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SERVICES INFRASTRUCTURE REPORT

**815 PACIFIC HIGHWAY CHASTWOOD
NSW 2067**

REVISION: 001

DATE: 29th August 2025



Level 17, 275 Alfred Street,
North Sydney NSW 2060

RE: 815 Pacific Highway, Chatswood NSW 2067

INTRODUCTION

This report has been prepared to outline the extent of the existing authority services infrastructure available to serve the site, identify potential upgrades required to facilitate the proposed future development, and identify potential services diversions.

This report has been prepared with only preliminary investigation of the relevant authorities existing infrastructure from publicly available records. The conclusions are limited to our experience with these authorities and similar developments. All services infrastructure connection requirements will need to be confirmed with the relevant authorities.

Information on existing infrastructure as detailed within this report has been obtained from Dial-Before-You-Dig (DBYD), Ausgrid GIS and site survey documents, which include:

- Water Authority – Sydney Water
- Gas Authority - Jemena
- Electrical Authority – Ausgrid
- Communications Authority – Telstra & NBNCo

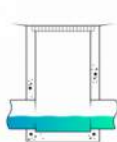
Any potential works on existing authority infrastructure services is subject to negotiation and approvals by each affected authority. Liaison with each authority will be undertaken as part of the detailed design phase works for the site.



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PROPOSED DEVELOPMENT

The proposed development is located at 815 Pacific Highway, Chatswood, NSW 2067, which is currently an existing commercial building proposed to be demolished. The local authority is Willoughby City Council. The site is bounded on the eastern side by an adjoining property.

EXISTING SITE PLAN – EXTRACT FROM SIX MAPS



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AUTHORITIES MAINS INFRASTRUCTURE

Sydney Water Mains

Existing Sewer Mains

The site appears to be adequately served by Sydney Water's sewer main as follows:

- 150mm SGW sewer main in McIntosh Street.
- 150mm VC sewer main in Help Street.

Sewer Mains Augmentation Works

Servicing of the proposed development will be governed by the following Sydney Water development guidelines extracts:

TABLE 4.3
MINIMUM PIPE SIZES FOR RETICULATION AND PROPERTY CONNECTION SEWERS

Sewer	Minimum size DN
Property connection sewer servicing 1 or more residential lots	150
Property connection sewer servicing commercial and industrial lots $\leq 300 \text{ m}^2$	
Reticulation sewers servicing residential lots	
Reticulation sewer servicing commercial and industrial lots $> 300 \text{ m}^2$ and other complexes where large flows may be expected	225

4.5.5 Maximum EP for reticulation sewers

Irrespective of hydraulic analysis, the maximum EP that may be serviced by reticulation sewers shall be as specified in Table 4.4.

TABLE 4.4
EP CAPACITY LIMITATIONS FOR RETICULATION SEWERS

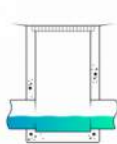
Pipe size DN	Maximum allowable EP
150	600
225	1600
300	3200



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Based on the above information, the probable sewer connection size for the development will be at least a minimum of 225mm.

The existing 150mm SGW and 150mm VC Sydney Water sewer main in McIntosh Street and Help Street appears to be insufficient to serve the proposed development. Augmentation works will be required to upsize one of the existing sewer mains to 225mm with a new sideline connection extended to the site boundary to serve the site. This would be deemed as 'Major Works'. There may be an opportunity to split the sewer systems into two systems connecting to each of the existing sewer mains in McIntosh Street and Help Street. This would be subject to final site sewerage loads and Sydney Water approval via the Sydney Water coordinator.

The final location of the sewer connection is subject to site constraints, and Sydney Water approvals. It is recommended a Sydney Water coordinator is engaged to provide further advice for the final Sydney Water connections, requirements and approvals.

Our opinion of costs for Sydney Water sewer upgrades to the existing sewer main or mains is approximately \$1,500.00 per metre not including traffic control and operation works.

The final length and locations of sewerage upgrades will be required to be determined by Sydney Water Via the Sydney Water Coordinator.

Existing Potable Water Mains

The site appears to be adequately served by Sydney Water's potable water mains as follows:

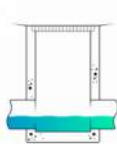
- 150mm CICL Potable Water main in Pacific Highway (Western Street side).
- 600mm CICL Potable Water main (Trunk main) in Pacific Highway (Western Street side).
- 300mm CICL Potable Water main (Trunk main) in Pacific Highway (Eastern Street side).
- 300mm CICL Potable Water main (Trunk main) in Help Street.



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Potable Water Main Augmentation Works

Servicing of the proposed development will be governed by the following Sydney Water development guidelines extracts:

3.1.2 Minimum pipe sizes

Minimum pipe sizes shall comply with [Table 3.1](#) except in the following locations where specific design requirements apply:

- (a) Mains in dual water supply systems, see [Clause 3.1.4](#);
- (b) Reduced sized mains for the purpose of maintaining water quality, see [Clause 5.2.4](#).

Minimum pipe diameters have been established to ensure adequate flow rates and residual pressures.

Equivalent pipe diameters for commonly used material are summarised in [Appendix B - Equivalent Pipe Diameters for Commonly Used Materials](#).

For particular types of development such as CBDs, the Water Agency may specify alternative minimum pipe diameters.

TABLE 3.1
MINIMUM PIPE SIZES FOR PARTICULAR DEVELOPMENTS

ZONING/DEVELOPMENT	MINIMUM PIPE SIZE (DN)	
	Cast iron outside diameter series	ISO series ⁽³⁾
Low and medium density residential	100 ⁽¹⁾	125 ⁽¹⁾
High density residential (≥ 4 storeys)	150	180
Multiple developments of high density residential (≥ 8 storeys)	200 or 225 ⁽²⁾	250 or 280 ⁽²⁾
Industrial and commercial	150	180

NOTES:

- 1 The Water Agency may authorise smaller pipe sizes to address issues such as water quality, provided that requirements for fire fighting supply are otherwise met.
- 2 The Water Agency to nominate the preferred size.
- 3 For steel (SCL) and polyethylene (PE) pipes only.

Based on the above information, the probable potable water connection size for the development will be at least a minimum of 150mm.

The existing 150mm CICL Sydney Water Potable Water main in Pacific Highway appears to be sufficient to serve the proposed development with no augmentation works required. However, Sydney Water may request that the existing 150mm CICL Potable water main in Pacific Highway be upgraded to 200mm > along the entirety of the site frontage, based on the above table 3.1 requirements. This will be based on the Sydney Water Assessment and obtaining the Section 73 requirements.



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The two Sydney Water existing 600mm CIL and 300mm CIL potable water mains in Pacific Highway, and the 300mm CIL Potable water main in Help Street are classed as trunk mains. It is not permissible to connect to these mains in accordance with Sydney Water requirements.

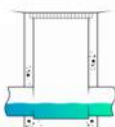
The final location of the potable water connection is subject to available pressures and flows in the potable water main, site constraints, and Sydney Water approvals. It is recommended that a Sydney Water coordinator be engaged to provide further advice for the final Sydney Water connections, requirements and approvals.



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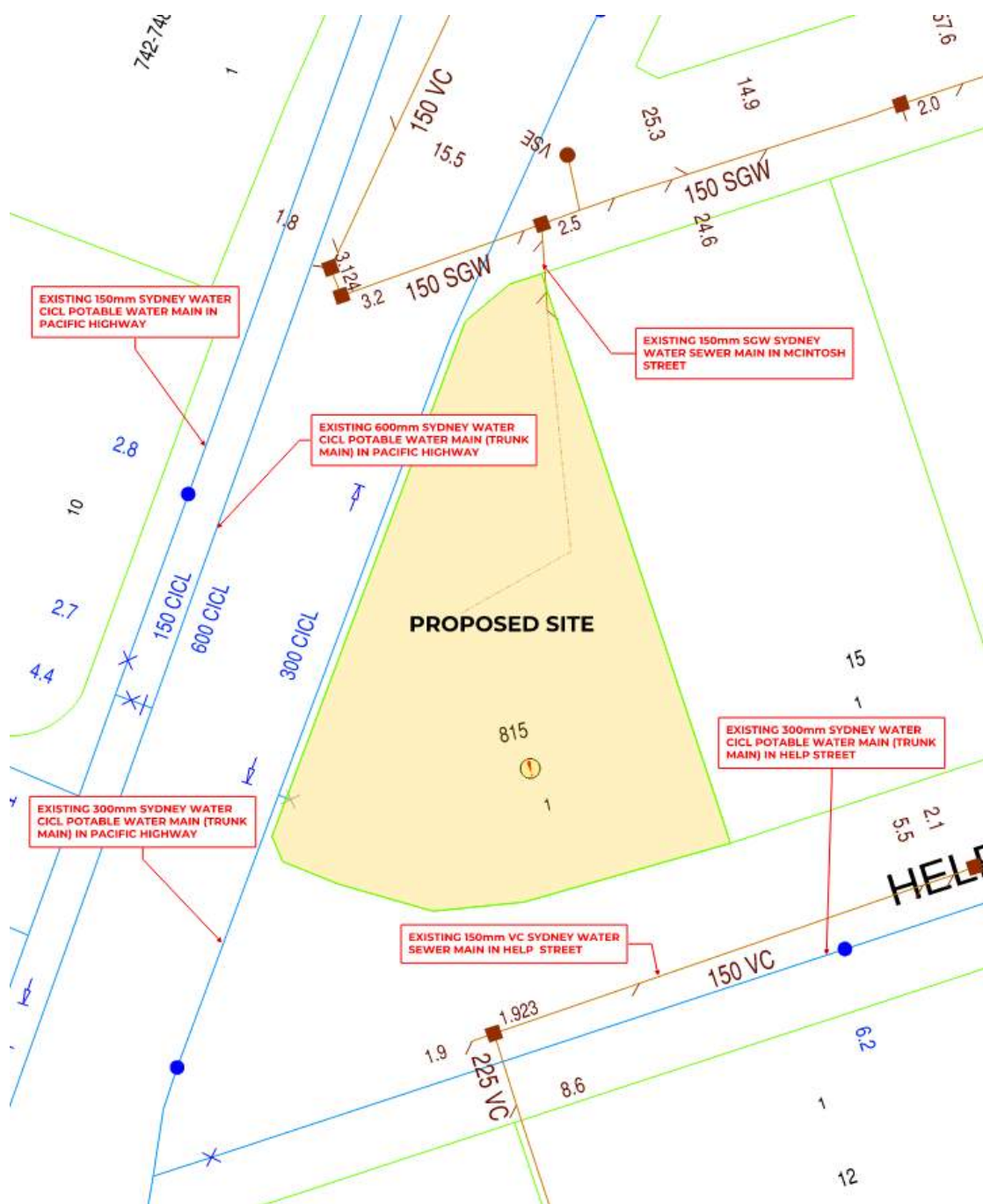


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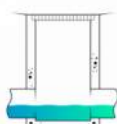
Sydney Water Mains Map



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Jemena Natural Gas Mains

Existing Jemena Gas Mains

The site appears to be adequately served by Jemena's natural gas mains as follows:

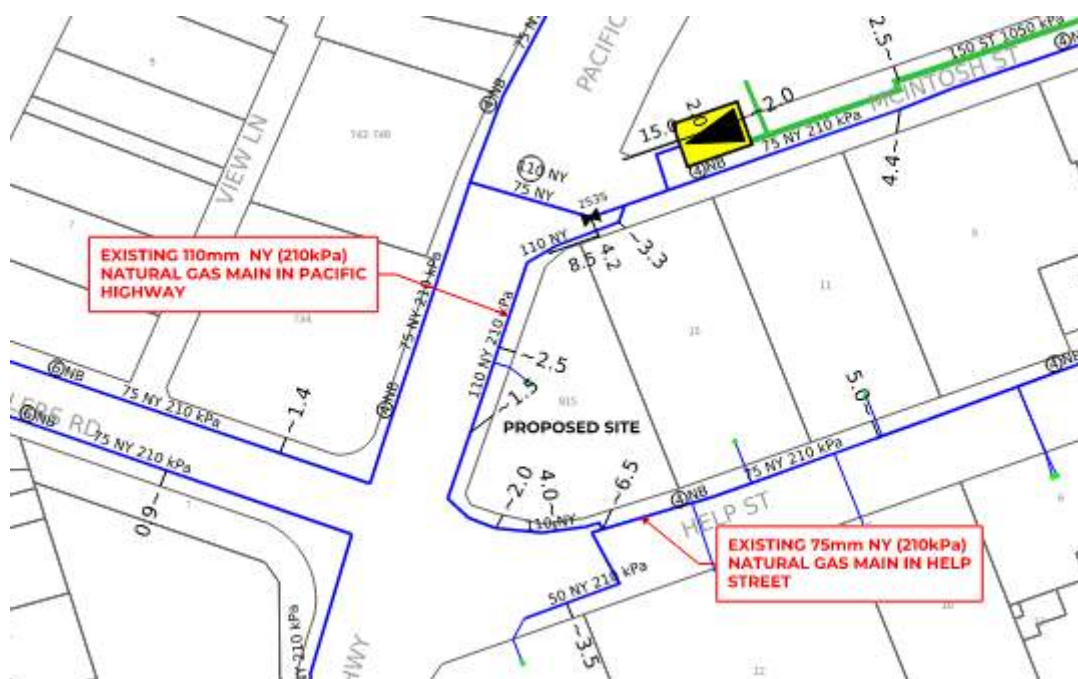
- 110mm NY (210kPa) natural gas main in Pacific Highway
- 75mm NY (210kPa) natural gas main in Help Street

1.

Based on the Jemena DBYD the 110mm NY (210kPa) and 75mm NY (210kPa) natural gas main in Pacific Highway and Help Street appear to be sufficient to serve the proposed development with no augmentation works required.

The final location of the natural gas connection is subject to site constraints, and Jemena approvals.

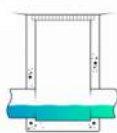
Jemena Mains Map



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Electrical Services

Existing Authorities Mains

The existing building is serviced by an existing chamber substation S.6328 located within adjacent building at 15 Help Street. The existing substation is also serving the surrounding sites via underground Low Voltage network cables. The existing substation within adjacent building contains a 3x750kVA transformers commissioned in 1986. The existing substation is a firm rated substation and maintained by Ausgrid. The substation currently has following LV Distributors. The reference made to "BMA Towers 2" is the proposed site at 815 Pacific Highway.

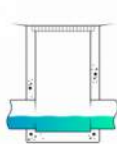
- **Dist #1** – McIntosh St Underground (400Amps)
- **Dist #2** – BMA Towers 2 (Unknown)
- **Dist #3** – 13-15 Help St (1200Amps)
- **Dist #4** – Pacific Highway North (Unknown)
- **Dist #5** – Pacific Highway South (400Amps)
- **Dist #6** – WDNO (Spare)



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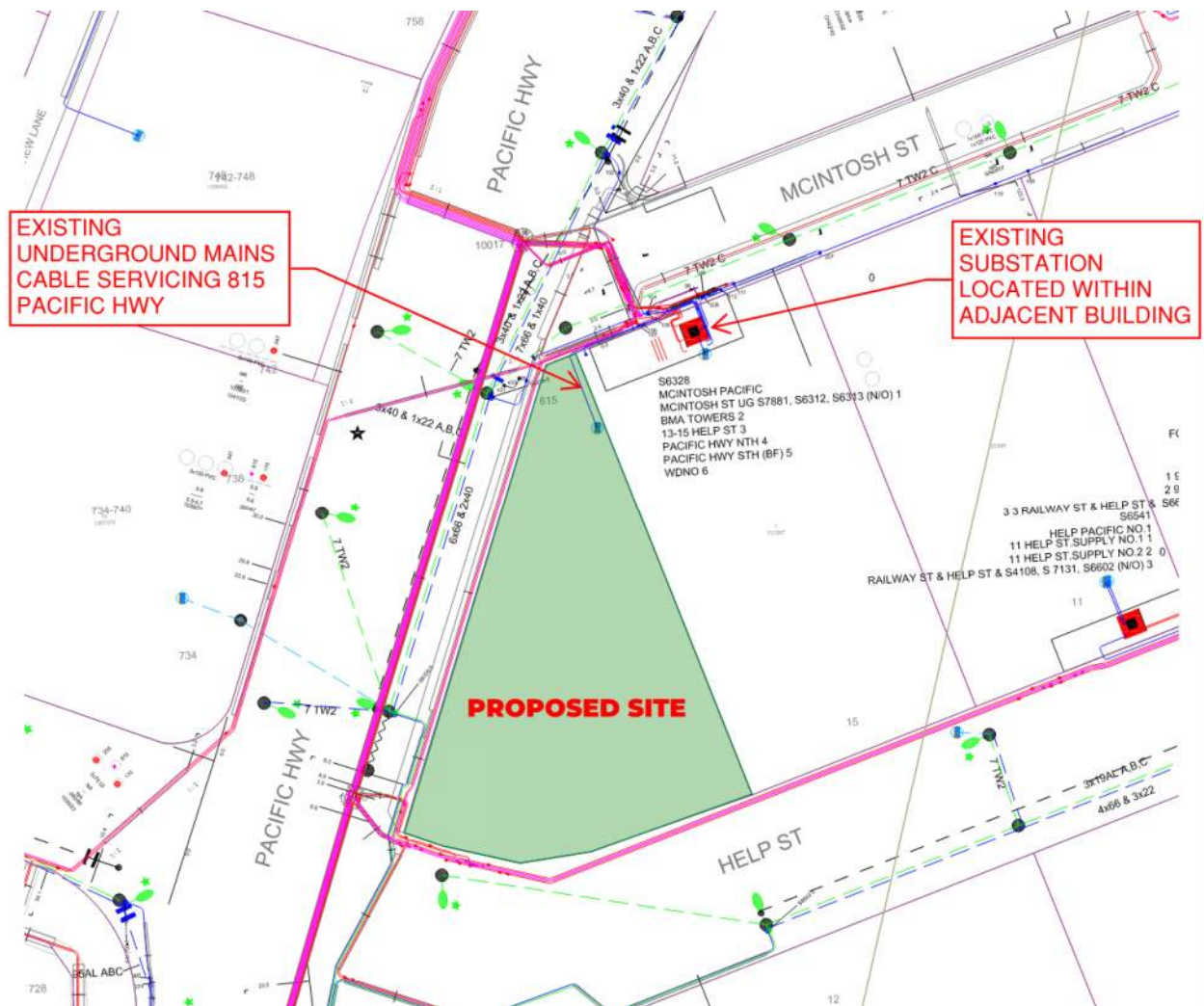


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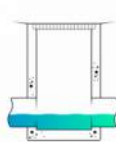
Ausgrid Existing Mains Map



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Authority Augmentation Works

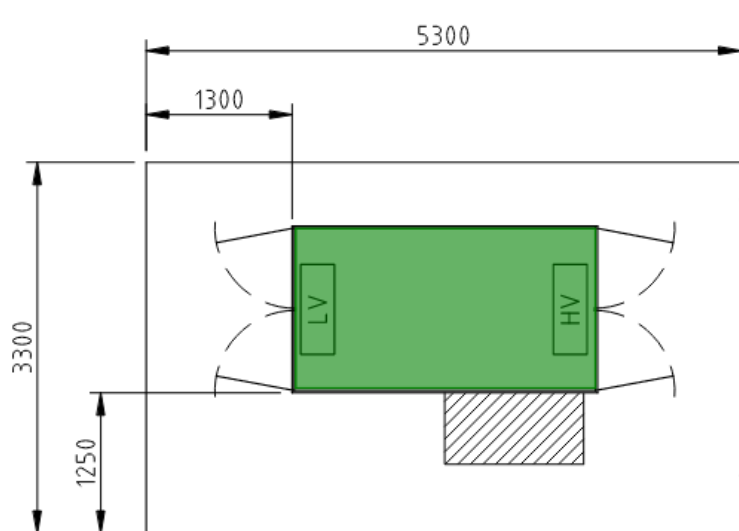
Temporary Works

The existing power supply can potentially be used for the construction temporary supply subject to temporary power needs for the construction works.

If the existing supply is insufficient for the temporary construction works, then a single kiosk substation will be required within the site boundary. However, this will be subject to approval from Ausgrid and Local Council. The low voltage configuration of the temporary substation can be as below;

- **Dist #1** – Temp Builders Supply (1200Amps)
- **Dist #2** – WDNO (Spare)
- **Dist #3** – WDNO (Spare)

Below is a typical substation spatial requirement. (1x1000kVA Kiosk Substation)



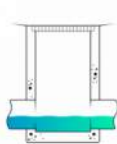
Typical Single Temporary Kiosk Substation Layout



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Permanent Substation Works

Based on the initial maximum demand calculations, it was determined that the demand for the new development would be approximately **4.1 MVA**. The maximum demand calculations consider the residential apartments and retails being full electric building uses electricity as the sole energy source for all its function with no natural gas for heating, hot water, cooking and other equipment. i.e. electric cooktop, electric storage HWU, heat pumps, electric commercial kitchen F&B retails, etc.

If the development, apartments and commercial kitchen retails utilise full natural gas appliances, the demand will reduce slightly down to approximately to **3.45 MVA**.

Based on the data available from Ausgrid WEBGIS, the existing low voltage capacity from the existing LV Network has insufficient capacity to serve the proposed development.

The existing high voltage Ausgrid assets reticulate below ground surrounding the site along Pacific Highway and Help Street, outside of the development boundary within the public footpath.

The calculations also consider the NLA allocated for retails spaces which would include electric commercial kitchen and F&B retails.

The development will operate as a Low Voltage customer, with 400V connections being made from newly proposed Ausgrid substations located within the building footprint.

Subject to application to Ausgrid and Ausgrid's further assessment below are the likely options to serve the new development being;

- A 3x1,500kVA Surface Chamber Substation located on Ground Floor fronting Help Street,
- A 3x1,500kVA Basement Chamber Substation located on Basement Level fronting Help Street,

A multiple kiosk substation(s) within the boundary is not proposed to be an option due to Ausgrid Network Standards requirements.

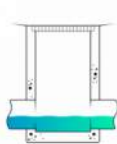
Furthermore, a multiple kiosk substation(s) will likely result in adverse impact from an aesthetics perspective. Hence, a chamber substation is recommended for the proposed development.



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Based on above, possible substation arrangement options will be as below for the development:

SUBSTATION OPTIONS (FULL ELECTRIC APPLIANCES)

1	Help St frontage	2	Approx. Non-Firm Amp Rating	3	Approx. Non-Firm kVA Rating
Option 1 - Ausgrid Surface Chamber Substation on Ground Floor		6,000A (Non-Firm)		3x1.5 MVA	
Option 2 - Ausgrid Basement Chamber Substation located in Basement 1 Level		6,000A (Non-Firm)		3x1.5 MVA	
Required Capacity				~4.1 MVA	
Spare Capacity				~0.9 MVA	

SUBSTATION OPTIONS (NATURAL GAS-DRIVEN APPLIANCES)

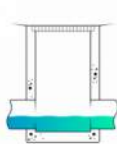
4	Help St frontage	5	Approx. Non-Firm Amp Rating	6	Approx. Non-Firm kVA Rating
Option 1 - Ausgrid Surface Chamber Substation on Ground Floor		6,000A (Non-Firm)		3x1.5 MVA	
Option 2 - Ausgrid Basement Chamber Substation located in Basement 1 Level		6,000A (Non-Firm)		3x1.5 MVA	
Required Capacity				~3.45 MVA	
Spare Capacity				~1.55 MVA	



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The building's substation options along with spatial requirements can be summarised as follows.

Due to site having limited landscape and external areas, we recommend a Surface chamber substation option which is outlined in **Option 1** below. The Basement Chamber Substation which is outlined in **Option 2** is not proposed due to 3.2m minimum clear height not likely being achieved in Basement 1 Level and difficulties in construction and space planning for the transformer access hatch, personnel access hatch and dedicated personnel stair requirements.

OPTION 1 – Surface Chamber Substation (3 x 1,500kVA)

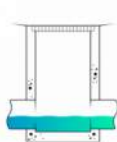
- Chamber Substation to be located within the boundary on Ground Floor facing Help Street (subject to approval from Council).
- All substations to be located within private property.
- Subject to location, a cable easement and a right of way are required.
- The substation chamber wall, ceiling and floor to be 180/180/180 FRL.
- Any structural, architectural or material within 3m of the substation will require to be 3hr fire rated.
- The chamber clear height to be 3200mm.
- Distance between building ventilation and the substation will require to be more than 6m.
- Distance between fire hydrants and the substation will require to be more than 10m.
- No awning is allowed above the substations.
- 24hr/7day week access is to be provided from Help Street to the substations.
- Substation frontage to be hardstand and withstand 22 tons of loading.
- All works are to be in accordance with the site specific Ausgrid Design Information Package, Ausgrid Network Standards, and a certified Level 3 design.



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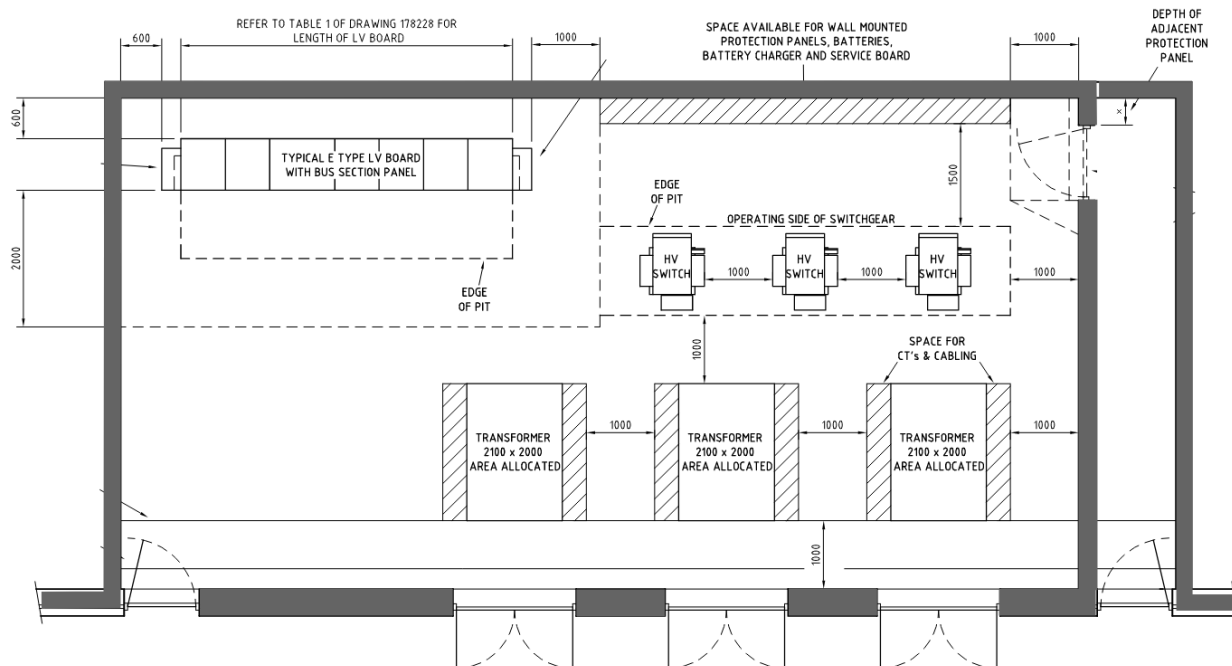
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Option 1 – Surface Chamber Substation Layout

OPTION 2 – Basement Chamber Substation (3 x 1,500kVA)

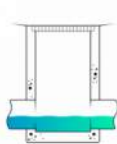
- Chamber Substation to be located one floor below ground level facing Help Street (subject to approval from Council).
- All substations to be located within private property.
- Subject to location, a cable easement and a right of way are required.
- The substation chamber wall, ceiling and floor to be 180/180/180 FRL.
- Any structural, architectural or material within 3m of the substation will require to be 3hr fire rated.
- The chamber clear height to be 3200mm.
- Distance between building ventilation and the substation will require to be more than 6m.
- A transformer access hatch (2200x1700mm) is required within the boundary located directly above the chamber.
- Exhaust and intake ducts are required for the chamber substation. The external outlets of those ducts shall be a minimum 6m away from each other located on Level 1



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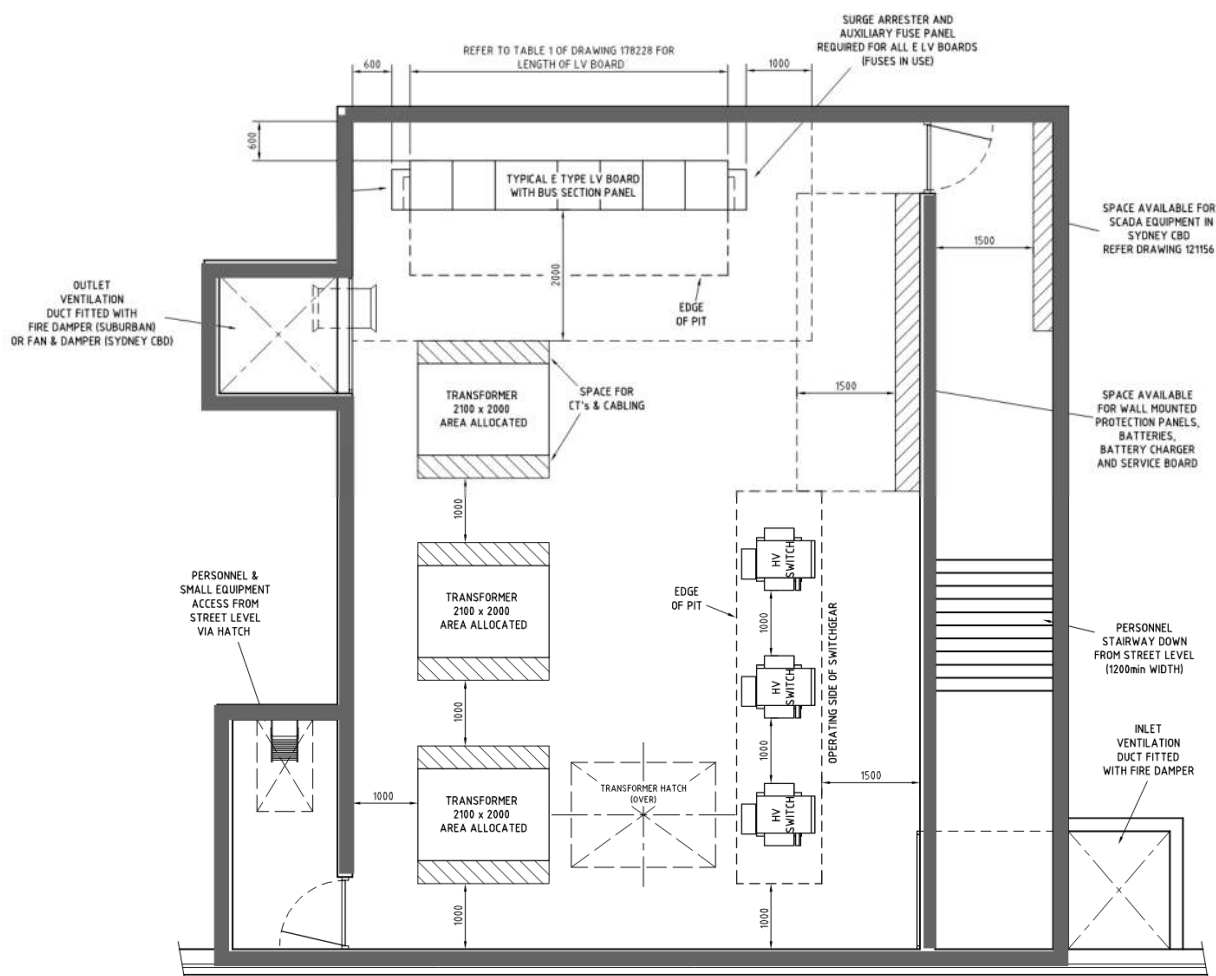


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- A dedicated personnel stairs is required directly from the street frontage.
- Personal access hatch and chamber is required to allow Ausgrid personnel access into chamber as an alternative pathway.
- No awning is allowed above the substations.
- 24hr/7day week access is to be provided from Help Street to the substations.
- Substation frontage to be hardstand and withstand 22 tons of loading.
- All works are to be in accordance with the site specific Ausgrid Design Information Package, Ausgrid Network Standards, and a certified Level 3 design.



Option 2 – Basement Chamber Substation Layout



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Permanent High Voltage Network

To provide electrical supply connections to the development, the existing Ausgrid high voltage underground cables located along the Help Street may be utilised to connect the new Ausgrid substations fronting the site. However, this arrangement and capacity of high voltage cables are subject to suitable spare capacity in the existing HV feeder and Ausgrid's further assessment and approval.

Due to site requiring significant power demand more than 4 MVA with full electric building option, Ausgrid may require a separate high voltage new feeder from the zone substation. This may be a project risk which needs to be considered during the planning phase. Subject to availability of spare HV switchgear within the zone substation, a new underground HV feeder approximately 3.5km run may be required if Ausgrid assesses demand being more than their existing high voltage network fronting Help St or Pacific Highway. This will also increase the project cost significantly.

Subject to Ausgrid's assessment, if the existing high voltage capacity along Help St and Pacific Highway is sufficient to cater for building's demand, then the high voltage joints will be installed within the street footpath to the existing high voltage cables and new cabling installed via underground cables to the new substation infrastructure.

To reduce is the risk of having a new underground HV feeder cable from the zone substation, gas driven home appliances and gas driven F&B commercial kitchen appliances may be considered in lieu of full electric driven appliances.

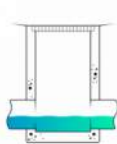
A formal application to Ausgrid is strongly recommended at the early stage of the project to determine the available capacity in the existing HV network and if a new HV feeder is required for the new development. Both options given whether the development will have full electric or natural gas driven appliances, an application to Ausgrid is strongly recommended as early as possible to avoid re-planning and re-budgeting works.



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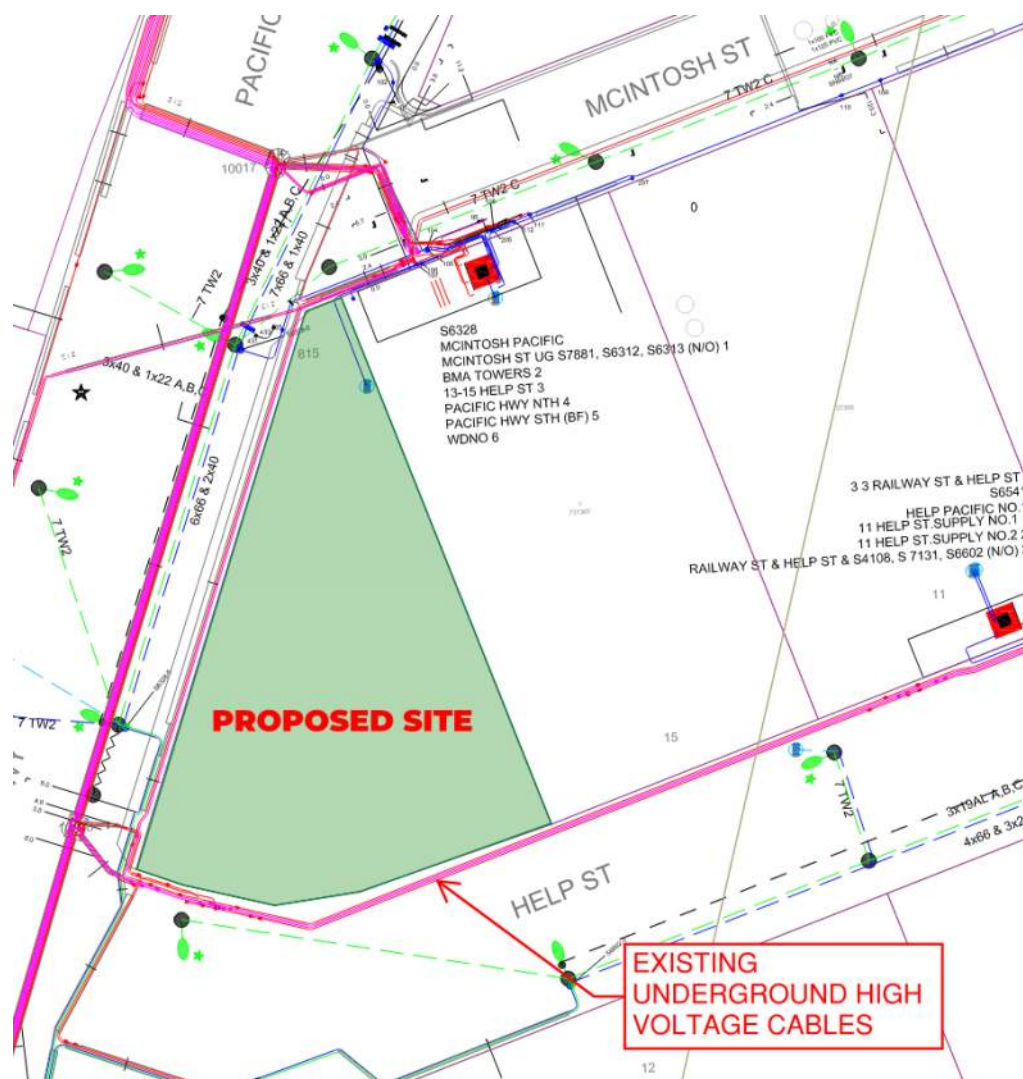


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Proposed High Voltage Mains Map (No new HV Feeder)



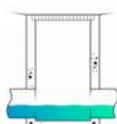
The above sketch assumes the existing HV feeder cables have sufficient capacity to serve the proposed development.



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As an opinion of Costs, we would estimate the above augmentation works to be as follows:

- Establish a new temporary kiosk substation **\$350,000**
- Establish a new surface chamber substation **\$1,350,000**
- Trench for Low and High Voltage new conduits and cable joints - **\$150,000**
- New Low voltage pillar - **\$30,000**
- Ausgrid fees and charges, L3 Design and certification **\$200,000**
- **TOTAL = \$2,030,000**

Notes:

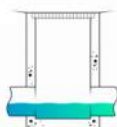
1. The above estimates exclude Contingency and escalation.
2. The above estimates exclude the builder's work and the builder's margins.
3. The above excludes maintenance costs during the DLP period.
4. The above figures exclude any consumer mains, temporary switchboards and building permanent electrical infrastructure.
5. The above figures exclude any cost associated with a new HV Feeder from the zone substation.
6. The above estimates exclude GST.



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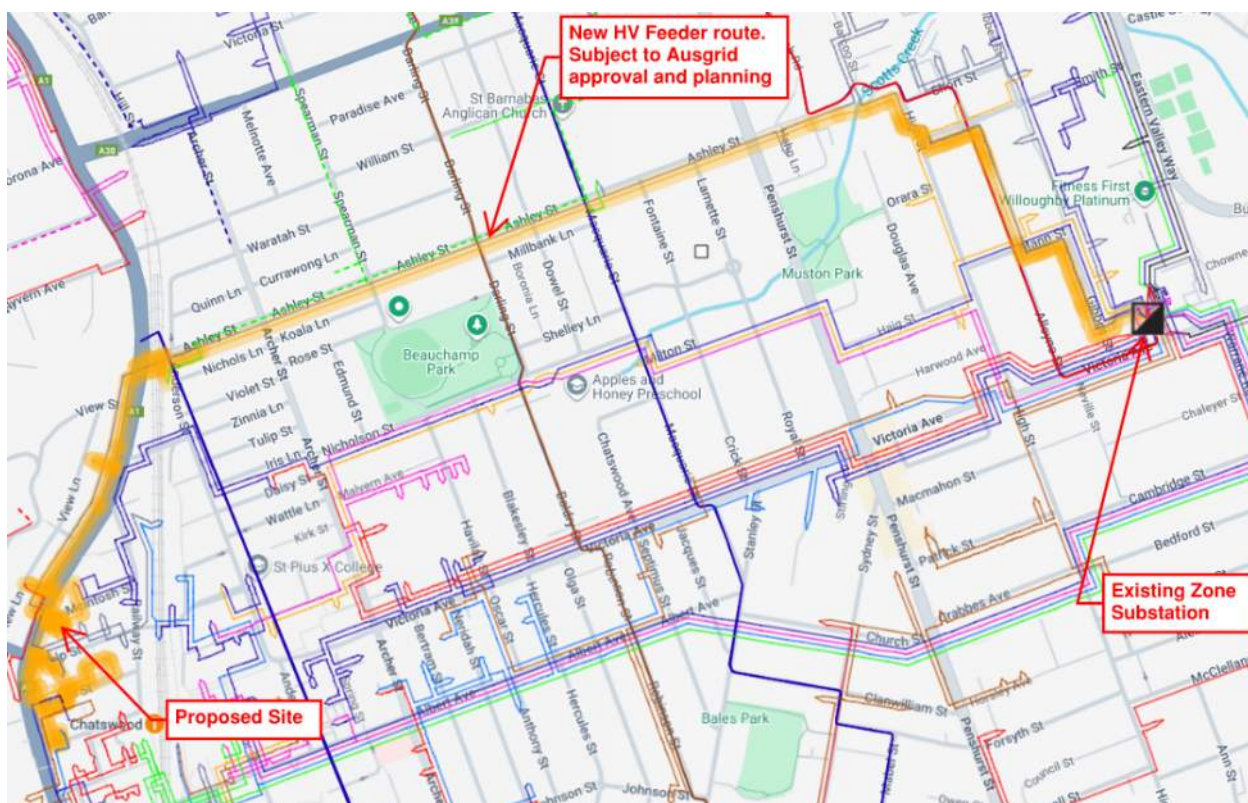


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Proposed New High Voltage Feeder From Zone Substation Map



The above sketch shows the possible new HV feeder cable route from the existing zone substation if Ausgrid determines the development requires a new HV Feeder from the zone substation.

As an opinion of Costs, we would estimate the above augmentation works to be as follows:

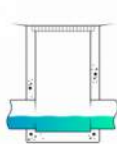
- Trench for new High Voltage feeder and new conduits from substation zone - **\$12,250,000**
- Ausgrid fees and charges, L3 Design and certification **\$400,000**
- **TOTAL = \$12,650,000**



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Notes:

1. The above estimates exclude Contingency and escalation.
2. The above estimates exclude the builder's work and the builder's margins.
3. The above figure assumes there is spare HV switchgear in the zone substation and no modifications works is required within the zone substation.
4. Above figure does not include railway corridor crossing associated fees and any design and documentation for Transport NSW or Sydney Trains.

As JR Engineering group has no control over the cost of labour, materials, equipment or services furnished by others, or over contactors' methods of determining prices, or over competitive bidding or market conditions, any indication of costs is made on the basis of JR Group's experience, and represents reasonable care as a professional engineering consultant, who is familiar with the relevant industry.

JR Group cannot and does not guarantee that proposals, bids or actual construction costs will not vary from the cost indications given. JR Group also requests that the services cost indications given are verified by the client's Cost Consultant.

Existing Telecommunications Carrier Assets

Telstra and NBNCo have existing cables and pits along Help Street.

The existing site is well-served by Telstra and NBNCo via existing conduits and pits.

There is NBNCo and Telstra existing pits fronting Help Street which can likely be utilised for the proposed development.

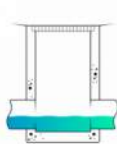
No major augmentation works are likely to be required for the communications lead-in services.



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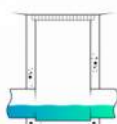
Telstra Mains Map



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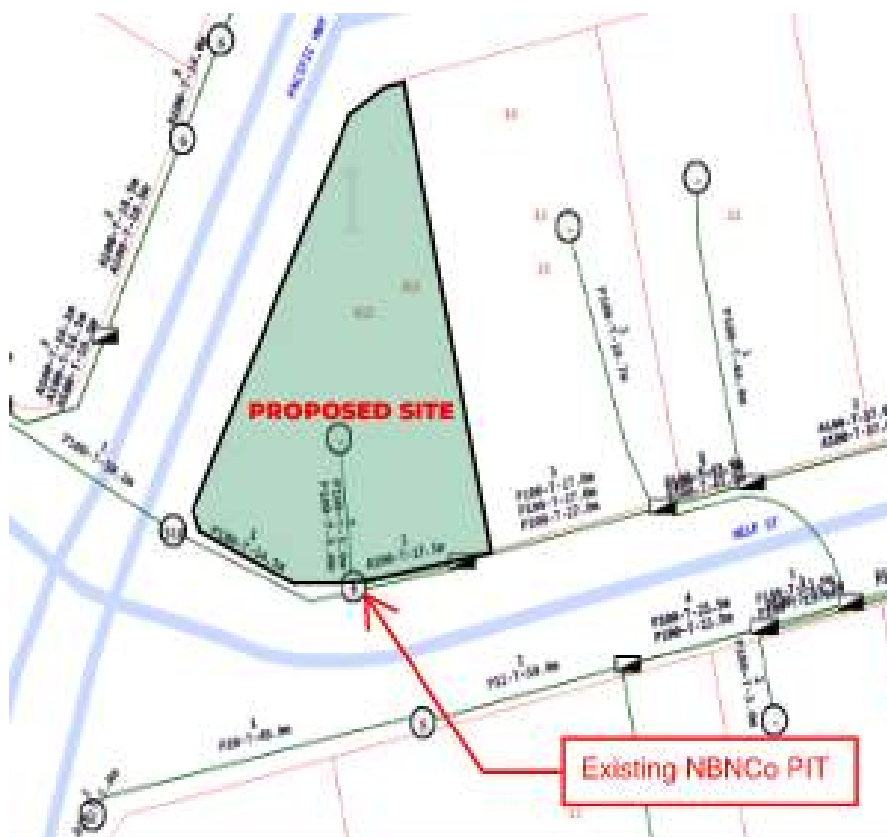


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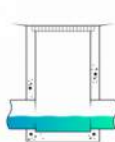
NBNCo Mains Map



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Disclaimer

This report has been prepared in good faith and with due care having regard for the scope of the brief and the timeframe for reporting. It is provided for the information of the party only to whom it is addressed.

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Statement of Limiting Conditions

This report has been prepared on the basis of a desktop review in conjunction with a review of building documentation made available by the Client and its agents within the time available and excludes latent defects.

The report does not represent an in-depth analysis to identify any latent defects in the existing installation nor does it provide a conclusive estimate of the cost of any rectification and/or upgrade works. Such estimates as may be provided are intended to be an indication of the nature of scope of work. No testing of elements or the engineering systems has been carried out for the preparation of this Report, nor have concealed spaces or plant been opened up for inspection.

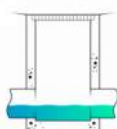
Work on these aspects has not been done by JR Engineering Group and these matters are expressly not dealt with in this report as they require a more comprehensive study than our instructions allow. The opinions expressed in this report are specifically qualified in this way.



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Kind Regards,



James Filby- Browne
Director

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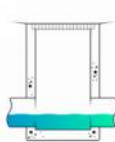
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