



1 KING ST, REDEVELOPMENT  
HYDRAULIC & ELECTRICAL SERVICES ENGINEERING  
INFRASTRUCTURE MANAGEMENT PLAN

DOCUMENT CONTROL SHEET

Title	Infrastructure Management Report
Project	1 King Street, Development
Description	Hydraulic and Electrical Services
Key Contact	Diego Montelvere

Prepared By

Company	JHA
Address	Level 23, 101 Miller Street, North Sydney NSW 2060
Phone	61-2-9437 1000
Email	<a href="mailto:diego.montelvere@jhaengineers.com.au">diego.montelvere@jhaengineers.com.au</a>
Website	<a href="http://www.jhaservices.com">www.jhaservices.com</a>
Author	Diego Montelvere/ Kosma Tzannes
Checked	Patrick Ilagan
Authorised	Diego Montelvere

Revision History

Issued To	Revision and Date								
Concord West Pty Ltd	REV	P1	D						
	DATE	04/11/22	13/03/24						
	REV	B							
	DATE	24/11/22							
	REV	C							
	DATE	18/07/23							

CONTENTS

DOCUMENT CONTROL SHEET .....2

CONTENTS .....2

1. EXECUTIVE SUMMARY .....3

2. INTRODUCTION .....3

2.1 THE SITE ..... 3

2.2 REPORT QUALIFICATIONS..... 3

3. EXISTING INFRASTRUCTURE .....4

3.1 HYDRAULIC INFRASTRUCTURE ..... 4

3.2 ELECTRICAL INFRASTRUCTURE ..... 6

4. PROPOSED INFRASTRUCTURE SERVICES.....7

4.1 HYDRAULIC INFRASTRUCTURE ..... 7

4.2 ELECTRICAL INFRASTRUCTURE ..... 10

5. APPENDIX A – SYDNEY WATER ASSET DRAWINGS..... 13

5.1 OVERALL PLAN..... 13

5.2 LONG SECTION OF LINE 1..... 14



## 1. EXECUTIVE SUMMARY

Concord West Pty Ltd is seeking a proposal to redevelop the existing 1 King St, Concord West site. This report has been prepared in accordance with attachment F – LEP Making Guideline December 2021 – Supporting Technical Information, as outlined by the City of Canada Bay

This report has been prepared by JHA Consulting Engineers to identify and summarise the proposed utility infrastructure requirements which will be incorporated into the design of the proposed 1 King St Redevelopment.

This report demonstrates that the existing authority's infrastructure has adequate capacity to support the proposed redevelopment. This report should be read in conjunction with the Architectural design drawings and other consultant design reports submitted as part of the application.

## 2. INTRODUCTION

This Infrastructure Management Report is submitted to the Council of the City of Canada Bay (Council) to support a request for a Planning Proposal relating to land at 1 King Street, Concord West. The Planning Proposal report prepared by Ethos Urban outlines the proposed amendments to the Canada Bay Local Environmental Plan (CBLEP) 2013. The Planning Proposal is supported by a concept master plan prepared by GroupGSA which will facilitate the following:

- 10 buildings, ranging from 4-12 storeys accommodating approximately 600 dwellings in a range of 1, 2, 3 and 4 bedroom apartments and townhouses.
- New loop road through the site connecting King Street and George Street.
- A total of approximately 69,982m<sup>2</sup> of gross floor area which equates to a floor space ratio of 2.23:1. The gross floor area comprises approximately:
  - 65,641m<sup>2</sup> residential floor area
  - 4,229m<sup>2</sup> non-residential floor area
- A green connection of approximately 2,500m<sup>2</sup> to provide pedestrian and cycle access north-south through the site and including a neighbourhood park.
- A new civic precinct – the 'station precinct' – focused along the active spine and community plaza accommodating a range of non-residential uses (i.e.: retail, food and beverage, gym, health and childcare) at street level.

### 2.1 THE SITE

The site is located at 1 King Street, Concord West. It is legally described as Lot 101 DP791908, approximately 31,390m<sup>2</sup> in area and is the largest landholding in Concord West under single ownership. It is irregular in shape and has frontages to King Street to the north and George Street to the west. The site is currently accessed from King Street at its southern termination point and is primarily occupied by a large footprint office building, previously used as a call centre facility by Westpac. It also accommodates a multistorey carpark, a childcare centre and tennis court.

An aerial photo of the site is shown at **Figure 1**.



**Figure 1 Site aerial**

Source: Nearmap / Ethos Urban

### 2.2 REPORT QUALIFICATIONS

All analysis and investigation undertaken has been done so with an understanding that a high level of seamless integration with the development is achieved.

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

- Water Authority – Sydney Water
- Gas Authority - Jemena
- Electrical Authority – Ausgrid

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.

### 3. EXISTING INFRASTRUCTURE

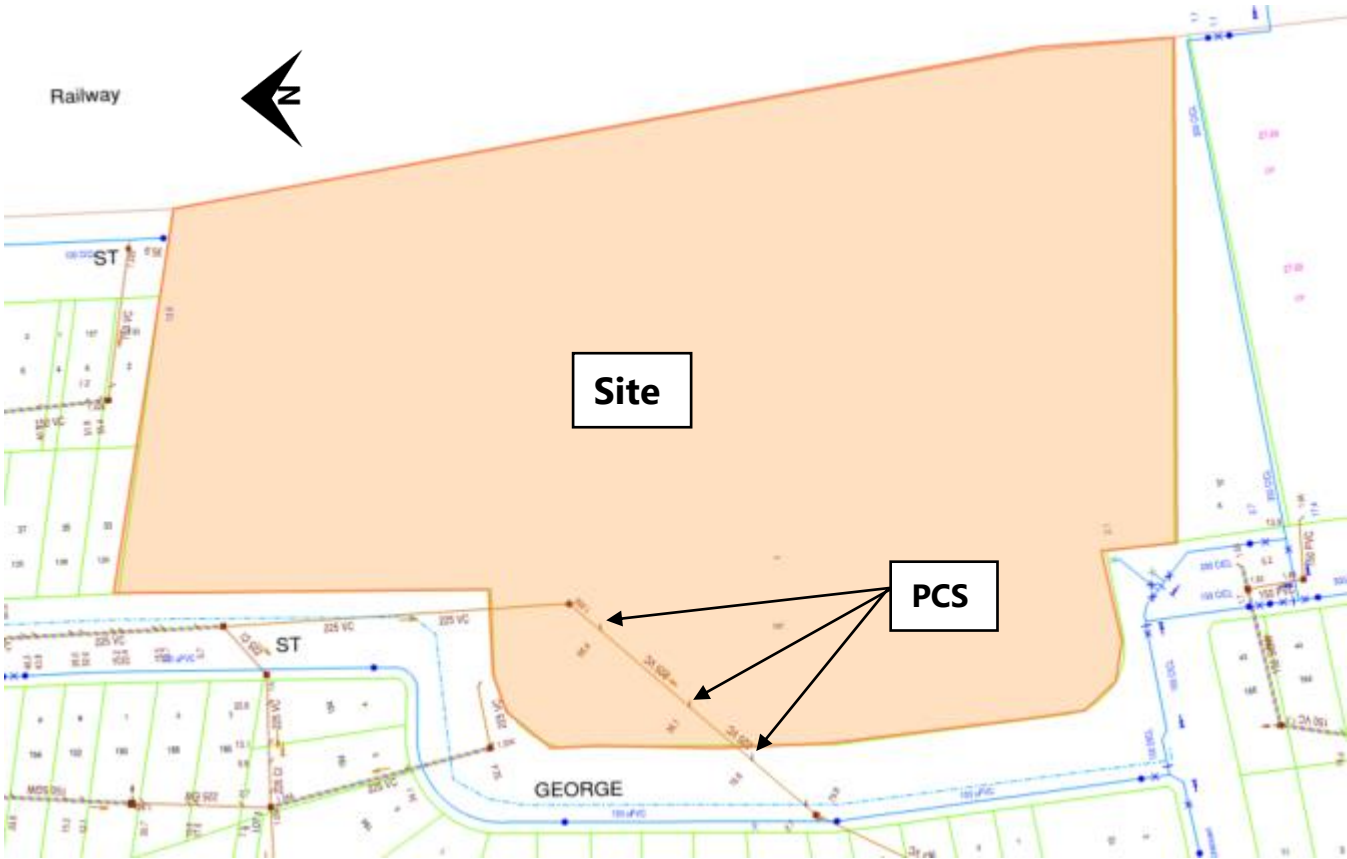
#### 3.1 HYDRAULIC INFRASTRUCTURE

##### 3.1.1 SEWER DRAINAGE

The existing 1 King St site is gravity drained by a single Ø225mm authority sewer main, extending through along George St and the western boundary of the site.

It is also noted that there are 3 x Property Connection Services (PCS) provided to the 1 King St site from the existing authority sewer main

Diagram 3.1.1 below, illustrates the surrounding authority sewer mains.

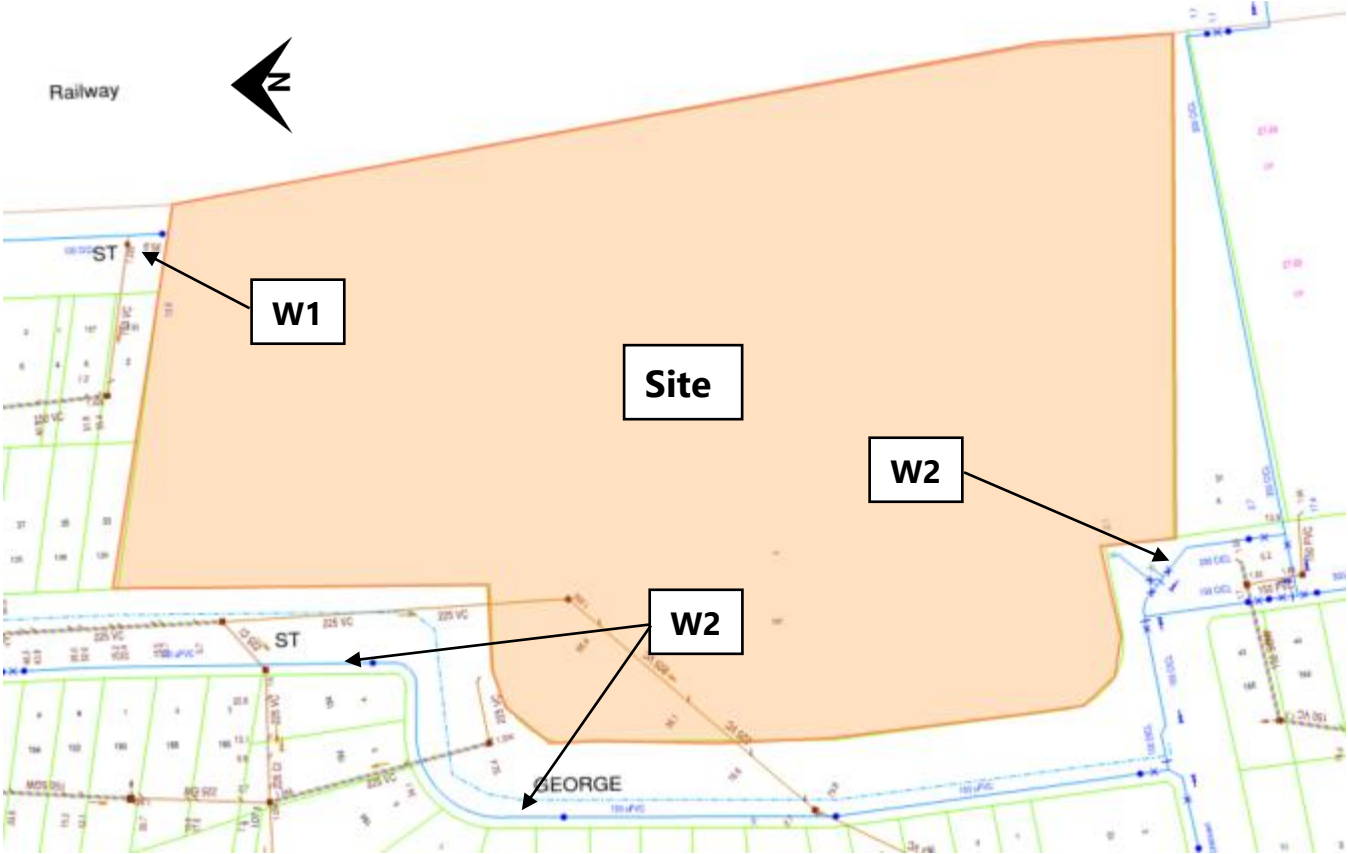


##### 3.1.2 POTABLE WATER

The existing 1 King St site has frontage to the following authority water mains:

- Ø100mm CICL main in King St (W1)
- Ø100mm uPVC main in George St (W2)
- Ø200mm CICL main in George St (W3)
- 

Diagram 3.1.2 below, illustrates the surrounding authority water mains.





### 3.1.3 GAS SERVICES

The existing 1 King St site has frontage to the following authority natural gas mains:

- Ø32mm Nylon, 210kPa main in King St (G1)
- Ø1100mm Nylon, 210kPa main in George St (G2)
- Ø1500mm Steel, 1,0500kPa trunk main in George St (G3)

Diagram 3.1.3 illustrates the location of the existing authority gas mains.



### 3.2 ELECTRICAL INFRASTRUCTURE

#### 3.2.1 HIGH VOLTAGE INFRASTRUCTURE

The subject site is currently encumbered by existing Ausgrid infrastructure assets in the form of two (2) kiosk substations and associated underground cabling, located along the western side of the site (S.3011 George Rothwell No.1 and S.3023 George Rothwell No.2).

These existing kiosk substations are understood to be dedicated to the site providing Low Voltage (LV) power. High Voltage (HV) supply connections to these substations from the existing Ausgrid network is provided from George Street via underground cables and ducts located under an Electrical easement in favour of Ausgrid.

Existing High Voltage Ausgrid assets reticulate below ground along the George Street frontage of the site, outside of the development boundary within public footpath.

There is also an existing Ausgrid Zone Substation located directly to the south of the site for overall reference of infrastructure. Zone Substations typically have several HV feeders reticulating in the area surrounding and, in this instance, amalgamate within George Street.

As part of the proposed redevelopment works, existing substations S.3011 and S.3023 will require decommissioning and removal from site.

#### 3.2.2 LOW VOLTAGE INFRASTRUCTURE

The subject development site is currently a single large lot and is supplied LV power from existing substations on site.

There is also an existing underground service connection towards the north of the site extending from an existing timber pole in George Street which will require removal as part of the new development works.

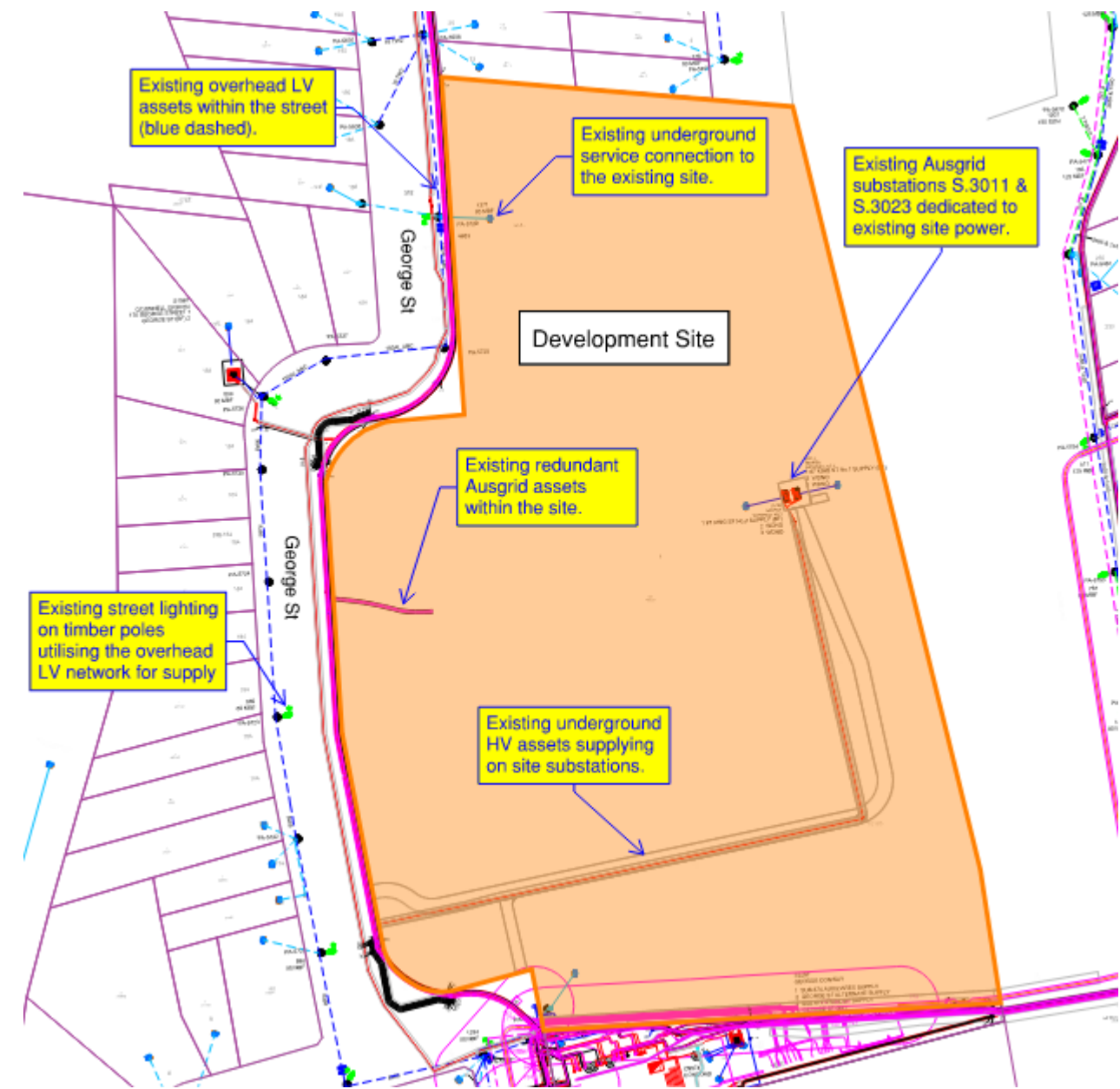
Existing low voltage Ausgrid assets reticulate around the perimeter of the site within George Street outside of the development boundary within public footpath and roadways as overhead assets utilising timber poles.

#### 3.2.3 MISCELLANEOUS INFRASTRUCTURE

The site also is encumbered by a small section of existing redundant Ausgrid HV cables, Aux communication cables, and ducts, likely from Ausgrid infrastructure that has since been removed from the site. These redundant assets will also require removal from the site.

#### 3.2.4 STREET LIGHTING INFRASTRUCTURE

Existing Ausgrid street lighting assets currently provide illuminance to the area surrounding the development site. These includes and street lighting luminaires attached to timber poles along George Street supplied by existing overhead LV aerial cables.



Existing Ausgrid Network Assets (Ausgrid GIS Extract 13/09/2022)

4. PROPOSED INFRASTRUCTURE SERVICES

4.1 HYDRAULIC INFRASTRUCTURE

4.1.1 SEWER DRAINAGE

4.1.1.1 Connection Point

Sewer drainage for the mixed-use development will utilise the existing 3 x Ø225mm connections to authority sewer mains. No additional connections to authority lines will be required.

It is anticipated that all sanitary fixtures located on ground level and above, can gravity drain to the sewer main in George St, as this is the lowest point of the existing site.

4.1.1.2 Load Estimation

A preliminary load analysis has been undertaken and the following sewer discharges have been calculated:

Calculated EP's Residential	Calculated EP's Retail	Sub – Total EP's
1,500	211	1,711
Total		1,711

4.1.1.3 Adequacy of Authorities Infrastructure

Sydney Water As- Built documentation indicates that the existing Ø225 sewermain running along George St, has laid at 1:200, or 0.5% fall Based on the load estimates, and in accordance with Water Supply Code of Australia (WSA 02), Sydney Water Edition, the existing Ø225 sewer mains is adequate to serve the development, without the need for amplification. Refer to below extract

DN 225	1 in 270	0.37%	1,600
	1 in 250	0.40%	1,700
	1 in 200	0.50%	1,950
	1 in 150	0.67%	2,350
	1 in 125	0.80%	2,650
	1 in 100	1.00%	3,025
	1 in 80	1.25%	3,450
	1 in 60	1.67%	4,100

The above load estimates does not however consider any upstream flows; therefore, further investigations with Sydney Water are required to determine the upstream flows and confirm whether any amplifications are required.

4.1.2 WATER SUPPLY

4.1.2.1 Connection Points

Potable water is proposed to be provided from the Sydney Water potable watermain in George St, by utilising the existing connection points.

The need for amplification will be confirmed with Sydney Water via the Section 73 application, after receiving development approval; however as per current Sydney Water codes, it is anticipated that the existing Ø200mm CICL watermain in George St is adequate to satisfy the potable demands of the project

4.1.2.2 Load Estimation

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

- Average daily demand – 283kL
- Average flow – 3.28 l/s
- Peal flow – 16.40 l/s

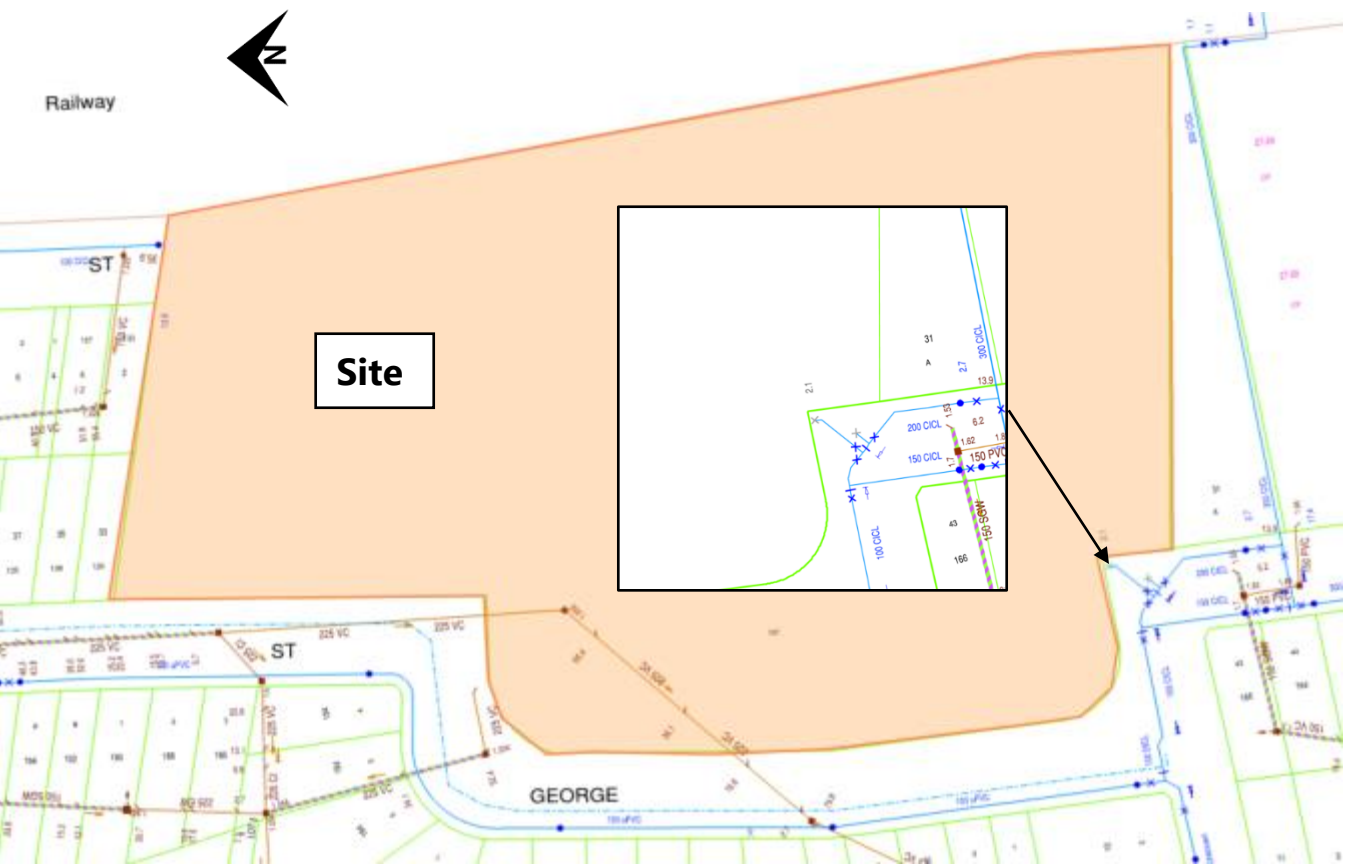
4.1.2.3 Adequacy of Authorities’ Infrastructure

Based on the size of the supply watermain it is anticipated that flows can be achieved. Pressure boosting pumps will be required to boost low towns mains pressures and ensure adequate pressure are received at the upper most floors of the proposed residential towers.

In accordance with the Water Supply Code of Australia (WSA 03), Sydney Water Edition, amplification is not anticipated. Refer to extract below

Multiple developments of high density residential (≥ 8 storeys)	200 or 225 <sup>(2)</sup> If a 100 or 150 mm main currently fronts a proposed development and the hydraulic capacity is sufficient to serve the property's domestic future demand, then the existing main will be deemed acceptable until the main requires renewal. The developer might upgrade the existing pipe size for other reasons – this is subject to Water Agency agreement.	250 or 280 <sup>(2)</sup> If a 125 or 180 mm main currently fronts a proposed development and the hydraulic capacity is sufficient to serve the property's domestic future demand, then the existing main will be deemed acceptable until the main requires renewal. The developer might upgrade the existing pipe size for other reasons – this is subject to Water Agency agreement.
---	---	---

The below snapshot illustrates the existing connection from the existing Ø200mm watermain, which are proposed to be utilised





### 4.1.3 GAS SUPPLY

#### 4.1.3.1 Connection Points

It is noted that natural gas is to the development shall only be provided to the retail portion of the development, from the existing Ø110mm Nylon, 210kPa main in King St. Full electrification of the residential buildings is proposed.

#### 4.1.3.2 Load Estimation

A preliminary gas load analysis has been undertaken and the following estimated usages have been calculated:

- Supermarket – 40m<sup>3</sup>/hr
- Retail Tenancies x 8– 16m<sup>3</sup>/hr (each)

The total diversified (50%) peak gas load is estimated to be 84m<sup>3</sup>/hr

### 4.1.4 ADEQUACY OF AUTHORITIES INFRASTRUCTURE

Given the relatively low gas demand and the calculated capacity of the Ø110mm, 210kPa gas main (more than 2,000m<sup>3</sup>/hr), the surrounding main are appropriate to meet the gas needs of the proposed development. The adequacy of the supply main will be formally confirmed with Jemena prior to construction certificate.

4.2 ELECTRICAL INFRASTRUCTURE

4.2.1 ELECTRICAL DEMAND LOADINGS

A site-specific preliminary maximum demand was calculated to determine the potential anticipated demand for the proposed development. From this it was determined the optimum demand for the site is anticipated to be approximately 6.0 MVA.

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

On the strength of the above, the constraints set by Ausgrid regarding their chamber substation firm ratings, and consideration towards futureproofing the installation, the following authority electrical infrastructure will be required for the Eden Street development:

Eden Street Development	Approx. Amp Rating	Approx. Firm KVA Rating
Ausgrid 3 TX Custom Chamber	5,500A Firm	3.8MVA
Ausgrid 3 TX Custom Chamber	5,500A Firm	3.8MVA
Total Capacity	11,000A Firm	7.6MVA
Required Capacity		~6.0MVA
Spare Capacity		~1.6MVA

These substations are standard fixed sizes from Ausgrid and are the only available in discrete step sizes. These discrete step sizes are quite large, which yields the spare capacity noted above.

The buildings power distribution system can be summarised as follows:

- Two (2) Ausgrid custom surface / basement chamber substations within the building envelopes
- Each substation shall be firm rated in accordance with NS109 with a rating of 5,500A
- Connected LV Main Switchboards to service the building will be documented by others.

Formal load demand calculations are advised to be undertaken by a qualified Electrical Consultant to confirm the above load arrangements and requirements for infrastructure.

4.2.2 HV FEEDER CONNECTIONS & RETICULATION

To provide electrical supply connections to the proposed development, it is proposed the existing Ausgrid High Voltage (HV) feeders located within George Street will be utilised to connect the new Ausgrid chamber substations proposed along the George Street frontage of the site. This arrangement is subject to suitable spare capacity in the existing HV feeder and Ausgrid design acceptance.

High voltage joints will be installed within George Street footpath to the existing high voltage feeders and new cabling installed underground to the new substation infrastructure.

Should Ausgrid determine new HV feeder infrastructure is required to be installed to the site for the indicated load demands, this will likely be from the existing Zone Substation ZN.874 Concord located directly adjacent and

to the south of the development site. The location of the existing zone substation will minimise the length of any new HV feeder works including trenching and costs.

A formal application will be required for submission to Ausgrid to determine the available capacity in the existing HV network and to confirm viability of the proposed substation infrastructure for the development site.

4.2.3 AUSGRID SUBSTATION ARRANGEMENTS

The design team has considered several options for substation locations and have determined the new Ausgrid substation infrastructure will be in the form of either two (2) customer surface or basement chamber substations along the George Street frontage.

The following are general spatial requirements/principles adopted for the proposed basement and surface chamber substations:

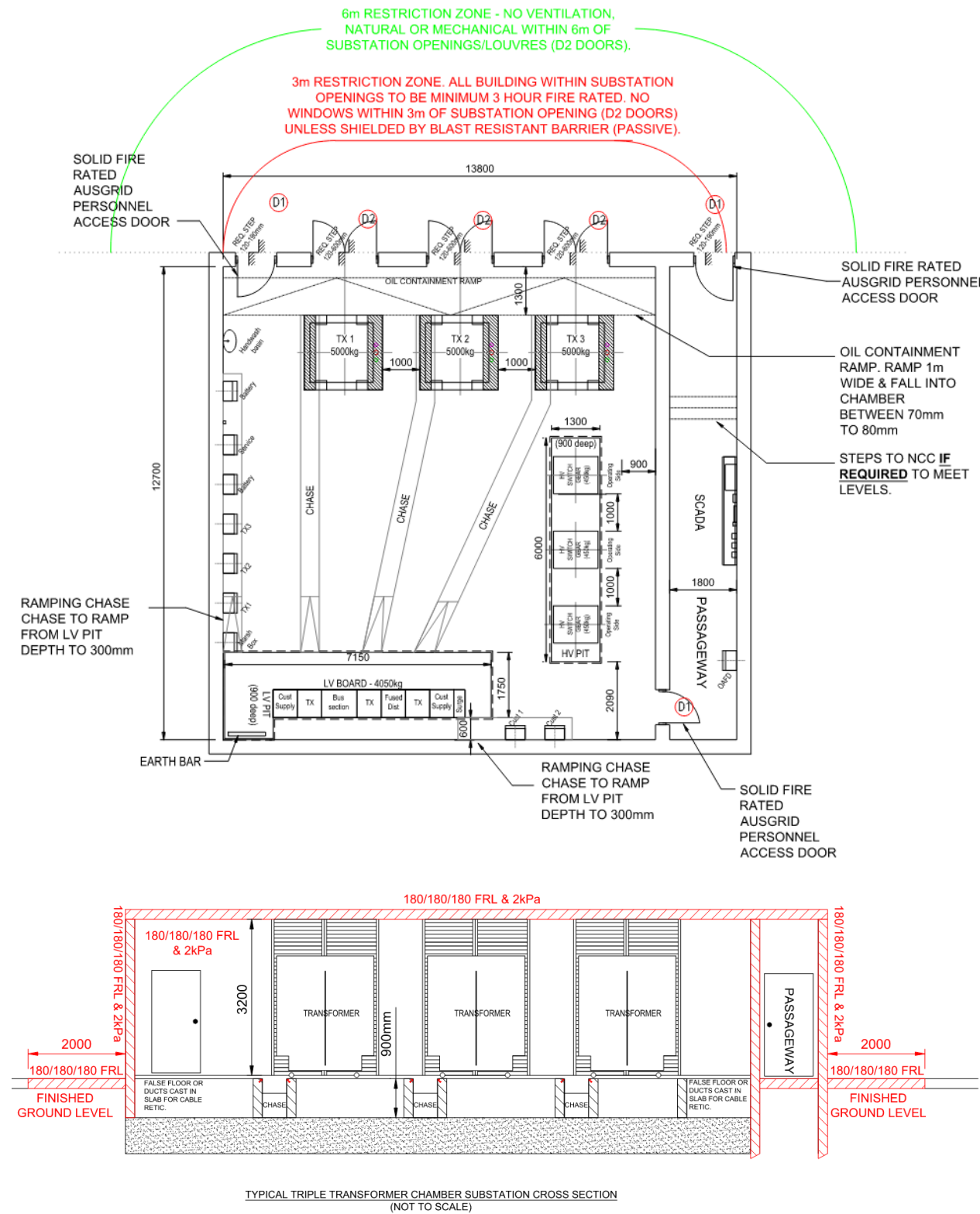
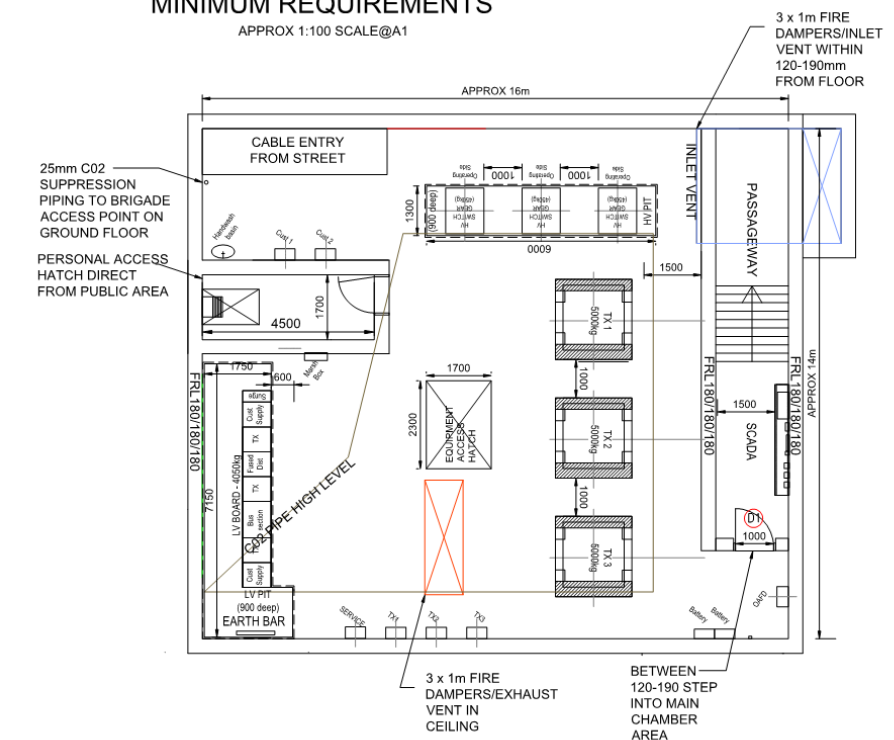
- Surface Chamber Substation (3 x 1000kVA Transformers)
  - Chamber rooms (160m<sup>2</sup> each) to be established at Ground Level, within the building envelope facing a public roadway
  - All substation structural and architectural elements will require a fire rating of minimum FRL 180/180/180 and a blast rating of 2kPa
  - A transformer handling area in front of the chambers is to be provided to Ausgrid’s requirements. Ausgrid generally use a Franna crane for moving large equipment in and out of the substation using and require a minimum 4.0m head height clearance for the full width of the chamber room from the boundary
  - Where the substations are not located directly on the property boundary, a minimum 4.0m wide x 4.0m high clear right-of-way will be required from the public road to the substation façade
  - The substations will be naturally ventilated using louvers for the entire façade of the substation. All building elements within 3m of the substation are to be 3hr fire rated; and all other building ventilation openings (natural or forced) is to be at least 6m from the substation louvers.
  - 24hr/7day week access is to be provided from George Street to the substation from the boundary for heavy vehicle movement and personnel access to the substation
  - All works are to be in accordance with the site specific Ausgrid Design Information Package, Ausgrid Network Standards, and a certified Level 3 design

### Basement Chamber Substation (3 x 1500kVA Transformers)

- Chamber room is to be established on Level B1, within the building envelope close to a public road
- All substation structural and architectural elements will require a fire rating of minimum FRL 180/180/180 and a blast rating of 2kPa
- Equipment and personnel access will be through dedicated hatches/shafts at Ground Level to be access using a Franna Crane and Ausgrid vehicles
- A transformer handling area in front of the equipment hatches is to be provided to Ausgrid's requirements. Ausgrid generally use a Franna crane for moving large equipment in and out of the substation using these hatches and require a minimum 4.0m head height clearance
- A dedicated access door will be required via dedicated stairwell providing free Ausgrid access from Ground Level. These accessways are dedicated to the substation and are not to lead to any other portion of the building
- The substation will be naturally ventilated through dedicated ventilation shafts at a minimum 3m above the ground. The substation will have a dedicated intake shaft and exhaust shaft (2 vent shafts in total). Shaft discharges are to be spaced a minimum 6m apart. All building elements within 3m of a ventilation shaft's discharge are to be 3hr fire rated and all other building ventilation is to be at least 6m from a vent shaft's discharge.
- 24hr/7day week access is to be provided from George Street to the hatches and doorways at Ground Level for heavy vehicle movement to the substation hatches
- A dedicated CO2 injection system shall be installed for fire suppression to Ausgrid requirements. The injection point shall be in an accessible location from the Ground Level area
- All works are to be in accordance with the site specific Ausgrid Design Information Package, Ausgrid Network Standards, and a certified Level 3 design

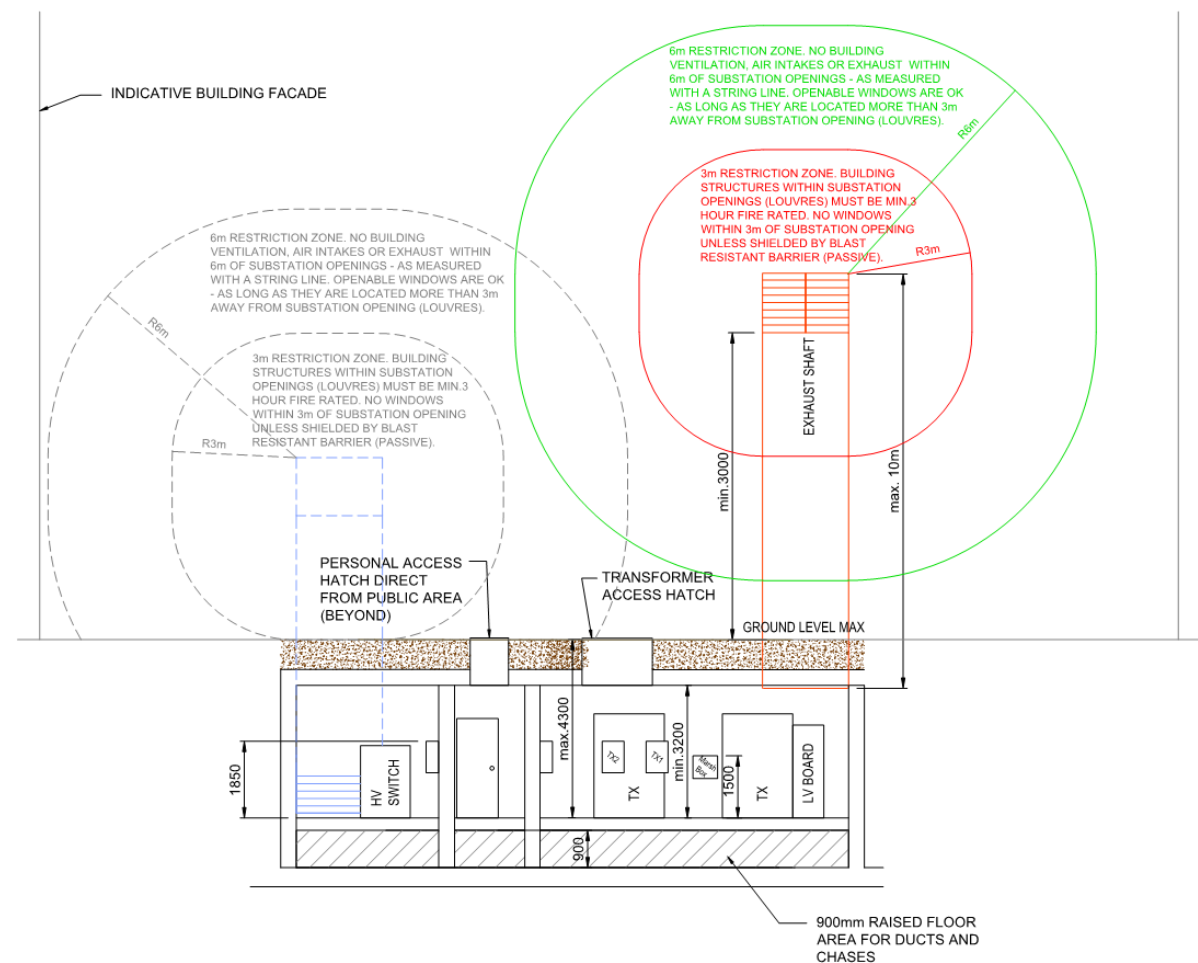
### TRIPLE TRANSFORMER BASEMENT CHAMBER MINIMUM REQUIREMENTS

APPROX 1:100 SCALE@A1



Typical 3 x Transformer Surface Chamber Layout





*Typical 3 x 1500kVA Transformer Basement Chamber Layouts*

#### 4.2.4 AUSGRID OVERHEAD ASSET RELOCATIONS

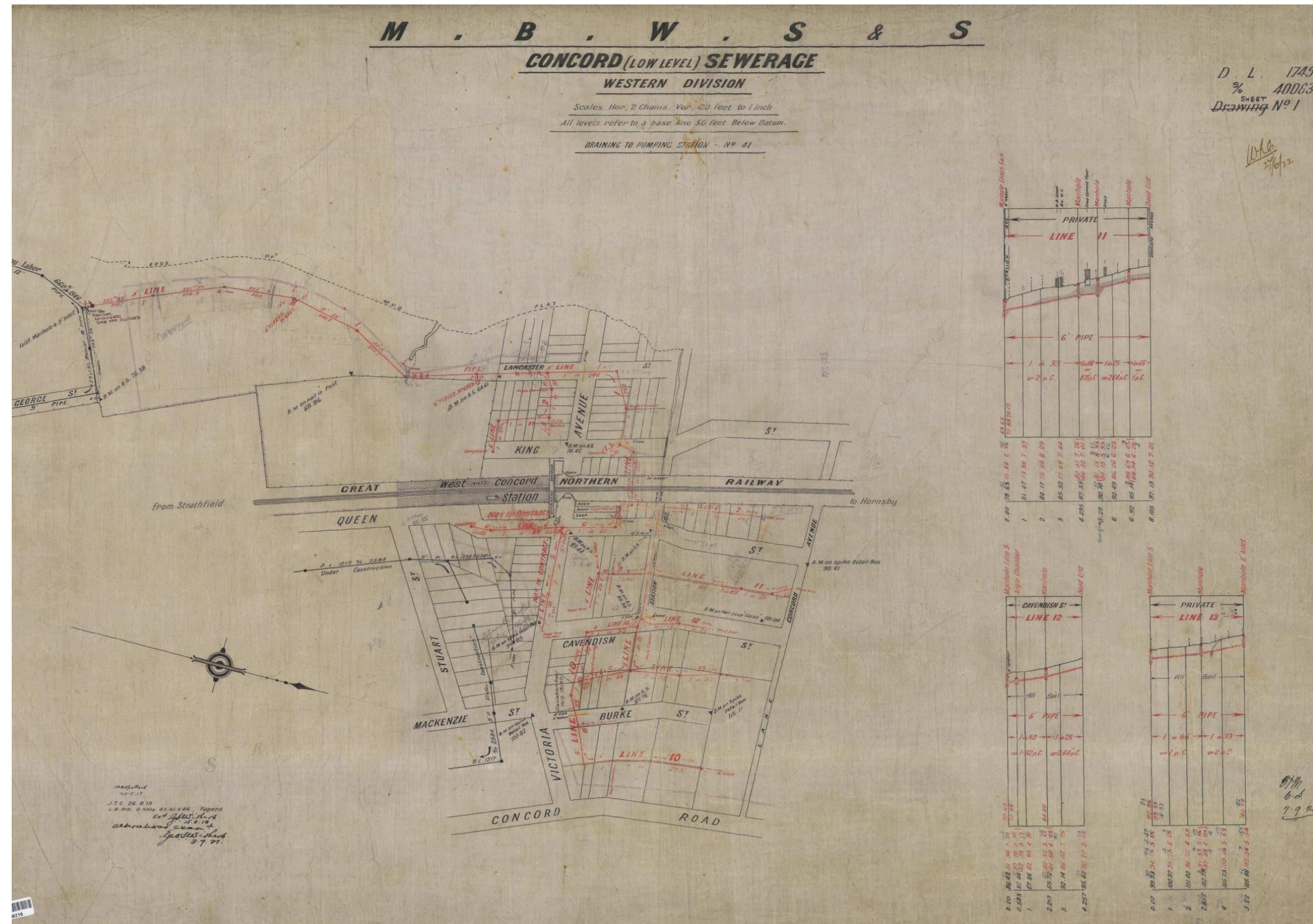
As is typical with most new high-rise developments, the local Council can request for any existing Electrical overhead conductors along the site frontage to be relocated underground.

This requirement will also be accompanied with the requirement to upgrade lighting around the local streets to a Council requested AS/NZS1158 compliance level. These lighting level category requirements will dictate the number and spacing of any new street lighting infrastructure. To achieve the underground asset arrangement, all street light poles will be of the standard Ausgrid steel column arrangement.

All street lighting works will be in accordance with the City of Canada Bay Council requirements.



## 5.1 OVERALL PLAN





**JHA**

