

Adina Central Station

Civil, Electrical & Hydraulic

Services Infrastructure Statement

Prepared for: Toga Group

Attention: David McLaren

Date: 9th September 2020

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Revision

Site Address: Adina Central Station
Proposed Development: Mixed Used Development
Client: Toga Group
Local Authority: City of Sydney
Authority Reference #: N/A
Stantec Reference: 44091-MD-RE-007



Ian Harris Beng (Hons)
For and on behalf of
Stantec

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1. Introduction

The purpose of this report is to provide the Toga Group with information on the current provision and condition of the existing public utilities and likely authority requirements to support the re-development of the Adina Central project. The report also identifies opportunities for utility infrastructure provision for future development of the sites.

This report is based on the following sources of information:

- Dial Before You Dig information
- Publicly available information

At this time no discussions have been had with authorities for the project. The expectation is that once the risks and opportunities are defined and communicated to internal stakeholders, the strategy and approach to instigating discussions with external stakeholders will be developed.

Limitations of this report are as follows:

- No calculations were performed to check system capacities
- No taking or testing of material samples was carried out
- All information provided by others, particularly verbal information, has been taken at face value
- No testing for or advice is provided with respect to asbestos, microbiological or other contaminants
- No detailed survey and detailed authority information is available
- No formal discussions with Authorities (feedback only available through a formal submission)



2. Site Information

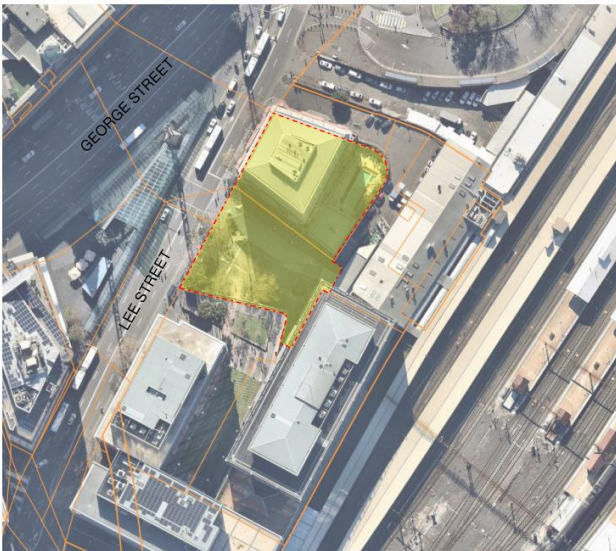
The site is located on Lee Street directly adjacent to the Central train station.

We confirm that the project comprises of the development of a mixed use building consisting of a retail base with commercial and hotel tower. The approximate GFA is 41,000m² (excluding 2000m² retail GFA within Henry Dean Plaza) with shared basement levels below.

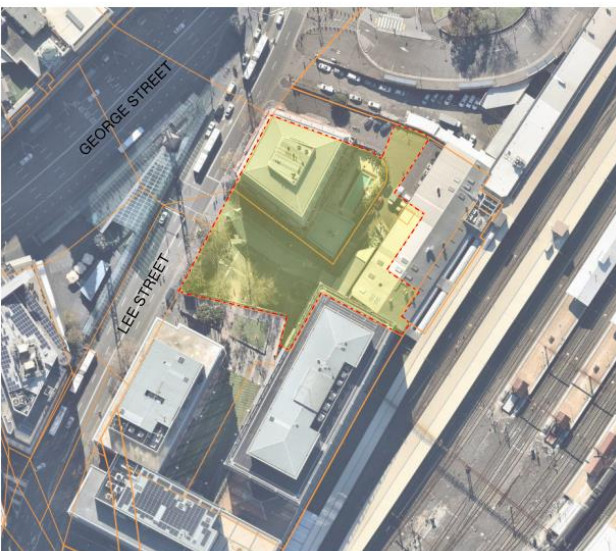
The summary of the GFA is

- 28,000m² office GFA
- 12,000m² Hotel GFA
- 1,000m² retail GFA
- 2,000m² retail GFA in Henry Deane Plaza

The image below indicates the sites location.



Site Extent above RL19.10m AHD (Source: Nearmaps 2019)



Site Extent below RL19.10m AHD (Source: Nearmaps 2019)



3.1.3 Stormwater Detention

City of Sydney Council specify in their technical specification that:

- Compliance is required with the Sydney Water on site detention requirements;
- For kerb outlets the maximum permitted discharge from any property is 25 litres per second for storms up to and including the 20yr ARI;

Sydney Water state in their On-site Stormwater Detention guidelines:

To determine your PSD and SSR, email the Land and Waterways team at stormwater@sydneywater.com.au with the following information about your site:

- development address
- total site area (m²)
- existing pre-development impervious area (m²)
- proposed post-development impervious area (m²)

We will then calculate and inform you of the PSD and SSR for your site.

From recent projects in the area the following PSD and SSR rates are likely to apply:

Site Storage Rate (SSR) 154m³/ha

Permissible Site Discharge (PSD) 368L/s/ha

Based on the development sites total area of 4,784m² the following would apply:

SSR: 73.7m³

PSD: 176L/s

3.1.4 Stormwater Quality Treatment

City of Sydney Council specify in their technical specification that:

- The device shall be designed to achieve 100 years life expectancy
- The device shall remove no less than, 70% of all particles between 0.125mm and 5mm in size and 90% of particles greater than 5mm in size
- The device shall remove 30% of Total Phosphorus
- The device shall treat the 3 month ARI design flow rate with high flows bypassing the device
- The device shall be sized for a 6 month cleaning interval
- Devices shall have non-blocking self-cleaning screens; and
- Total pollutant storage volume per device shall not exceed 3 cubic metres and shall not be less than 0.7 cubic metres
- Devices shall have a high flow bypass
- Surcharging of devices onto roads as a bypass method shall not be permitted and devices shall not at any time cause surcharging; and
- Devices shall be designed in a manner that minimises blockage of the device or remobilisation of pollutants.



Water quality can be provided in the form of the following treatment methods:

- Filtration sacks in stormwater pits
- Filter cartridge units
- Biofiltration basins
- Raingardens
- Gross Pollutant Traps
- Rainwater Tanks

To minimise the special impact of Water Quality Treatment infrastructure filter units are commonly adopted for mixed-use developments such as this site as space will be a premium. However, there are opportunities to provide water quality treatment within the public plaza areas proposed on the development. Rain gardens and Bio-filtration trenches can be integrated into the podium plazas and provide a more environmentally sustainable method for treating pollutants contained within stormwater runoff.



4. Flooding

4.1 Existing Flooding

The development site is located within the Darling Harbour catchment. Flows from this catchment are conveyed in a north westerly direction towards the harbour located to the north west of the site.

Modelling of the flood impacts through this catchment has been undertaken and recorded in the Darling Harbour Catchment Flood Study prepared by BMT WBM for City of Sydney Council.

An extract from Council's flood model is shown below which identifies the flood impact on the proposed development site.



Extracts from Darling Harbour Catchment Flood Study

The modelling indicates that the site is flood impacted. Review of the flood mapping would suggest that during a 100 year flood event water would be trapped and stored on the site until such time as the in ground drainage can convey the flood water from the site. Any change to this flood storage volume is likely to have adverse flood impacts upstream and downstream of the development, these impacts would need to be considered during the DA phase and submitted to council as part of the application. Council would need to approve this prior to conditions being released for the development.

4.1.1 Flood Planning Impacts

Council set minimum flood planning requirements for developments affected by floodwater in their Interim Floodplain Management Policy. This section discusses these requirements and their impact on the development site.

Flood Planning Levels

Council set minimum freeboard requires in Section 5 of their Interim Floodplain Management Policy. An extract of this table is included below.

Development		Type of flooding	Flood Planning Level
Residential	Habitable rooms	Mainstream flooding	1% AEP flood level + 0.5 m
		Local drainage flooding (Refer to Note 2)	1% AEP flood level + 0.5 m or Two times the depth of flow with a minimum of 0.3 m above the surrounding surface if the depth of flow in the 1% AEP flood is less than 0.25 m
		Outside floodplain	0.3 m above surrounding ground
	Non-habitable rooms such as a laundry or garage (excluding below-ground car parks)	Mainstream or local drainage flooding	1% AEP flood level
Industrial or Commercial	Business	Mainstream or local drainage flooding	Merits approach presented by the applicant with a minimum of the 1% AEP flood level
	Schools and child care facilities	Mainstream or local drainage flooding	Merits approach presented by the applicant with a minimum of the 1% AEP flood level + 0.5m
	Residential floors within tourist establishments	Mainstream or local drainage flooding	1% AEP flood level + 0.5 m
	Housing for older people or people with disabilities	Mainstream or local drainage flooding	1% AEP flood level + 0.5 m or a the PMF, whichever is the higher
	On-site sewer management (sewer mining)	Mainstream or local drainage flooding	1% AEP flood level
	Retail Floor Levels	Mainstream or local drainage flooding	Merits approach presented by the applicant with a minimum of the 1% AEP flood. The proposal must demonstrate a reasonable balance between flood protection and urban design outcomes for street level activation.
Below-ground garage/ car park	Single property owner with not more than 2 car spaces.	Mainstream or local drainage flooding	1% AEP flood level + 0.5 m



Development		Type of flooding	Flood Planning Level
	All other below-ground car parks	Mainstream or local drainage flooding	1% AEP flood level + 0.5 m or the PMF (whichever is the higher) See Note 1
	Below-ground car park outside floodplain	Outside floodplain	0.3 m above the surrounding surface
Above ground car park	Enclosed car parks	Mainstream or local drainage flooding	1% AEP flood level
	Open car parks	Mainstream or local drainage	5% AEP flood level
Critical Facilities	Floor level	Mainstream or local drainage flooding	1% AEP flood level + 0.5m or the PMF (whichever is higher)
	Access to and from critical facility within development site	Mainstream or local drainage flooding	1% AEP flood level

Minimum Freeboard Requirements (Source: Interim Floodplain Management Policy)

Critically for the proposed development will be the habitable floor level freeboard requirement above the flood waters within the public road corridors. For residential development a freeboard of 0.5m should be provided above the 100 year flood level, for commercial this can be reduced to being above the 1% EAP (100 Year design flood level). This would set the ground floor levels for the at RL14.33m and RL13.83m AHD respectively.

Entrance to underground car parking would need to be set at RL14.34m as to would any critical infrastructure situated on ground floor such as a substation.

Flood Impact Statement

As part of the Development Application documentation a Flood Impact Statement should be prepared. For the development. This statement should cover:

- Description of the Flood Regime (Similar to above)
- Proposed Floor Levels
- Description of how building component relate to flood impact
- Impact of the development on existing flooding (2D flood modelling)
- Flood Evacuation

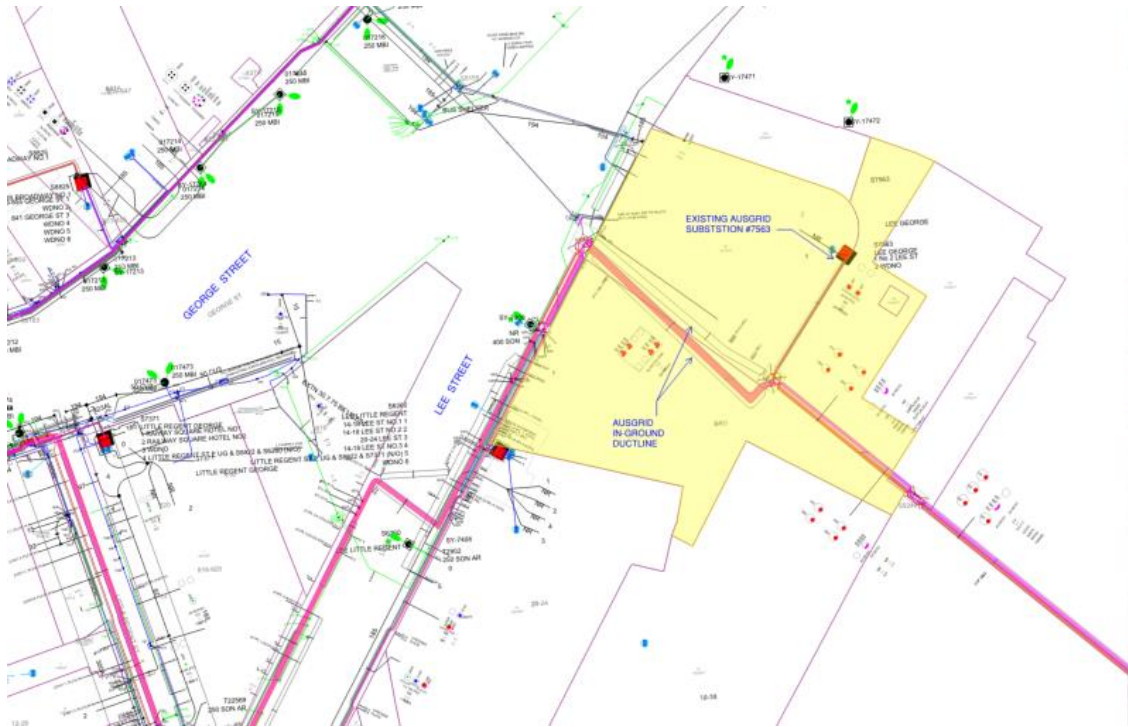


5. Electrical Services

5.1 High Voltage Network

5.1.1 Existing Supply Authority Network

The Supply Authority for the area is Ausgrid. The site is currently supplied from Ausgrid substation #57563 (Lee_George) and is rated at 1,200A (fused supply)



Ausgrid assets in vicinity of the Development Site

It is noted that there are two large Ausgrid duct-lines traversing the site. One of the duct lines contains asbestos. Ausgrid records did not show depths of duct lines and there is a likelihood that they could impact any planned basement excavations.

There are no overhead services (power and Carrier Services) on Lee Street that would require undergrounding



Street View : Lee Street

5.1.2 Calculated Maximum Demand

The calculated maximum demand for the proposed development is 4.3MVA (5,955 Amps/phase). A breakdown of the demand is depicted below:

USE	AREA (m ²)	VA/m ²	POWER TOTAL (VA)
Commercial	28,000	100	2,800,000
Hotel	12,000	75	900,000
Retail	3,000	200	600,000
TOTAL			4,300,000 VA

It is noted that the applied VA/m² rate would be appropriate for technology tenants.

5.1.3 Substation and HV Augmentation Requirements

Substation Requirements

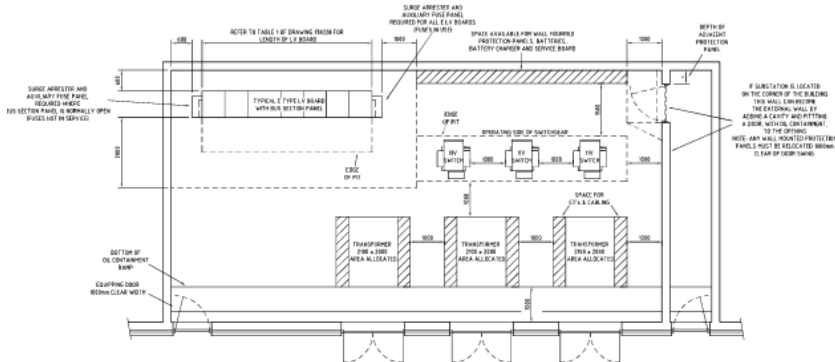
Based on the area schedules, the following substation options are available

- 2 off Chamber Substation with 3 x 1,500kVA

Substation Spatial Requirements

Chamber Type Substation

- Chamber substation can either be of the basement or surface type. Approximate size of 140m². Each substation will require mechanical ventilation.



HV Augmentation

It is unknown whether HV augmentation will be required to supply the site loads, but this will only be known/confirmed once an application for load is submitted to the Supply Authority.

5.2 Telecommunications

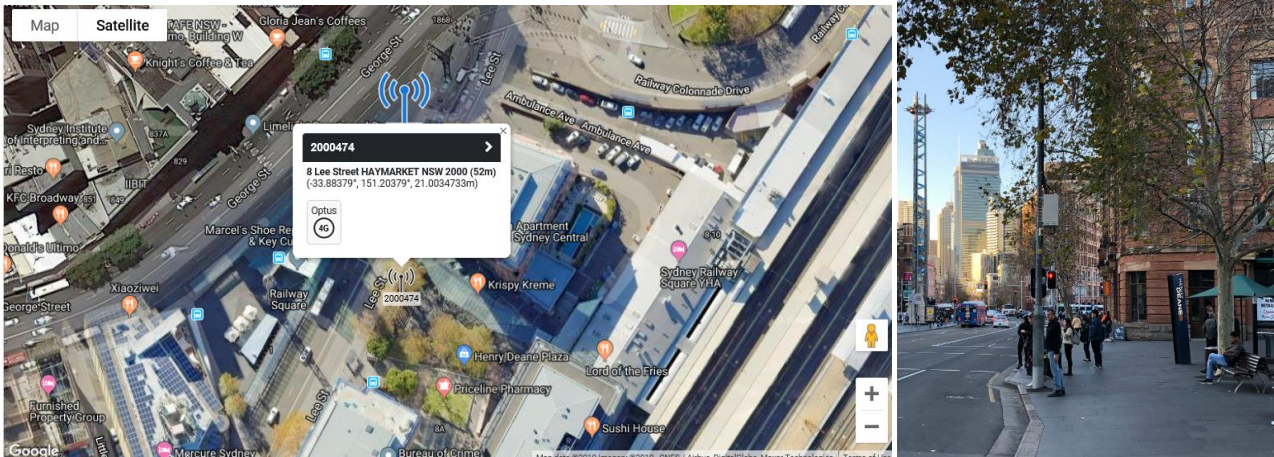
5.2.1 General

Existing Carrier infrastructure is depicted in drawings below. The site is well serviced by existing Carrier networks, including NBN.

From the available information, No Carrier diversions are required.

5.2.2 Carrier Mobile Base Stations

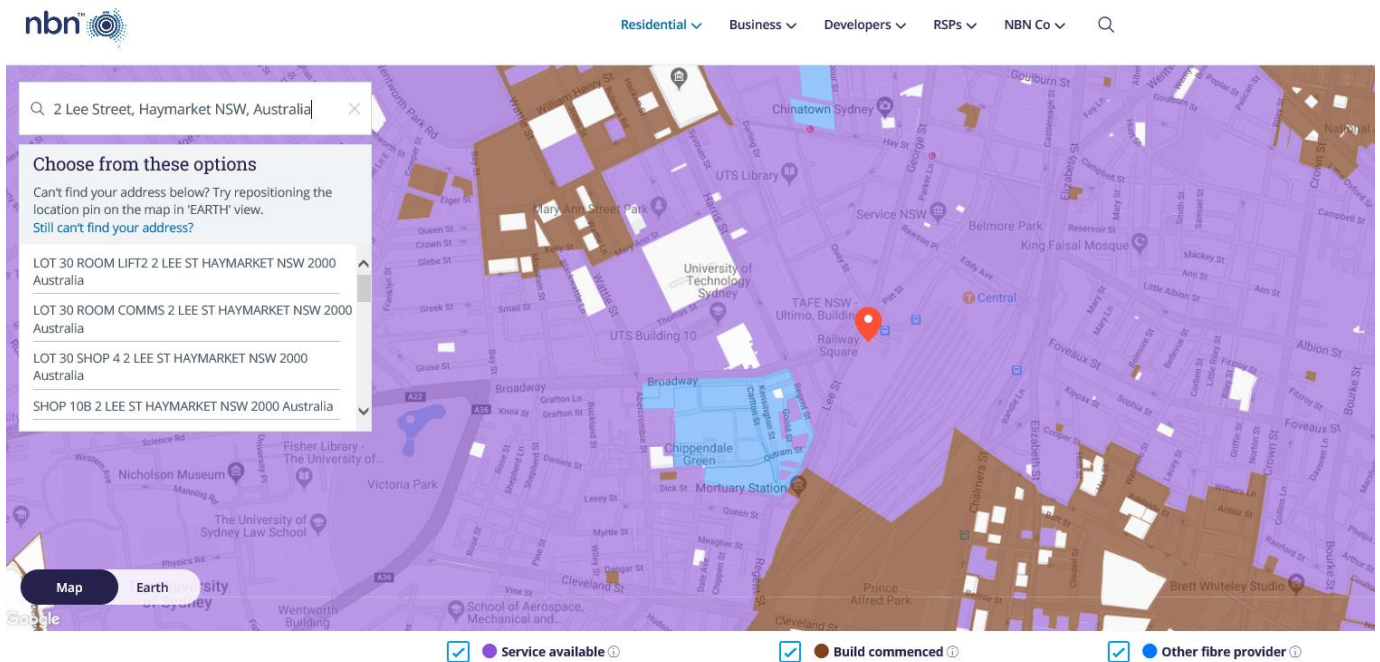
It is noted that there is an Optus Carrier Mobile Base Station (#2000474) on the site boundary adjacent the Adina building.



It would be necessary to liaise with OPTUS should any proposed works impede the Base Station location

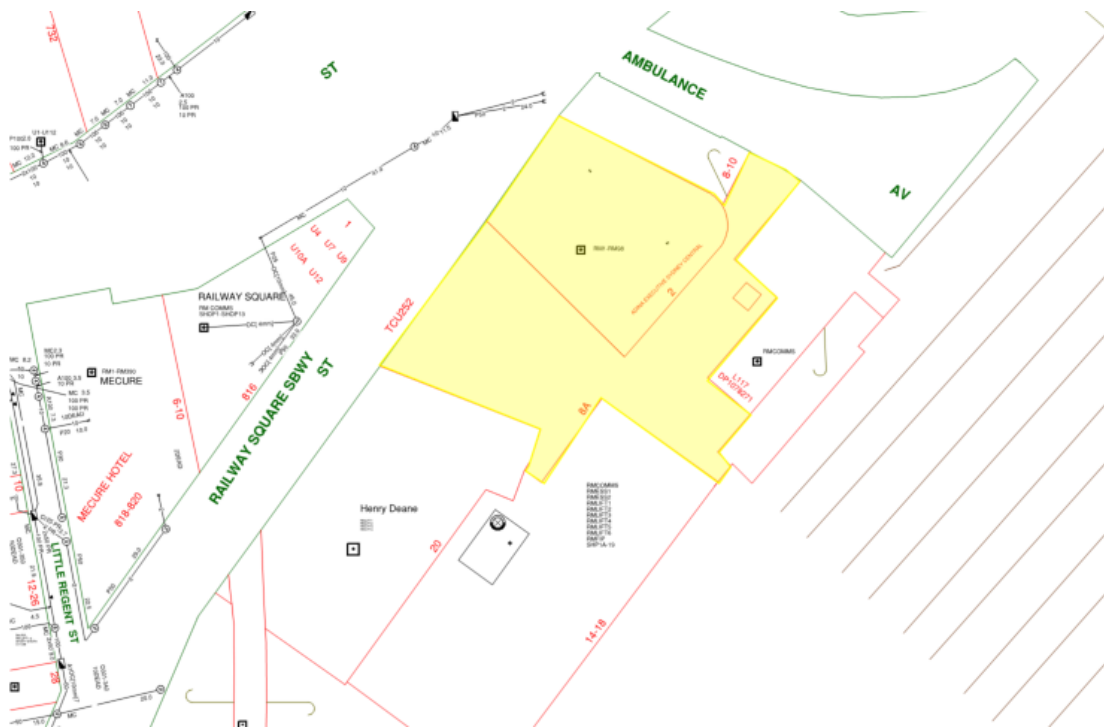
5.2.3 Existing Carrier Service Infrastructure

NBN

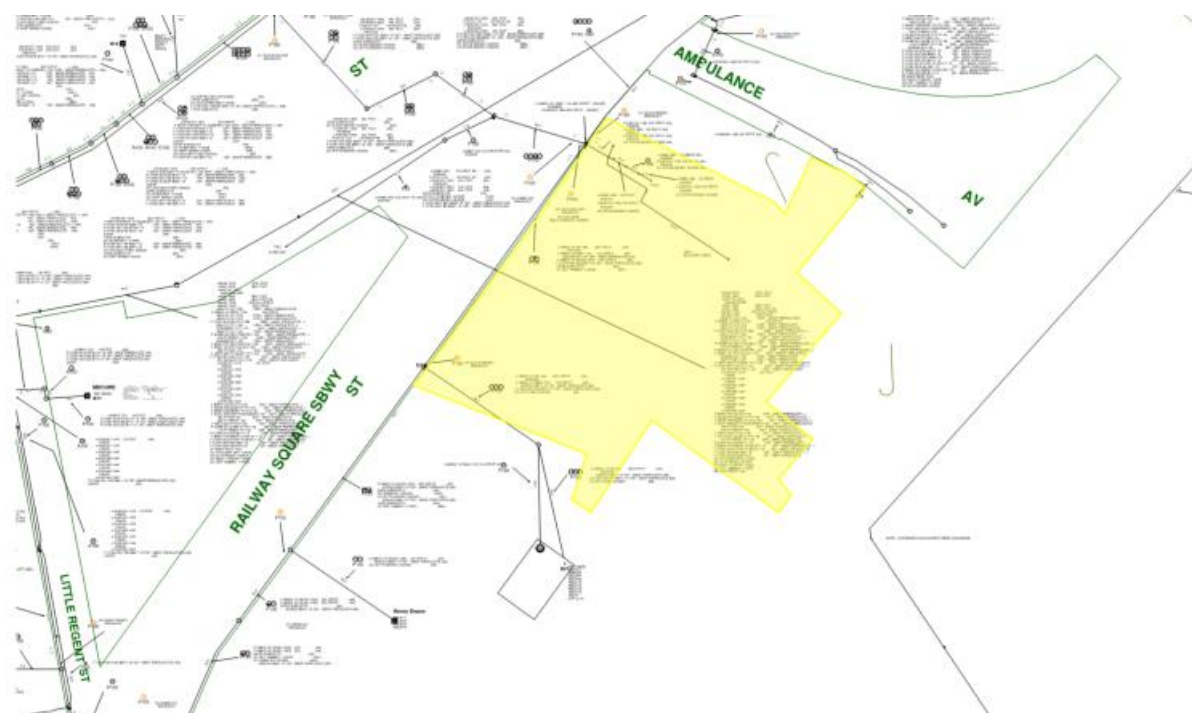


TELSTRA

Cable Plan



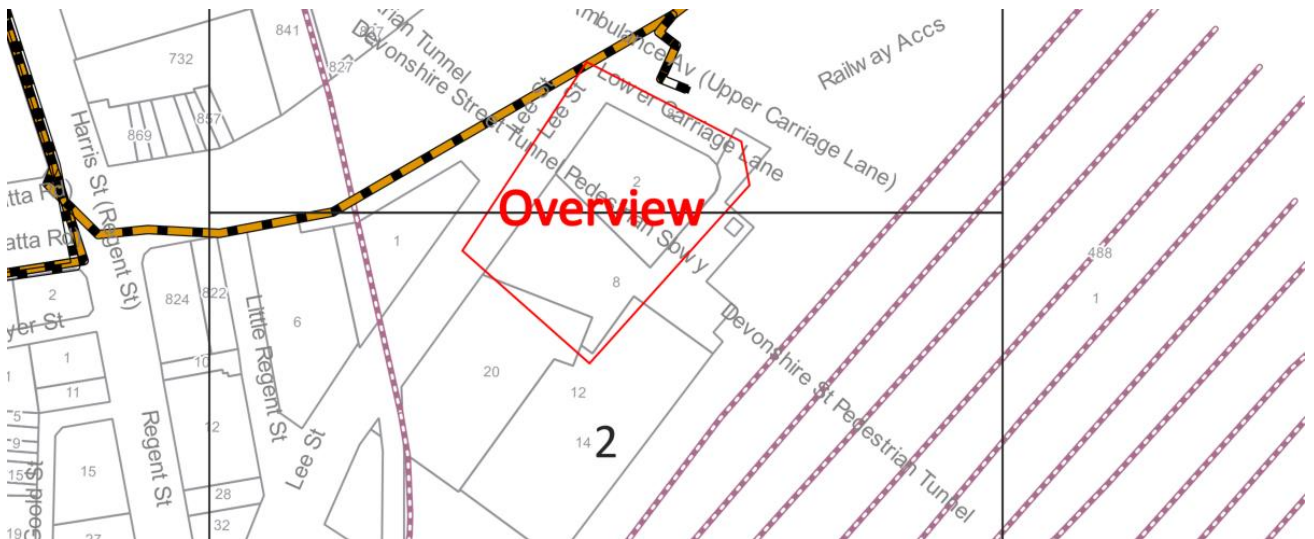
Mains Cable Plan



OPTUS



Nextgen



6. Hydraulic Services

The hydraulic services in the following section provides information regarding existing and proposed infrastructure across the following key utilities:

- Sewer Network (network authority, Sydney Water)
- Water Supply Network (network authority, Sydney Water)
- Gas Supply Network (network authority, Jemena)

Note that all infrastructure options and capacities are based on experience and other similar projects, however at no point have any utility providers been contacted or have they assessed the recommendations in this report. This is subject to change following development of the design and further stakeholder engagement.

6.1 Sewer Services Review

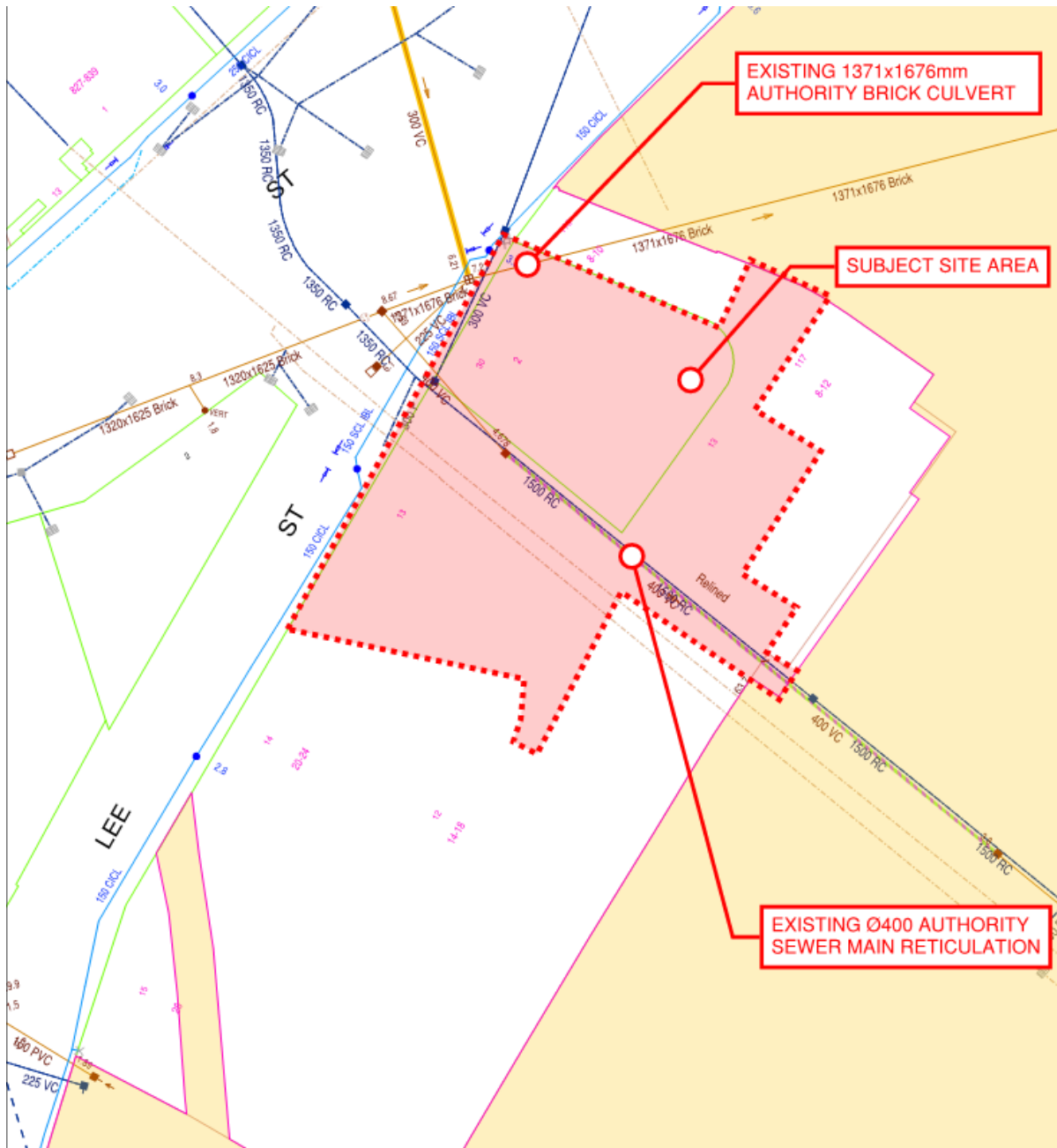
The proposed development site has a Ø400 authority sewer main reticulation that runs through the property adjacent the storm water line. We would anticipate that the basement levels of the development would impact the authority sewer main thus requiring major works to either divert the sewer around the site or concrete encase the service to protect from damage. The current intent of the Toga development is to build around the sewer main.

There is also an existing authority 1371x1676mm brick culvert that runs through the north western corner of the subject site. Upon review of the plans provided we anticipate the development will not impact on the culvert, however this should be highlighted as a potential risk to the development. Sydney Water have strict guidelines surrounding building near the zone of influence of their assets. If the site is deemed suitable to develop by Sydney Water, they may require monitoring of their assets throughout construction at the developers' expense.

The above would be carried out as part of Sydney Waters Building Plan approval process and input would be required from a Sydney Water accredited Water Servicing Coordinator (WSC) as well as further discussion with Sydney Water to confirm whether they will accept this as a design solution. It is advised that confirmation regarding the proposed developments impacts on Sydney Water assets be carried out as soon as possible to confirm the developments feasibility.

Based on the proposed 28,000m² of commercial GFA and 230 hotel rooms we would estimate the daily sewer discharge to be in the order of 160,000 litres per day which the existing Ø400 sewer drainage line would be able to cater for this load. This would be further confirmed through the Sydney Water Section 73 application process.



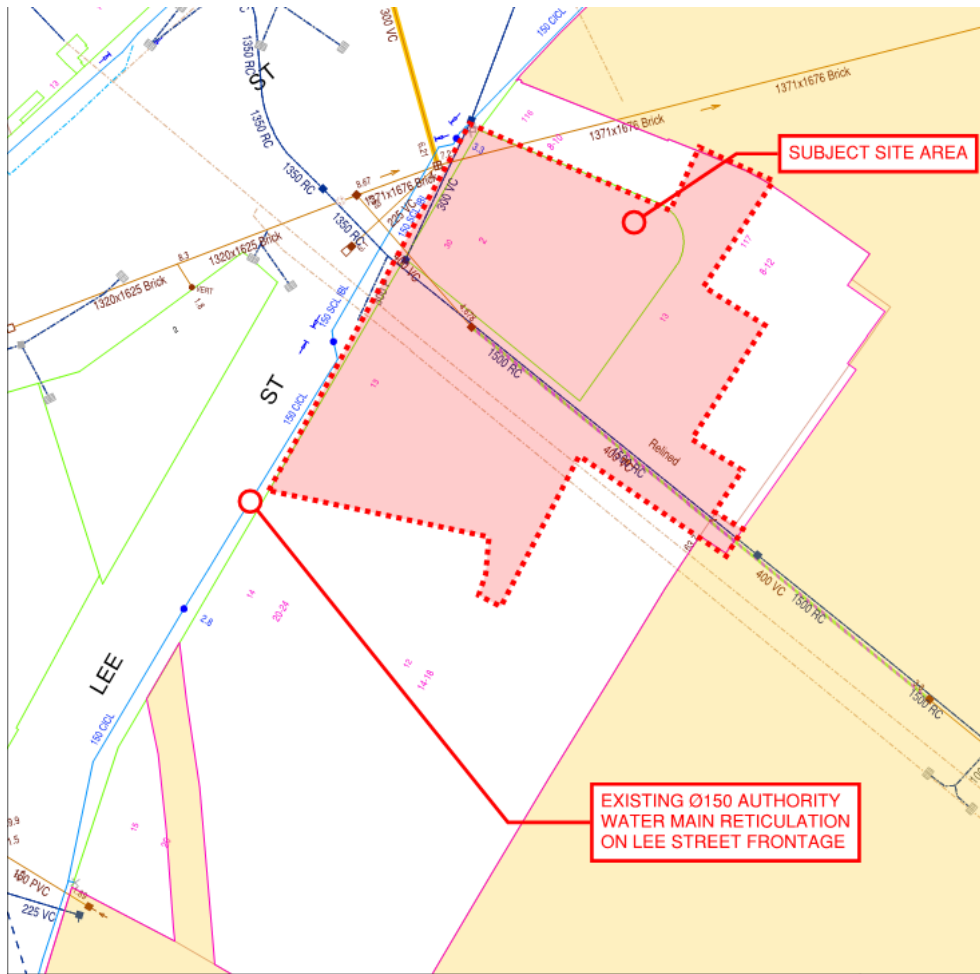


Sewer Mains

6.2 Water Services Review

DBYD plans have indicated Sydney Water, water assets within proximity to the subject site (see image below). This includes the existing Ø150 water main that reticulates on the Lee Street frontage of the subject site. We expect the water main to be sufficient in providing the required domestic potable water flow rates and flow for fire-fighting purposes.





Water Mains

6.2.1 Domestic Potable Water Capacity

The potable water demand for the proposed development scheme is considerable, however the probable simultaneous demands (PSD) based on the scheme amounts to approximately 35L/s (see table below). The Ø150 main located in Lee Street will be more than capable of providing this flow rate. Refer to image above for available water mains to be used for connection for potable water services.

Domestic Potable Water Expected Flow Rates

Development Area	Room Numbers/GFA Area(m ²)	Approximate PSD (L/s)	Existing Ø150 Main Expected Flow (L/s)
Hotel Rooms	230	12	50-60
Commercial/Retail	31,000	11	50-60
Total		23	50-60L/s

*Gross floor area and room numbers were taken from email dated 12.09.19 from Toga.

WE note that this is the probable water demand of this building only and there is expected additional demand for the two adjacent commercial tower sites that may cause downstream augmentation requirements to cater for all three developments on the site. In the planning there should be allowance for on site water storage for risk mitigation in respect to water main flows.

6.3 Fire Water Capacity

The development will trigger the requirement of a fire sprinkler system to be installed according to the current BCA 2019 as the building exceeds 25m in effective height and to protect the basement and retail portion of the development.

The development will trigger the requirement for sprinkler protection based on the following classifications and uses:

- Basement (Class 7A) – Fire sprinkler protection throughout assuming more than 40 car parking spaces
- Commercial (Class 5) – Greater than 25m in effective height.
- Retail (Class 6) – Floor area more than 3,500 square meters
- Hotel - (Class 3) – Greater than 25m in effective height.

Based on building classifications and the development area we estimate the following combined approximate fire systems flow rates;

Fire-Fighting Expected Flow Rates

Development Area	Sprinkler Flow (L/s)	Fire Hydrant Flow (L/s)	Total
Hotel Rooms	6	20	26
Commercial/Retail	18	20	38
Basement	12	30	42
Approximate Combined Flow Rate (including fire drenchers)	45-50L/s		

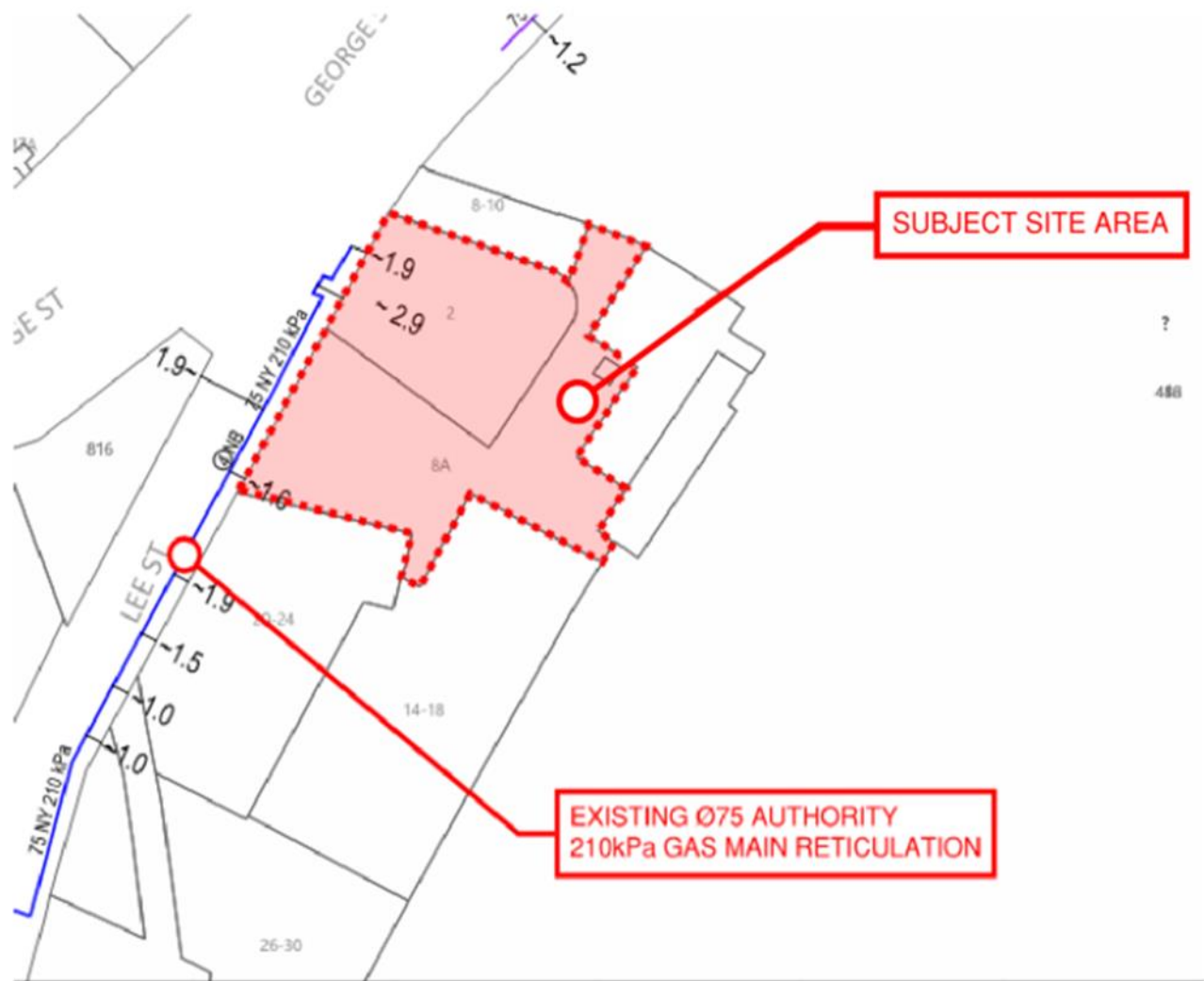
In our experience we anticipate the Ø150 water main located in Lee Street should be capable of providing the flow rate required for fire-fighting purposes (pending confirmation of pressure and flow), however a fire services storage tank and pump set will still be required due to the effective height of the development.

6.4 Gas Services Review

The proposed development is seeking to reduce combustible fuels therefore gas load is expected to be moderate for a future mixed-use development. The allowances for gas may include the following:

- Gas cooking for commercial and retail use
- Gas hot water heating for commercial & retail
- Gas cooking for hotel
- Gas provisions to mechanical plant

Based on our experience we would anticipate the maximum gas load to be circa 50,000MJ/hr (see table below) and would be serviced by the Ø75 210kPa gas main within Lee Street nominated within DBYD plans (see image below). The gas main will be adequate in servicing the expected gas load for the development.



Gas Mains

Gas Expected Loading

Development Area	Cooking Gas Load (MJ/hr)	HW Heating Gas Load (MJ/hr)	Mechanical Gas Load (MJ/hr)	Total (MJ/hr)
Hotel Rooms	2,000	5,000	20,000	27,000
Commercial/Retail	5,000	5,000	10,000	20,000
Combined Total				47,000



Design with
community in mind

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For more information please visit
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