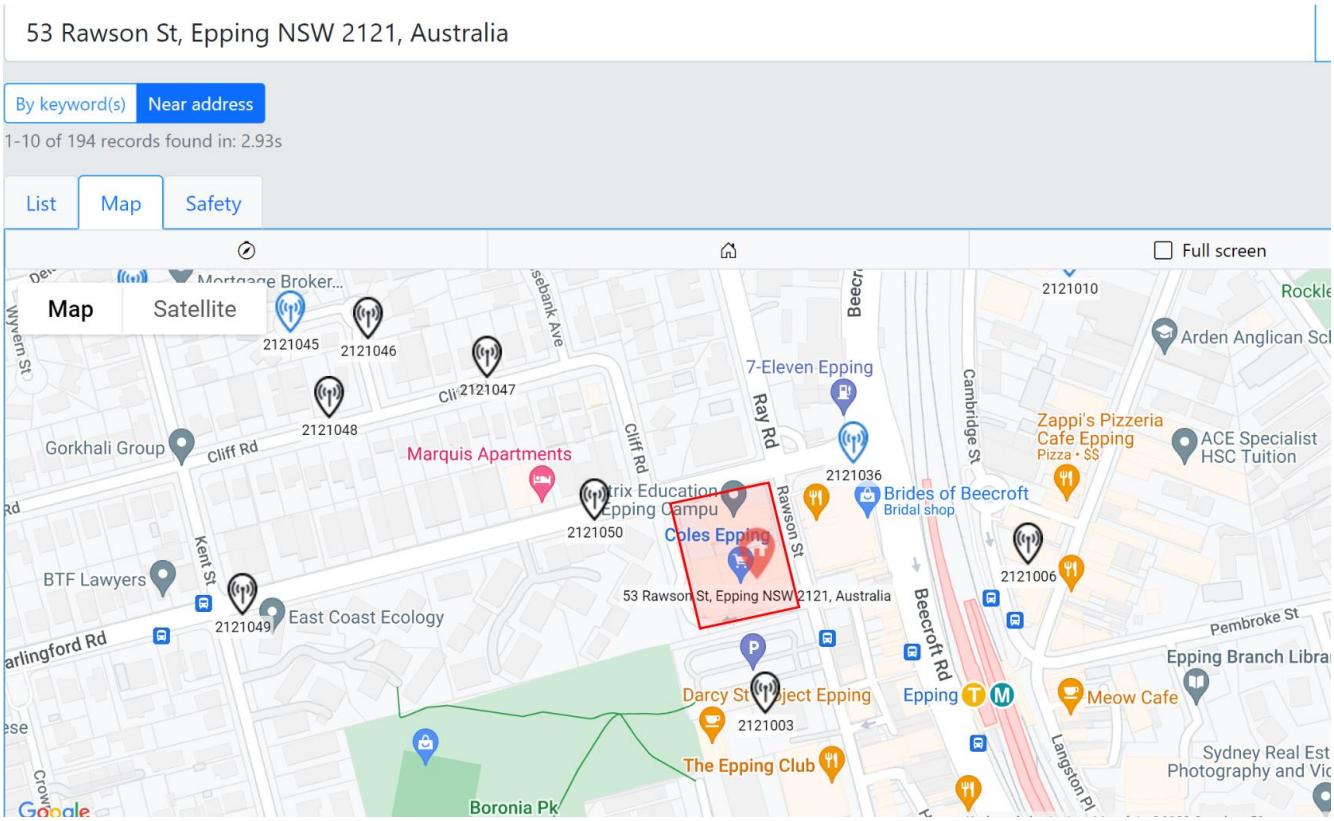
New Carrier lead-ins would be required for the site. It is proposed to allow sufficient lead-in conduit to service at least 2 carriers.

The area is NBN ready. An application for carrier services would need to be made with the NBN Co.

Owing to the existing carrier network infrastructure available, it is not expected that any backhaul charges will be charged.

3.5.2 Carrier Mobile Base Stations

It is noted that there are no carrier mobile base stations located on the site that will require relocation as per information available from Radio Frequency National Site Archive website search.



3.5.3 NBN

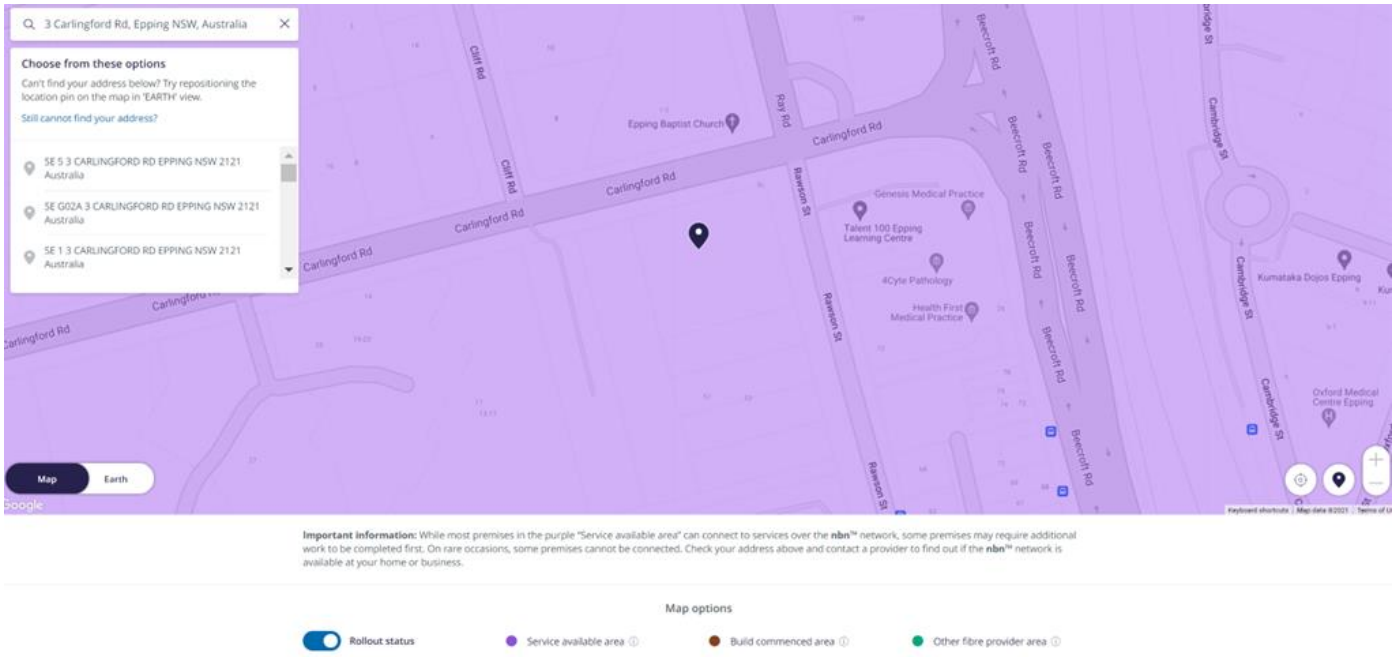
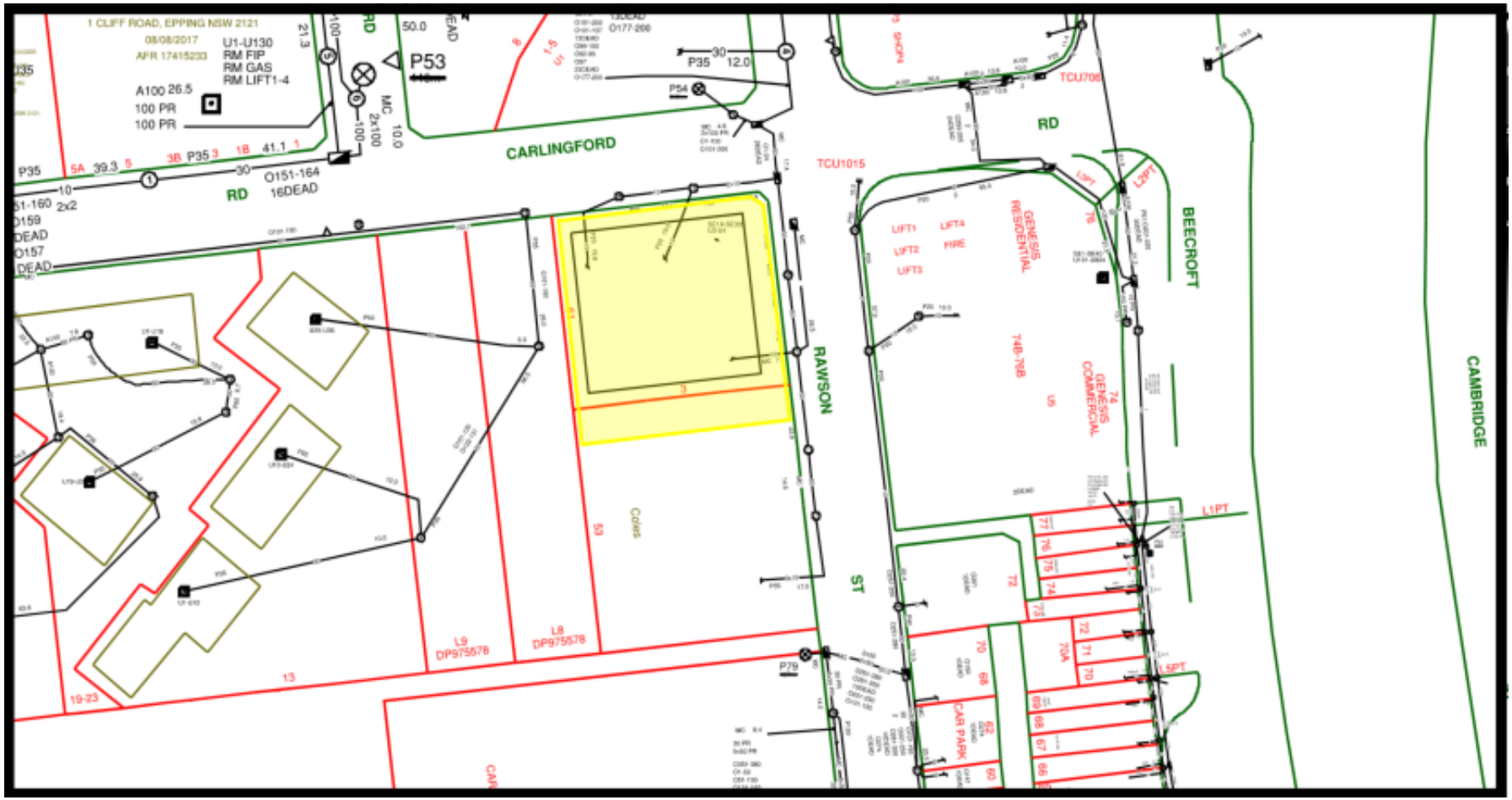


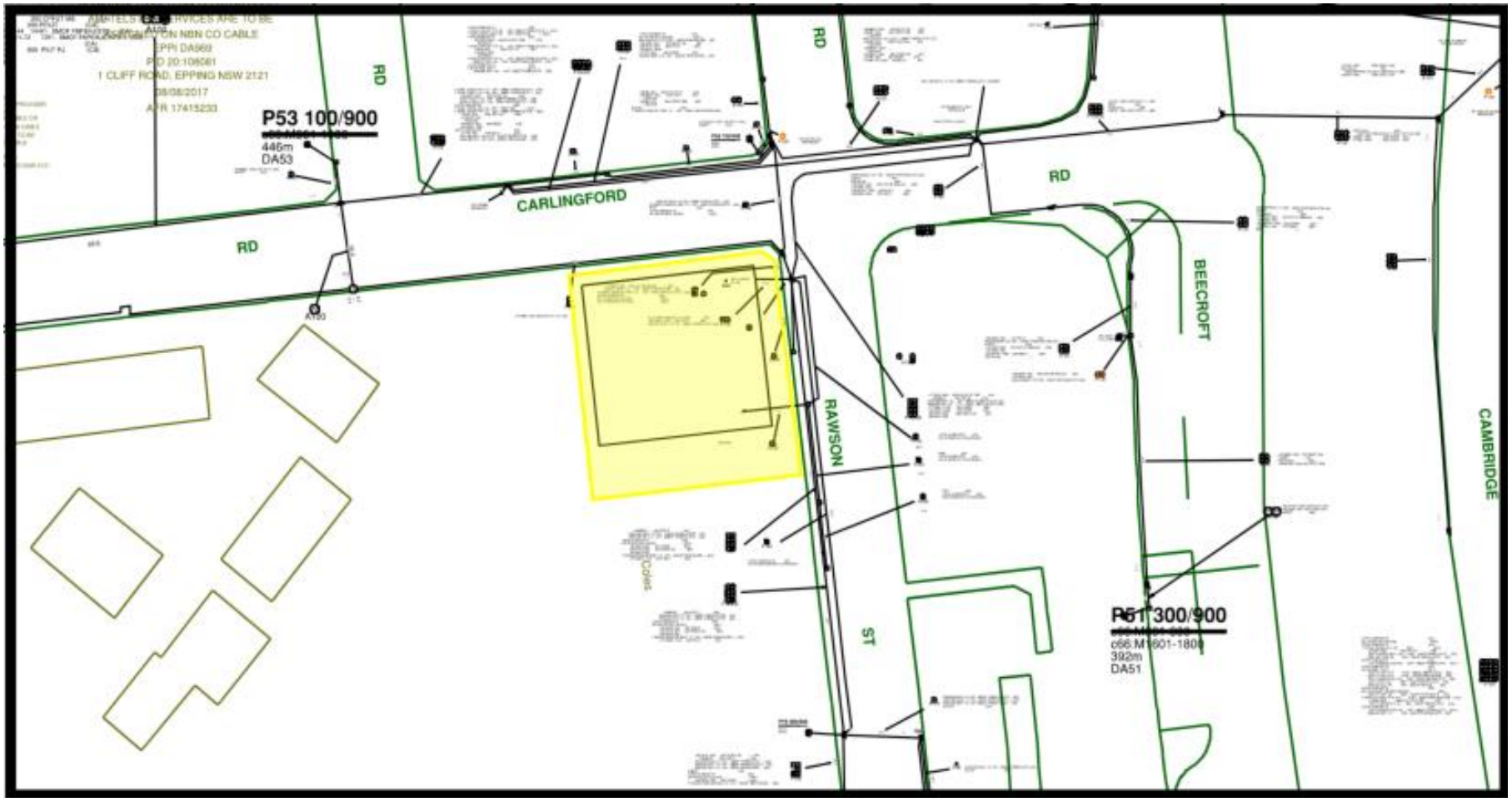
Figure 6 NBN Rollout Map

3.5.4 Telstra

Cable Plan



Mains Cable Plan



3.5.5 Optus


CLIFF RD
CARLINGFORD RD
CARLINGFORD RD
FORD RD
VICTORIA ST
RAWSON ST
RAWSON ST
BEECROFT RD
CAMBRIDGE ST
LANGSTON PL
PEMBROKE ST
PEMBROKE ST
PEMBROKE ST
1
2

4. Hydraulic Services

4.1 Sanitary Drainage (Sewer)

4.1.1 Sewer Investigations

- Based on our initial investigations, connection to the 225mm diameter sanitary sewer main infrastructure surrounding our site are deemed to have sufficient capacity to service the demands of the project as noted below. Engagement of a Water Servicing Co-ordinator (WSC) will be required during the detailed design phase of the project to design the required alterations & deviations to the affected assets traversing through our site to allow for construction works. Refer to Sydney Water hydra map below for affected assets:

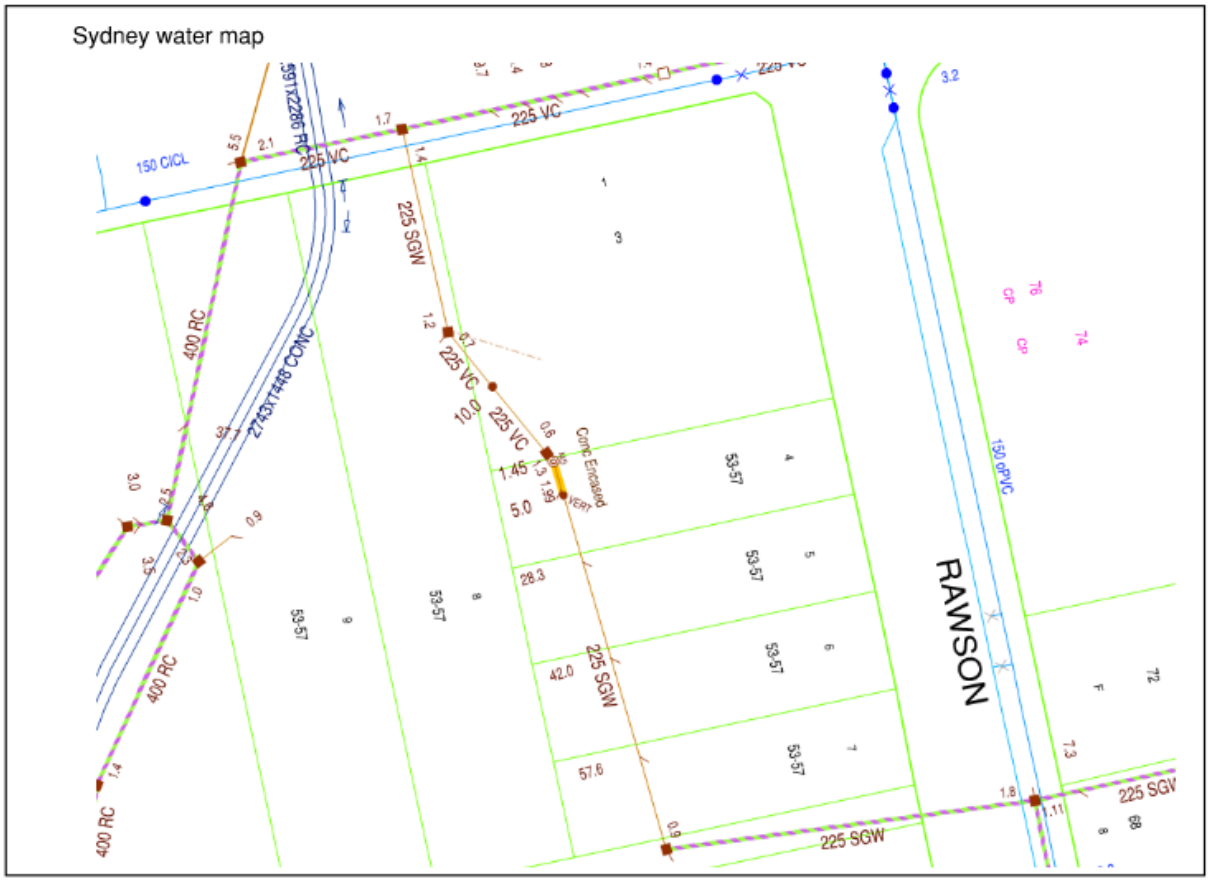


Figure 7 Sydney Water DBYD

4.1.2 Existing Sewer Assets

- As illustrated, the DBYD Information indicated that there is an existing sewer main running through the site.
- This sewer will likely need to be modified to enable the excavation of the basement car park levels. The proposed modifications are indicated on the following spatial layouts and we strongly recommend that a Sydney Water Coordinator is engaged and a section 73 preliminary investigation is conducted.

4.1.3 Proposed development load

- There is a 225mm VC & 400mm RC Sydney Water sewer mains traversing through the proposed property. These services will need to be re-routed to allow for building excavation and service the property with a connection.
- The sanitary sewer demand for the site is approximately 14,200 sanitary fixture units. 3 x 225mm gravity connections on the north and southern portions of the site to the Authorities main sewer infrastructure running through the site depending on final invert levels after the sewer deviation works.

TABLE 3.3.1

MAXIMUM FIXTURE UNIT LOADING FOR VENTED DRAINS

Grade %	Nominal size of drain DN						
	65 (see Note 1)	80	100	125	150	225	300
5.00	60	215	515	1450	2920	11 900	26 900
3.35	36	140	345	1040	2200	9490	21 800
2.50	25	100	255	815	1790	8060	18 700
2.00	×	76	205	665	1510	7090	16 600
1.65	×	61	165	560	1310	6370	15 000
1.45	×	(50)	(140)	485	1160	5810	13 900
1.25	×	(42)	(120)	425	1040	5360	12 900
1.10	×	×	×	(380)	935	4970	12 100
1.00	×	×	×	(340)	855	4500	11 400
0.85	×	×	×	×	(725)	3850	10 300
0.65	×	×	×	×	(595)	3250	9090
0.50	×	×	×	×	×	×	7720
0.40	×	×	×	×	×	×	6780

Figure 8 Fixture Unit Loading Table

4.1.4 Sewer Servicing recommendation/ Conclusion

- The authority sewer main infrastructure surrounding the site has sufficient capacity to service the needs of the proposed development.

4.2 Potable Water & Fire Fighting

4.2.1 Potable Water & Fire Fighting Investigation

- Based on our initial investigations, connection to the 150mm diameter water main infrastructure in Carlingford Road or Rawson Street are deemed to have sufficient capacity to service the demands of the project as noted below. Sydney Water pressure and flow readings information will be required during the detailed design phase of the project to determine water storage requirements for the project. We confirm the potable water simultaneous demand to be in the range of 20-22 L/s. The fire water load is to be approximately 55 L/s (3 hydrants flowing in carpark and ordinary hazard group 3 (OH3) sprinklers to retail areas) allowing for simultaneous hydrant and sprinkler operation.

4.2.2 Domestic Cold-Water load

- A 150mm connection to the Authorities water main infrastructure running along Rawson St and Carlingford Rd complete with main isolation valve and water master meter
- On-site tank storage complete with filtration and pumping equipment

4.2.3 Fire Services load

- A 150mm connection to the Authorities water main along Rawson St and Carlingford Rd complete with main isolation valve and water master meter

- Provision for a 150mm brigade booster set in cabinet 3600L x 1800H x 800D (clear internal dimensions)
- Conduct testing of the Authorities water main infrastructure to determine flow and pressure characteristics for fire fighting purposes
- Provision for on-site pumps and tanks (subject to receipt of the pressure and flow enquiry)

4.2.4 Potable Water & Fire Fighting water recommendation/ Conclusion

- The authority water infrastructure surrounding the site has sufficient capacity to service the needs of the proposed development. The on-site water storage infrastructure requirement will be further determined in the detailed design phase of the project.

4.3 Gas

Based on our initial investigations, connection to the 32mm @ 210kPa gas main infrastructure in Carlingford Road or Rawson Street are deemed to have sufficient capacity to service the demands of the project as noted below. A Jemena gas network tap-in application will be required during the detailed design phase of the project to determine the final adequacy for the project. There is an existing gas main sideline traversing the site that will need to be demolished and capped off to facilitate the building footprint and excavation process. Refer to Jemena gas network map below for affected asset.

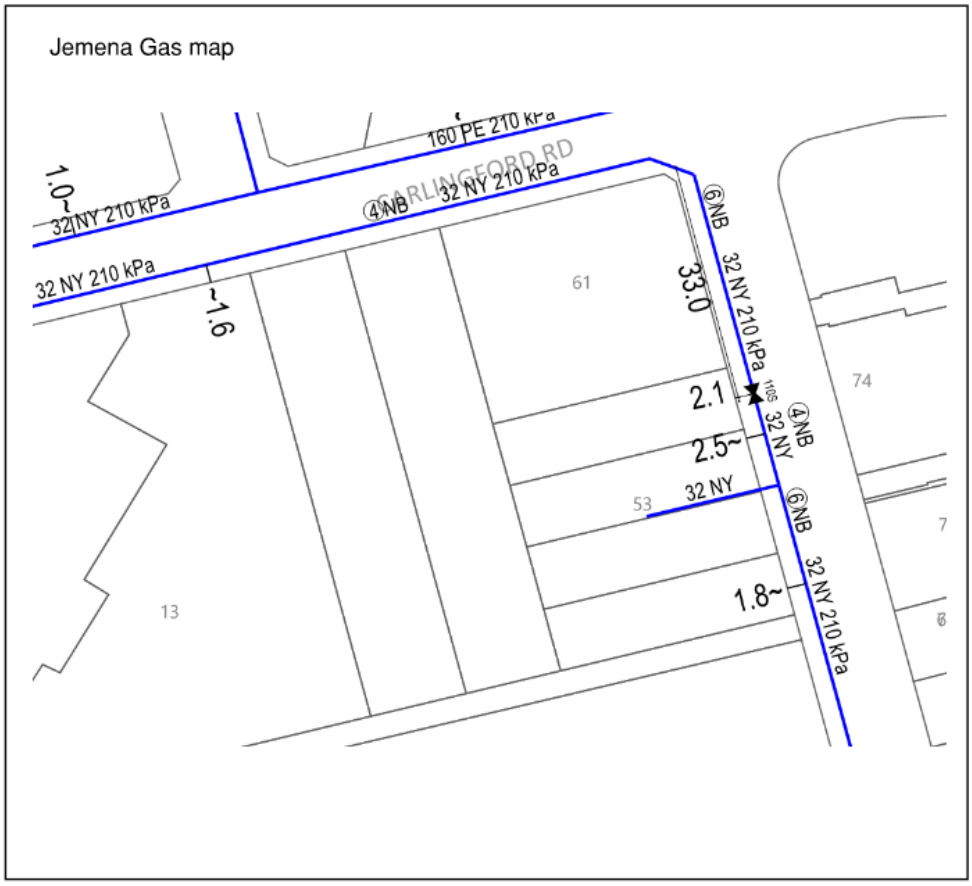


Figure 9 Jemena Gas Network Map

4.3.1 Existing Gas Infrastructure

- As illustrated in Figure 9 the DBYD information indicates that there is an existing medium pressure main extending along Carlingford Road and Rawson Street.
- The proposed connection point is to be connected to the Carlingford Road frontage, a connection application will need to be sought to confirm final connection location and details.

4.3.2 Gas Load

- Gas Services incorporating:
  - The gas demand for the site comprises of the following items:

    Residential Cooktops (Diversified) – 4,000 MJ/Hour

    Hot Water Plant (Full Load) – 3,500 MJ/Hour

Retail (Full Load) – 3,500 MJ/Hour

Total Gas Demand = <u>11,000 MJ/Hour</u>

- A **32mm** connection at 210 kPa available to the Authorities gas main infrastructure located **along Rawson Street** complete with main isolation valve and 1# gas master meters each for Commercial and Residential.
- Retail boundary regulator for retail stratum and each retail tenancy to apply for own sub-meters.

4.3.3 Gas recommendation/ Conclusion

- The authority gas infrastructure surrounding the site has sufficient capacity to service the needs of the proposed development. A Jemena gas connection tap-in application will be required during the design development phase of the project to determine final adequacy. The gas assets will be subject to alterations to allow for the construction of the development, this will be a part of the Jemena application noted above.

5. Conclusion

- In conclusion, based on our investigations and findings we can confirm that the surrounding authority infrastructure will be of adequate capacity to service this development.

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