



IGS INTEGRATED
GROUP
SERVICES



LONGHURST EDGECLIFF CENTRE

Engineering Services Desktop Due Diligence Report

Job Number: EN – N20_018
March 2020
Rev 3.0

Suite 1.11 – 75 Mary Street
St Peters, NSW 2044
Phone: +61 2 8488 4600
Fax: +61 2 9475 4588
Email: admin@igs.com.au
Web: www.igs.com.au
 [linkedin.com/company/3213174](https://www.linkedin.com/company/3213174)
ABN: 68 163 019 029

Document Control

Version	Date	Author		Reviewer	
1.0	23 March 2020	Goran Muratbegovic	GM	Mays Chalak	MC
2.0	15 May 2020	Goran Muratbegovic	GM	Mays Chalak	MC
3.0	16 June 2020	Goran Muratbegovic	GM	Mays Chalak	MC

"© 2020 IGS Pty Ltd All Rights Reserved. Copyright in the whole and every part of this document belongs to IGS Pty Ltd and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or in or on any media to any person without the prior written consent of IGS Pty Ltd."

CONTENTS

1. INTRODUCTION	1
1.1 GENERAL	1
1.2 THE SITE	2
1.3 BCA CLASSIFICATION	3
1.4 MANDATORY BCA ENERGY EFFICIENCY REQUIREMENTS	3
2. UTILITY ENGINEERING SERVICES	4
2.1 UTILITIES SERVICES REVIEW / ANALYSIS	4
2.2 CAPACITY CALCULATION ASSUMPTIONS	4
3. ELECTRICIAL.....	5
3.1 ELECTRICAL MAXIMUM DEMAND	5
3.2 EXISTING SERVICES	6
3.3 NEW SUBSTATION OPTIONS FOR THE DEVELOPMENT	7
3.4 SUMMARY & CONCLUSIONS	12
4. NATURAL GAS	13
4.1 GAS MAXIMUM DEMAND	13
4.2 EXISTING SERVICES	13
4.3 JEMENA INFRASTRUCTURE IN THE VICINITY OF THE SITE.....	13
4.4 SUMMARY AND CONCLUSIONS.....	14
5. TELECOMMUNICATIONS.....	15
5.1 TELECOMMUNICATIONS INFRASTRUCTURE IN THE VICINITY OF THE SITE.....	15
5.2 SUMMARY AND CONCLUSIONS.....	15
6. MAINS WATER.....	16
6.1 WATER MAXIMUM DEMAND	16
6.2 EXISTING SERVICES	16
6.3 MAINS WATER INFRASTRUCTURE IN THE VICINITY OF THE SITE	16
6.4 SUMMARY AND CONCLUSIONS.....	17
7. SEWER	18
7.1 SEWER MAXIMUM DEMAND	18
7.2 EXISTING SERVICES	18
7.3 SEWER INFRASTRUCTURE IN THE VICINITY OF THE SITE	18
7.4 SUMMARY & CONCLUSIONS	18
8. HEADWORKS COST ESTIMATES.....	19

1. INTRODUCTION

1.1 General

This Engineering Services Report has been prepared on behalf of Longhurst Investments No. 1 Pty Ltd in support of a planning proposal for the Edgecliff Centre (the site). The planning proposal will support amendments to the Woollahra Local Environmental Plan 2014 in order to facilitate the future redevelopment of the site for a mixed-use development comprising retail/commercial/medical-wellbeing uses podium and residential tower.

Specifically, in order to facilitate the future redevelopment of the site for the intended purpose, the planning proposal seeks to:

- Increase the maximum Height of Buildings development standard and
- Increase the maximum Floor Space Ratio development standard.

The planning proposal is supported by an indicative development concept. The concept is indicative only and has been prepared for the sole purpose of demonstrating that the planning proposal can deliver a viable scheme within the amended controls being proposed.

The indicative development scheme includes:

- Commercial, retail, medical/wellness facilities and residential.
- Provision for a publicly accessible open space sky-park at podium level.
- Introduction of public community space.
- Revitalisation and enhancement of the existing intermodal and transport interchange within the site.
- Public domain improvements at ground level including a new plaza and permeable transit interchange entry way; and
- Improvements to existing vehicular access and loading dock arrangement.

This report has been prepared solely for Longhurst Group. No warranty is provided to third parties who rely on this report for any other purpose.

The Edgecliff Centre site is a total of 4,910 m². It is understood that the carpark will be underground and will require carpark ventilation.

The effective building height will be in excess of 25m in height, therefore **it will** require stair pressurisation, smoke management systems, EWIS, sprinkler protection, sprinkler/hydrant tanks and emergency lifts to comply with the BCA.

This report presents the findings of a desk study review with respect to:

- Utility infrastructure (electrical, mains water, natural gas, sewer, telecommunications) assessment.

The findings of the assessment indicate that the site is well serviced and capable of supporting the proposed development.

1.2 The Site

The Edgecliff Centre site is irregular in shape with frontage to New South Head Road on the northern boundary and New McLean Street on western and southern boundary. Edgecliff train station entry and bus terminal is located adjacent to the site on the eastern boundary. The site's topography features considerable fall toward South.

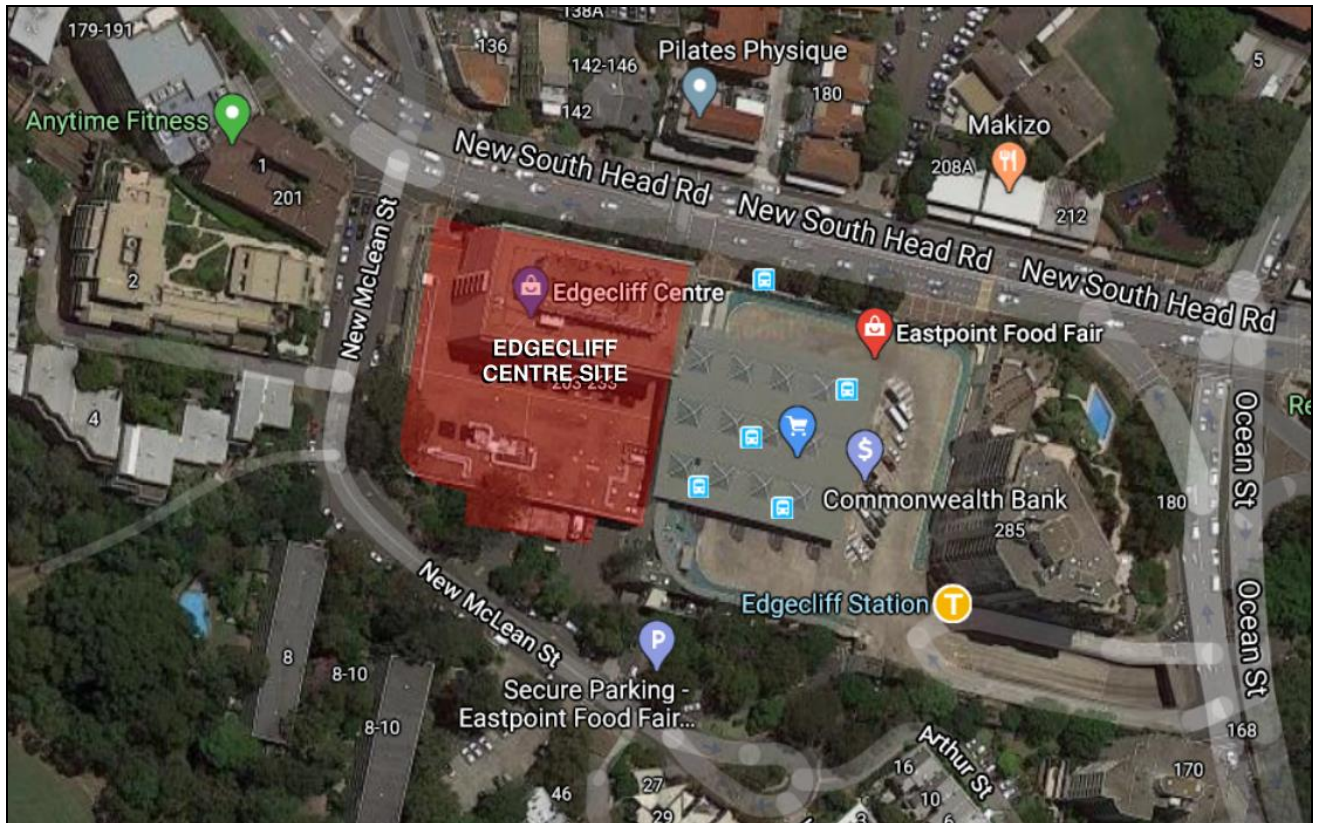


Figure 1 – Site location and vehicular access (Source: Google Maps)

The Edgecliff Centre is a rare opportunity to develop a high density mixed-use precinct with a variety of commercial and retail spaces.

1.3 BCA Classification

BCA classification(s) of the development are as follows:

BCA Classification	Class 2 Residential/Apartments Class 5 Commercial Class 6 Retail Class 7a Carpark
Type of Construction	Type A Construction
Effective Height	More than 25m

1.4 Mandatory BCA Energy Efficiency Requirements

Mandatory BCA Energy Efficiency requirements are as follows:

- Part J1 – Building Fabric;
- Part J2 – External Glazing;
- Part J3 – Building Sealing;
- Part J5 – Air Conditioning and Ventilation;
- Part J6 – Lighting and Power;
- Part J7 – Hot Water Supply.

Additional Requirements:

- Woollahra Municipal Council Requirements;
- BASIX (residential);
- NaTHERS (residential);
- NCC Section J;
- Apartment Design Guide (residential);

2. UTILITY ENGINEERING SERVICES

2.1 Utilities Services Review / Analysis

A utilities review has been carried out in consultation with the relevant local authorities to identify the existing utilities at the site.

Dial Before You Dig (DBYD) requests were submitted on the 22 January 2020 to investigate the presence of existing utilities such as natural gas, water, stormwater, sewer and telecommunications.

The following utilities with interests/assets in the vicinity of the site were notified in this process:

Seq. No.	Authority Name	Phone	Status
94060958	Ausgrid	0249510899	NOTIFIED
94060961	Jemena Gas South	1300880906	NOTIFIED
94060963	NBN Co, NswAct	1800626329	NOTIFIED
94060960	Optus and/or Uecomm, Nsw	1800505777	NOTIFIED
94060957	PIPE Networks, Nsw	1800201100	NOTIFIED
94060956	RailCorp Central	0298489578 / 0413006517	NOTIFIED
94060955	Roads and Maritime Services	0288370285	NOTIFIED
94060965	Superloop (Australia) Pty Ltd	0739052400	NOTIFIED
94060962	Sydney Water	132092	NOTIFIED
94060959	Telstra NSW, Central	1800653935	NOTIFIED
94060964	Vocus Communications	0892446114	NOTIFIED

END OF UTILITIES LIST

2.2 Capacity Calculation Assumptions

The following assumptions have been made in carrying out this assessment:

- Site area 4,910 m²;
- 235 - 262 apartments;
- 10,235 m² of Medical/well-being/ Commercial space (GFA);
- 7,143 m² of Retail space (GFA);
- 18,525 m² of Basement GBA;
- Average population of 2.5 persons per apartment;
- Water demand 100,000 L/day;
- Sanitary / Sewer Discharge 90,000 L/day;
- Gas 15,000 MJ/h diversified load;
- Fire Sprinkler System 18 L/s
- Fire Hydrant System 20 L/s.

3. ELECTRICAL

3.1 Electrical Maximum Demand

Based on our preliminary electrical maximum demand calculations, the new development will require approximately 2705.1 Amps, or 1874.1 kVA. This load is subject to final residential numbers, retail spaces intended use and General/Back of House areas.

The detailed maximum demand calculation is presented below:

Electrical Maximum Demand Calculation							
Edgecliff Centre - Mixed Use Development							
Job No: EN - N120_018							
Residential							
Basements	Area (m2)	Quantities	VA/m2	VA	I (A)	Subdivided I (A)	
Carpark (Mechanically Ventilated)	18525		5	92625	132.3		
Common Space				0	0.0		
Carpark Lighting	18525		5	92625	132.3		
						264.6	
General	Area (m2)	Quantities	VA/m2	Load (A)	VA	I (A)	Subdivided I (A)
Common Space	8300		5		41500	59.3	
Escalators		2		40		80.0	
Lifts		9		80		520.0	
						659.3	
Apartments	Area (m2)	Quantities	VA/Bed	VA	I (A)	Subdivided I (A)	
Studio			1750	0	0.0		
1 bed			2000	0	0.0		
2 bed			2500	0	0.0		
3 bed		262	3000	786000	1122.9		
						1122.9	
Commercial							
Commercial	Area (m2)		VA/m2	VA	I (A)		
Office	4984		100	498400	712.0		
Retail	10207		120	1224840	1749.8		
						2461.8	
Total (without ADMD)						4508.6	
Total (with 60% ADMD)						2705.1	
Total in kVA						1874.1	

The redevelopment of the site will most likely necessitate two (2) new onsite substations.

To accommodate the new development load 2 x 1,000 kVA substation(s) will be required.

Based on maximum demand calculations, following substation arrangements need to be considered:

Option 1 – 2 x kiosk substations;

Option 2 – 2 x mini chamber substations;

Option 3 – 1 x chamber substations.

Option 1 and 2 are more feasible than Option 3.

3.2 Existing Services

Based on infrastructure plan provided by Ausgrid, extensive HV infrastructure is located in the vicinity of Edgecliff Centre site, including a number of substations and HV inground cables surrounding the site.

The capacity of this feeder will be determined once an application for connection has been lodged to the authorities.

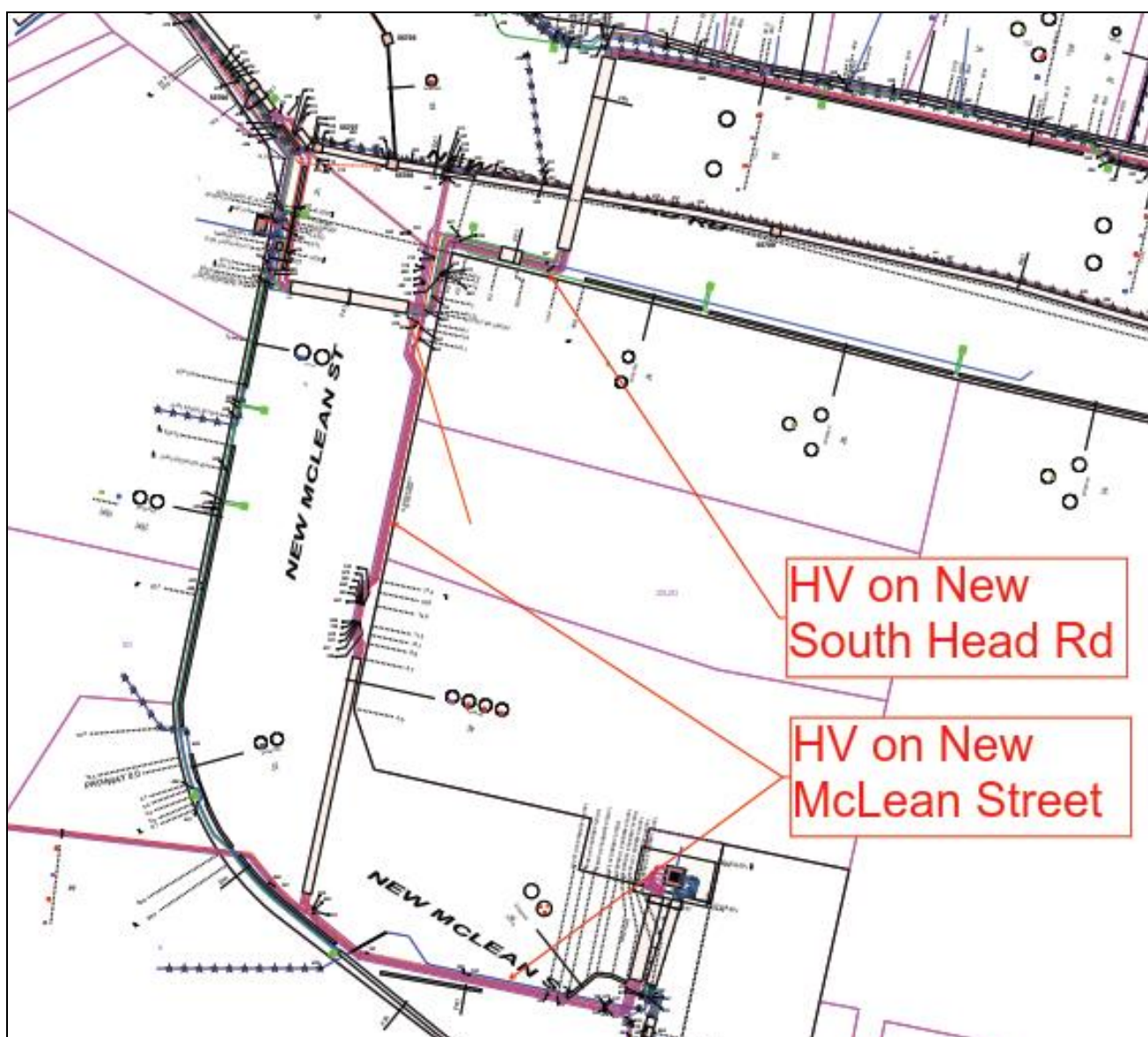


Figure 2 – HV infrastructure in the vicinity of the Site (source: Ausgrid)

3.3 New Substation Options for the Development

3.3.1 Option 1 – Kiosk Substation

Quantity Required

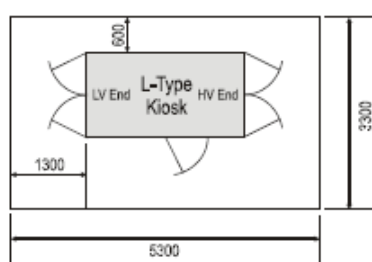
If a kiosk substation is considered, then two (2) would be required of 1,000kVA capacity.

Spatial Requirements

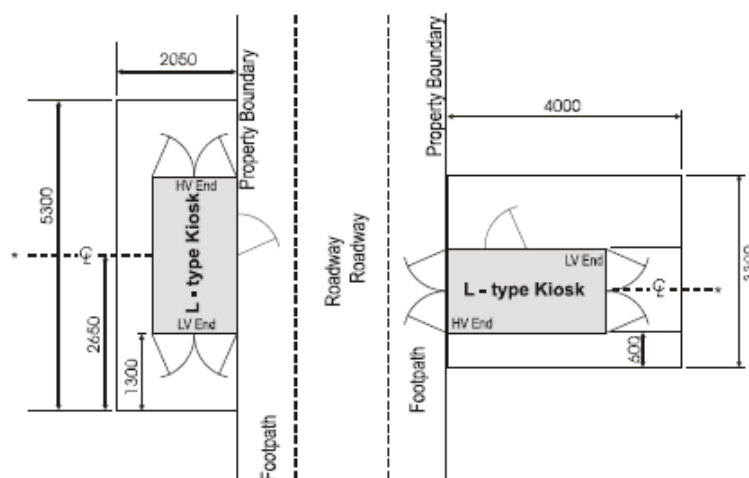
Below are some spatial options for kiosk substations:

L Type Kiosk

L type kiosk minimum site requirements are indicated in the following site plans and notes:



Site Plan A



Site Plan B

Site Plan C

(* Property boundary between lots, if kiosk site is located across adjacent residential lots.)

L Type Kiosk - Notes.

- Note 1. The L kiosk site plans shown with one edge of the kiosk structure on the street frontage property boundary (Site Plans B and C) are restricted options generally only available for underground residential distribution (URD) sites. Approval for these options in areas other than URD will be at the discretion of Ausgrid, after consideration of all relevant factors.
- Note 2. Where the 5300 mm x 3300 mm L kiosk site is set back from the street frontage property boundary (ie Site Plan A with additional set back), it will be necessary for an associated cable easement and a right-of-way for access to be established. (Refer to Clause 3.8.)

Special Requirements

Kiosk substations have the following special requirements:

- Must be located off vehicular road for direct street access by Ausgrid trucks.
- Preferably sited on grade (can be on suspended slabs with dispensation);
- Must be 6m (stringline) from any air intakes and exhausts;
- Must be 6m (stringline) blast zone from apartments and/or balconies;
- Any walls within 3m of the easement must be 3hr fire rated; and
- Free to air (ie. no encroachments above).

Advantages

The following are advantages associated with kiosk substations:

- More flexible with respect to splitting up and locating closer to the respective loads rather than one main substation;
- Cost effective;
- Space efficient;
- No construction costs associated for special purpose rooms.

Disadvantages

The following are disadvantages associated with kiosk substations:

- Not aesthetically pleasing;
- Segregation constraints.

Budget Estimates

It is estimated that a kiosk substation will be worth \$150,000.

3.3.2 Option 2 – Mini Sub

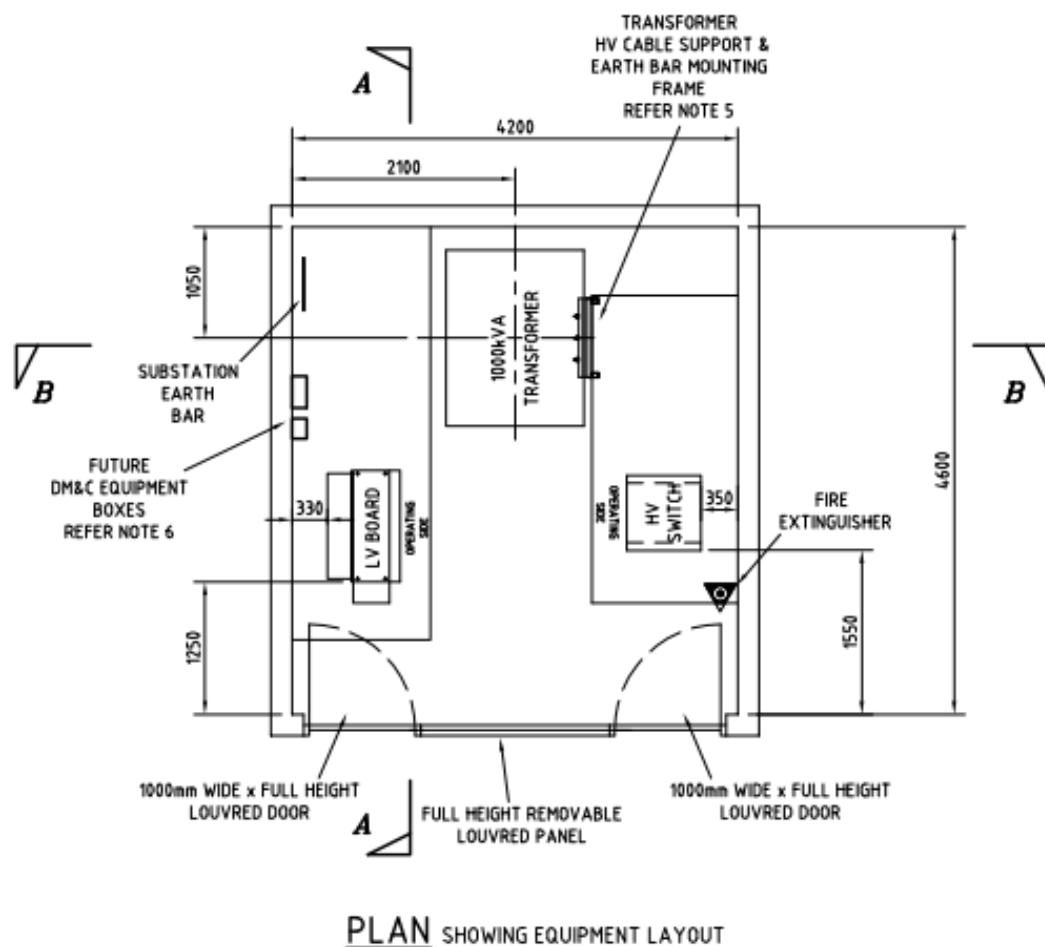
Quantity Required

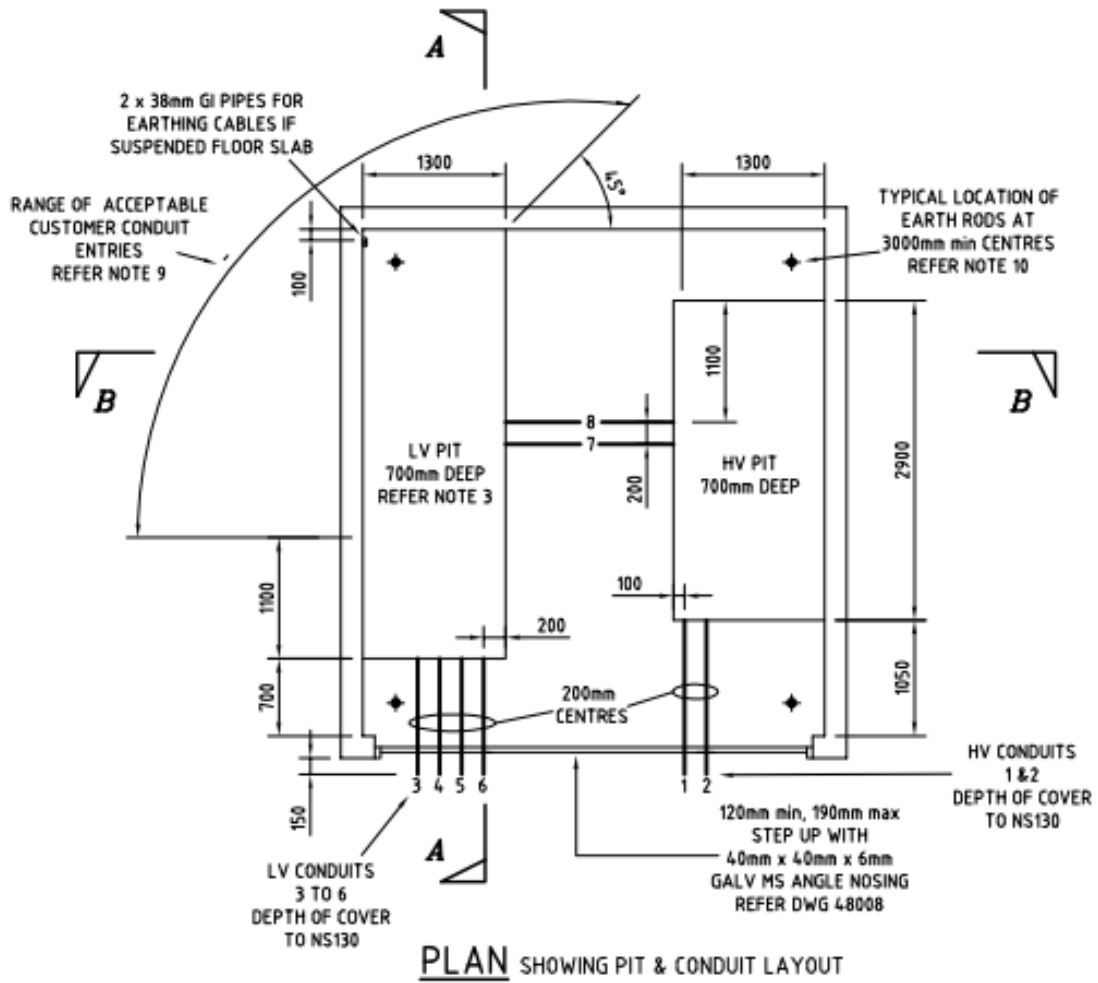
If a mini sub is considered, then two (2) would be required of 1,000kVA capacity.

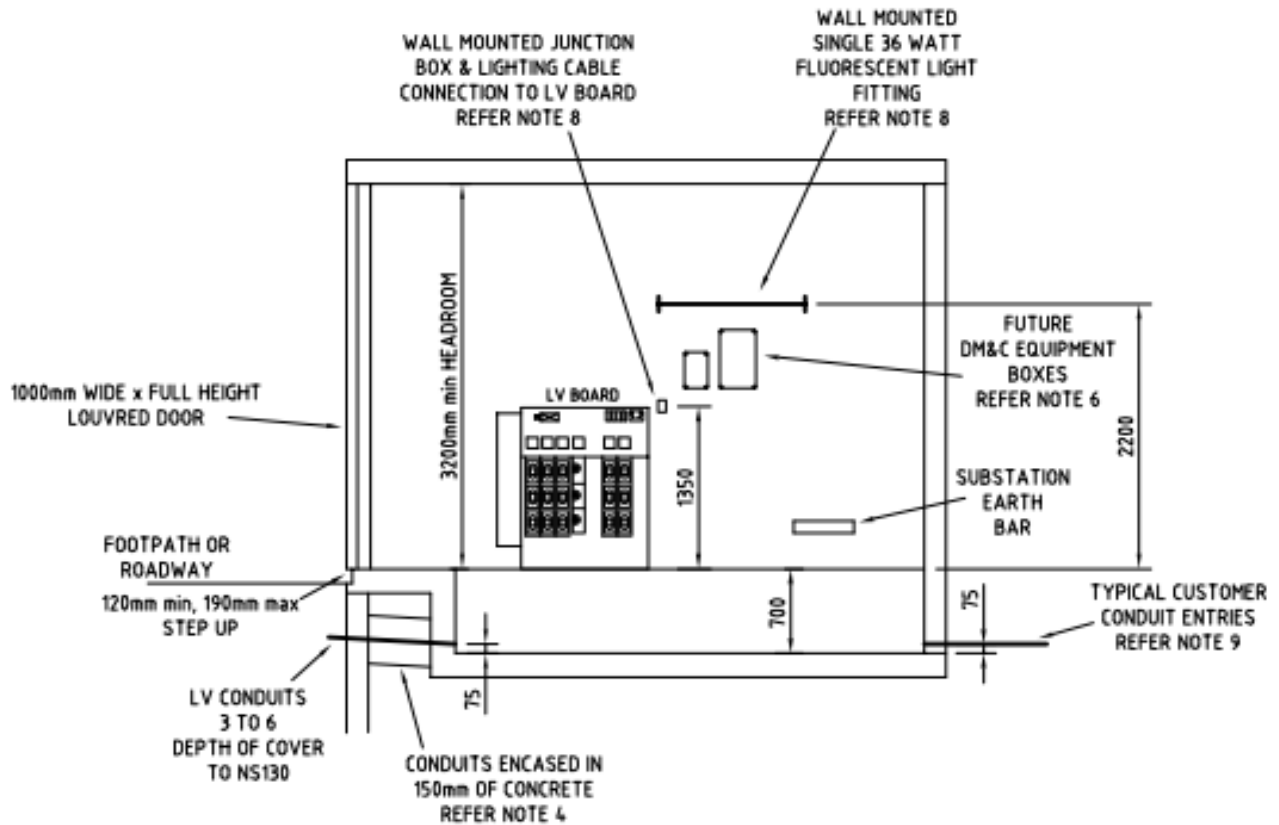
Spatial Requirements

A room of approximately 16m² is required for the mini sub.

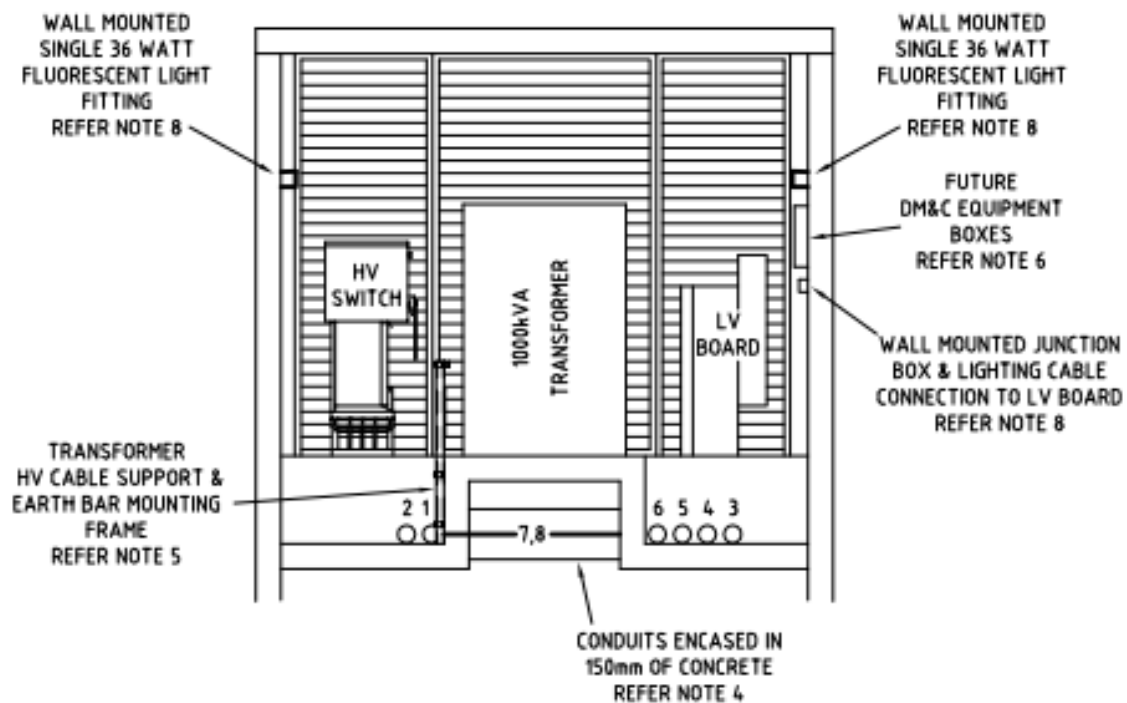
Below is an example of this installation:







SECTION A-A



SECTION B-B

Special Requirements

Mini subs have the following special requirements:

- Must be located off vehicular road for direct street access by Ausgrid trucks.
- Can be sited on suspended slabs;
- Front door louvres must be 6m (stringline) from any openable windows;
- Front door louvres be 6m (stringline) blast zone from apartments and/or balconies;
- Any walls must be 3hr fire rated; and
- Minimum 3m floor to ceiling space.

Advantages

The following are advantages associated with mini subs:

- Aesthetically pleasing;
- Reduced blast zones;
- Space efficient.

Disadvantages

The following are disadvantages associated with mini subs:

- Construction costs associated with building the special purpose space;
- More expensive than kiosks because rooms will be required and individual equipment (ie. switchgear, transformers, boards, etc.) will require onsite installation.

Budget Estimates

It is estimated that a mini sub will be worth \$250,000 (excluding building works).

4.4.3 Option 3 – Full Surface Chamber Substation

Not recommended.

3.4 Summary & Conclusions

The following items will need to be further considered with respect to the electrical services associated with the site during detailed design development:

- **Connection to existing HV feeders.**

4. NATURAL GAS

4.1 Gas Maximum Demand

The gas maximum demand has been estimated at:

- 15,000 MJ/h diversified load.

This is based on the Heating Ventilation and Air Conditioning (HVAC) System being a reverse cycle, split, air cooled, type system. It has been assumed that centralised hot water plant, cook tops, bbq bayonets and commercial kitchen will require gas.

4.2 Existing Services

There are no major existing gas services within the site that will need to be decommissioned and/or diverted. Refer to details below in Figure 4.

4.3 Jemena Infrastructure in the Vicinity of the Site

Area natural gas infrastructure plan issued by Jemena shows two natural gas mains in the vicinity of the site. There is an existing 75mm NY 210 kPa gas main in New South Head Road, reticulating on the opposite side of the street. In addition, there is a 32mm PE 210 kPa gas main reticulating in New McMillan Street and extending close to the site boundary. These mains are estimated to have adequate capacity for the proposed new mixed-use development, subject to Jemena assessment and approval. For details refer below to Figure 4.

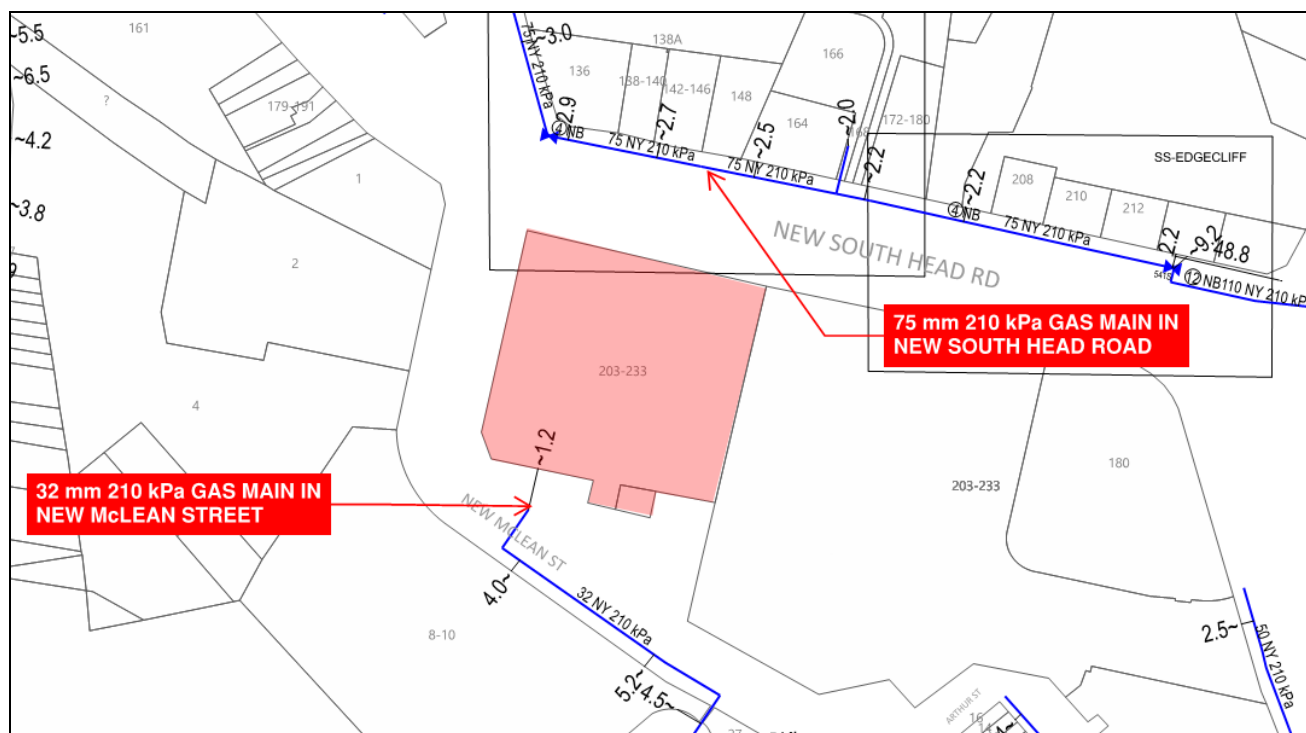


Figure 4 – Jemena Natural Gas Infrastructure

4.4 Summary and Conclusions

Jemena have extensive infrastructure in the vicinity of the site and can easily cater for the proposed new development.

The existing 32mm 210kPa Natural Gas main is the likely point of connection, subject to Jemena approval.

5. TELECOMMUNICATIONS

5.1 Telecommunications Infrastructure in the Vicinity of the Site

Response from the respective Telecommunication suppliers and NBN shows multiple conduits located along both New South Head Road and New Mclean Street.

The telecommunications services identified in the vicinity of the site are expected to have the carrying capacity to suit the needs of the proposed development.

It is noted that NBN is applicable to this site.

5.2 Summary and Conclusions

NBNCo has high bandwidth infrastructure in the vicinity of the site and can easily cater for the proposed new development.

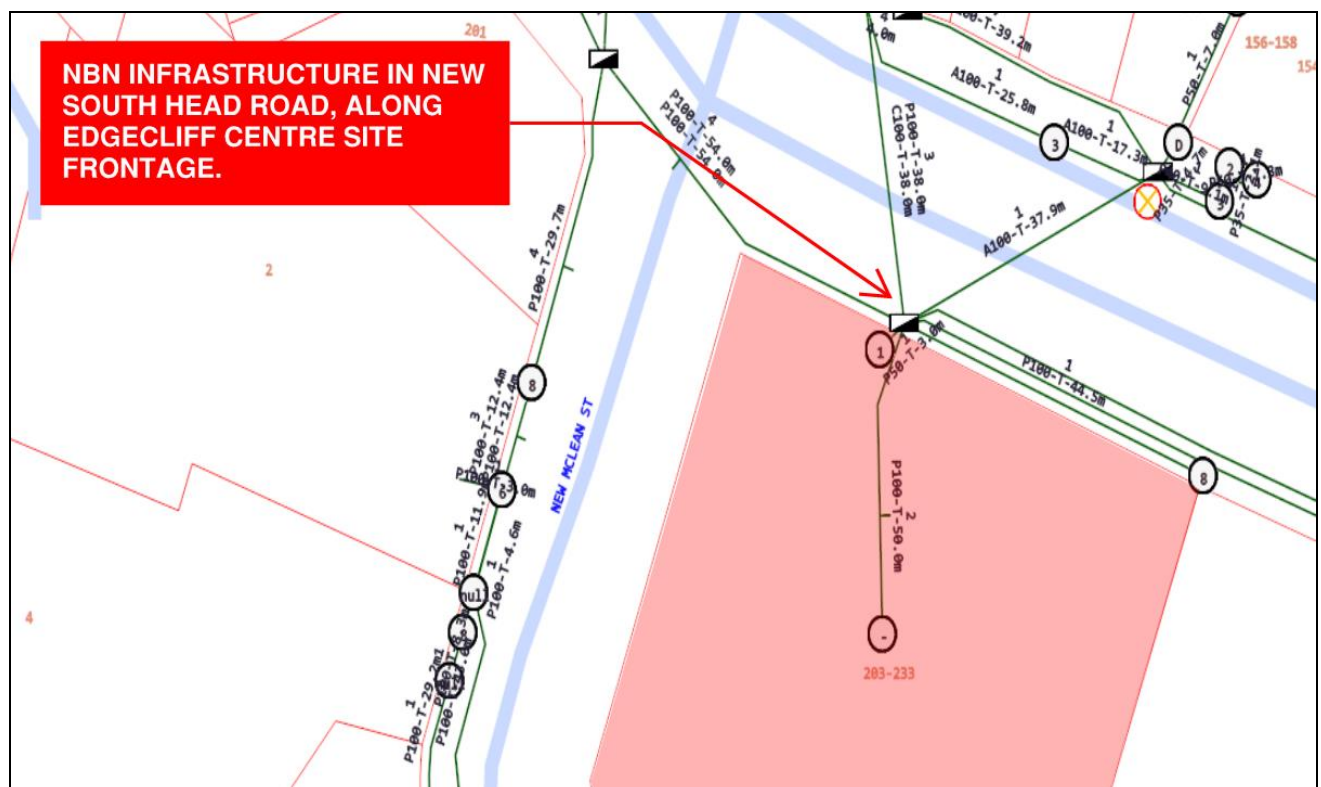


Figure 6 – NBNco infrastructure in the vicinity of the site

6. MAINS WATER

6.1 Water Maximum Demand

Water maximum demand has been estimated as follows:

- Cold Water 100,000 L/day;
- Fire Hydrant System 20 L/s;
- Fire Sprinkler System 18 L/s; and

6.2 Existing Services

There are no major water services within the site that will need to be decommissioned and/or diverted. Any minor water services within the site, if present, can be readily decommissioned during site works/demolition.

6.3 Mains Water Infrastructure in the Vicinity of the Site

Sydney Water is the responsible authority for the provision of potable water to the site.

There is a 150 mm DICL reticulation water main located in New McLean Street, a 375 mm DICL trunk water main in New South Head Road with a 150mm reticulation tee available for connection.

Figure 8 below indicates the above mentioned SWC Water infrastructure in the vicinity of the site.

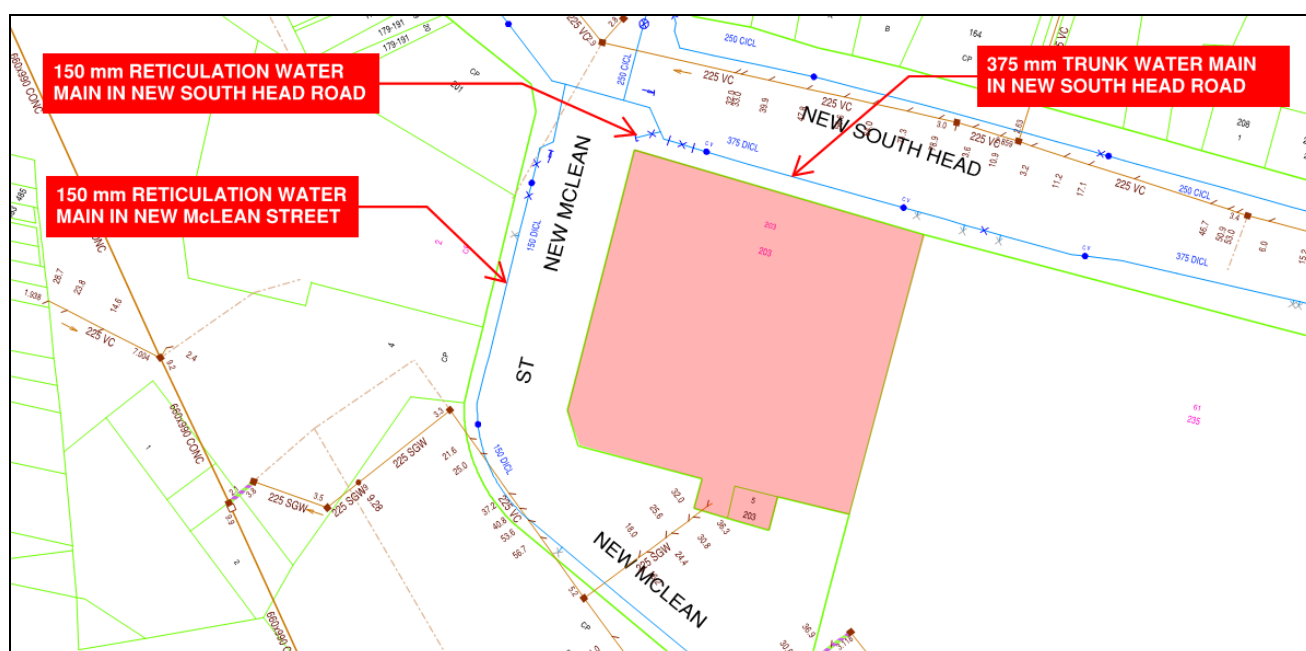


Figure 8 – Sydney Water - Water Infrastructure Map

6.4 Summary and Conclusions

The existing 150mm reticulation tee of the 375mm trunk main will likely need to be amplified to 200mm to supply the new development subject to Section 73 Notice of Requirements. Major works extension to the site frontage may be required, albeit to a relatively short length. Depending on stratum subdivision of the development site, Sydney Water may allow more than one potable water connection to serve the site. Subject to pressure and flow capacity of connections, balance tank(s) may be required due to the size of this development, as the peak demand may exceed the available flow from the main. Internal pressure boosting requirement is highly likely due to head pressure resulting from building height.

7. SEWER

7.1 Sewer Maximum Demand

Sewer maximum demand has been estimated as follows:

- Sanitary / Sewer Discharge 90,000 L/day.

7.2 Existing Services

There a 225mm SGW sewer main located on the southern end of the site, extending in south-westerly direction and connection to a 225 mm sewer main in New McLean Street. This main may need to be disused to a smaller extension.

7.3 Sewer Infrastructure in the Vicinity of the Site

Sydney Water is the responsible authority for the provision of sewer services to and through the site. Information provided by Sydney Water shows 225mm gravity sewer main extending from the southern boundary of the site, crossing New McLean Street and connecting to a 225mm sewer main in New McLean Street. This main is estimated to have sufficient capacity to serve the site and is located favourably on the lower point of the site to accommodate gravity drainage.

7.4 Summary & Conclusions

In summary, the 225mm sewer main in New McLean Street has sufficient capacity to serve the new development. The nominated point of connection to Sydney Water sewer network will be confirmed in Section 73 NOR.

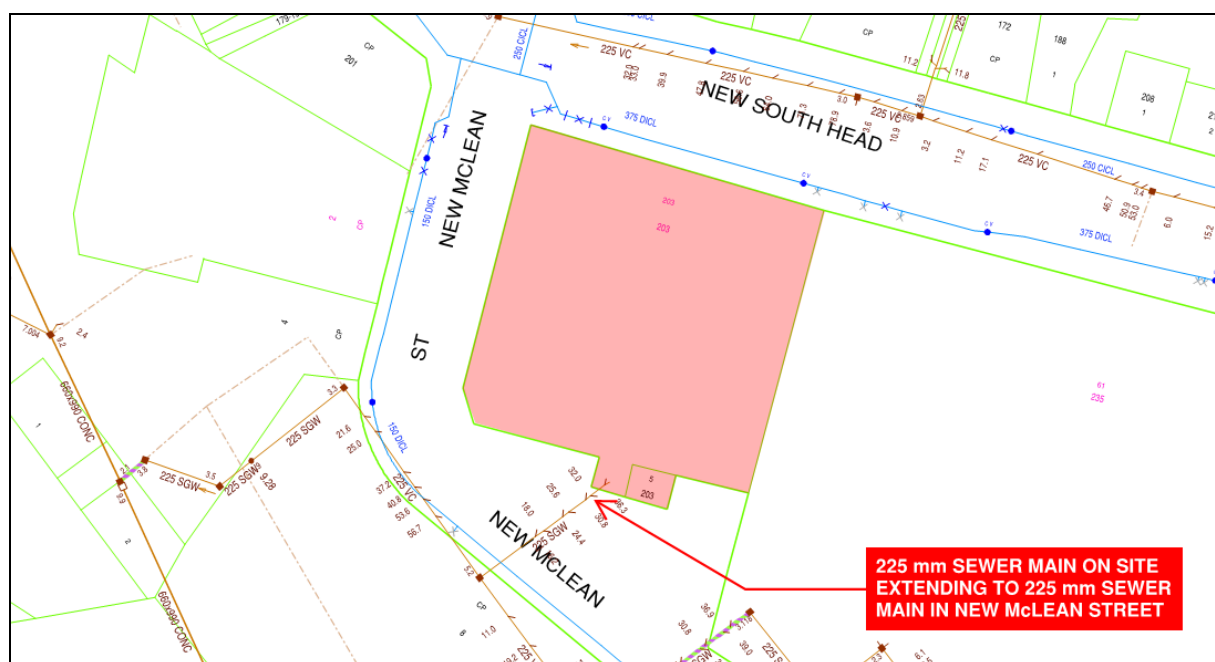


Figure 9 – Sydney Water - Sewer Infrastructure Map

8. HEADWORKS COST ESTIMATES

SERVICE	BUDGET HEADWORKS COSTS	COMMENTS
Water	\$250,000	Major works. Potable and Recycled water mains extension to the site from New South Head Road
Sewer	\$50,000	Minor works
NBN / Telco	\$150,000	Allows for NBN lead-in's & connections
Electricity	\$6,600,000 – \$8,800,000	Allows for 2 new kiosks or mini substations
Gas	\$50,000	Allow for new connection
