
Appendix EE

Utilities and Infrastructural Servicing Assessment

Sydney Olympic Park Over and Adjacent Station Development Utilities and Infrastructure Servicing Assessment

Appendix EE

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Glossary

Term	Definition
ADWF	Average Dry Weather Flow
ASD	Adjacent Station Development
Concept and Stage 1 CSSI Approval	Application SSI-10038, including all major civil construction works between Westmead and The Bays, including station excavation and tunnelling, associated with the Sydney Metro West line
Concept SSDA	A concept development application as defined in section 4.22 of the EP&A Act, as a development application that sets out concept proposals for the development of a site, and for which detailed proposals for the site or for separate parts of the site are to be the subject of a subsequent development application or applications.
Council	City of Parramatta
CSSI	Critical State Significant Infrastructure
DPE	Department of Planning and Environment
EIS	Environmental impact statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
GFA	Gross floor area
HLFC	High Level Feature Code
LGA	Local Government Area
MDD	Maximum day demand
NLA	Net lettable area
OSD	Over Station Development
SWC	Sydney Water Corporation
SEARs	Secretary's Environmental Assessment Requirements
SOPA	Sydney Olympic Park Authority
SSD	State Significant Development
SSI	State Significant Infrastructure
Stage 2 CSSI Application	Application SSI-19238057, including major civil construction works between The Bays and Hunter Street Station
Stage 3 CSSI Application	Application SSI-22765520, including rail infrastructure, stations, precincts and operation of the Sydney Metro West line
Sydney Metro West	Construction and operation of a metro rail line and associated stations between Westmead and the Sydney CBD as described in section 1.1
The site	The site which is the subject of the Concept SSDA
WRAMS	Water Reclamation Management Scheme
WSUD	Water Sensitive Urban Design

Executive summary

This Utilities and Infrastructure Servicing Assessment supports a Concept State Significant Development Application (Concept SSDA) submitted to the Department of Planning and Environment (DPE) pursuant to part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Concept SSDA is made under section 4.22 of the EP&A Act.

Sydney Metro is seeking to secure concept approval for an over station development (OSD) and adjacent station development (ASD) on an area defined as Site 47 within the Central Precinct of Sydney Olympic Park (referred collectively as the 'proposed development'). The proposed development will comprise of one new commercial and retail building (Building 1) above the Sydney Olympic Park metro station and two residential accommodation buildings (Buildings 2 and 3) with retail and commercial space, adjacent to the Sydney Olympic Park metro station.

The Concept SSDA seeks consent for a building envelope and mixed-use purposes, maximum building height, a maximum gross floor area (GFA), pedestrian and vehicular access, circulation arrangements and associated car parking and the strategies and design parameters for the future detailed design of development.

Detailed site information can be found in section 2 of this report.

This report has been prepared as Appendix EE of the environmental impact statement (EIS) for the Concept SSDA to specifically respond to the Secretary's Environmental Assessment Requirements (SEARs) issued on 18 February 2022. The scope of this report is to summarise existing utility infrastructure, calculate indicative demands for each utility service type and consider required relocations and/or upgrade works to service the proposed development.

This assessment relates to the works required for the proposed development (works associated to the Sydney Metro West line itself are not included within this report except where utility coordination is required). This report identifies preliminary development staging and utility authority consultation. Final staging and delivery of utility infrastructure will form part of subsequent design stages.

Services

The site is currently serviced through the following means:

- **Stormwater:** Stormwater flows from the local catchment areas are collected through the Sydney Olympic Park Authority (SOPA) stormwater drainage system draining the southern pond catchment, the Water Reclamation Management Scheme (WRAMS) system or a creek south of Shirley Strickland Avenue. Further information on the stormwater servicing can be found in the Sydney Olympic Park Integrated Water Management Plan.
- **Wastewater:** Wastewater servicing is provided by Sydney Water Corporation (SWC), which is directed to the SOPA WRAMS water treatment plant.
- **Potable Water:** Drinking water is provided by SWC from the Prospect Water Filtration Plant and associated reservoirs via the Potts Hill Water Delivery System.
- **Recycled Water:** Non-drinking water is provided by SOPA from SOPA WRAMS water reclamation plant.
- **Telecommunications:** Various telecommunications providers have assets in the vicinity of the site including Telstra and NBN Co.

- Electrical: Low voltage electrical supply is provided by Ausgrid via the Olympic Park 132kV zone substation.
- Gas: Gas supply is provided by Jemena via the Eastern Gas Pipeline.

Indicative demand

Demand modelling has been based on indicative development yields which are listed in section 3.2 of this report for the purpose of considering lead-in utility infrastructure requirements. A summary of the results is presented below:

- Wastewater: Average Dry Weather Flow (ADWF) including BASIX reduction of 5.6L/s total demand
- Potable Water: Maximum daily demand including BASIX of 679kL/day total demand
- Telecommunications: Demand for telecommunications infrastructure has not been confirmed and is subject to on-going consultation with service providers
- Electrical: Peak demand including 0.8 Diversity Factor of 6.4MVA total demand
- Gas: Daily demand including BASIX of 1800m³/day, noting commercial and retail usage excluded for the purposes of this estimate due to varying demand.

Servicing constraints

- Key servicing constraints for this development are to be determined following feasibility application responses from utility authorities.

Sustainable development initiatives

An Ecologically Sustainable Development report (Appendix S of the EIS) has been developed for this proposed development site. Key initiatives that may be applicable to this report are listed below. These will be investigated and developed as the design progresses, including evaluation of impact on indicative demands.

- Stormwater harvesting: a large portion of the proposed development site boundary falls within the existing SOPA WRAMS where stormwater flows are collected and stored at Brickpit. There is opportunity to include the entire site catchment into the existing SOPA WRAMS.
- Recycled water: non-drinking water is supplied via the existing SOPA WRAMS and it is there is opportunity to also provide recycled water to service the station and proposed development.

1 Introduction

1.1 Sydney Metro West

Sydney Metro West will double rail capacity between Greater Parramatta and the Sydney Central Business District (CBD), transforming Sydney for generations to come. The once in a century infrastructure investment will have a target travel time of about 20 minutes between Parramatta and the Sydney CBD, link new communities to rail services and support employment growth and housing supply.

Stations have been confirmed at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and Hunter Street (Sydney CBD).

Sydney Metro West station locations are shown in Figure 1-1.

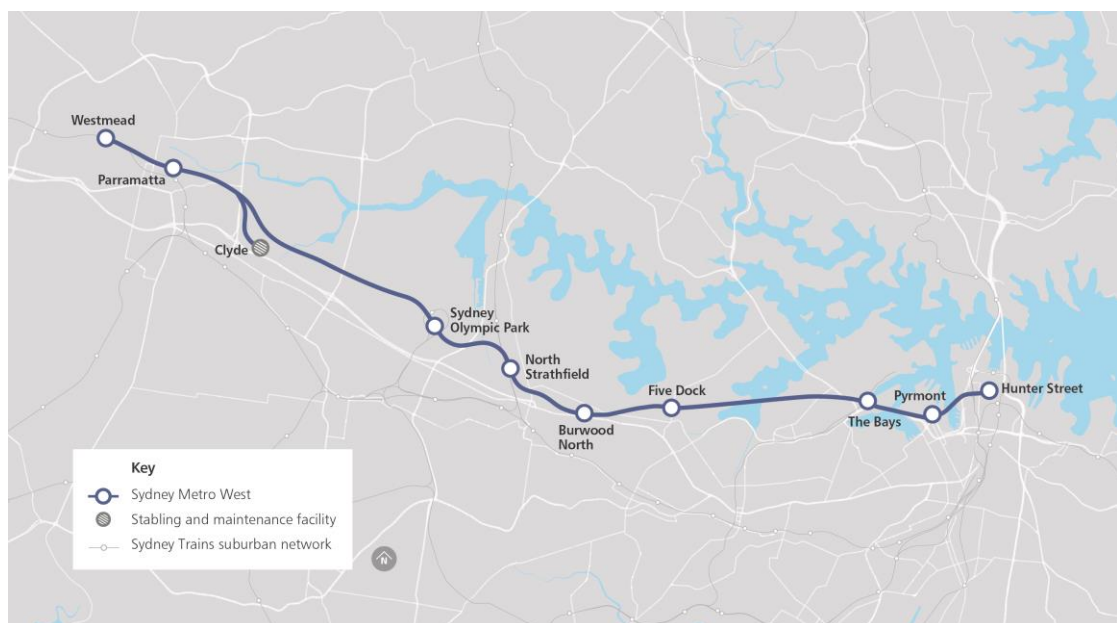


Figure 1-1 Sydney Metro West

1.2 Background and planning context

Sydney Metro is seeking to deliver Sydney Olympic Park metro station under a two-part planning approval process. The station fit-out infrastructure is to be delivered under a Critical State Significant Infrastructure (CSSI) application subject to provisions under division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), while the over and adjacent station developments are to be delivered under a State Significant Development (SSD) subject to the provisions of part 4 of the EP&A Act.

1.2.1 Critical State Significant Infrastructure

The State Significant Infrastructure (SSI) planning approval process for the Sydney Metro West metro line, including delivery of station infrastructure, has been broken down into a number of planning application stages, comprising the following:

- Concept and Stage 1 CSSI Approval (SSI-10038) – All major civil construction works between Westmead and The Bays including station excavation, tunnelling and demolition of existing buildings (approved 11 March 2021).

- Stage 2 CSSI Application (SSI-19238057) – All major civil construction works between The Bays and Hunter Street Station (under assessment).
- Stage 3 CSSI Application (SSI-22765520) – Tunnel fit-out, construction of stations, ancillary facilities and station precincts between Westmead and Hunter Street Station, and operation and maintenance of the Sydney Metro West line (under assessment).

1.2.2 State Significant Development Application

The SSD will be undertaken as a staged development with the subject Concept State Significant Development Application (Concept SSDA) being consistent with the meaning under section 4.22 of the EP&A Act and seeking conceptual approval for a building envelope, land uses, maximum building heights, a maximum gross floor area (GFA), pedestrian and vehicle access, vertical circulation arrangements and associated car parking. A subsequent Detailed SSD/s is to be prepared by a future development partner which will seek consent for detailed design and construction of the development.

1.3 Purpose of this report

This Utilities and Infrastructure Servicing Assessment report supports a Concept SSDA submitted to the Department of Planning and Environment (DPE) pursuant to part 4 of the EP&A Act. The Concept SSDA is made under section 4.22 of the EP&A Act.

This report has been prepared to specifically respond to the SEARs issued for the Concept SSDA on 18 February 2022 which states that the environmental impact statement (EIS) is to address the following requirements:

SEARs requirement	Where address in report
22. Infrastructure requirements and utilities	Sections 3, 4 and 5
In consultation with relevant service provider:	
<ul style="list-style-type: none"> • assess the impacts of the development on existing utility infrastructure and service provider assets surrounding the site. • identify any infrastructure upgrades required on-site and off-site to facilitate the development and any arrangements to ensure upgrades will be implemented on time and be maintained. • provide an infrastructure delivery and staging plan, including a description of how infrastructure requirements would be coordinated, funded and delivered to facilitate the development. 	

Specifically, this report aims to:

- describe how the input data has been obtained, collected and interpreted, including its limitations of use
- describe details of the existing utility services in the proposed development area
- summarise recommended strategies and treatments for each utility service in the proposed development area
- summarise consultation with utility authorities
- detail required next steps and further civil engineering work required to develop the design in subsequent stages.

2 The site and proposal

2.1 Site location and description

The site is located within Sydney Olympic Park and is situated within the City of Parramatta Local Government Area. The site is in the Central Precinct of Sydney Olympic Park and defined as Site 47 in the Proposed SOP Master Plan (Interim Metro Review). The broader metro site is bound by Herb Elliot Avenue to the north, Olympic Boulevard to the west and Figtree Drive to the south as shown in Figure 2-1.

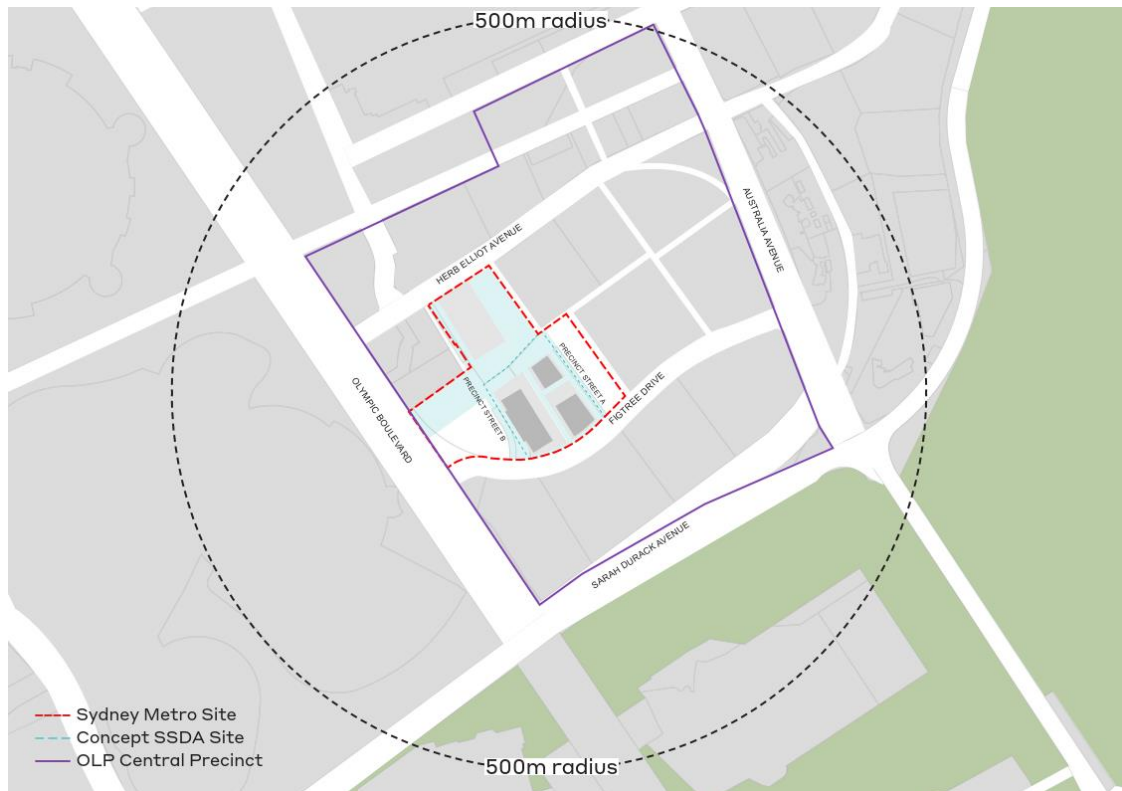


Figure 2-1 Sydney Olympic Park metro station location precinct

As described in Table 2-1, the site comprises part of Lot 59 in DP 786296 and Lot 58 in DP 786296, and comprises approximately 11,407m² of land.

Table 2-1 Site legal description

Street address	Legal description
5 Figtree Drive, Sydney Olympic Park	Lot 58 in DP 786296
7 Figtree Drive, Sydney Olympic Park	Lot 59 in DP 786296

2.2 Overview of this proposal

The Concept SSDA will seek consent for three building envelopes and delivery of Precinct Street A as detailed in Table 1-2 and Figure 1-3.

Table 2-2 Sydney Olympic Park proposed development overview

Item	Description
Land use	Building 1: Commercial and retail Building 2: Commercial, retail and residential Building 3: Commercial, retail and residential
Building height (RL) / Number of storeys	Building 1: 120.20 / 21 storeys Building 2: 116.90 / 27 storeys Building 3: 171.50 / 45 storeys
Gross floor area (m ²)	Building 1: 28,517 Building 2: 12,089 Building 3: 27,384 TOTAL: 68,000
Car parking spaces	358

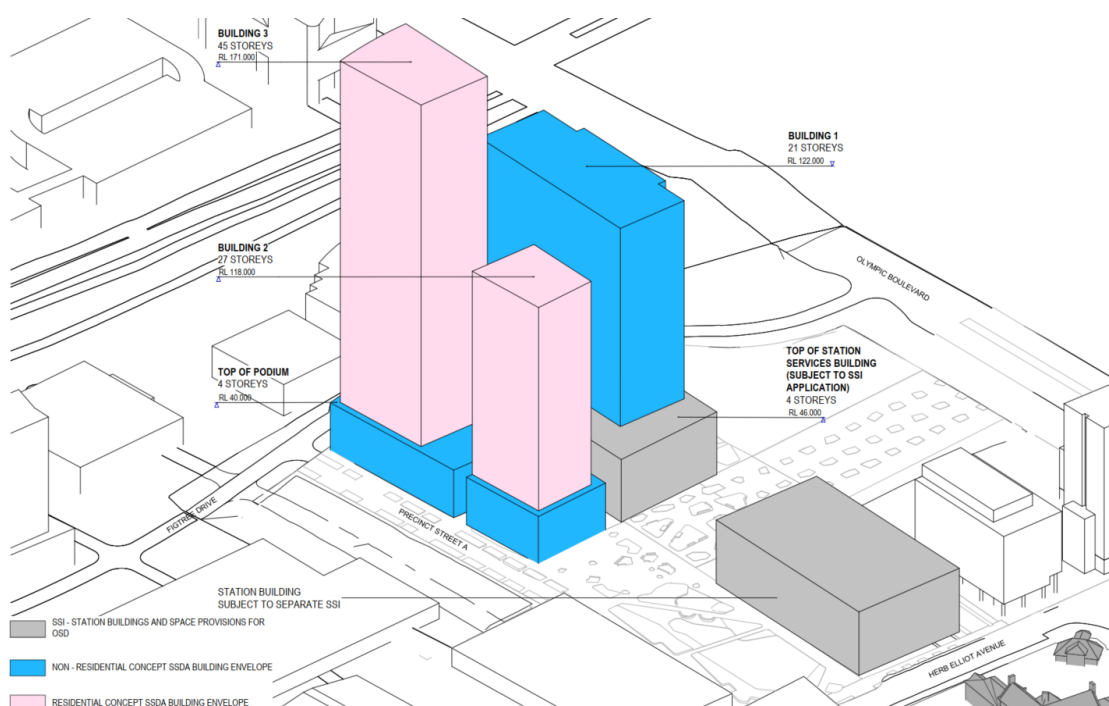
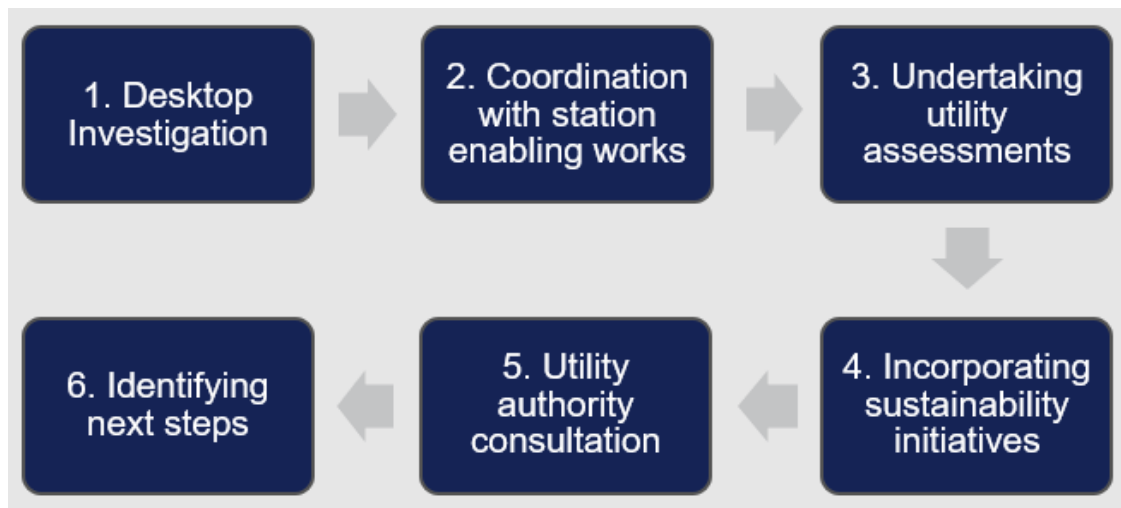


Figure 2-2 Proposed Concept SSDA development and CSSI scope

3 Assessment methodology

3.1 Assessment steps

The utilities and infrastructure servicing assessment methodology is summarised in the flow chart as shown in below:



Desktop investigation:

- Desktop investigation through 'Dial Before You Dig' enquiries of existing utility services.
- Review of utility information obtained from site surveys.
- Review of authority utility information from relevant service providers.
- Gap analysis and advice on further investigations required.

Coordination with station enabling works:

- Review of station utility servicing requirements.
- Assessment of opportunities for coordination with station services approved under the Concept and Stage 1 CSSI Approval.

Undertaking utility assessments:

- Undertake demand modelling to determine utility demand rates based on the intended use and using authority demand rates.
- Consider building specific utility demand draws and the effects of changes in building use such as decreased electrical usage or changes to gas demand.

Incorporating sustainability initiatives:

- Incorporate building and station precinct initiatives including BASIX and any other selected sustainability (e.g. Green Star Ratings or NABERS).
- Coordination with any precinct wide utility sustainability measures.

Utility authority consultation:

- Development and submission of feasibility applications to each utility authority with projected demands.
- Incorporation of utility agency advice around servicing options, routes, timings, costs and timings for delivery.

- Continual coordination around any changes to demand assessments and detailing of any further assessments or studies required to confirm supply methods (e.g. water or wastewater modelling).

Identifying next steps:

- Plans of potential utility relocations, supply points and potential constraints.
- Detailing of further investigations or additional works required during subsequent design stages.
- Confirmation of the feasibility of obtaining utility servicing for the proposed development.

3.2 Assessment status

Baseline demand calculations have been undertaken and feasibility applications to the utility authorities prepared according to the development yields available at the time of application submittal. Applications and utility authority feedback received to date are contained in Appendix A.

While the development yields are finalised, indicative development profiles based on the architectural targets were provided to estimate the future servicing demand. The development profiles for Sydney Olympic Park, as used for the initial feasibility applications to utility authorities, are shown in Table 3-1 below. These initial estimates were based on conservative values for the purposes of initiating discussions with utility providers.

Table 3-1 Indicative development yields (Sydney Metro, 18 June 2021)

Precinct	Residential apartments (Number)	Commercial space GFA (m ²)	Retail space GFA (m ²)	Total GFA (m ²)	Development timeframe
Sydney Olympic Park	1,000	35,000	8,000	143,000	2024-2028

The station box and station servicing building are not included in this development profile and have been calculated separately. Both the station box and station servicing building have been approved under the Concept and Stage 1 CSSI Application.

The residential, commercial and retail GFA figures are provided for the purposes of assessing the required utility infrastructure upgrades and may be subject to change as the architectural design of the proposed development continues.

4 Desktop investigation

This report details the investigation of existing utilities in the vicinity of the development, the likely points of future connection to the utilities; and associated potential upgrades or augmentation that may be required. This report does not consider any utility infrastructure outside the enquiry boundary and its potential relationship to, or impact on the supply of utility services to the proposed development site.

While preliminary development staging and sequencing information has formed the basis of consultation with utility providers to date, the final staging of utility works and the protection of assets is dependent on detailed construction staging and shall be developed in detail at a later stage during the preparation of the Detailed SSDAs.

As a part of the desktop investigation, utility information was obtained from a number of sources:

- 'Dial Before You Dig' enquires
- utility authority GIS systems
- site utility surveys (varying from Quality Level A to D)
- information provided for utility agencies.

Table 4-1 below shows a summary of the identified utility services within the precinct.

Table 4-1 Summary of utilities services

Authority name	Utility type	Potential impacts
Sydney Olympic Park Authority	Stormwater	Yes
Sydney Water	Wastewater	Yes
Sydney Water	Potable Water	Yes
Sydney Olympic Park Authority	Recycled Water	Yes
AARNet	Telecommunications	Yes
NBN	Telecommunications	Yes
Superloop	Telecommunications	No
Telstra	Telecommunications	Yes
TPG	Telecommunications	Yes
Uecomm	Telecommunications	Yes
Verizon	Telecommunications	No
Vocus	Telecommunications	Yes
Ausgrid	Electrical	Yes
Jemena	Gas	Yes

As this report is for the Adjacent Station Development (ASD) and Over Station Development (OSD), this table does not include the utility services for the Sydney Olympic Park metro station (as assessed in the Concept and Stage 1 CSSI Application) unless required for coordination purposes.

A combined services plan for the proposed development site has been developed in Figure 4-1 which shows:

- indicative connections to existing utility services
- potential constraints with the utility servicing and crossings
- potential building connection points.

These services are shown for schematic purposes only and are subject to further development in subsequent design phases as the architectural and services design develops.

It is also important that this report has been developed to show potential servicing points and the number and type of utility connections to the building will depend on the ultimate ownership and stratum.

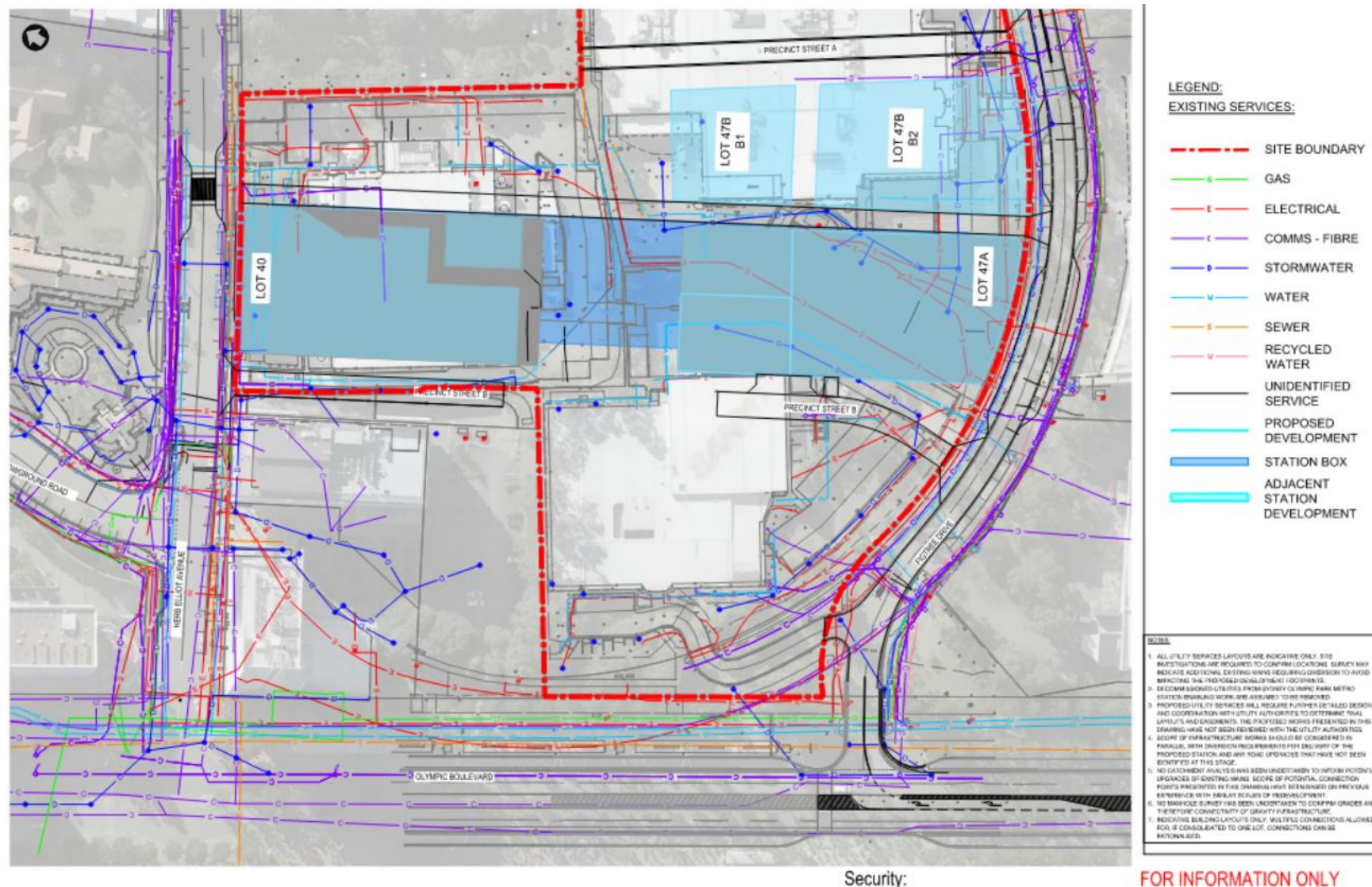


Figure 4-1 Overall combined existing services plan

5 Coordination with enabling works

As a part of the tunnel and station excavation works for Sydney Metro West, utility protection, amendment or relocation works will need to be undertaken. These will take place prior to any planning works proposed as part of the Stage 3 CSSI Application and include:

- pot holing investigations and survey of existing utilities surrounding and impacted by the proposed development
- pre-condition surveys of gravity networks impacted by the proposed development
- decommission existing utility services to lots within the development's designation
- protection to shallow utility services in footpaths surrounding the proposed development from construction activities.

The enabling works are still being fully developed and are subject to change. A summary of identified utilities enabling works has been provided in the sections below.

5.1 Ausgrid Electricity

There are a number of electrical designs at the proposed development site. Refer to Table 5-1 below.

Table 5-1 Proposed development - Ausgrid impacted asset design

Design	Design stage	Design name	Description
Construction power			
HV feeder for road header and construction power	Certified	AN-20939_R0 - 20201127 - Certified Design _Amd 0	HV feeders at Sydney Olympic Park for construction and road header power
Impacted asset design			
Substation and underground relocations	Certified	AN20936_Certified_SOP_Decommission S6911 and S6695_Amd 0	Certified design for the Decommissioning of substations S6695 and S6911 Underground cable relocation / removal is incorporated into the design of the decommissioning of the 2 substations within the proposed development.

5.2 Sydney Water

The proposed development (including the basement carpark footprint for Building 2 and Building 3) have been used to identify affected Sydney Water assets. This initial desktop assessment by others is summarised in below in Table 5-2.

Table 5-2 Proposed development – Sydney Water affected asset summary

SWC asset type	Treatment description				BPA application
	Asset diversion required	Asset to be disused and removed	Asset to be protected	Asset not affected	
Potable water	0	0	2	0	2
Wastewater	1	0	1	0	2
Stormwater	0	0	0	0	0
Recycled	0	0	3	0	3
Total	1	0	6	0	7

Following the initial assessment, the Sydney Metro West designers completed adjustment and deviation designs for all Sydney Water assets that clash with the station box, based off the current station and excavation footprint. These adjustments and deviation designs are summarised below in Table 5-3.

Table 5-3 Sydney Water adjustments and deviation designs

Location	Design stage	Design name	NOR/LOC received	Certified design due date
Sydney Olympic Park	Certified	CASE187469WW-D-1.3[4]	November 2020	March 2021

5.3 Jemena Gas

One Jemena asset will be impacted within the proposed development. Initial desktop survey analysis carried out for the Sydney Metro West Concept and Stage 3 EIS has indicated that the clash identified will require protection works (no anticipated relocation works). This will need to be confirmed with Jemena.

Sydney Metro have engaged Jemena to provide a desktop study, cost estimate and basis of design manual for all assets impacted along the Sydney Metro West alignment.

5.4 Telecommunications

Ongoing discussions will be held with telecommunications services providers regarding these assets and the proposed development.

6 Utility assessments

6.1 Stormwater

6.1.1 Existing assets

Stormwater assets within the public road reserve are owned and maintained by Sydney Olympic Park Authority (SOPA). Stormwater assets within private property are expected to be the responsibility of the landowners, although this is to be confirmed. The desktop information indicates the presence of a number of stormwater assets in the area. The existing stormwater arrangement is shown below in Figure 6-1 for the purposes of coordination with the utility services.

A separate stormwater assessment has been undertaken in the Sydney Olympic Park Integrated Water Management Plan (Appendix X of the EIS).

6.1.2 Proposed stormwater works

While the full details are to be contained in the Sydney Olympic Park Integrated Water Management Plan (Appendix X of the EIS) a summary of potential stormwater works is given below.

- Construction of stormwater pipe network and associated storage and rainwater tanks (hydraulics) within the proposed development.
- Decommission existing stormwater connections within the site boundaries.
- Protection of existing stormwater assets to be retained from construction activities.
- Water Sensitive Urban Design (WSUD) treatment measures, including:
 - rainwater tank
 - storm filters
 - gross pollutant traps
 - bio-retention basin (raingardens/tree pits).



Figure 6-1 Existing stormwater services

6.2 Wastewater

6.2.1 Background

Wastewater servicing is provided by the Sydney Water Corporation (SWC), which directs wastewater within the proposed development site area to the SOPA Water Reclamation Management Scheme (WRAMS) water treatment plant at the corner of Old Hill Link and Edwin Flack Avenue.

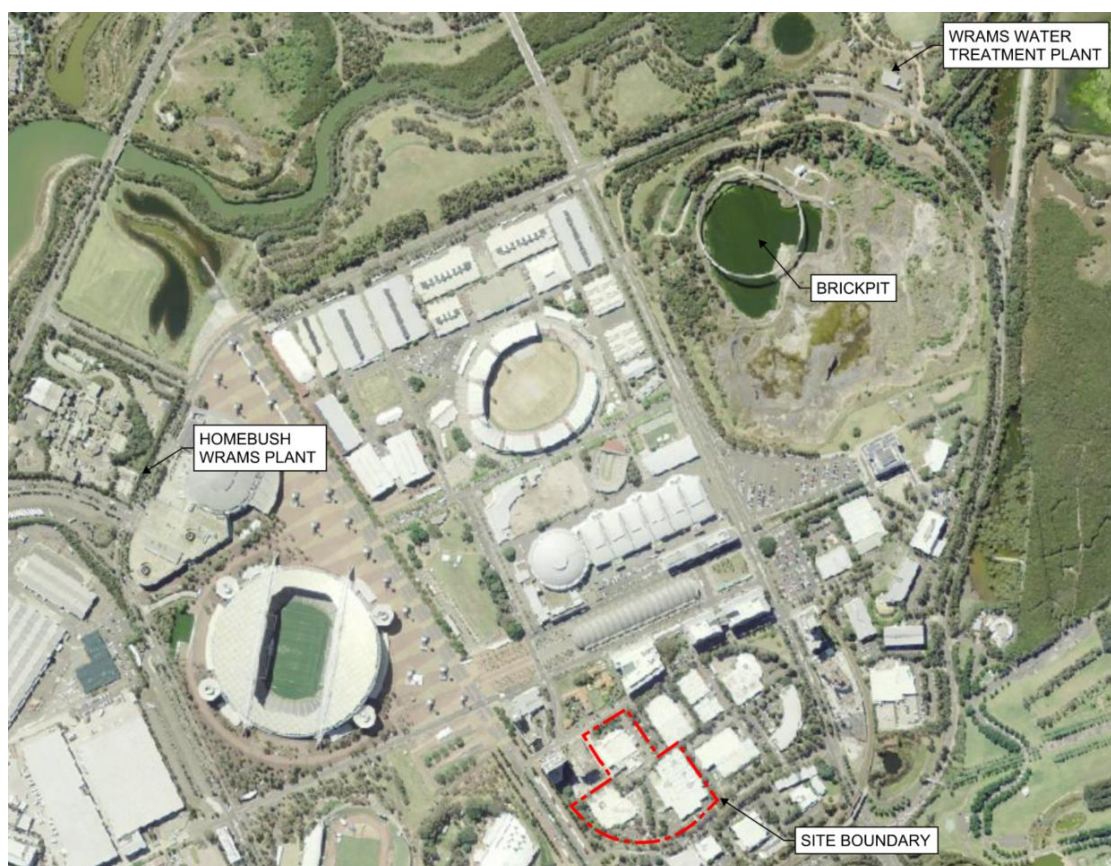


Figure 6-2 SOPA WRAMS plant locations

6.2.2 Existing assets

The desktop information indicates the presence of a number of Sydney Water assets in the surrounding area. These are summarised in Table 6-1 below and shown below in Figure 6-3.

Table 6-1 Existing Sydney Water wastewater assets

Metro ID	Owner	HLFC	Size (DN)	Configuration	Material	Status	Treatment	Location	Design contract
WW-07-010	Sydney Water	Sewer	150	Reticulation, gravity	VC	In service	Decommission	Along Herb Elliot Avenue between Australia Avenue and Olympic Boulevard	CSSI
WW-07-020	Sydney Water	Sewer	300	Reticulation, gravity	VC	In service	Protect	Along Herb Elliot Avenue between Australia Avenue and Olympic Boulevard	N/A
WW-07-030	Sydney Water	Sewer	225	Reticulation, gravity	DICL	In service	Identified (no works)	Along Dawn Fraser Avenue from Olympic Blvd to Park Street	N/A
WW-07-040	Sydney Water	Sewer	225	Reticulation, gravity	PVC	In service	Identified (no works)	Along Herb Elliot Avenue between Australia Avenue and Olympic Boulevard	N/A
WW-07-050	Sydney Water	Sewer	150	Pressure main, effluent	DICL	In service	Identified (no works)	Along Herb Elliot Avenue between Australia Avenue and Olympic Boulevard	N/A
WW-07-060	Sydney Water	Sewer	150	Pressure main, sewage	DICL	In service	Identified (no works)	Along Olympic Boulevard between Dawn Fraser Avenue and Sarah Durack Avenue	N/A
WW-07-070	Sydney Water	Sewer	-	Maintenance hole	Not applicable	In service	Identified (no works)	Along Herb Elliot Avenue between Australia Avenue and Olympic Boulevard	N/A
WW-07-080	Sydney Water	Sewer	-	Maintenance hole	Not applicable	In service	Identified (no works)	Along Olympic Boulevard between Dawn Fraser Avenue and Sarah Durack Avenue	N/A
WW-07-090	Sydney Water	Sewer	-	Maintenance hole	Not applicable	In service	Identified (no works)	Along Herb Elliot Avenue between Australia Avenue and Olympic Boulevard	N/A
WW-07-100	Sydney Water	Sewer	-	Maintenance hole	Not applicable	In service	Identified (no works)	Along Herb Elliot Avenue between Australia Avenue and Olympic Boulevard	N/A

Metro ID	Owner	HLFC	Size (DN)	Configuration	Material	Status	Treatment	Location	Design contract
WW-07-110	Sydney Water	Sewer	TBA	Pipe	TBA	In service	Identified (no works)	Along Herb Elliott Avenue	N/A
WW-07-120	Sydney Water	Sewer	-	Maintenance hole	Not applicable	In service	Decommission	Construction site	CSSI
WW-07-130	Sydney Water	Sewer	TBA	Pipe	TBA	In service	Decommission	Construction site	CSSI
WW-07-140	Sydney Water	Sewer	-	Maintenance hole	Not applicable	In service	Decommission	Construction site	CSSI
WW-07-150	Sydney Water	Sewer	-	Maintenance hole	Not applicable	In service	Identified (no works)	Along Figtree Drive	N/A
WW-07-160	Sydney Water	Sewer	-	Maintenance hole	Not applicable	In service	Decommission	Construction site	CSSI



Figure 6-3 Existing wastewater assets

6.2.3 Proposed wastewater servicing and relocations

To allow for construction and servicing of the development, the following alteration works are required:

- protect DN300mm VC pipe on Herb Elliott Avenue from new kiss and ride works
- protect the DN225mm VC and DN150mm VC gravity pipes on Herb Elliott Avenue within the site boundary for use as a connection back to the sewer mining pressure main
- protect DN150mm VC gravity pipe crossing Australia Avenue at the Figtree Drive intersection from intersection upgrade works
- new sewer gravity connection from Site 47 to existing gravity main within No. 5 Figtree Drive
- new sewer gravity connection from Site 40 to existing sewer main on along Herb Elliott Avenue.

The proposed wastewater relocations and potential new building connections are shown below in Figure 6-4. It is important to note that these designs are schematic only and further consultation will be undertaken with Sydney Water during the preparation of the Detailed SSDAs.

Following Sydney Water consultation, Sydney Metro has received a feasibility letter (dated 1 April 2022) which states that the development can be serviced by two sewer mains, as follows:

- DN300 in Herb Elliot Avenue which has been adjusted and deviated under CN187469 to facilitate the connection for proposed construction of the Sydney Metro West - Sydney Olympic Park metro station.
- existing DN150 sewer main within the development required to be upsized.

See Appendix B for full Sydney Water feasibility letter.

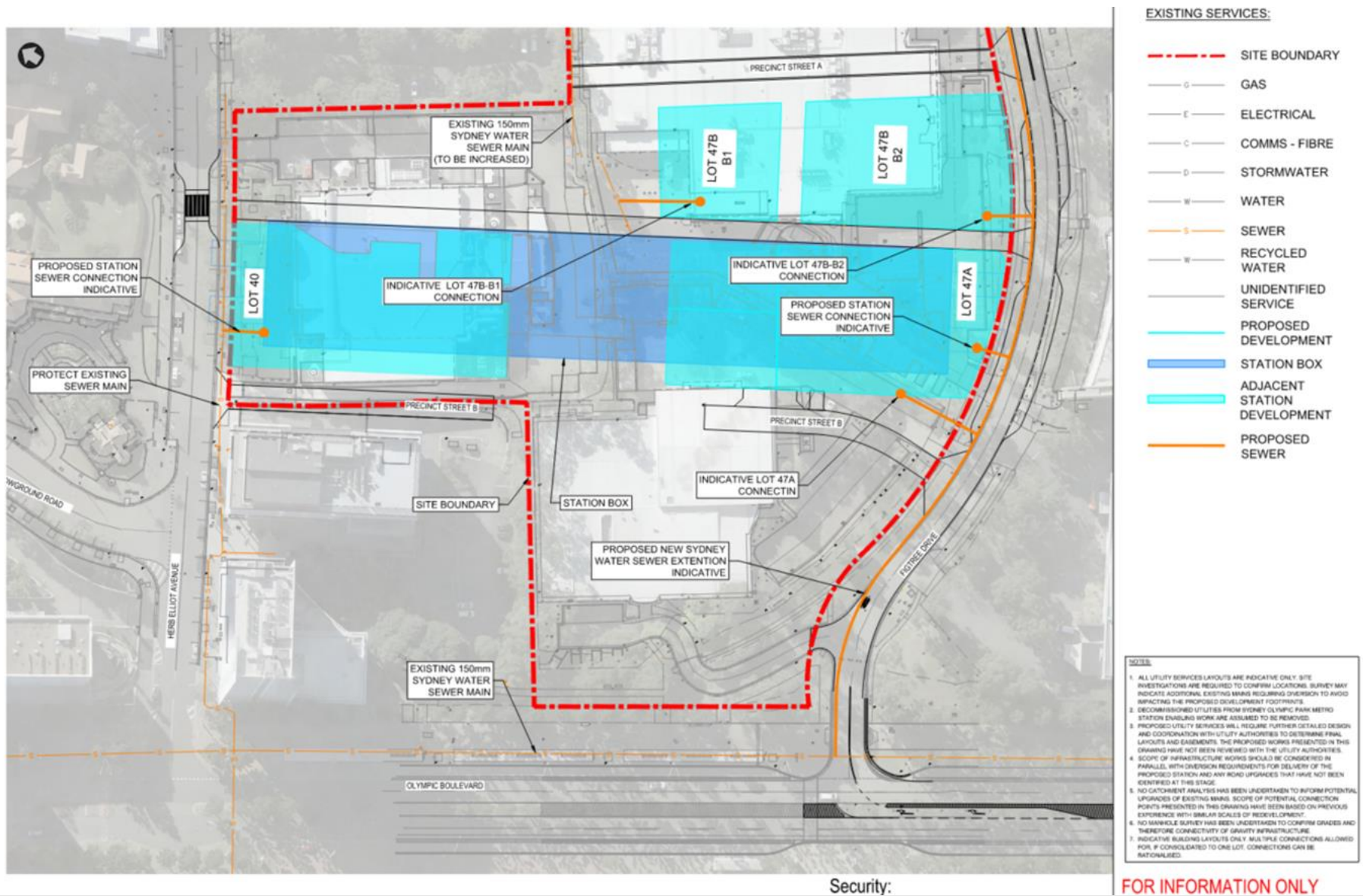


Figure 6-4 Proposed wastewater servicing and relocation plan

6.2.4 Demand assessment

Development demand

The estimated wastewater demand is calculated based on the standard unit rates summarised in Table 6-2 below and the development yields in section 3.2. This development yield was used for the purposes of utilities infrastructure assessments and feasibility applications only and the final architectural designs should be used to confirm the building details. This demand assessment is summarised in Table 6-3.

Table 6-2 Sewer design loading criteria

Land use	Design criteria	Unit	Demand rate	Source
Residential – single occupancy high density dwelling	Average Dry Weather Flow (ADWF)	EP/dwelling	2.5	Gravity Sewerage Code of Australia, WSA 02-2014
Commercial – high density commercial	ADWF	EP/ha (gross)	500	Gravity Sewerage Code of Australia, WSA 02-2014
Retail – local commercial	ADWF	EP/ha (gross)	75	Gravity Sewerage Code of Australia, WSA 02-2014
BASIX reduction (residential only)	N/A	%	40	Building Sustainability Index

Table 6-3 Estimated ADWF for wastewater including BASIX (L/s)

Location	Residential (incl. BASIX)	Commercial and retail	Total (L/s)
Estimated ADWF for Building 1	-	0.4	0.4
Estimated ADWF for Building 2 and 3	2.6	2.6	5.2
Total	2.6	3.0	5.6

Station demand

The sewer demand for Sydney Olympic Park metro station was calculated based on current design parameters and the Traffic and Transport Planning's Passengers Movement as per 2056 AM Peak Hour + 15% Station Movements (October 2020) – Transfer, Entry and Exit Model. The quantities and associated load may vary as detail design is developed. The following assumptions were used in the calculations:

- allowance of 3% of (daily) total passengers using toilets and handwash basins during peak and off-peak
- 95% of total water usage to discharge to sewer except cooling tower make-up demands
- 50,000L/day for cooling tower make-up water supply
- allowance of 20% spare flow capacity
- fixture outlets for new/temporary fixtures with minimum WELS Star Rating of 6.

The proposed wastewater demand for Sydney Olympic Park metro station was estimated to be 0.12 L/s and 0.14 L/s with an allowance of 20% spare flow capacity.

Please note that the station box demand has been included in this assessment for reference only and has not been accounted for in the total demand calculations as it forms part of the Concept and Stage 1 CSSI Approval.

6.3 Potable water

6.3.1 Background

Potable water at the Sydney Olympic Park metro station precinct is currently supplied by Sydney Water from the Prospect Water Filtration Plant and the Sydney Desalination Plant (when required) through the Potts Hill Water Delivery System.



Figure 6-5 Potts Hill water delivery system (SWC, 2021)

6.3.2 Existing assets

The desktop information indicates the presence of a number of Sydney Water assets in the surrounding area. These are summarised in Table 6-4 below and the existing assets are shown in Figure 6-6.

Table 6-4 Existing Sydney Water potable water assets

Metro ID	Owner	HLFC	Size (DN)	Material	Status	Treatment	Location	Design contract
PW-07-010	Sydney Water	Water	200	DICL	In Service	Identified (no works)	Along Herb Elliot Avenue between Australia Avenue and Olympic Boulevard	N/A
PW-07-020	Sydney Water	Water	250	DICL	In Service	Protect	Along Herb Elliot Avenue between Australia Avenue and Olympic Boulevard	SSDA
PW-07-030	Sydney Water	Water	150	DICL	In Service	Protect	Along Figtree Drive between Australia Avenue and Olympic Boulevard	SSDA
PW-07-040	Sydney Water	Water	200	DICL	In Service	Identified (no works)	Along Figtree Drive between Australia Avenue and Olympic Boulevard	N/A
PW-07-050	Sydney Water	Water	150	DICL	In Service	Identified (no works)	Along Figtree Drive between Australia Avenue and Olympic Boulevard	N/A
PW-07-060	Sydney Water	Water	100	DICL	In Service	Identified (no works)	Along Figtree Drive between Australia Avenue and Olympic Boulevard	N/A
PW-07-070	Sydney Water	Water	100	DICL	In Service	Identified (no works)	Along Figtree Drive between Australia Avenue and Olympic Boulevard	N/A
PW-07-080	Sydney Water	Water	150	DICL	In Service	Identified (no works)	Along Olympic Boulevard between Dawn Fraser Avenue and Sarah Durack Avenue	N/A
PW-07-090	Sydney Water	Water	250	DICL	In Service	Identified (no works)	Along Olympic Boulevard between Dawn Fraser Avenue and Sarah Durack Avenue	N/A
PW-07-100	Sydney Water	Water	150	DICL	In service	Identified (no works)	Along Olympic Boulevard between Dawn Fraser Avenue and Sarah Durack Avenue	N/A

Metro ID	Owner	HLFC	Size (DN)	Material	Status	Treatment	Location	Design contract
PW-07-110	Sydney Water	Water	TBA	TBA	TBA	Identified (no works)	Construction site	N/A
PW-07-120	Sydney Water	Water	TBA	TBA	In service	Decommission	Construction site	CSSI
PW-07-130	Sydney Water	Water	TBA	TBA	In service	Identified (no works)	Along Showground Road between Dawn Fraser Avenue and Herb Elliott Avenue	N/A
PW-07-140	Sydney Water	Water	TBA	TBA	TBA	Relocate	Along Showground Road between Dawn Fraser Avenue and Herb Elliott Avenue	CSSI
PW-07-160	Sydney Water	Water	TBA	TBA	TBA	Identified (no works)	Along Showground Road between Dawn Fraser Avenue and Herb Elliott Avenue	N/A
PW-07-170	Sydney Water	Water	TBA	TBA	In service	Identified (no works)	Construction site	N/A
PW-07-180	Sydney Water	Water	TBA	TBA	In service	Identified (no works)	Along Herb Elliott Avenue	N/A
PW-07-190	Sydney Water	Water	TBA	TBA	In service	Identified (no works)	Construction site	N/A
PW-07-200	Sydney Water	Water	TBA	TBA	In service	Decommission	Along Herb Elliott Avenue	CSSI
PW-07-210	Sydney Water	Water	TBA	TBA	In service	Decommission	Along Herb Elliott Avenue	CSSI
PW-07-220	Sydney Water	Water	TBA	TBA	In service	Decommission	Along Herb Elliott Avenue	CSSI
PW-07-230	Sydney Water	Water	TBA	TBA	In service	Decommission	Along Herb Elliott Avenue	CSSI
PW-07-240	Sydney Water	Water	TBA	TBA	In service	Decommission	Construction site	CSSI

Metro ID	Owner	HLFC	Size (DN)	Material	Status	Treatment	Location	Design contract
PW-07-250	Sydney Water	Water	TBA	TBA	In service	Decommission	Construction site	CSSI
PW-07-260	Sydney Water	Water	TBA	TBA	In service	Decommission	Construction site	CSSI
PW-07-270	Sydney Water	Water	TBA	TBA	In service	Decommission	Construction site	CSSI
PW-07-280	Sydney Water	Water	TBA	TBA	In service	Decommission	Construction site	CSSI
PW-07-290	Sydney Water	Water	TBA	TBA	In service	Decommission	Construction site	CSSI
PW-07-300	Sydney Water	Water	TBA	TBA	In service	Decommission	Construction site	CSSI
PW-07-310	Sydney Water	Water	TBA	TBA	In service	Identified (no works)	Along Figtree Drive	N/A
PW-07-320	Sydney Water	Water	TBA	TBA	In service	Identified (no works)	Along Figtree Drive	N/A
PW-07-330	Sydney Water	Water	TBA	TBA	In service	Identified (no works)	Along Figtree Drive	N/A
PW-07-340	Sydney Water	Water	TBA	TBA	In service	Decommission	Construction site	CSSI
PW-07-350	Sydney Water	Water	TBA	TBA	In service	Decommission	Along Figtree Drive	CSSI
PW-07-360	Sydney Water	Water	TBA	TBA	In service	Identified (no works)	Along Figtree Drive	N/A
PW-07-370	Sydney Water	Water	TBA	TBA	In service	Decommission	Construction site	CSSI
PW-07-380	Sydney Water	Water	TBA	TBA	In service	Decommission	Construction site	CSSI

Metro ID	Owner	HLFC	Size (DN)	Material	Status	Treatment	Location	Design contract
PW-07-390	Sydney Water	Water	TBA	TBA	In service	Identified (no works)	Along Figtree Drive	N/A
PW-07-400	Sydney Water	Water	TBA	TBA	In service	Identified (no works)	Along Figtree Drive	N/A
PW-07-410	Sydney Water	Water	TBA	TBA	In service	Decommission	Along Figtree Drive	CSSI
PW-07-420	Sydney Water	Water	TBA	TBA	In service	Identified (no works)	Along Figtree Drive	N/A
PW-07-430	Sydney Water	Water	TBA	TBA	In service	Identified (no works)	Along Figtree Drive	N/A
PW-07-440	Sydney Water	Water	TBA	TBA	In service	Identified (no works)	Along Figtree Drive	N/A
PW-07-450	Sydney Water	Water	TBA	TBA	In service	Identified (no works)	Along Figtree Drive	N/A
PW-07-460	Sydney Water	Water	TBA	TBA	In service	Identified (no works)	Along Figtree Drive	N/A
PW-07-470	Sydney Water	Water	TBA	TBA	In service	Identified (no works)	Along Figtree Drive	N/A

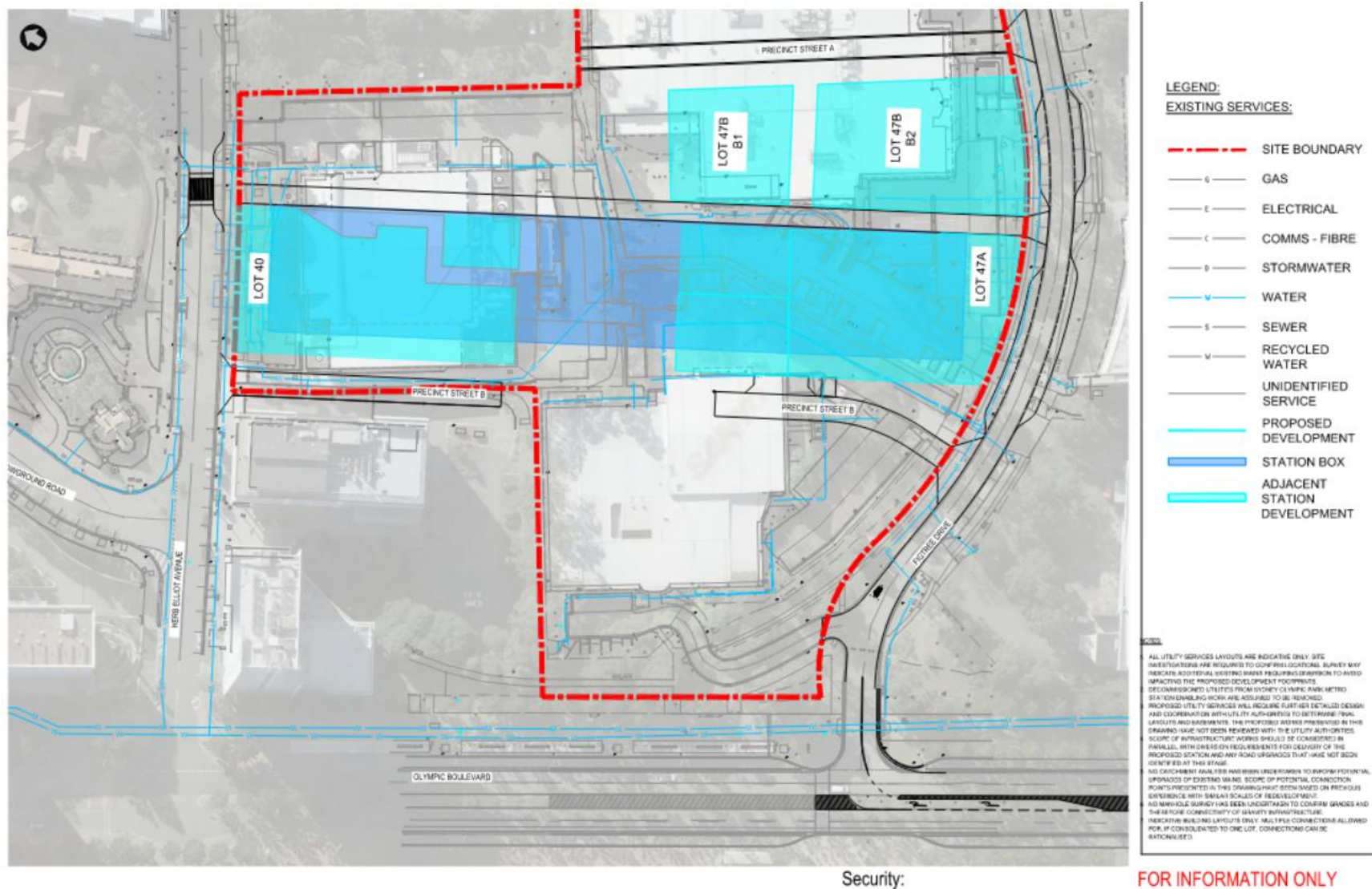


Figure 6-6 Existing potable water assets

6.3.3 Proposed water servicing and relocations

To allow for construction and servicing of the proposed development, the following alteration works are required:

- protect 1 x DN200mm and 1 x DN250mm DICL pipes along Herb Elliott Avenue between Australia Avenue and Olympic Boulevard
- relocate 2 x DN100mm, 1 x DN150mm and 1 x DN200mm DICL pipes along Figtree Drive between Australia Avenue and Olympic Boulevard
- protect DN150 DICL in-trench pipes crossing Australia Avenue at the Figtree Drive intersection
- new water supply for fire systems and domestic water connection to Site 47 (including station services) from the existing water main on Figtree Drive
- new water supply for fire systems and domestic water connection to the station building from the existing water main on Herb Elliott Avenue.

The proposed potable water relocations and potential new building connections are shown below in Figure 6-7. It is important to note that these designs are schematic only and further consultation will be undertaken with Sydney Water during the preparation of the Detailed SSDAs.

Following Sydney Water consultation, Sydney Metro has received a feasibility letter (dated 1 April 2022) which states that the current trunk system suggested has capacity to service the development in the short term. Where the proposed development has the option to connect to a DN250 either along Herb Elliott Avenue or along Olympic Boulevard. However, if any reticulation amplification is required beyond 2026, planning will be reassessed as part of S73 application. See Appendix B for full Sydney Water feasibility letter.

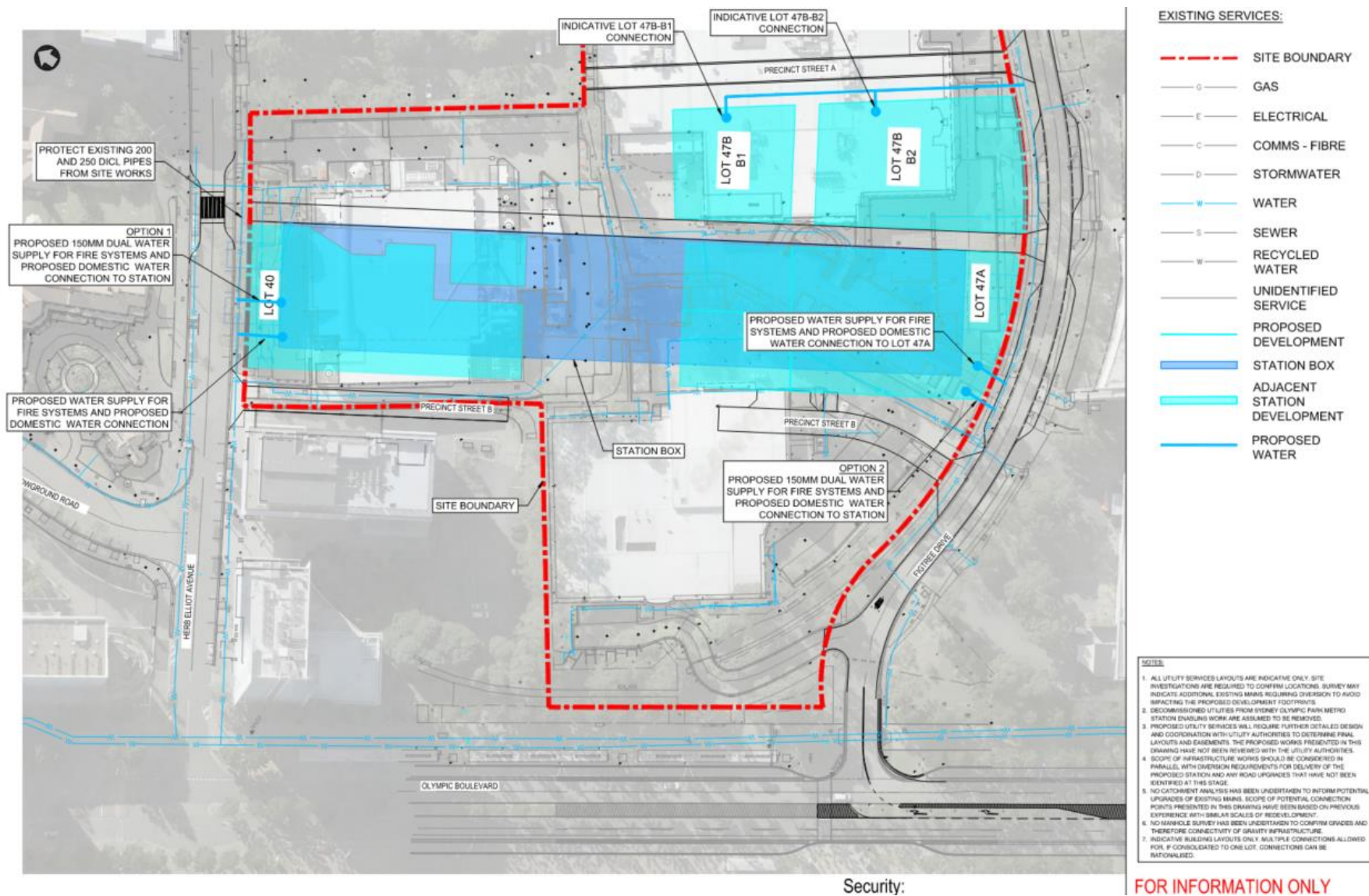


Figure 6-7 Proposed potable water servicing and relocation plan

6.3.4 Demand assessment

Development demand

A high-level demand assessment was undertaken based on the indicative building development yield detailed in section 3.2. This development yield has been referenced for the purposes of utilities infrastructure assessments only and the final architectural designs should be used to confirm the building details.

The estimated potable water demand was calculated based on the standard unit rates summarised in Table 6-5 below and the development yields. The net lettable area (NLA) was assumed to be 80% of the GFA. Calculated values are summarised in Table 6-6.

Table 6-5 Potable water design loading criteria

Land use	Design criteria	Unit	Demand rate	Source
Residential – multi-unit (>140 units/net/ha)	Max day demand	kL/unit/day	0.8	WSA 03-2011
Commercial – city high rise commercial	Max day demand	kL/ha/day	63	WSA 03-2011
Retail – suburban commercial	Max day demand	kL/ha/day	41	WSA 03-2011
BASIX reduction (residential only)	N/A	%	40	Building Sustainability Index

Table 6-6 Estimated maximum day demand (MDD) for potable water including BASIX (kL/day)

Location	Residential (incl. BASIX)	Commercial and retail	Total (kL/day)
Estimated MDD for Building 1	-	172	172
Estimated MDD for Building 2 and 3	480	27	507
Totals	480	199	679

Station demand

The potable water demand for Sydney Olympic Park metro station was calculated based on current design parameters and the Traffic and Transport Planning's Passengers movement as per 2056 AM Peak Hour + 15% Station Movements (October 2020) – Transfer, Entry and Exit Model. The quantities and associated load may vary as detail design is developed. The following assumptions were used in the calculations:

- allowance of 3% of (daily) total passengers using toilets and handwash basins during peak and off-peak
- 95% of total water usage to discharge to sewer except cooling tower make-up demands
- 50,000L/day for cooling tower make-up water supply
- allowance of 20% spare flow capacity
- fixture outlets for new/temporary fixtures with minimum WELS Star Rating of 6.

The proposed potable water demand for Sydney Olympic Park metro station was estimated to be 61kL/day and 73kL/day with an allowance of 20% spare flow capacity.

Please note that the station box demand has been included in this assessment for reference only and has not been accounted for in the total demand calculations as it forms part of the Concept and Stage 1 CSSI Approval.

6.4 Recycled water

6.4.1 Background

Recycled water servicing is provided by SWC. Treated wastewater from the reclamation plant, along with water held at Brickpit storage, is sent to the water treatment plant on Marjorie Jackson Parkway, near Bennelong Parkway, where it is treated before being supplied back to SOPA venues.

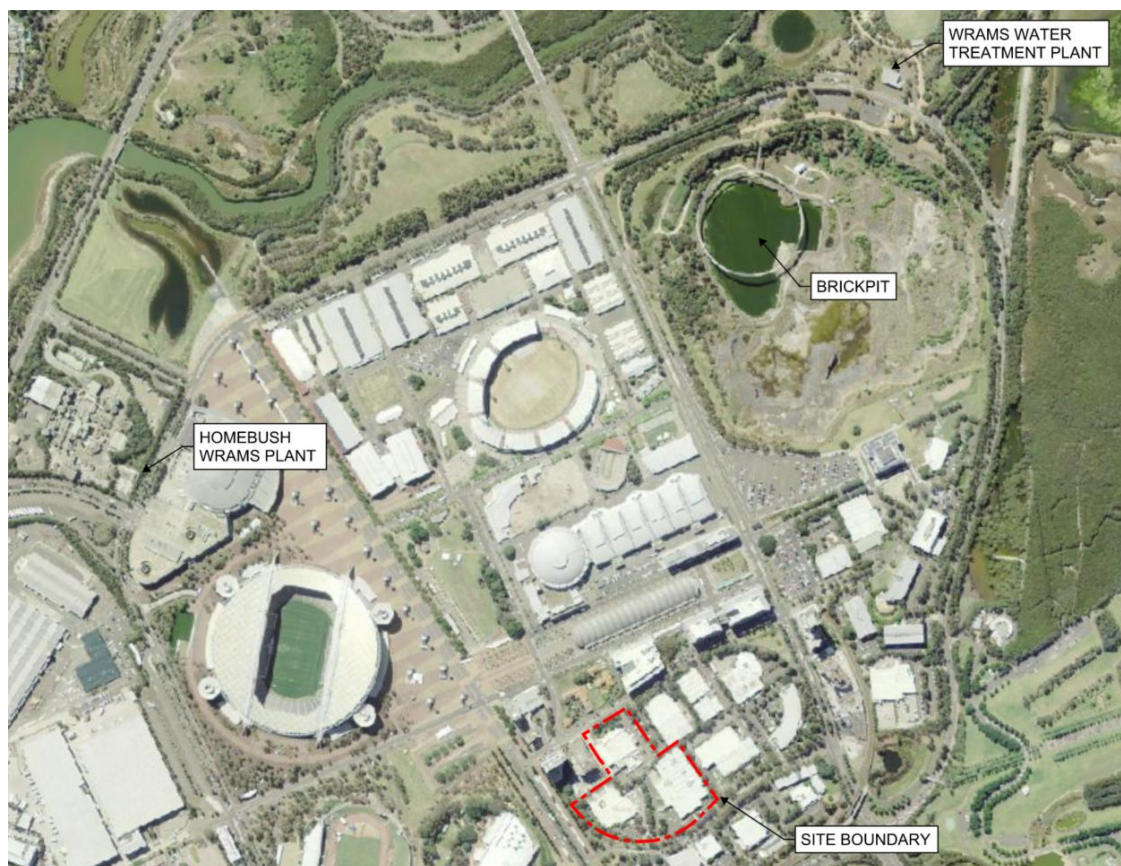


Figure 6-8 SOPA WRAMS plant locations

6.4.2 Existing assets

Recycled Water servicing is provided by SWC, the desktop information indicates the presence of a number of Sydney Water assets in the surrounding area. These are summarised in Table 6-7 below and shown in Figure 6-9.

Table 6-7 Existing Sydney Water recycled water assets

Metro ID	Owner	HLFC	Size (DN)	Material	Status	Treatment	Location	Design contract
RW-07-010	Sydney Water	Recycled Water	TBA	TBA	In service	Protect	Along Showground Road between Dawn Fraser Avenue and Herb Elliott Avenue	SSDA
RW-07-020	Sydney Water	Recycled Water	TBA	TBA	TBA	Relocate	Along Showground Road between Dawn Fraser Avenue and Herb Elliott Avenue	CSSI
RW-07-030	Sydney Water	Recycled Water	TBA	TBA	TBA	Identified (no works)	Along Herb Elliott Avenue	N/A
RW-07-040	Sydney Water	Recycled Water	TBA	TBA	In service	Protect	Along Herb Elliott Avenue	SSDA
RW-07-050	Sydney Water	Recycled Water	TBA	TBA	In service	Protect	Along Figtree Drive	SSDA
RW-07-060	Sydney Water	Recycled Water	TBA	TBA	In service	Protect	Along Figtree Drive	SSDA
RW-07-070	Sydney Water	Recycled Water	TBA	TBA	In service	Protect	Along Figtree Drive	SSDA
RW-07-080	Sydney Water	Recycled Water	TBA	TBA	In service	Protect	Along Figtree Drive	SSDA
RW-07-090	Sydney Water	Recycled Water	TBA	TBA	In service	Protect	Along Figtree Drive	SSDA
RW-07-100	Sydney Water	Recycled Water	TBA	TBA	In service	Protect	Along Figtree Drive	SSDA



Security:

FOR INFORMATION ONLY

Figure 6-9 Existing recycled water assets

6.4.3 Proposed recycled water servicing and relocations

To allow for construction and servicing of the development, the following alteration works are required:

- relocate DN150mm DICL in-trench pipe along Figtree Drive between Australia Avenue and Olympic Boulevard away from bus interchange work
- protect DN100mm DICL in-trench pipe crossing Australia Avenue at the Figtree Drive intersection
- a potential new recycled water connection from Site 47 to existing recycled water main on Figtree Drive
- a potential new recycled water connection from Site 40 to existing recycled water main on Herb Elliott Avenue.

The proposed recycled water relocations and potential new building connections are shown below in Figure 6-10. It is important to note that these designs are schematic only and further consultation will be undertaken with SOPA during the preparation of the Detailed SSDAs.

Following Sydney Water consultation, Sydney Metro has received a feasibility letter (dated 1 April 2022) which recommends that the integrated water management provision via dual-pipe controls is investigated for this development in line with the wider Greater Parramatta and the Olympic Peninsula recycled water initiatives. See Appendix B for full Sydney Water feasibility letter.

6.4.4 Demand assessment

No demand assessment has been calculated for this service however, advice on the quantity and type of connections will be ascertained via the feasibility application process with Sydney Water.

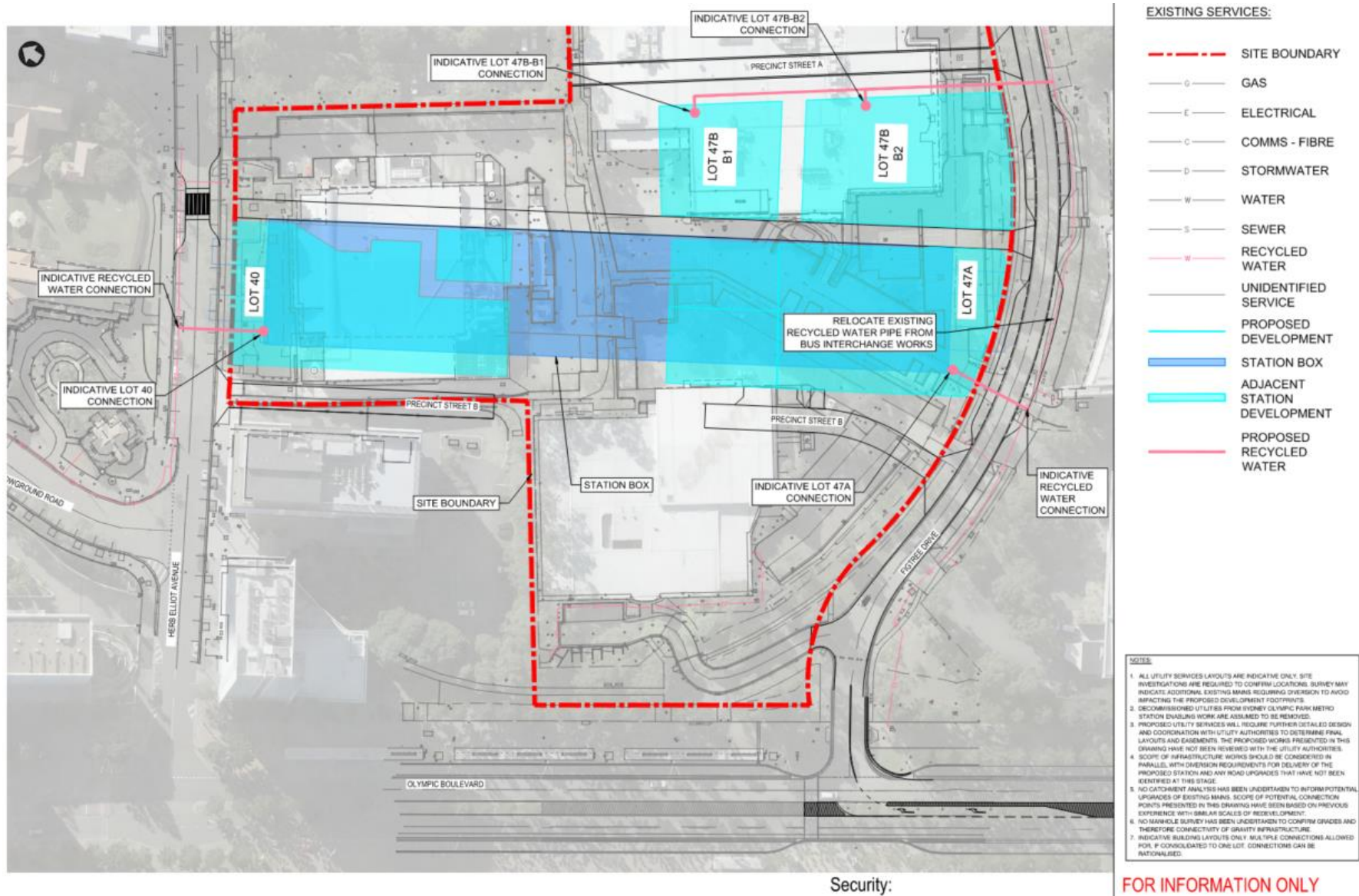


Figure 6-10 Proposed recycled water plan

6.5 Telecommunications

6.5.1 Existing assets

Telecommunications servicing are provided by Telstra, Optus, Uecomm, Vocus, Vodafone and TPG. The desktop information indicates the presence of a number of telecommunications assets in the surrounding area. These are summarised below.

The existing assets are shown in Figure 6-11.

Table 6-8 Existing telecommunications assets

Metro ID	Owner	HLFC	Type	Status	Treatment	Location	Design contract
NB-07-020	NBN	Optic fibre	Cable	In service	Decommission	Along Herb Elliot Avenue between Australia Avenue and Olympic Boulevard	CSSI
NB-07-040	NBN	Optic fibre	Conduit bank	In service	Decommission	Along Herb Elliot Avenue between Australia Avenue and Olympic Boulevard	CSSI
NB-07-060	NBN	Optic fibre	Conduit bank	In service	Relocate	Along Showground Road between Murray Rose Avenue and Herb Elliot Avenue	CSSI
NB-07-220	NBN	Optic fibre	Conduit bank	In service	Decommission	Along Figtree Drive between Australia Avenue and Olympic Boulevard	CSSI
NB-07-480	NBN	Optic fibre	Cable	In service	Decommission	Along Figtree Drive	CSSI
OC-07-140	SOPA	Optic fibre	Pit	In service	Decommission	Along Figtree Drive	CSSI
OC-07-150	SOPA	Optic fibre	Pit	In service	Decommission	Along Figtree Drive	CSSI
OC-07-160	SOPA	Optic fibre	Pit	In service	Decommission	Along Figtree Drive	CSSI
OC-07-170	SOPA	Optic fibre	Pit	In service	Decommission	Along Figtree Drive	CSSI
OP-07-020	Optus	Optic fibre	Pit	In service	Relocate	Along Showground Road between Dawn Fraser Avenue and Herb Elliott Avenue	CSSI
OP-07-030	Optus	Optic fibre	Pit	In service	Relocate	Along Showground Road between Dawn Fraser Avenue and Herb Elliott Avenue	CSSI

Metro ID	Owner	HLFC	Type	Status	Treatment	Location	Design contract
OP-07-040	Optus	Optic fibre	Cable	In service	Relocate	Along Showground Road between Dawn Fraser Avenue and Herb Elliott Avenue	CSSI
OP-07-060	Optus	Optic fibre	Cable	In service	Relocate	Along Showground Road between Murray Rose Avenue and Herb Elliot Avenue	CSSI
OP-07-150	Optus	Optic fibre	Cable	In service	Decommission	Along Figtree Drive between Australia Avenue and Olympic Boulevard	CSSI
OP-07-210	Optus	Optic fibre	Cable	In service	Decommission	Along Figtree Drive between Australia Avenue and Olympic Boulevard	CSSI
TE-07-020	Telstra	Optic fibre	Cable	In service	Decommission	Along Herb Elliot Avenue between Australia Avenue and Olympic Boulevard	CSSI
TE-07-040	Telstra	Optic fibre	Conduit bank	In service	Decommission	Along Herb Elliot Avenue between Australia Avenue and Olympic Boulevard	CSSI
TE-07-060	Telstra	Optic fibre	Conduit bank	In service	Relocate	Along Showground Road between Murray Rose Avenue and Herb Elliot Avenue	CSSI
TE-07-220	Telstra	Optic fibre	Conduit bank	In service	Decommission	Along Figtree Drive between Australia Avenue and Olympic Boulevard	CSSI
TE-07-480	Telstra	Optic fibre	Cable	In service	Decommission	Along Figtree Drive	CSSI
TP-07-030	TPG	Optic fibre	Cable	In service	Decommission	Along Figtree Drive	CSSI

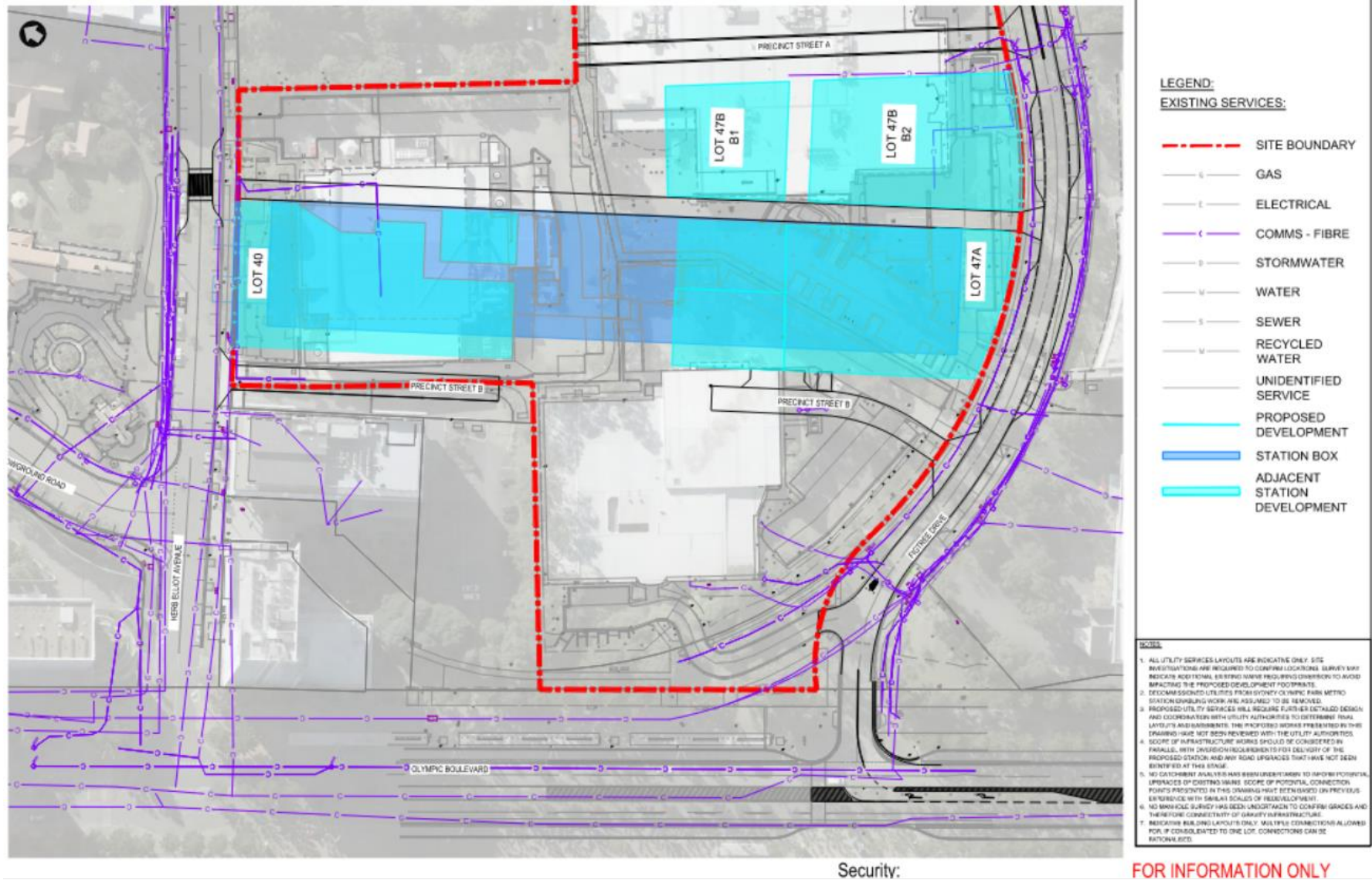


Figure 6-11 Existing telecommunication assets

6.5.2 Proposed telecommunications servicing and relocations

To allow for construction and servicing of the development, the following alteration works are required:

- protect 3 x Optus OF cables, 2 x TPG OF cables, 2 x Uecomm OF cables, Vocus OF cables and 1 x Telstra OF conduit bank along Herb Elliott Avenue between Australia Avenue and Olympic Boulevard
- protect 2 x Telstra OF conduit banks along Figtree Drive
- protect NBN OF cables in 5 x conduits along Figtree Drive
- protect Telstra OF conduits on Herb Elliott Avenue
- a potential new telecommunications connection from Site 40 to the existing conduit on Herb Elliott Avenue
- a potential new telecommunications connection from Site 47 from the existing conduit on Figtree Drive
- a potential new telecommunications connection from Site 47 to a proposed communications conduit along Precinct Street A connecting back to Figtree Drive.

The proposed telecommunication relocations and potential new building connections are shown below in Figure 6-12. It is important to note that these designs are schematic only and further consultation will be undertaken with affected telecommunications providers during the preparation of the Detailed SSDAs.

6.5.3 Demand assessment

No demand assessment has been calculated for this service however, advice on the quantity and type of connections will be ascertained via the feasibility application process with the telecommunications authorities. Telecommunication connections will be confirmed as the building services design develops and will be coordinated with service providers.

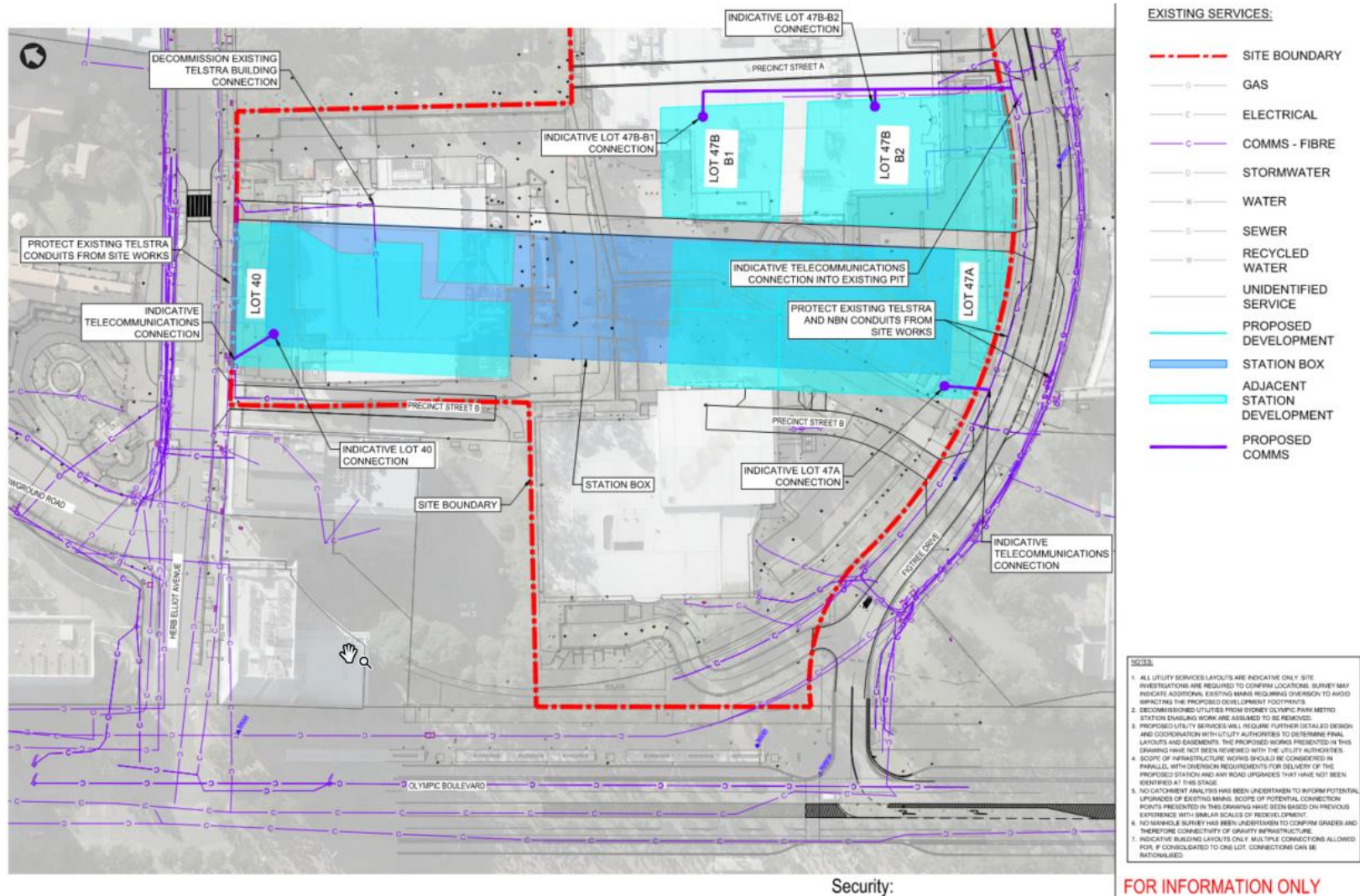


Figure 6-12 Proposed telecommunication servicing and relocation plan

6.6 Electrical

6.6.1 Existing assets

Electrical servicing is provided by Ausgrid, the desktop information indicates the presence of a number of Ausgrid assets in the surrounding area.

The existing assets are shown in Figure 6-13.

Table 6-9 Existing electrical assets

Metro ID	Owner	HLFC	Type	Status	Treatment	Location	Design contract
AG-07-050	Ausgrid	Optic fibre	Cable	Out of service	Relocate	Along Showground Road between Murray Rose Avenue and Herb Elliot Avenue	CSSI
AG-07-1010	Ausgrid	Optic fibre	Cable	In service	Decommission	Along Herb Elliott Avenue	CSSI
AG-07-1020	Ausgrid	Optic fibre	Cable	In service	Decommission	Along Herb Elliott Avenue	CSSI
AG-07-1030	Ausgrid	Optic fibre	Cable	In service	Decommission	Along Herb Elliott Avenue	CSSI
AG-07-1040	Ausgrid	Optic fibre	Cable	In service	Decommission	Construction site	CSSI
AG-07-1050	Ausgrid	Optic fibre	Cable	In service	Decommission	Construction site	CSSI
AG-07-1070	Ausgrid	Optic fibre	Cable	In service	Decommission	Along Figtree Drive	CSSI
AG-07-1080	Ausgrid	Optic fibre	Cable	In service	Decommission	Along Figtree Drive	CSSI
AG-07-1090	Ausgrid	Optic fibre	Cable	In service	Decommission	Along Figtree Drive	CSSI
AG-07-1100	Ausgrid	Optic fibre	Cable	In service	Decommission	Along Figtree Drive	CSSI
AG-07-1140	Ausgrid	Optic fibre	Cable	In service	Decommission	Along Figtree Drive	CSSI
AG-07-1150	Ausgrid	-	Cable	In service	Decommission	Construction site	CSSI
AG-07-1160	Ausgrid	-	Cable	In service	Decommission	Along Figtree Drive	CSSI
AG-07-1170	Ausgrid	-	Cable	In service	Decommission	Along Figtree Drive	CSSI
AG-07-1180	Ausgrid	-	Cable	In service	Decommission	Along Figtree Drive	CSSI
AG-07-1190	Ausgrid	-	Cable	In service	Decommission	Along Figtree Drive	CSSI
AG-07-1200	Ausgrid	-	Cable	In service	Decommission	Along Figtree Drive	CSSI
AG-07-1210	Ausgrid	-	Cable	In service	Decommission	Along Figtree Drive	CSSI
AG-07-1220	Ausgrid	-	Cable	In service	Decommission	Construction site	CSSI
AG-07-1230	Ausgrid	Optic fibre	Cable	In service	Decommission	Along Figtree Drive	CSSI
AG-07-1240	Ausgrid	Optic fibre	Cable	In service	Decommission	Along Figtree Drive	CSSI
AG-07-1250	Ausgrid	Optic fibre	Cable	In service	Decommission	Along Figtree Drive	CSSI
AG-07-1260	Ausgrid	Optic fibre	Cable	In service	Decommission	Along Figtree Drive	CSSI

Metro ID	Owner	HLFC	Type	Status	Treatment	Location	Design contract
AG-07-1270	Ausgrid	Optic fibre	Cable	In service	Decommission	Along Figtree Drive	CSSI
AG-07-1280	Ausgrid	Optic fibre	Cable	In service	Decommission	Along Figtree Drive	CSSI
AG-07-130	Ausgrid	-	Cable	In service	Relocate	Along Showground Road between Dawn Fraser Avenue and Herb Elliott Avenue	CSSI
AG-07-1310	Ausgrid	Optic fibre	Cable	In service	Decommission	Along Figtree Drive	CSSI
AG-07-170	Ausgrid	-	Cable	In service	Decommission	Along Herb Elliot Avenue between Australia Avenue and Olympic Boulevard	CSSI
AG-07-180	Ausgrid	-	Cable	In service	Decommission	Along Herb Elliot Avenue between Australia Avenue and Olympic Boulevard	CSSI
AG-07-190	Ausgrid	-	Cable	In service	Decommission	Along Figtree Drive between Australia Avenue and Olympic Boulevard	CSSI
AG-07-350	Ausgrid	-	Cable	In service	Relocate	Along Showground Road between Murray Rose Avenue and Herb Elliot Avenue	CSSI
AG-07-350	Ausgrid	-	Cable	In service	Relocate	Along Showground Road between Murray Rose Avenue and Herb Elliot Avenue	CSSI
AG-07-410	Ausgrid	-	Substation	In service	Decommission	Along Figtree Drive between Australia Avenue and Olympic Boulevard	CSSI
AG-07-440	Ausgrid	-	Substation	In service	Decommission	Along Herb Elliot Avenue between Australia Avenue and Olympic Boulevard	CSSI
AG-07-630	Ausgrid	-	Pole	In service	Relocate	Along Showground Road between Murray Rose Avenue and Herb Elliot Avenue	CSSI
AG-07-680	Ausgrid	-	Pole	In service	Relocate	Along Showground Road between Murray Rose Avenue and Herb Elliot Avenue	CSSI
AG-07-990	Ausgrid	-	Cable	Concept	Concept	Along Herb Elliot Avenue from Olympic Boulevard	CSSI

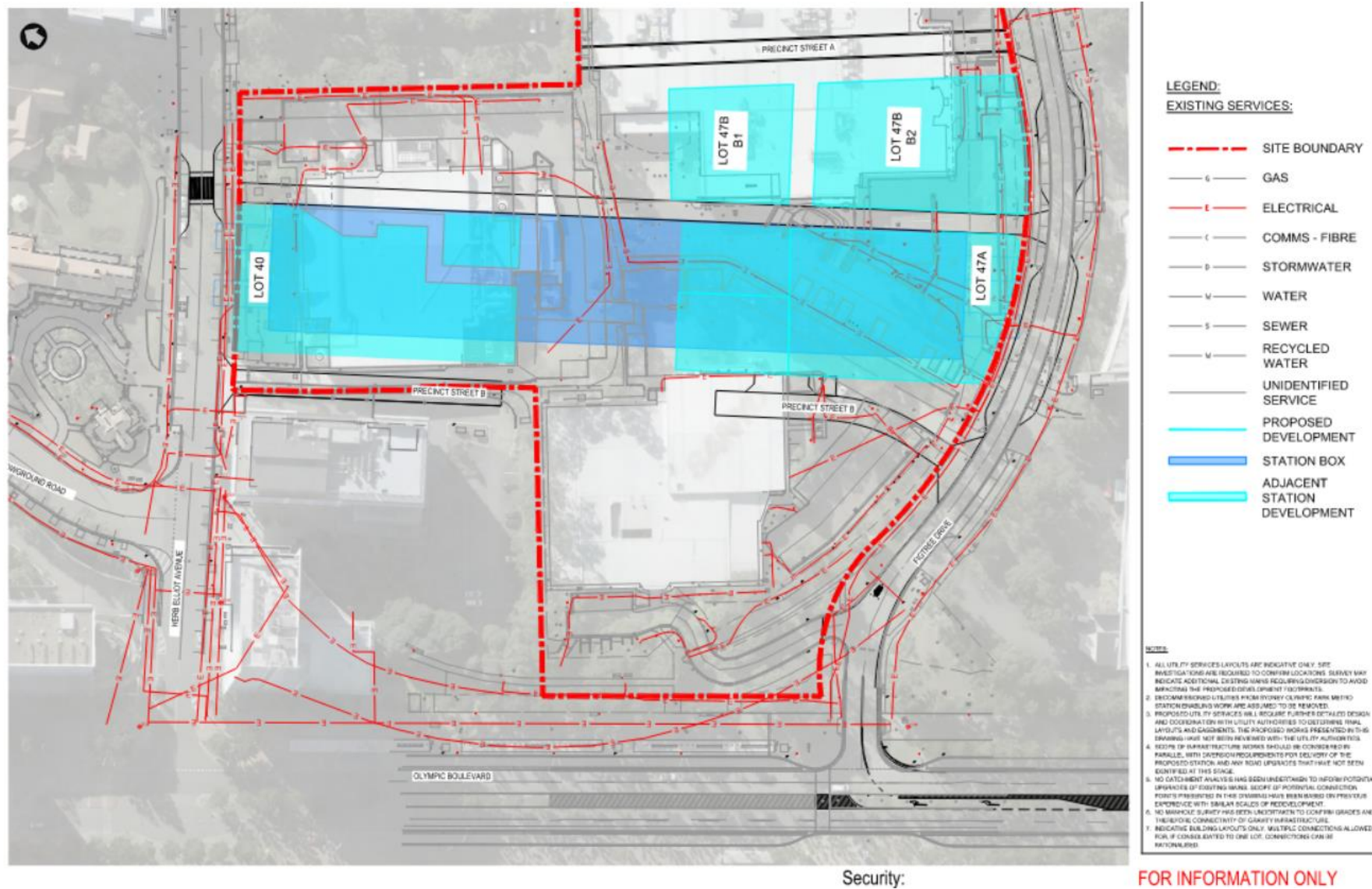


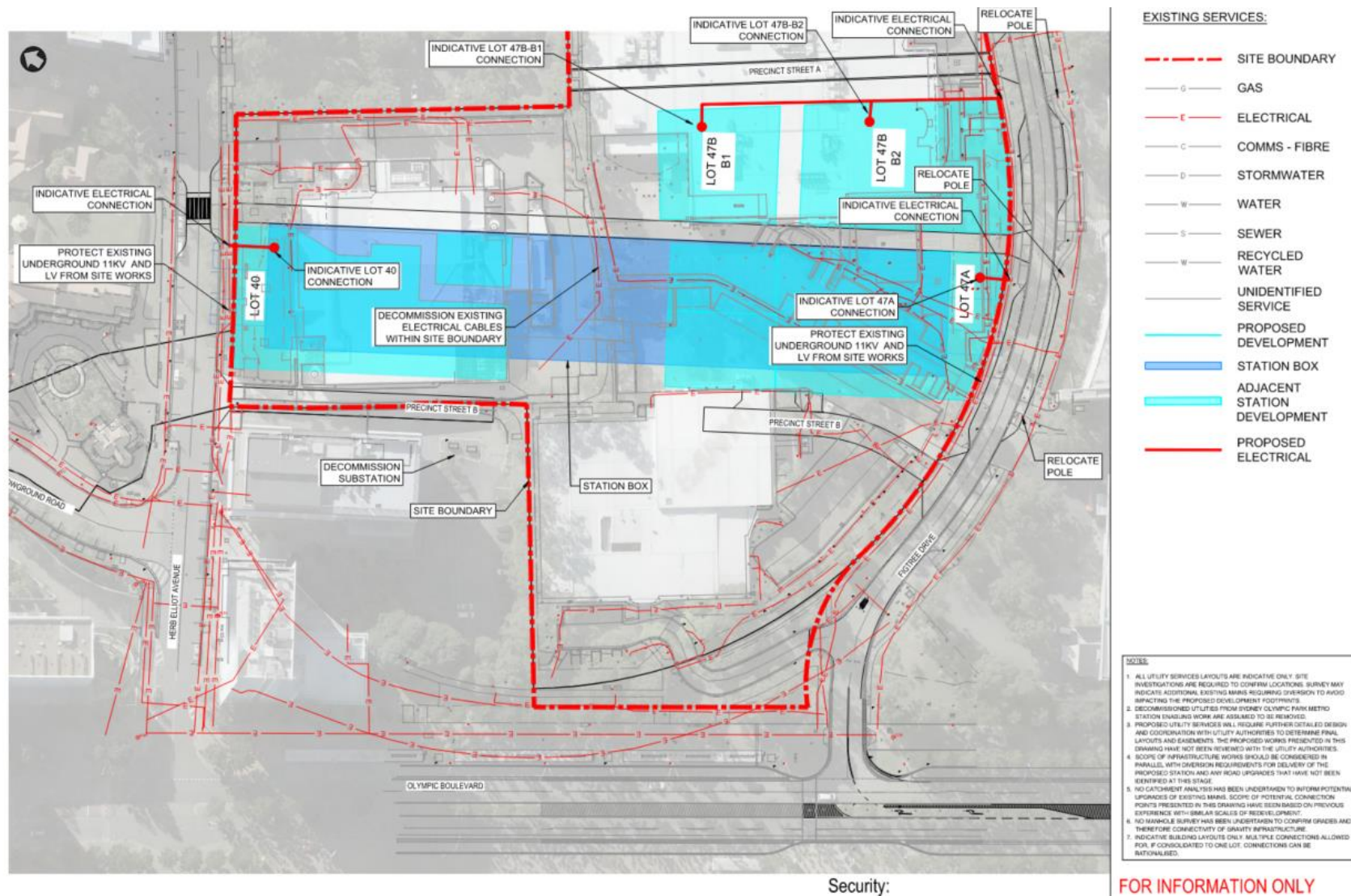
Figure 6-13 Existing electrical assets

6.6.2 Proposed electrical servicing and relocations

To allow for construction and servicing of the development, the following alteration works are required:

- installation of new HV cable crossing Herb Elliott Avenue and connecting into Lot 132 DP1889734 (No. 8 Herb Elliott Avenue)
- relocate three streetlighting poles on Figtree Drive between Australia Avenue and Olympic Boulevard
- decommission one HV ground substation and associated cabling (3 x 11kV and 3 x LV) along Figtree Drive between Australia Avenue and Olympic Boulevard
- decommission one HV chamber substation and associated cabling (4 x 11kV and 2 x LV) along Herb Elliott Avenue between Australia Avenue and Olympic Boulevard
- protect 7 x 11kV and 5 x LV underground cables outside the excavation area on Herb Elliott Avenue between Australia Avenue and Olympic Boulevard
- protect 2 x 11kV and 2 x LV cables along Herb Elliott Avenue between Park Street and Showground Road
- protect 4 x 11KV, 4 x LV and 1 x streetlighting LV cables along Figtree Drive between Australia Avenue and Olympic Boulevard
- a potential new electrical connection from Site 47 to the existing electrical cable on Figtree Drive
- a potential new electrical connection from Site 47 to a proposed electrical cable on Precinct Street A to the existing electrical cable on Figtree Drive
- a potential new electrical connection from Site 40 to the existing electrical cable on Herb Elliott Avenue.

The proposed electrical relocations and potential new building connections are shown below in Figure 6-14. It is important to note that these designs are schematic only and further consultation will be undertaken with Ausgrid during the preparation of the Detailed SSDAs.



Security:

FOR INFORMATION ONLY

Figure 6-14 Proposed electrical servicing and relocation plan

6.6.3 Demand assessment

A high-level demand assessment was undertaken based on the indicative building development yield detailed in section 6.2.4. This development yield was referenced for the purposes of utilities infrastructure assessments only and the final architectural designs should be used to confirm the building details.

The estimated electrical demand was calculated based on standard unit rates summarised in Table 6-10 below and the development yields. The NLA was assumed to be 80% of the GFA.

Table 6-10 Electrical design loading criteria

Land use	Design criteria	Unit	Demand rate	Source
Residential – apartments	Peak demand	kVA/dwelling	3.5	Endeavour Energy Growth Servicing Plan 2019 - Table 1
Commercial – office - electrical reheat zonal	Peak demand	kVA/m ²	0.11	Ausgrid NS109 – Table 4 Guide to Typical Load Densities
Retail – shops - air conditioned	Peak demand	kVA/m ²	0.1	Ausgrid NS109 – Table 4 Guide to Typical Load Densities
Diversity factor	N/A	%	80	AS3000

Table 6-11 Estimated electrical peak demand, including 0.8 diversity factor (MVA)

Location	Residential	Commercial and retail (incl. 0.8 diversity factor)	Total (MVA)
Estimated peak demand for Building 1	-	0.4	0.4
Estimated peak demand for Building 2 and 3	3.5	2.5	6.0
Totals	3.5	2.9	6.4

6.7 Gas

6.7.1 Existing assets

Gas servicing is provided by Jemena, the desktop information indicates the presence of a number of Jemena assets in the surrounding area.

These are summarised in Table 6-12 and the existing assets are shown in Figure 6-15

Table 6-12 Existing Jemena gas assets

Metro ID	Owner	HLFC	Size (DN)	Material	Status	Treatment	Location	Design contract
JE-07-010	Jemena	MP	75	Nylon	In service	Protect	Along Showground Road between Murray Rose Avenue and Herb Elliot Avenue	SSDA
JE-07-030	Jemena	MP	50	Nylon	In service	Identified (no works)	Along Olympic Boulevard between Dawn Fraser Avenue and Sarah Durack Avenue	N/A
JE-07-040	Jemena	MP	110	Nylon	In service	Identified (no works)	Along Olympic Boulevard between Dawn Fraser Avenue and Sarah Durack Avenue	N/A
JE-07-050	Jemena	HP	150	Steel	In service	Identified (no works)	Along Olympic Boulevard between Dawn Fraser Avenue and Sarah Durack Avenue	N/A
JE-07-060	Jemena	MP	110	Nylon	In service	Relocate	Along Showground Road between Murray Rose Avenue and Herb Elliot Avenue	CSSI
JE-07-070	Jemena	MP	75	Nylon	In service	Identified (no works)	Between Herb Elliot Avenue and Figtree Drive	N/A
JE-07-080	Jemena	MP	75	Nylon	In service	Identified (no works)	Along Figtree Drive between Australia Avenue and Olympic Boulevard	N/A
JE-07-090	Jemena	MP	-	-	In service	Identified (no works)	Along Figtree Drive	N/A

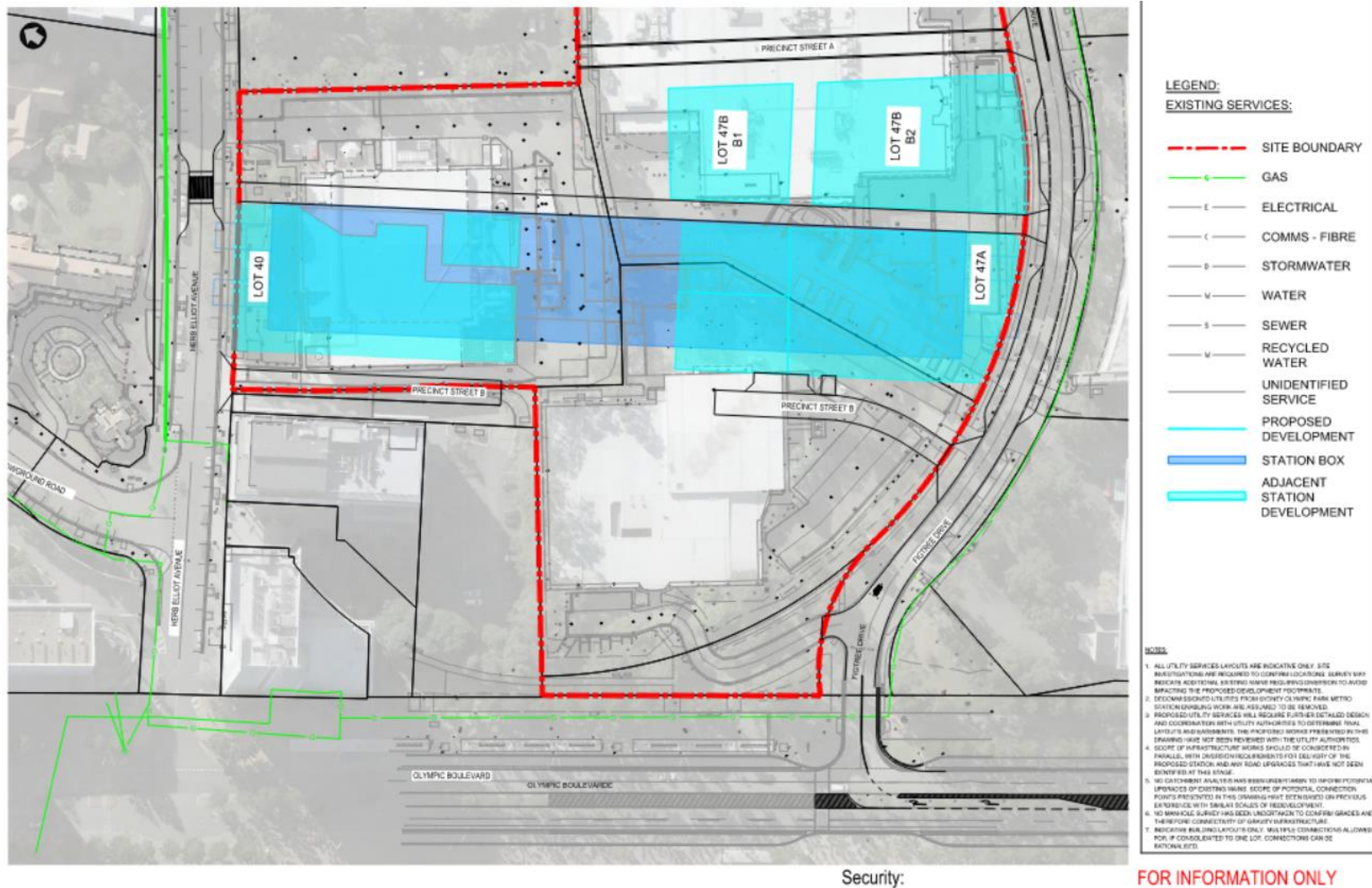


Figure 6-15 Existing gas assets

6.7.2 Proposed gas servicing and relocations

To allow for construction and servicing of the development, the following alteration works are required:

- protect DN75mm MP nylon pipe along Figtree Drive between Australia Avenue and Olympic Boulevard
- a new regulator set will be required
- one 110mm PE main interconnection in Herb Elliot Avenue and one main upgrade in Olympic Boulevard will be required
- a potential new gas connection from Site 40 to the existing gas main on Herb Elliott Avenue
- a potential new gas connection from Site 47 to the existing gas main on Figtree Drive
- a potential new gas connection from Site 47 to a proposed gas main on Precinct Street A, which connects to the existing gas main on Figtree Drive.

The proposed gas relocations and potential new building connections are shown below in Figure 6-16. It is important to note that these designs are schematic only and further consultation will be undertaken with Jemena during the preparation of the Detailed SSDAs.

6.7.3 Demand assessment

A high-level demand assessment was undertaken based on the indicative building development yield detailed in section 3.2. This development yield was referenced for the purposes of utilities infrastructure assessments only and the final architectural designs should be used to confirm the building details.

The estimated electrical demand was calculated based on standard unit rates summarised in Table 6-13 below and the development yields. The NLA was assumed to be 80% of the GFA.

Table 6-13 Gas design loading criteria

Land use	Design criteria	Unit	Demand rate	Source
Residential - apartments	Daily Demand	m ³ /day/dwelling	2.17*	Jemena Guidelines
Commercial	N/A	N/A	N/A	Jemena Guidelines
Retail	N/A	N/A	N/A	Jemena Guidelines
BASIX reduction (residential only)	N/A	%	25	Building Sustainability Index

*Based on 20GJ per year per apartment

Table 6-14 Estimated gas demand (m³/day)

Location	Residential (incl. BASIX)	Commercial and retail	Total (m ³ /day)
Estimated demand for Building 1	-	TBA	-
Estimated demand for Building 2 and 3	1800	TBA	1800
Totals	1800	TBA	1800

Please note commercial and retail usages has been excluded in this estimate due to varying demand. Facility uses are currently under discussion as part of the design development process and demand estimates will be communicated to Jemena when made known.

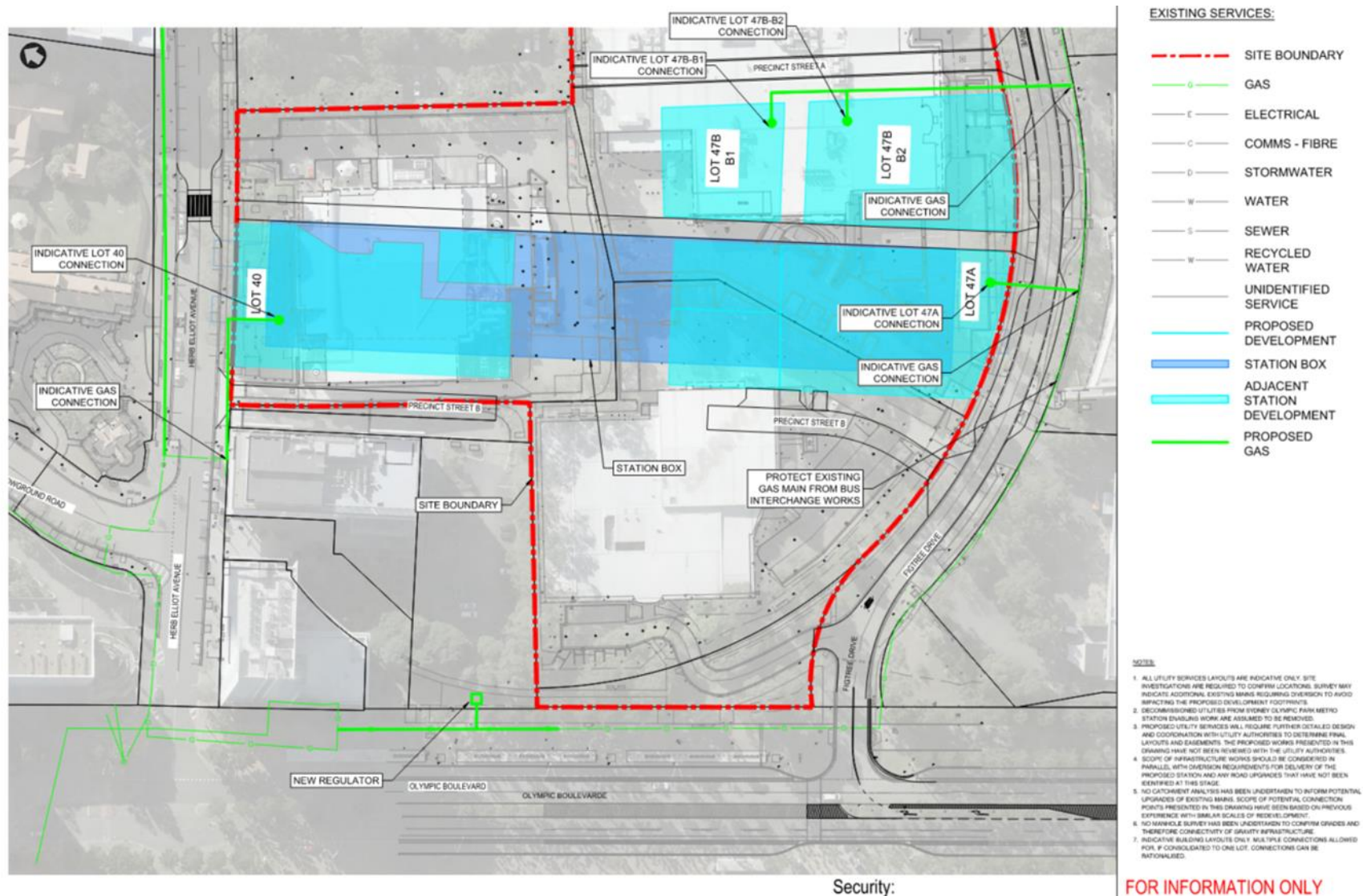


Figure 6-16 Proposed gas servicing and relocation plan

7 Sustainability initiatives

There are a range of potential sustainability initiatives that are being considered for the development works that may impact the demand calculations and servicing of the proposed development.

An Ecologically Sustainable Development Report (Appendix S of the EIS) has been developed for this proposed development site. Key initiatives that may be applicable to this report are listed below. These will be investigated and developed as the design progresses, including evaluation of impact on indicative demands.

- Implementation of passive and active design measures to minimise consumption of fuel and materials including smart metering and monitoring systems to support data collection and continual improvement.
- Minimise the quantity of stormwater run-off.
- Reduce the consumption of potable water, including the harvesting and reuse of rainwater and stormwater.
- Install dual plumbing systems and make provision for a future ready connection to a recycled water network.

These are still under investigation as the design progresses but have been included to ensure that they are fully considered in future design stages. The eventual use of any of these sustainability initiatives will potentially reduce the type and quantity of required utility servicing and may also be used to assist in offsetting utility supply constraints.

These are to be further investigated in future design stages in coordination with the building services design.

8 Cumulative impacts

For the purpose of providing a high-level assessment of the potential environmental impacts directly associated with the Concept SSDA development were considered, the subject of this SSD Application, in addition to the cumulative impacts associated with the CSSI (Metro Station) and the following developments:

- Site 2A and 2B, Australia Avenue, Sydney Olympic Park
- Site 43/44 Sydney Olympic Park – Stage 1 and 2 (6 Australia Avenue and 2 Herb Elliott Avenue).

It should be noted that the construction program for the above listed developments is not available (using publicly available documents for those projects) including the number of proposed utility modification associated with those. Therefore, a high-level cumulative assessment was undertaken in consistency with what was undertaken for Stage 3 of the EIS of the CSSI Application under the assumption that those developments would be constructed at the same time with this proposal as a worst-case scenario.

Limited information regarding the estimated demand of utility requirements of neighbouring sites. Utility providers to determine the effective demand of all sites and coordinate utility works to ensure adequate servicing.

Appropriate diversions, protections and utility upgrades will be facilitated by utility provider inputs following completed consultations.

Any cumulative impacts on utility infrastructure will be discussed with utility providers and be noted during the construction of Site 2A and 2B, Sydney Olympic Park and Site 43/44 Sydney Olympic Park.

No additional mitigation measures will be required for the site.

9 Utility authority consultation

As a part of the utility services assessment process, feasibility applications were prepared for each of the following utility authorities with the estimated demand of the development and indicative servicing arrangements for authority review and comment:

- Sydney Water
- NBN Co.
- Ausgrid
- Jemena.

Copies of these feasibility applications and authority responses are contained within Appendix A.

Response letter has been received from Sydney Water, this being contained within Appendix B. Further consultation to the specific design responses with utility authorities will be required as part of future applications; this will further facilitate the cumulative impacts assessment.

10 Conclusion

This Utilities and Infrastructure Servicing Assessment responds specifically to the SEARs. The assessment has concluded that servicing is available to the proposed development site with indicative connections for each service being:

- new sewer gravity connections from the proposed station and development site to a proposed sewer main along Figtree Drive to a new pit at the intersection with Olympic Boulevard
- new potable water connection to the proposed station and development site from the existing Sydney Water mains on Figtree Drive and Herb Elliott Avenue.

Additionally, a number of existing services will require relocation as a part of the construction works and future work will be required to provide servicing for the proposed development.

The building design of the proposed development is subject to further design development as part of Detailed SSDAs, what is required to ensure adequate servicing includes:

- further coordination with utility agencies on lead-in infrastructure connections and any amplifications of existing assets
- further utility investigation including slit trenching and obtaining Quality Level A survey information of existing utility assets
- implementation of selected sustainability initiatives in the building design and revised demand modelling to determine the impacts on the required lead-in infrastructure
- formal connection applications for utility services through appropriate channels such as Water Service Coordinators and Accredited Service Providers
- development of formal utility relocation and connection packages to the utility agencies including any protection details of existing utility assets.

Further information will be included as part of Detailed SSDAs.

Appendix A Utility authority consultation

July 7, 2021

Zachary Kennett
Network Development Specialist – I&C
Jemena
99 Walker Street
North Sydney, NSW 2060

Reference: [REDACTED]
Sydney Metro West Integrated Station Development Gas Feasibility
Application

Dear Mr. Kennett,

Introduction

Sydney Metro West is a fully segregated new Metro line connecting seamlessly with other existing transport modes. Sydney Metro West is principally a 'greenfield' development that does not rely on the expansion or repurposing of existing infrastructure (excepting the development of existing concourses at Westmead and North Strathfield Stations), providing the opportunity to develop the next evolution of the metro product.



Figure 1: Sydney Metro West Context

A summary of the key elements of the Sydney Metro West configuration and operating concept is provided below for the purposes of this application:

Sydney Metro

Level 43, 680 George Street, Sydney NSW 2000 | PO Box K659, Haymarket NSW 1240
T 02 8265 9400 | sydneymetro.info | ABN 12 354 063 515

- Approximately 24km of twin underground rail tunnels from Westmead to the Sydney CBD
- Nine new underground Metro stations at Westmead, Parramatta CBD, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and Hunter Street (Sydney CBD) and the provisioning for the sale of air space over stations and surplus land for property development
- Integrated Station Developments at Parramatta, Sydney Olympic Park, Hunter Street (Sydney CBD) and potentially The Bays
- A combined maintenance and stabling facility and Operations Control Centre at Clyde Passenger interchanges at Westmead and North Strathfield to the Sydney Trains T1 Western and T9 Northern lines
- Tunnel ventilation services facilities at Rosehill, Silverwater and Lilyfield.

Table 1 below provides a breakdown of the latest approximate development yields for each Metro station site, including a breakdown of dwellings, commercial and retail space. Figures 2 to 11 in Attachment A show indicative extents for each site development. Please note this application is for the property developments only and excludes the metro station itself due to differences in development staging timeframes. Furthermore, the details provided as part of this application are to facilitate preliminary infrastructure studies only and are subject to change as the designs develop.

Table 1: Indicative Development Growth (18th June 2021)¹

Investigation Area		Residential Apartments ³ (No.)	Indicative Commercial Space GFA ² (m ²)	Indicative Retail Space GFA ² (m ²)	Development Timeframe (Year)
1.	Westmead	250	40,000	4,500	2028 - 2032
2.	Parramatta	250	150,000	20,000	2024 - 2028
3.	Clyde MSF	N/A	N/A	N/A	2024 - 2028
4.	Sydney Olympic Park	1,000	35,000	8,000	2024 - 2028
5.	North Strathfield	N/A	N/A	N/A	2024 - 2028
6.	Burwood North	210	11,000	6,000	2024 - 2028
7.	Five Dock	21	5,000	900	2024 - 2028
8.	The Bays	550	32,450	6,150	2024 - 2028
9.	Pyrmont	180	8,000	500	2024 - 2028
10.	Hunter Street (Sydney CBD)	0	160,000	2,000	2024 - 2028

Note:

¹Apartment numbers and commercial/retail space figures are assumptions only and are subject to review. They are provided for the infrastructure capacity analysis only.

²An assumed 0.8 conversion factor from gross floor area (GFA) to net lettable area (NLA) has been applied.

³1 apartment = 100 sqm of Residential GFA

Gas Demand Rates

A preliminary assessment has been undertaken of the potential gas demand associated with each proposed development.

Demand forecasting and profiles were developed for the ISDs and development precincts based on the number of dwellings. Please note, this excludes commercial usage as we understand the rates can vary widely for different uses.

For the purposes of this assessment we used an energy demand of 20 gigajoules (GJ) per year (equating to 2.17m³/day/dwelling) to estimate the average annual domestic usage of natural gas for residential dwellings. We also included a BASIX reduction target of 25% to the residential

dwellings.

A factor of 39.6 m³/GJ was then used to convert the estimated usage into a volume of gas (Parliament of Australia, Natural Gas: Energy for the New Millennium, 2015).

Projected Gas Demand

Using the development yields outlined in Section 1 and the demand rates in Section 2, estimates for the cumulative residential gas usages were developed as shown in Table 2. Please note that, as the design is still evolving, we believe it is appropriate to apply a ±15% factor to these numbers.

Table 2: Gas Demand Rates

Development		Estimated Gas Demand (m ³ /day) (2024-2032)		Total (m ³ /day)
		Residential (incl. BASIX)	Commercial and Retail	
1.	Westmead	407	TBA ¹	407
2.	Parramatta	407	TBA ¹	407
3.	Clyde MSF	N/A	TBA ¹	N/A
4.	Sydney Olympic Park	1800	TBA ¹	1800
5.	North Strathfield	N/A	TBA ¹	N/A
6.	Burwood North	342	TBA ¹	342
7.	Five Dock	34	TBA ¹	34
8.	The Bays	895	TBA ¹	895
9.	Pymont	293	TBA ¹	293
10.	Hunter Street (Sydney CBD)	N/A	TBA ¹	N/A

Notes:

¹ Commercial and Retail usage excluded for the purposes of this estimate due to varying demand. Facility uses are currently under discussion as part of the design development process and demand estimates will be communicated to Jemena when made known.

The above demand estimates do not allow for reductions in existing demand resulting from the demolition of existing land uses. Furthermore, changes to these demand estimates from potential ecologically sustainable development (ESD) initiatives have not been considered. Any future impacts will be communicated to Jemena.

Feasibility Assessment Request

As demonstrated in the demand estimate, there is projected to be a significant impact on the gas infrastructure. As such, Sydney Metro seeks to actively engage with utility stakeholders to ensure the appropriate planning measures are implemented.

Additionally, we seek the following information:

- Confirmation of existing Jemena infrastructure within and adjacent to the sites;
- Identification of the existing capacity of the gas to service the projected growth and any augmentations that may be required to Jemena's network;
- Details of any planned infrastructure works to support development within the catchments which could be expanded to support the developments;

- Other major developments currently allowed for in the development areas as part of Jemena's infrastructure planning;
- Funding arrangements for infrastructure upgrades to meet the increased gas demand;
- Guidance on timeframes for forward planning of infrastructure works; and
- Advice on any alternative supply strategies that might be feasible for Jemena to implement for the proposed developments.

We welcome further discussion and collaboration with Jemena as part of the precinct planning and are happy to meet with Jemena and Sydney Metro to discuss the implications of this feasibility application.

Should you have any queries in relation to this application please do not hesitate to contact the undersigned. We look forward to working with Jemena on the next stages of the developments.

Yours sincerely

A handwritten signature in cursive script that reads "Paul Rogers".

Paul Rogers
Utilities & Stakeholder Manager
Sydney Metro

Attachment: *Sydney Metro West – Indicative Site Extents*

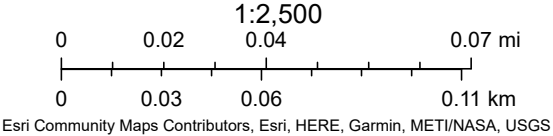
Westmead



Figure 2. Potential Westmead Site Extent

Legend:

-  Potential Site Extent
-  Proposed Metro Station Location



Parramatta

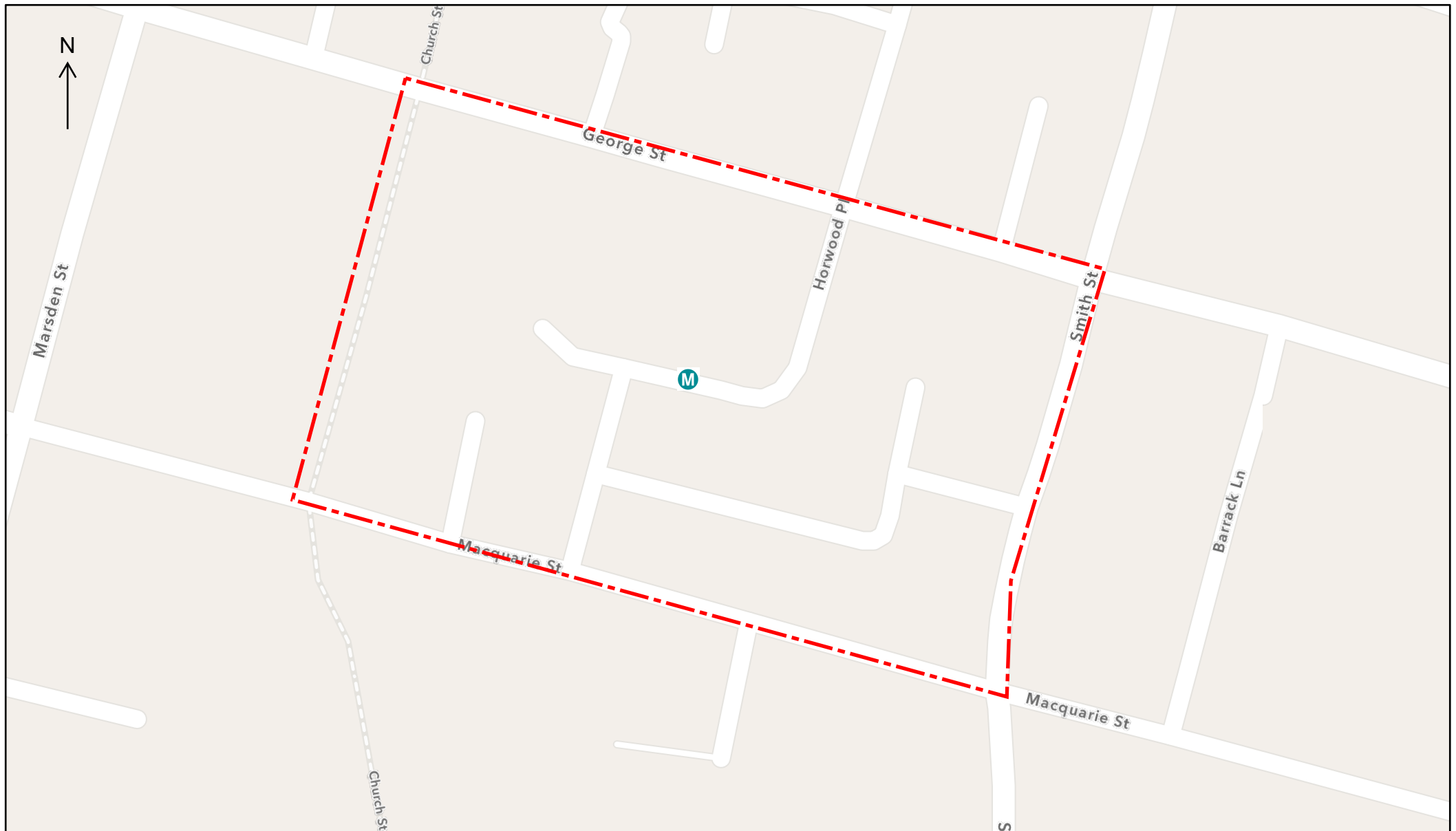
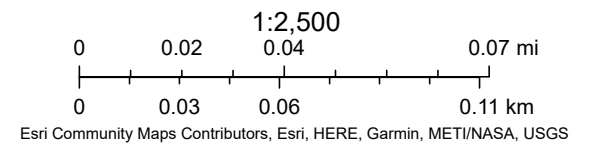


Figure 3. Potential Parramatta Site Extent

Legend:

- - - Potential Site Extent
- M Proposed Metro Station Location



Clyde MSF



Figure 4. Potential Clyde MSF Site Extent

Legend:
- - - Potential Site Extent

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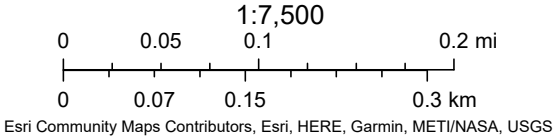
Sydney Olympic Park



Figure 5. Potential Sydney Olympic Park Site Extent

Legend:

- Potential Site Extent
- Ⓜ Proposed Metro Station Location



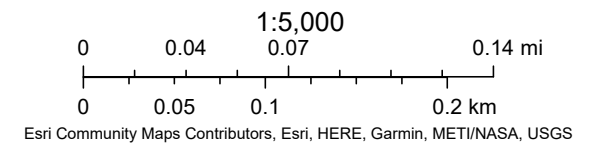
Strathfield North



Figure 6. Potential Strathfield North Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Burwood North

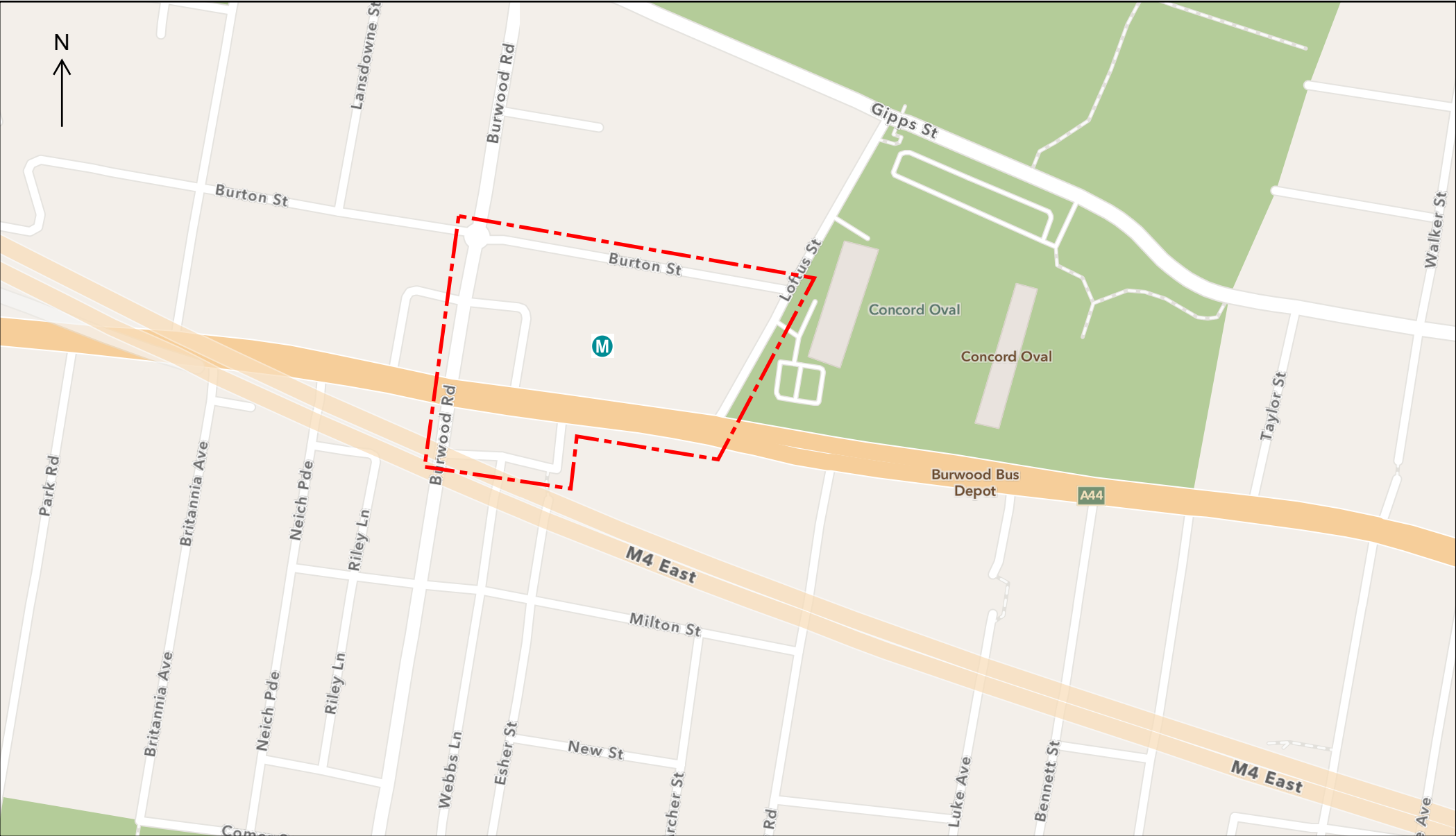
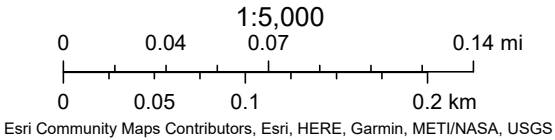


Figure 7. Potential Burwood North Site Extent

Legend:

- - - Potential Site Extent
- M Proposed Metro Station Location



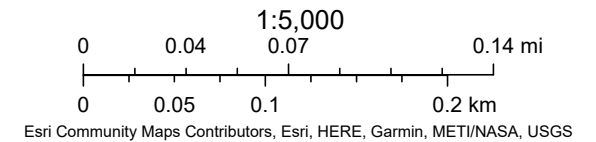
Five Dock



Figure 8. Potential Five Dock Site Extent

Legend:

- - - Potential Site Extent
- M Proposed Metro Station Location



The Bays

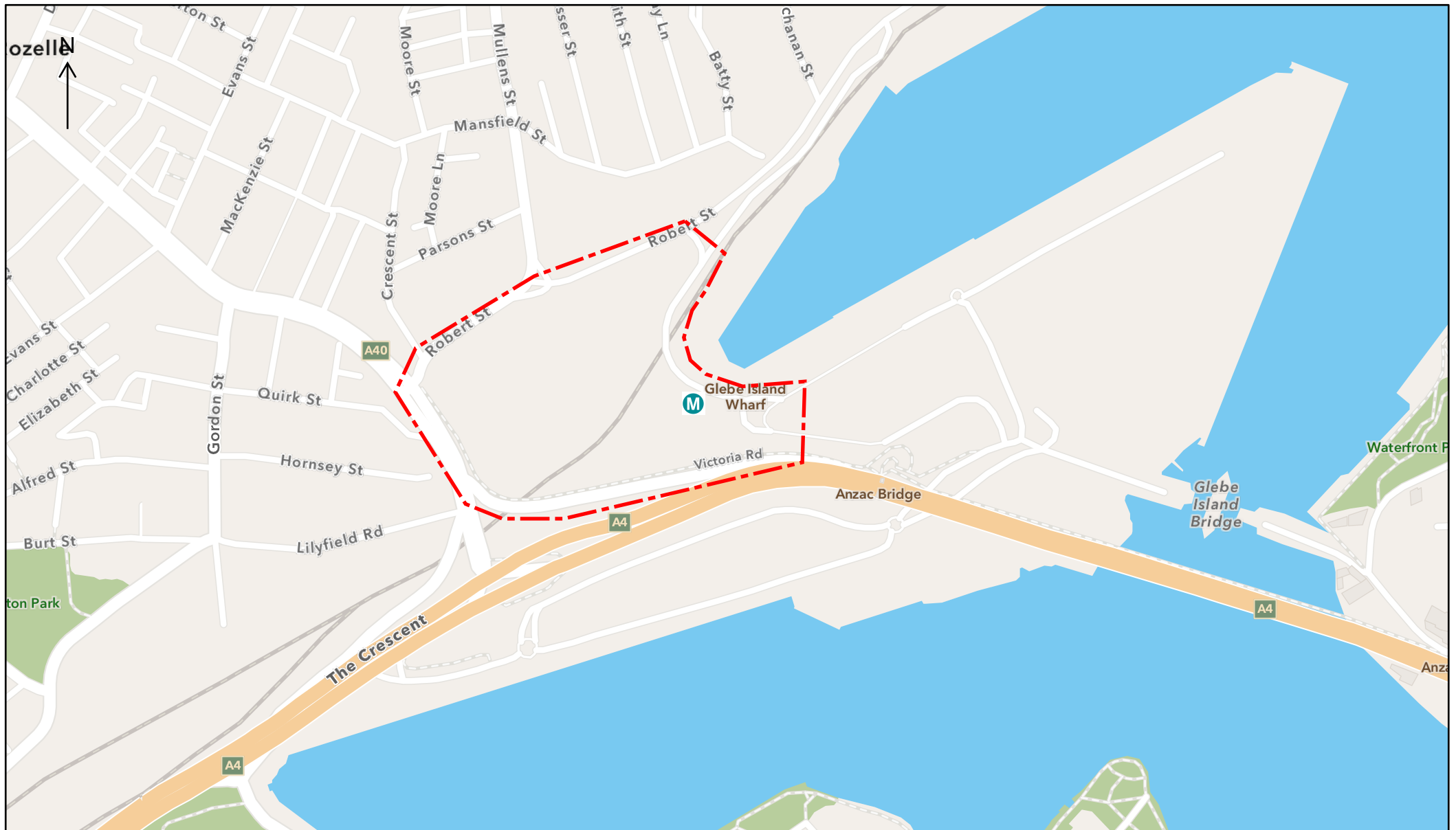
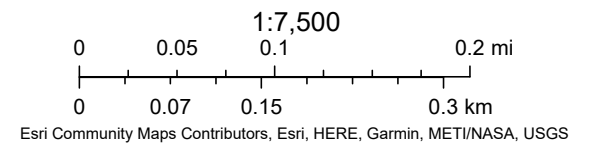


Figure 9. Potential The Bays Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Pymont

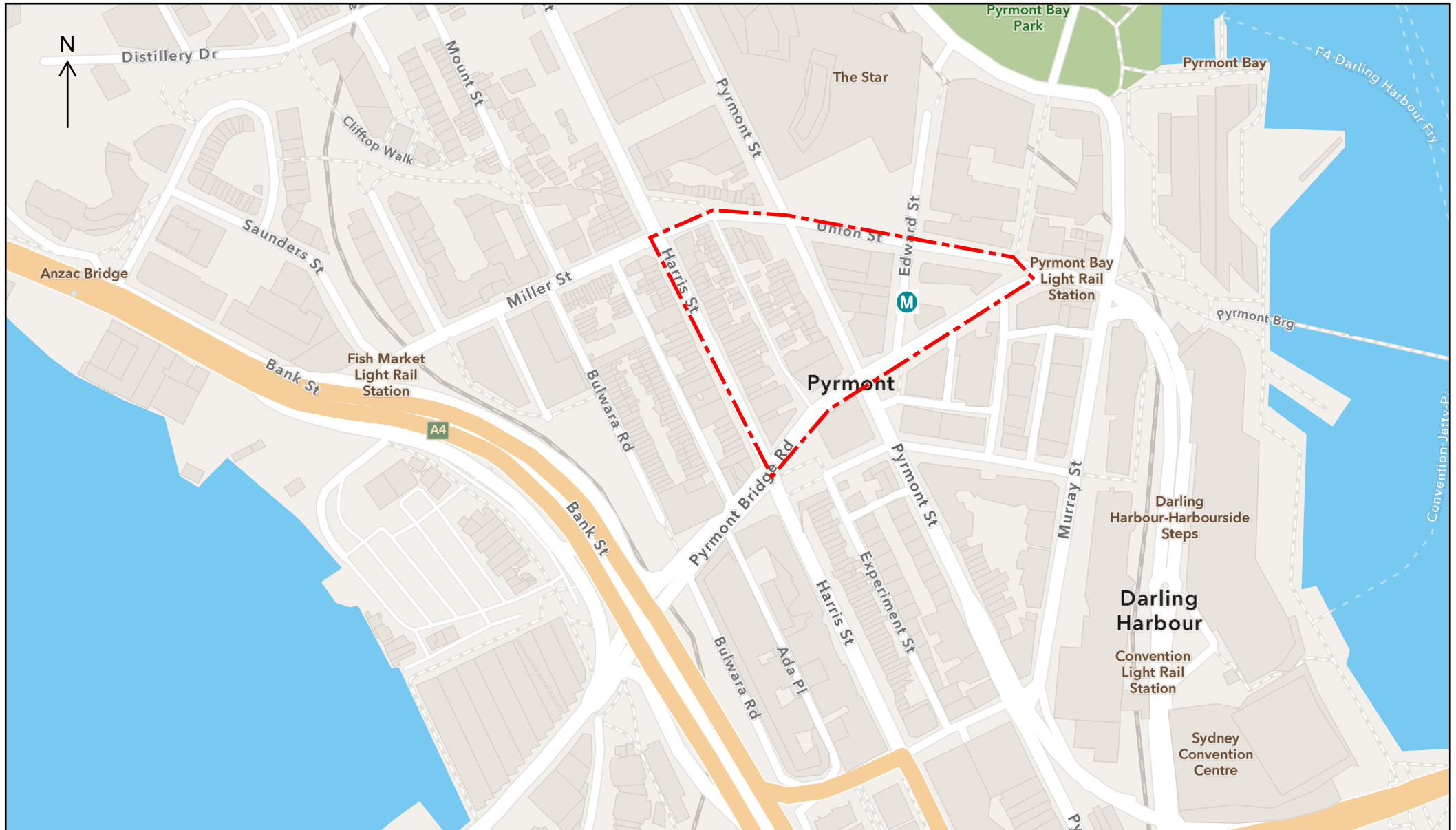
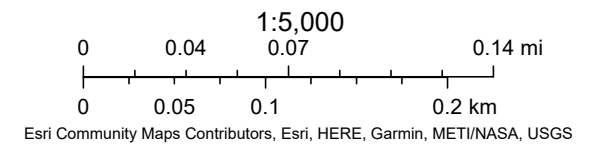


Figure 10. Potential Pymont Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Hunter Street (Sydney CBD)

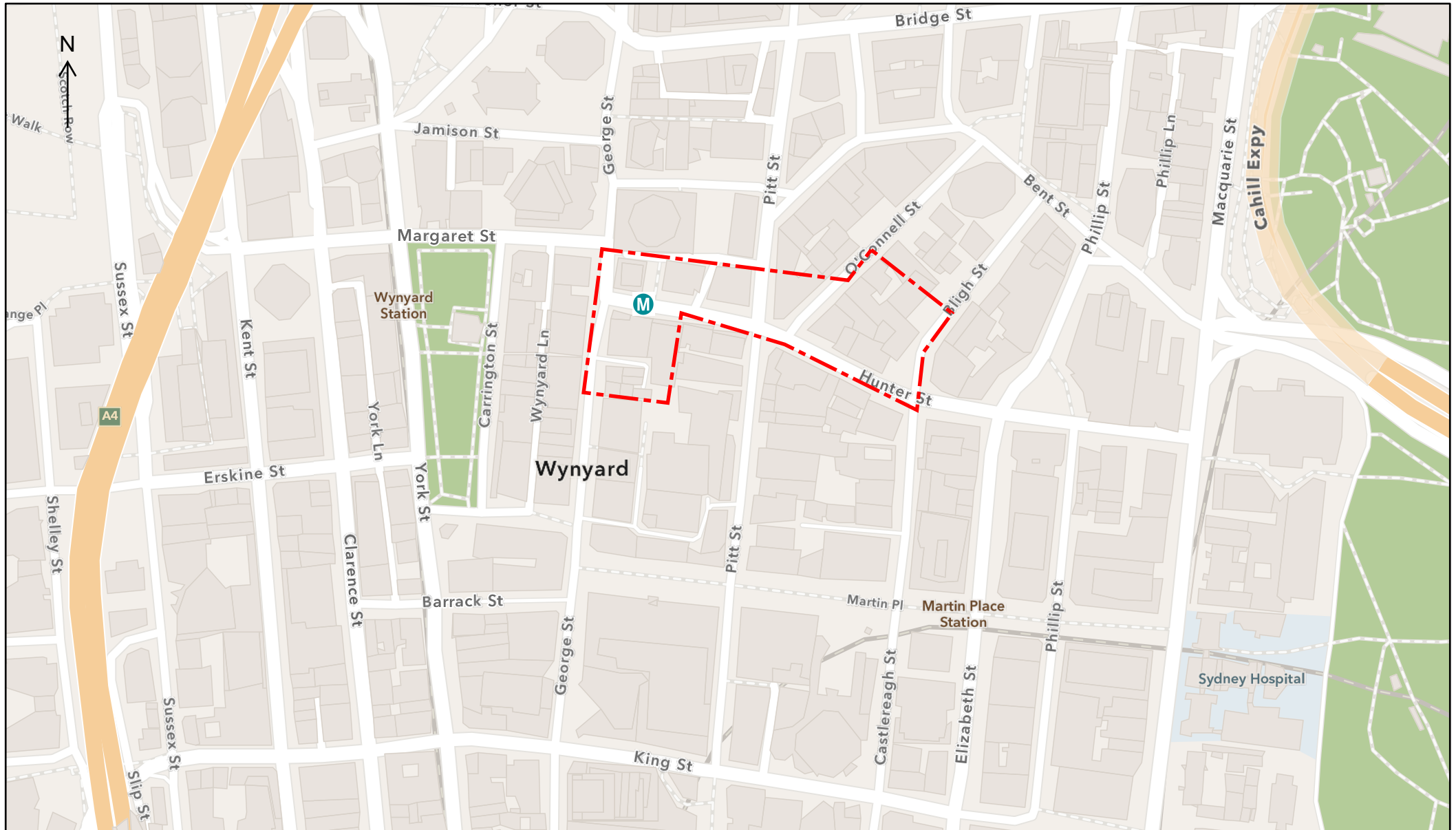
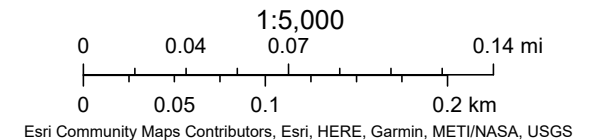


Figure 11. Potential Hunter Street (Sydney CBD) Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Memorandum



Subject: Sydney Metro West Integrated Station Development Water and Wastewater Feasibility Application

██████████ ██	██████████
██	Date: 22/06/2021
██	██

Introduction

Sydney Metro West is a fully segregated new Metro line connecting seamlessly with other existing transport modes. Sydney Metro West is principally a 'greenfield' development that does not rely on the expansion or repurposing of existing infrastructure (excepting the development of existing concourses at Westmead and North Strathfield Stations), providing the opportunity to develop the next evolution of the metro product.



Figure 1: Sydney Metro West Context

A summary of the key elements of the Sydney Metro West configuration and operating concept is provided below for the purposes of this application:

- Approximately 24km of twin underground rail tunnels from Westmead to the Sydney CBD
- Nine new underground Metro stations at Westmead, Parramatta CBD, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and Hunter Street (Sydney CBD) and the provisioning for the sale of air space over stations and surplus land for property development
- Integrated Station Developments at Parramatta, Sydney Olympic Park, Hunter Street (Sydney CBD) and potentially The Bays
- A combined maintenance and stabling facility and Operations Control Centre at Clyde
- Passenger interchanges at Westmead and North Strathfield to the Sydney Trains T1 Western and T9 Northern lines
- Tunnel ventilation services facilities at Rosehill, Silverwater and Lilyfield.

Table 1 below provides a breakdown of the latest approximate development yields for each Metro station site, including a breakdown of dwellings, commercial and retail space. Figures 2 to 11 in Attachment A show indicative extents for each site development. Please note this application is for the property developments only and excludes the metro station itself due to differences in development staging timeframes. Furthermore, the details provided as part of this application have been provided to facilitate preliminary infrastructure studies only and are subject to change as the designs develop.

Table 1: Indicative Development Growth (18th June 2021) ¹

Investigation Area		Residential Apartments ³ (No.)	Indicative Commercial Space GFA ² (m ²)	Indicative Retail Space GFA ² (m ²)	Development Timeframe (Year)
1.	Westmead	250	40,000	4,500	2028 - 2032
2.	Parramatta	250	150,000	20,000	2024 - 2028
3.	Clyde MSF	N/A	N/A	N/A	2024 - 2028
4.	Sydney Olympic Park	1,000	35,000	8,000	2024 - 2028
5.	North Strathfield	N/A	N/A	N/A	2024 - 2028
6.	Burwood North	210	11,000	6,000	2024 - 2028
7.	Five Dock	21	5,000	900	2024 - 2028
8.	The Bays	550	32,450	6,150	2024 - 2028
9.	Pyrmont	180	8,000	500	2024 - 2028
10.	Hunter Street (Sydney CBD)	0	160,000	2,000	2024 - 2028

Note:

¹Apartment numbers and commercial/retail space figures are assumptions only and are subject to review. They are provided for the infrastructure capacity analysis only.

²An assumed 0.8 conversion factor from gross floor area (GFA) to net lettable area (NLA) has been applied.

³1 apartment = 100 sqm of Residential GFA

Potable Water and Wastewater Demand Rates

A preliminary assessment has been undertaken of the potential potable water and wastewater demand associated with the proposed developments.

Demand forecasting and profiles were developed for the study area and individual precincts based on the number of dwellings and gross floor area for retail and commercial development. The demand assessment considered the unit rates and BASIX reduction factors as summarised in Table 2 and 3.

Table 2: Potable Water Demand Unit Rates

Land Use	Design Criteria	Units	Potable Water Demand	Sources
Multi-Unit (>140 unit/net/ha) 6-12 storey apartment	Max Day Demand	kL/unit/day	0.8	Water Supply Code of Australia WSA 03-2011 - 3.1 (Sydney Water Edition 2014)
Multi-Unit (61-100 unit/net/ha) 6-12 storey apartment	Max Day Demand	kL/unit/day	1.09	Water Supply Code of Australia WSA 03-2011 - 3.1 (Sydney Water Edition 2014)
City High Rise Commercial	Max Day Demand	kL/Nha/day	63	Water Supply Code of Australia WSA 03-2011 - 3.1 (Sydney Water Edition 2014)
Suburban Commercial	Max Day Demand	kL/Nha/day	41	Water Supply Code of Australia WSA 03-2011 - 3.1 (Sydney Water Edition 2014)
BASIX Reduction (residential only)		%	40	Building Sustainability Index Targets

Table 3: Wastewater Demand Unit Rates

Land Use	Units	Wastewater Demand	Sources
High Density Residential	EP/dwelling	2.5	Water Supply Code of Australia WSA 03-2011 - 3.1 (Sydney Water Edition 2014)
High Density Commercial	EP/ha	500	Water Supply Code of Australia WSA 03-2011 - 3.1 (Sydney Water Edition 2014)
Local Commercial	EP/ha	75	Water Supply Code of Australia WSA 03-2011 - 3.1 (Sydney Water Edition 2014)
Average Dry Weather Flow (ADWF)	L/s per EP	0.0017	Water Supply Code of Australia WSA 03-2011 - 3.1 (Sydney Water Edition 2014)
BASIX Reduction (residential only)	%	40	Building Sustainability Index Targets

Projected Water and Sewer Demand

Estimates for the potable water Maximum Day Demand (MDD) and the Average Dry Weather Flow (ADWF) for wastewater were developed using the development yields outlined in Section 1 and unit rates outlined in Section 2 for each station development. The BASIX reduction has also been applied to residential developments only, while commercial demand includes office and retail uses.

Unclassified

Table 4 summarises an estimate of the potable water Maximum Day Demand and Table 5 provides a summary of the ADWF estimates for wastewater. Please note that, as the design is still evolving, we believe it is appropriate to apply a $\pm 15\%$ factor to these numbers.

Table 4: Estimated Cumulative Maximum Day Demand for Potable Water including BASIX (kL/day)

Development		Estimated MDD (kL/day) (2024 – 2032)		Total (kL/day)
		Residential (incl. BASIX)	Commercial and Retail	
1.	Westmead	120	216	336
2.	Parramatta	120	1002	1122
3.	Clyde MSF	N/A	N/A	N/A
4.	Sydney Olympic Park	480	199	679
5.	North Strathfield	N/A	N/A	N/A
6.	Burwood North	137	75	212
7.	Five Dock	10	55	65
8.	The Bays	264	365	629
9.	Pymont	86	57	143
10.	Hunter Street (Sydney CBD)	0	1090	1090

Table 5: Estimated ADWF for Wastewater including BASIX (L/s)

Development		Estimated Wastewater ADWF (L/s) (2024 – 2032)		Total (L/s)
		Residential (incl. BASIX)	Commercial and Retail	
1.	Westmead	0.6	2.6	3.2
2.	Parramatta	0.6	12.7	13.3
3.	Clyde MSF	N/A	N/A	N/A
4.	Sydney Olympic Park	2.6	3.0	5.6
5.	North Strathfield	N/A	N/A	N/A
6.	Burwood North	0.5	0.8	1.3
7.	Five Dock	0.1	0.4	0.5
8.	The Bays	1.4	2.0	3.4
9.	Pymont	0.5	0.6	1.1
10.	Hunter Street (Sydney CBD)	0.0	8.4	8.4

The above demand estimates do not allow for reductions in existing demand resulting from the demolition of existing land uses.

Feasibility Assessment Request

As demonstrated in the demand estimate there is projected to be a significant impact on the water and wastewater infrastructure. As such Sydney Metro seeks to engage with utility stakeholders to ensure the appropriate planning measures are implemented.

This request seeks to initiate the consultation and planning process by providing the initial water and wastewater demand estimates.

We welcome further discussion and collaboration as part of the precinct planning and are happy to meet with water and wastewater utilities authorities to discuss the implications of this feasibility application.

Attachments

Attachment	Title
A	Sydney Metro West – Indicative Site Extents

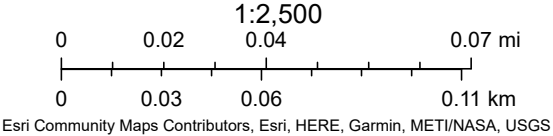
Westmead



Figure 2. Potential Westmead Site Extent

Legend:

- - - Potential Site Extent
- M Proposed Metro Station Location



Parramatta

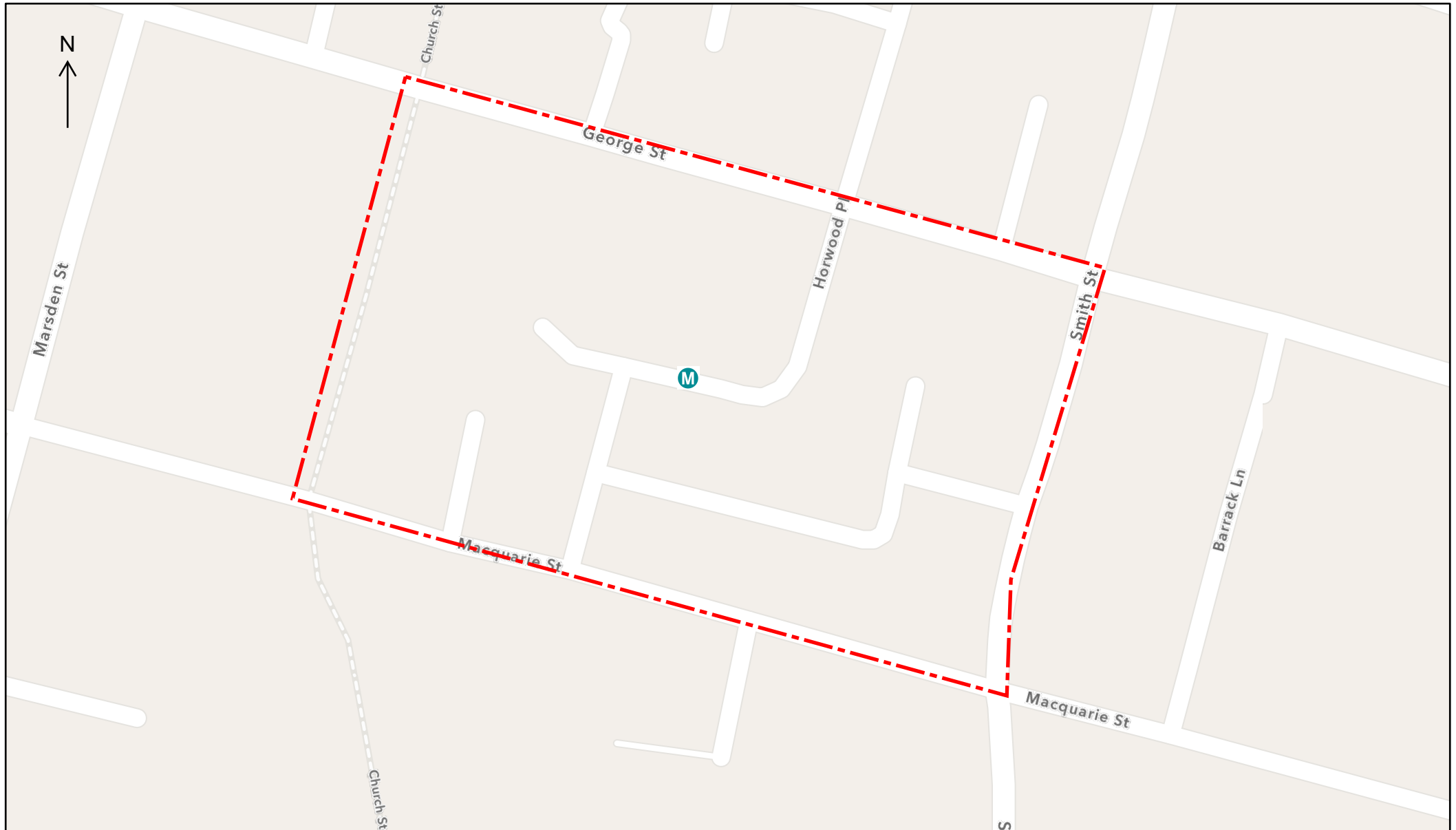
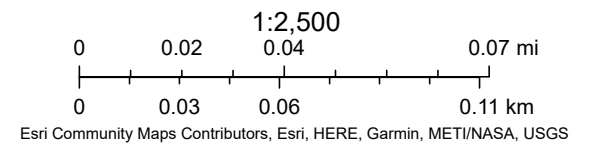


Figure 3. Potential Parramatta Site Extent

Legend:

- - - Potential Site Extent
- M Proposed Metro Station Location



Clyde MSF



Figure 4. Potential Clyde MSF Site Extent

Legend:
- - - Potential Site Extent

1:7,500
0 0.05 0.1 0.2 mi
0 0.07 0.15 0.3 km
Esri Community Maps Contributors, Esri, HERE, Garmin, METI/NASA, USGS

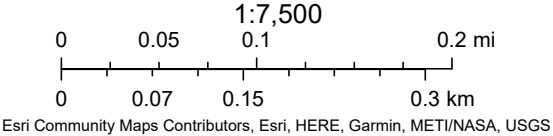
Sydney Olympic Park



Figure 5. Potential Sydney Olympic Park Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Strathfield North

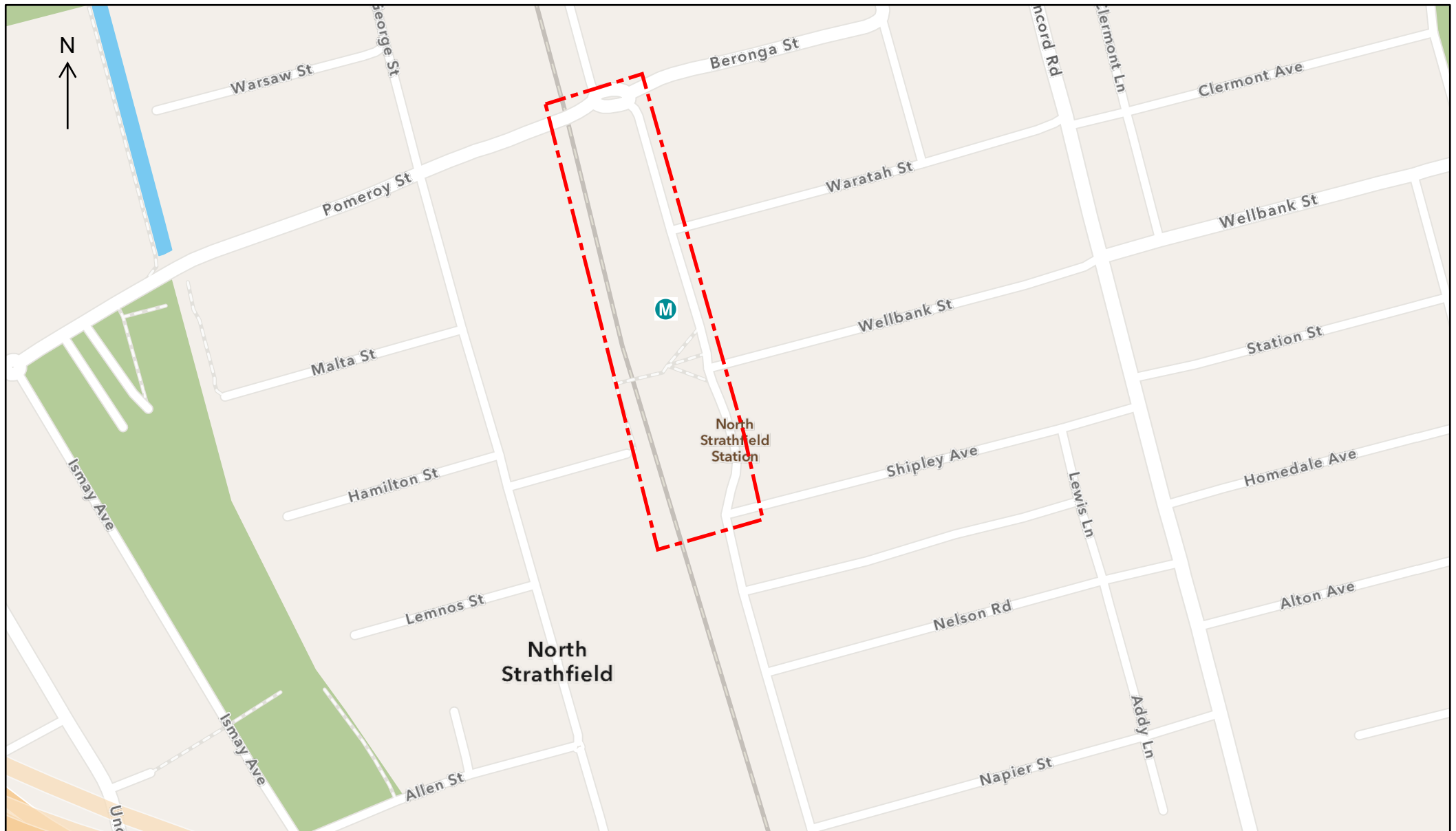
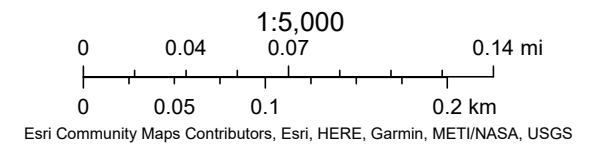


Figure 6. Potential Strathfield North Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Burwood North

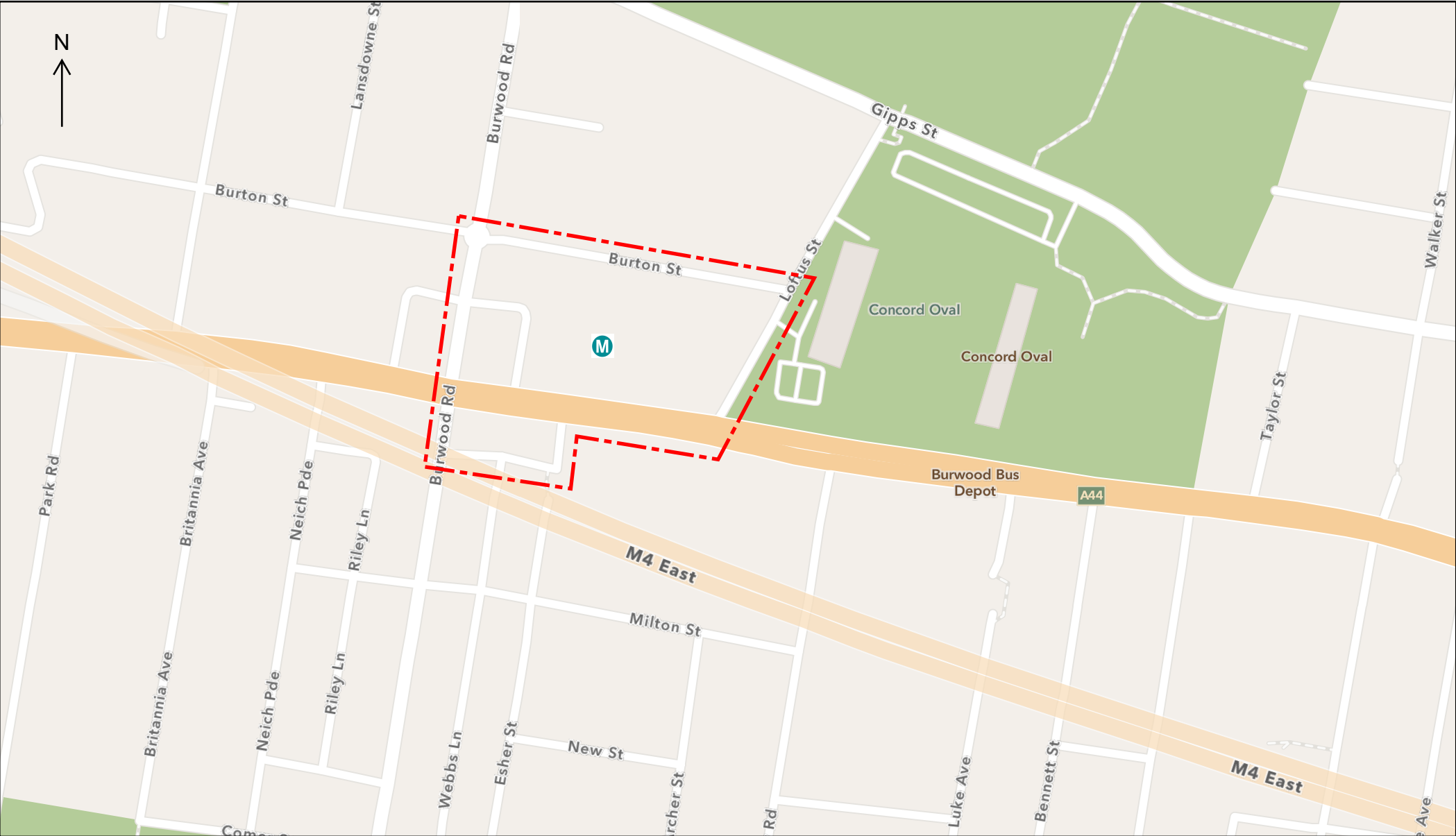
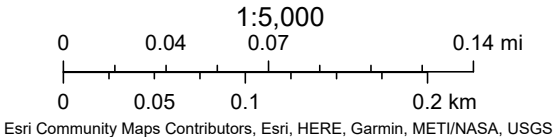


Figure 7. Potential Burwood North Site Extent

Legend:

- - - Potential Site Extent
- M Proposed Metro Station Location



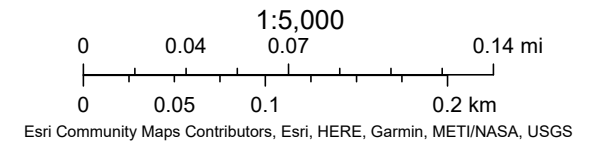
Five Dock



Figure 8. Potential Five Dock Site Extent

Legend:

- - - Potential Site Extent
- M Proposed Metro Station Location



The Bays

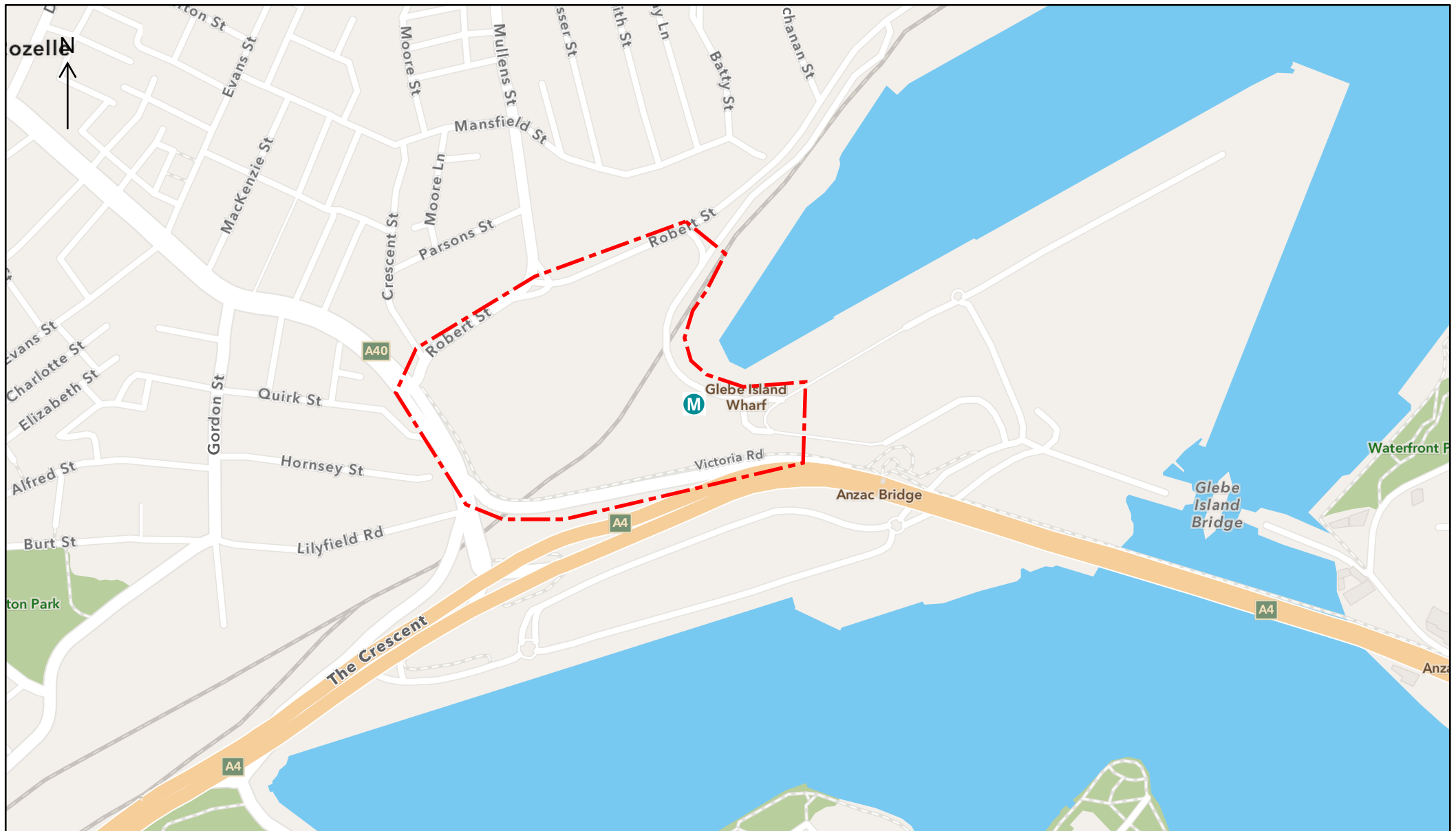
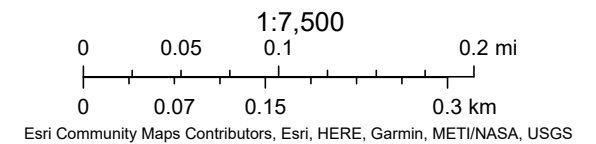


Figure 9. Potential The Bays Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Pymont

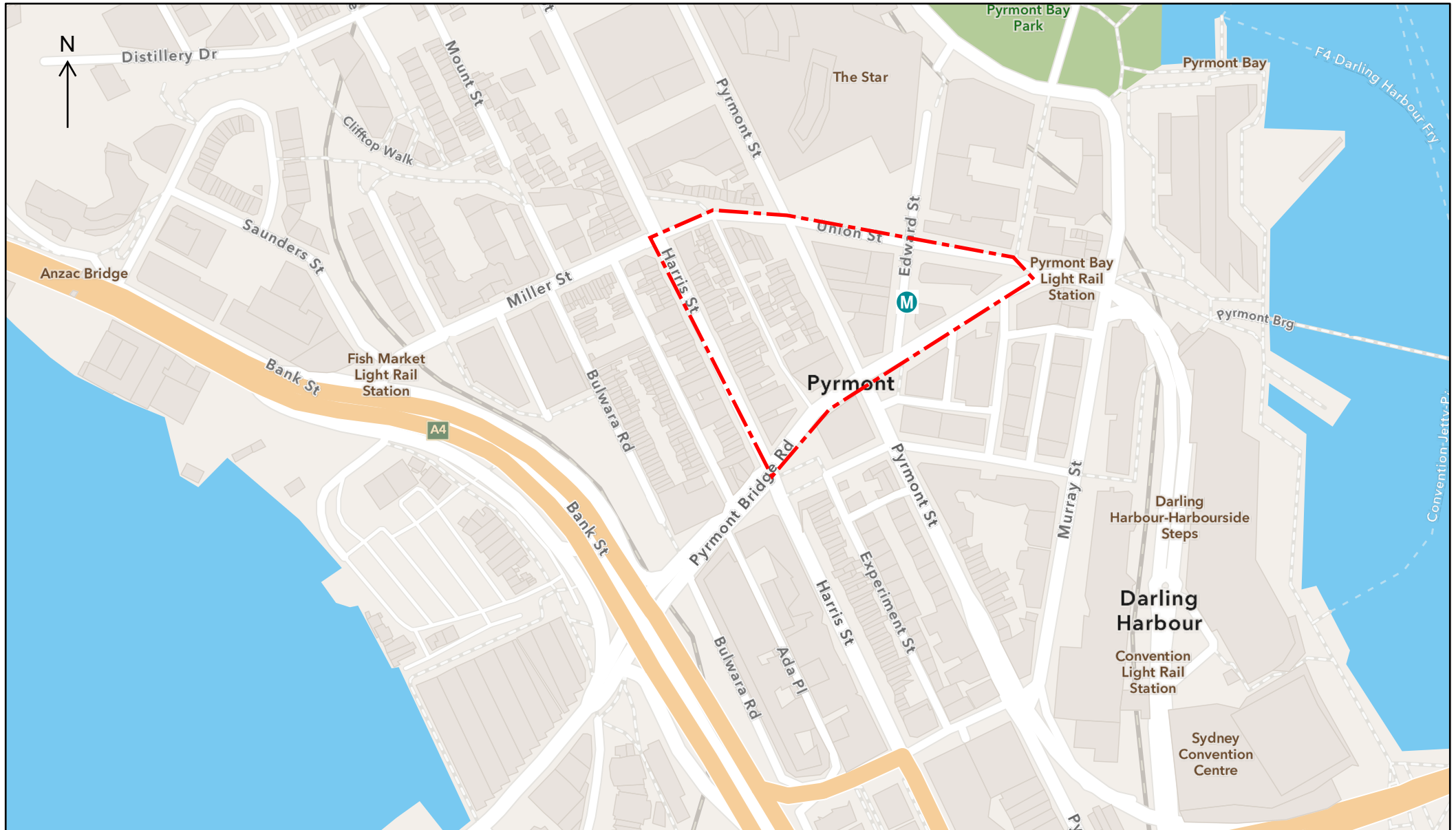
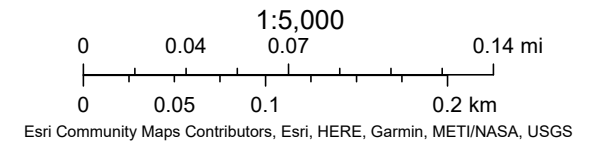


Figure 10. Potential Pymont Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Hunter Street (Sydney CBD)

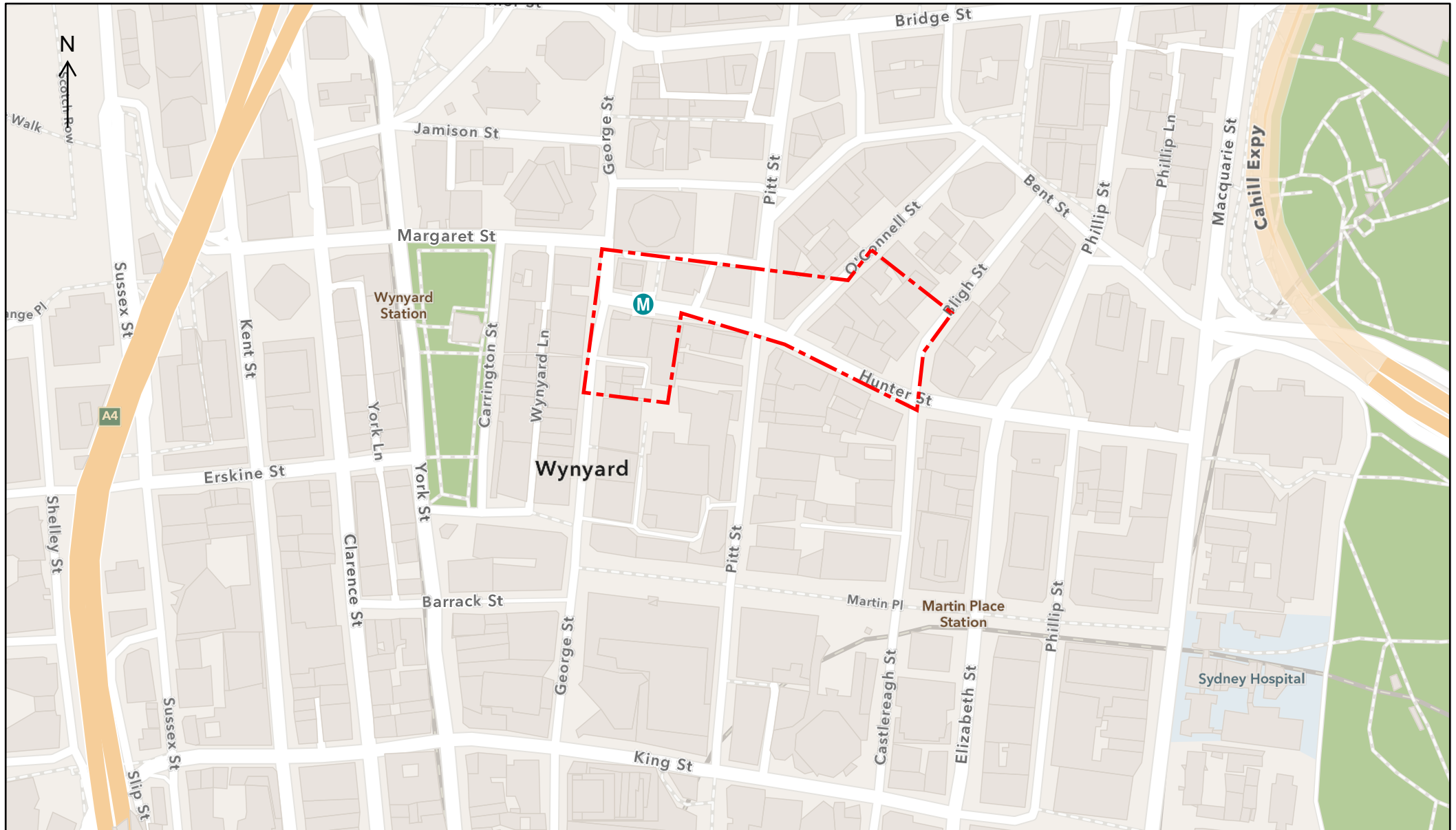
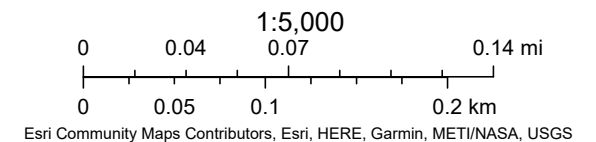


Figure 11. Potential Hunter Street (Sydney CBD) Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



June 22, 2021

Kenny D'Cruz
NBN Co
Level 11, 100 Arthur Street
North Sydney, NSW 2060

Reference:

Sydney Metro West Integrated Station Development NBN Feasibility Application

Dear Mr. D'Cruz,

Introduction

Sydney Metro West is a fully segregated new Metro line connecting seamlessly with other existing transport modes. Sydney Metro West is principally a 'greenfield' development that does not rely on the expansion or repurposing of existing infrastructure (excepting the development of existing concourses at Westmead and North Strathfield Stations), providing the opportunity to develop the next evolution of the metro product.



Figure 1: Sydney Metro West Context

A summary of the key elements of the Sydney Metro West configuration and operating concept is provided below for the purposes of this application:

Sydney Metro

Level 43, 680 George Street, Sydney NSW 2000 | PO Box K659, Haymarket NSW 1240
T 02 8265 9400 | sydneymetro.info | ABN 12 354 063 515

- Approximately 24km of twin underground rail tunnels from Westmead to the Sydney CBD
- Nine new underground Metro stations at Westmead, Parramatta CBD, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and Hunter Street (Sydney CBD) and the provisioning for the sale of air space over stations and surplus land for property development
- Integrated Station Developments at Parramatta, Sydney Olympic Park, Hunter Street (Sydney CBD) and potentially The Bays
- A combined maintenance and stabling facility and Operations Control Centre at Clyde Passenger interchanges at Westmead and North Strathfield to the Sydney Trains T1 Western and T9 Northern lines
- Tunnel ventilation services facilities at Rosehill, Silverwater and Lilyfield.

Table 1 below provides a breakdown of the latest approximate development yields for each Metro station site, including a breakdown of dwellings, commercial and retail space. Figures 2 to 11 in Attachment A show indicative extents for each site development. Please note this application is for the property developments only and excludes the metro station itself due to differences in development staging timeframes. Furthermore, the details provided as part of this application are to facilitate preliminary infrastructure studies only and are subject to change as the designs develop.

Table 1: Sydney Metro West - Indicative Development Growth (18th June 2021)¹

Investigation Area		Residential Apartments ³ (No.)	Indicative Commercial Space GFA ² (m ²)	Indicative Retail Space GFA ² (m ²)	Development Timeframe (Year)
1.	Westmead	250	40,000	4,500	2028 - 2032
2.	Parramatta	250	150,000	20,000	2024 - 2028
3.	Clyde MSF	N/A	N/A	N/A	2024 - 2028
4.	Sydney Olympic Park	1,000	35,000	8,000	2024 - 2028
5.	North Strathfield	N/A	N/A	N/A	2024 - 2028
6.	Burwood North	210	11,000	6,000	2024 - 2028
7.	Five Dock	21	5,000	900	2024 - 2028
8.	The Bays	550	32,450	6,150	2024 - 2028
9.	Pyrmont	180	8,000	500	2024 - 2028
10.	Hunter Street (Sydney CBD)	0	160,000	2,000	2024 - 2028

Note:

¹Apartment numbers and commercial/retail space figures are assumptions only and are subject to review. They are provided for the infrastructure capacity analysis only.

²An assumed 0.8 conversion factor from gross floor area (GFA) to net lettable area (NLA) has been applied.

³1 apartment = 100 sqm of Residential GFA

NBN Rollout

We understand the NBN Co (nbn) currently service the sites listed in Table 1 using existing fixed line phone and internet network infrastructure. We would appreciate the opportunity to coordinate a strategy with nbn to supply the proposed developments with nbn cables and conduits.

Feasibility Assessment Request

Sydney Metro seeks to actively engage with utility stakeholders to ensure the appropriate planning measures are implemented. To this end, we request the following information:

- Outline of the current nbn servicing arrangements for the proposed developments;
- Identification of the existing capacity of the nbn network to service the projected growth;
- Details of any planned infrastructure works to support development within the catchment which could be expanded to support the developments;
- Other major development currently allowed for in the areas as part of nbn's infrastructure planning;
- Summary of the infrastructure augmentations likely required to the nbn network to service the developments;
- Funding arrangements for infrastructure upgrades to meet the increased telecommunications demand; and
- Guidance on timeframes for forward planning of infrastructure works.

We welcome further discussion and collaboration with nbn as part of the precinct planning and are happy to meet to discuss the implications of this feasibility application.

Should you have any queries in relation to this application, please do not hesitate to contact the undersigned. We look forward to working with nbn on the next stages of the developments.

Yours sincerely

Jennine Finlayson
Principal Water Engineer

Attachment: *Sydney Metro West – Indicative Site Extents*

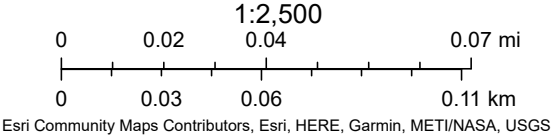
Westmead



Figure 2. Potential Westmead Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Parramatta

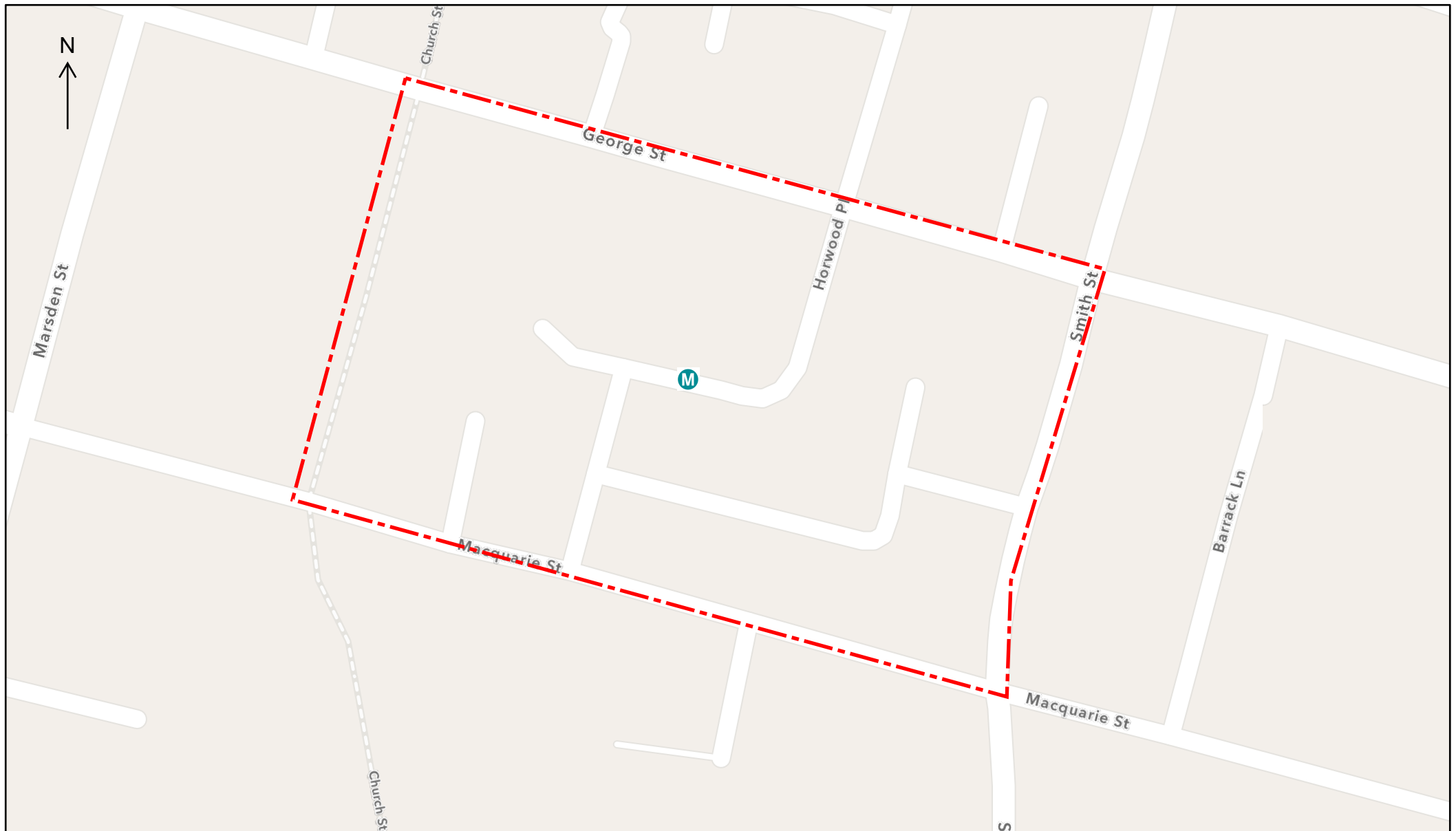
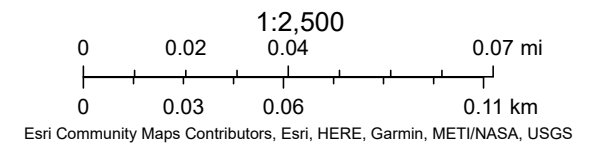


Figure 3. Potential Parramatta Site Extent

Legend:

- - - Potential Site Extent
- M Proposed Metro Station Location



Clyde MSF



Figure 4. Potential Clyde MSF Site Extent

Legend:
- - - Potential Site Extent

1:7,500
0 0.05 0.1 0.2 mi
0 0.07 0.15 0.3 km
Esri Community Maps Contributors, Esri, HERE, Garmin, METI/NASA, USGS

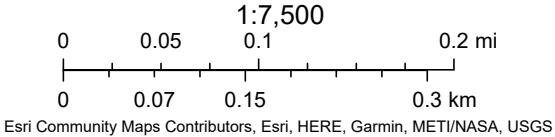
Sydney Olympic Park



Figure 5. Potential Sydney Olympic Park Site Extent

Legend:

- Potential Site Extent
- Ⓜ Proposed Metro Station Location



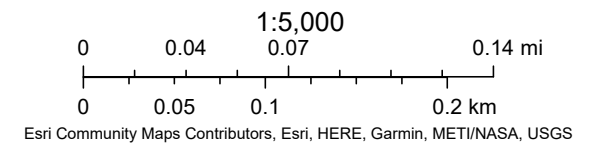
Strathfield North



Figure 6. Potential Strathfield North Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Burwood North

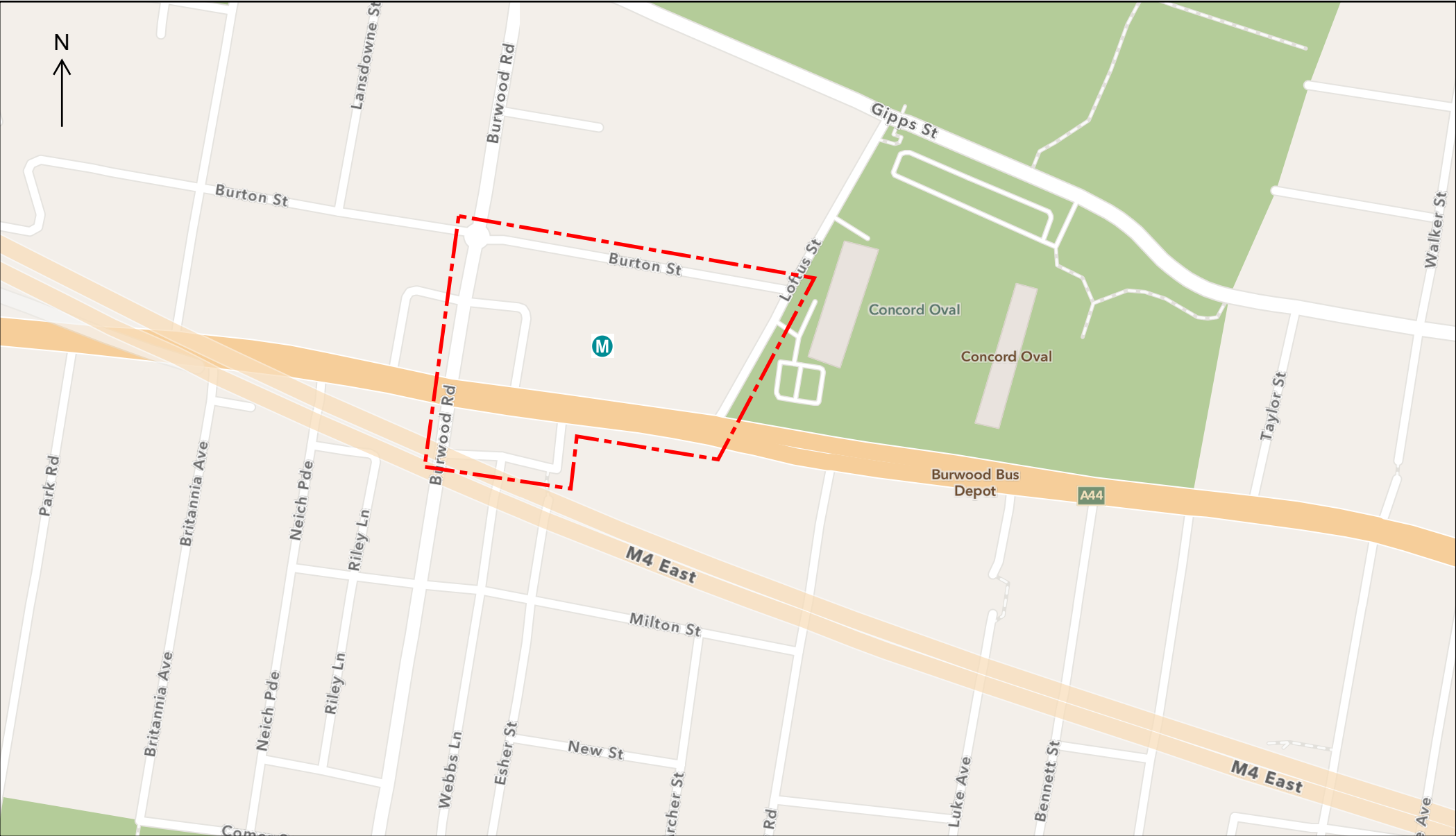
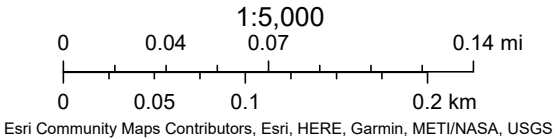


Figure 7. Potential Burwood North Site Extent

Legend:

- - - Potential Site Extent
- M Proposed Metro Station Location



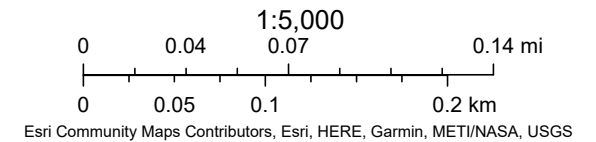
Five Dock



Figure 8. Potential Five Dock Site Extent

Legend:

- - - Potential Site Extent
- M Proposed Metro Station Location



The Bays

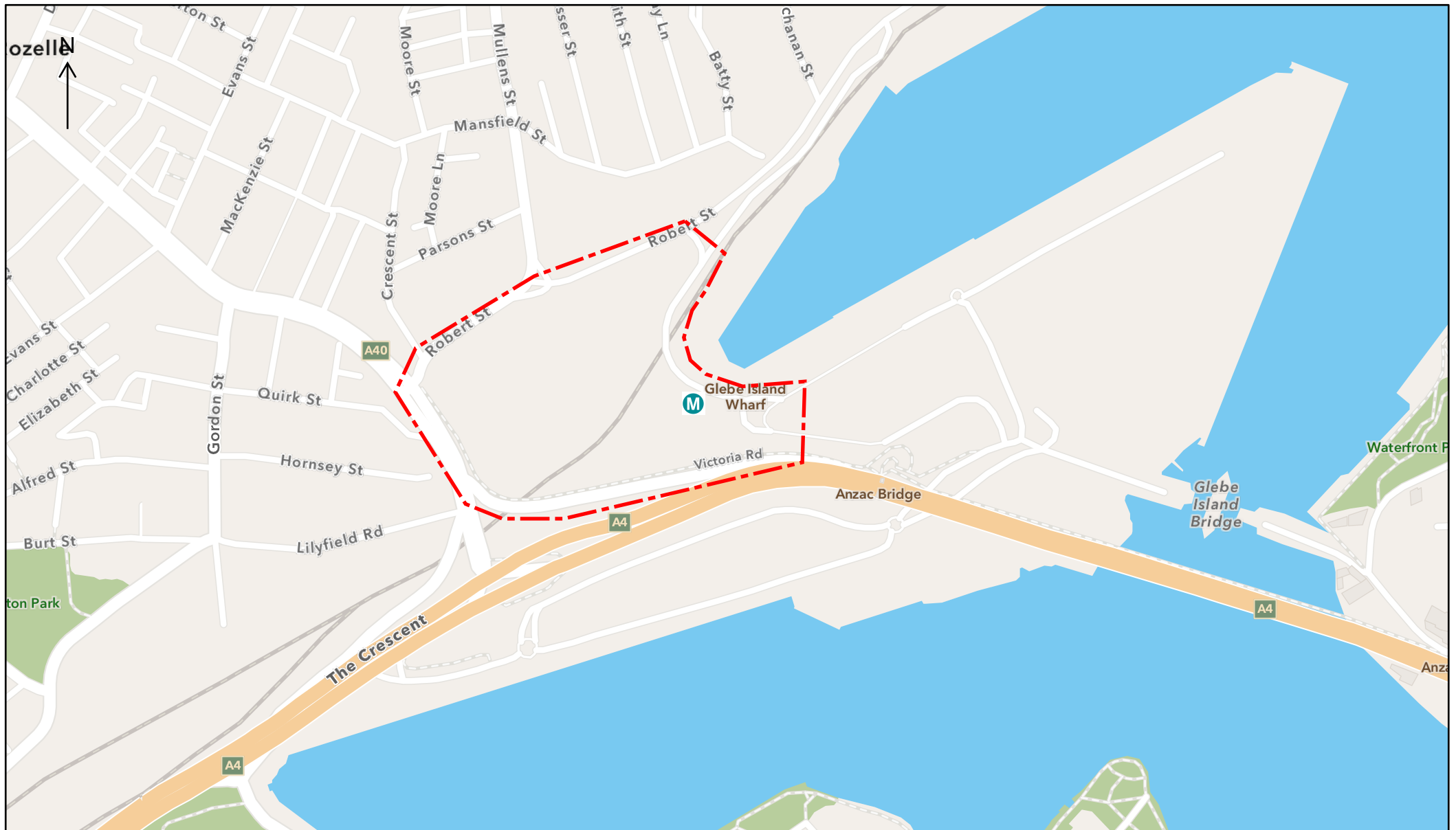
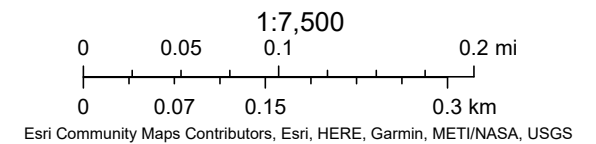


Figure 9. Potential The Bays Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Pymont

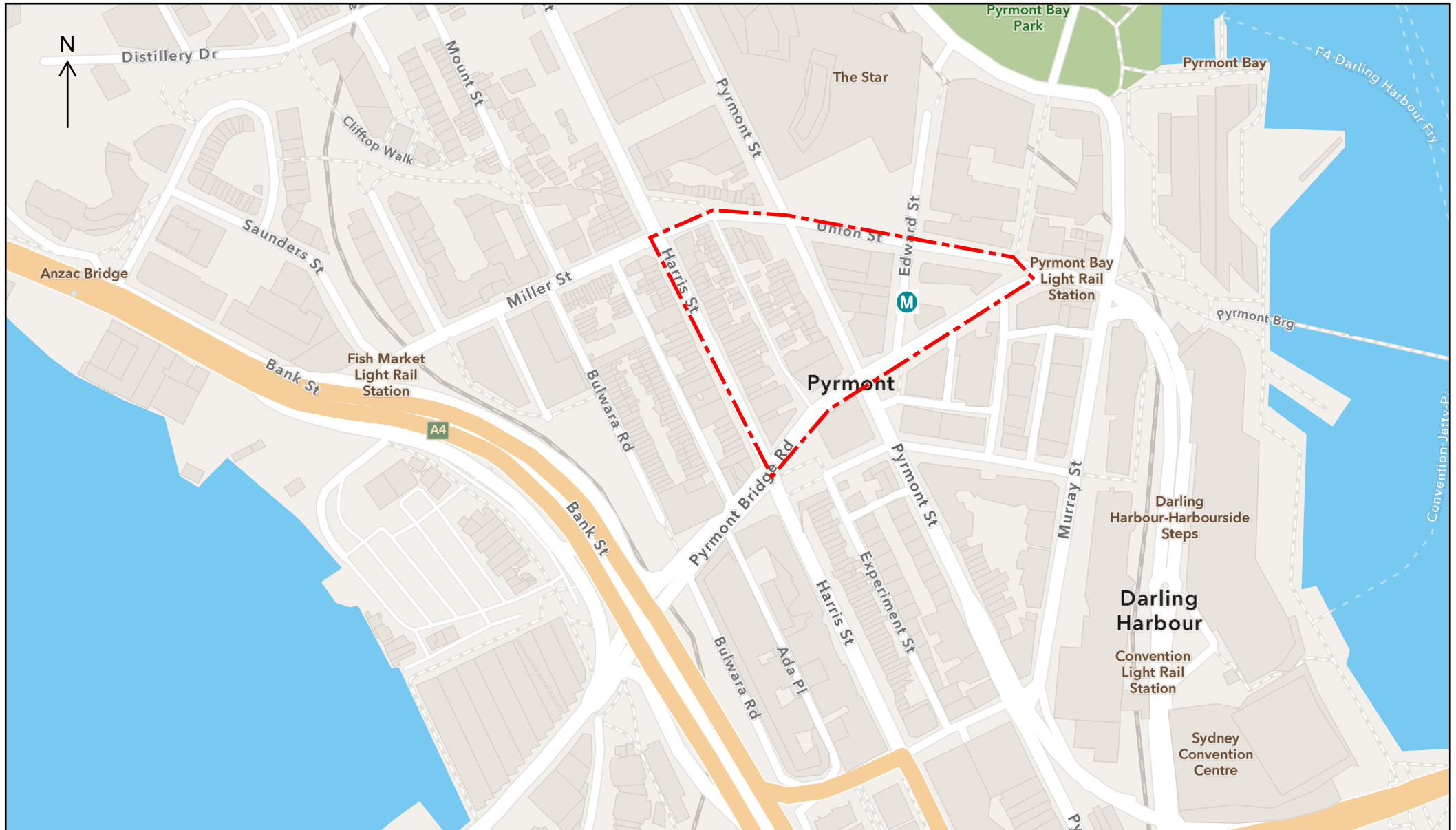
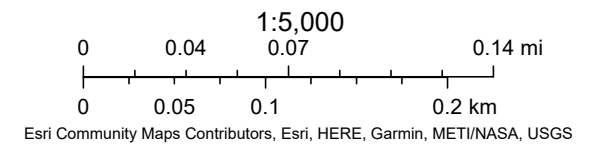


Figure 10. Potential Pymont Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Hunter Street (Sydney CBD)

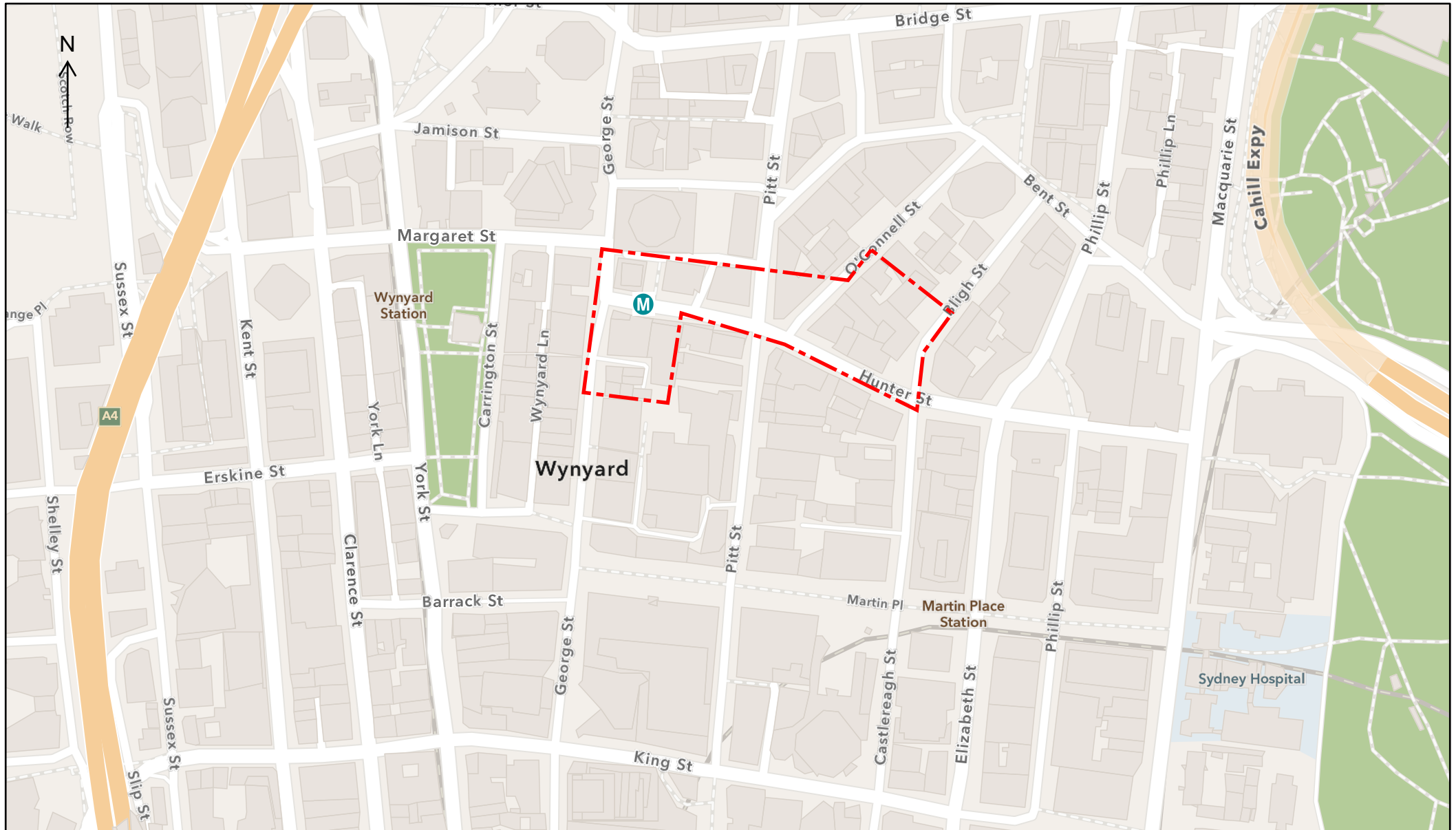
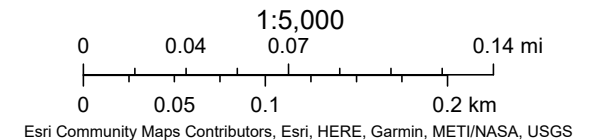


Figure 11. Potential Hunter Street (Sydney CBD) Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Memorandum



Subject: Sydney Metro West Integrated Station Development Electrical Feasibility Application

██████████ ██	██████████
██	Date: 22/06/2021
██	██

Introduction

Sydney Metro West is a fully segregated new Metro line connecting seamlessly with other existing transport modes. Sydney Metro West is principally a 'greenfield' development that does not rely on the expansion or repurposing of existing infrastructure (excepting the development of existing concourses at Westmead and North Strathfield Stations), providing the opportunity to develop the next evolution of the metro product.



Figure 1: Sydney Metro West Context

A summary of the key elements of the Sydney Metro West configuration and operating concept is provided below for the purposes of this application:

Unclassified

- Approximately 24km of twin underground rail tunnels from Westmead to the Sydney CBD
- Nine new underground Metro stations at Westmead, Parramatta CBD, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and Hunter Street (Sydney CBD) and the provisioning for the sale of air space over stations and surplus land for property development
- Integrated Station Developments at Parramatta, Sydney Olympic Park, Hunter Street (Sydney CBD) and potentially The Bays
- A combined maintenance and stabling facility and Operations Control Centre at Clyde
- Passenger interchanges at Westmead and North Strathfield to the Sydney Trains T1 Western and T9 Northern lines
- Tunnel ventilation services facilities at Rosehill, Silverwater and Lilyfield.

Table 1 below provides a breakdown of the latest approximate development yields for each Metro station site, including a breakdown of dwellings, commercial and retail space. Figures 2 to 11 in Attachment A show indicative extents for each site development. Please note this application is for the property developments only and excludes the metro station itself due to differences in development staging timeframes. Furthermore, the details provided as part of this application have been provided to facilitate preliminary infrastructure studies only and are subject to change as the designs develop.

Table 1 Indicative Development Growth (18th June 2021)¹

Investigation Area		Residential Apartments ³ (No.)	Indicative Commercial Space GFA ² (m ²)	Indicative Retail Space GFA ² (m ²)	Development Timeframe (Year)
1.	Westmead	250	40,000	4,500	2028 - 2032
2.	Parramatta	250	150,000	20,000	2024 - 2028
3.	Clyde MSF	N/A	N/A	N/A	2024 - 2028
4.	Sydney Olympic Park	1,000	35,000	8,000	2024 - 2028
5.	North Strathfield	N/A	N/A	N/A	2024 - 2028
6.	Burwood North	210	11,000	6,000	2024 - 2028
7.	Five Dock	21	5,000	900	2024 - 2028
8.	The Bays	550	32,450	6,150	2024 - 2028
9.	Pyrmont	180	8,000	500	2024 - 2028
10.	Hunter Street (Sydney CBD)	0	160,000	2,000	2024 - 2028

Note:

¹Apartment numbers and commercial/retail space figures are assumptions only and are subject to review. They are provided for the infrastructure capacity analysis only.

²An assumed 0.8 conversion factor from gross floor area (GFA) to net lettable area (NLA) has been applied.

³One apartment = 100 m² of Residential GFA.

Electrical Demand Rates

A high-level demand assessment was undertaken based on the indicative building development yield. This development yield was used for the purposes of electrical infrastructure assessments only and the final architectural designs should be used to confirm the building details.

The demand assessment considered the unit rates and peaking factors summarised in Table 2 below.

Table 2: Electrical Demand Unit Rates

Land Use	Design Criteria	Unit	Demand Rate	Source
Residential - Apartments	Peak Demand	kVA/dwelling	3.5	Endeavour Energy Growth Servicing Plan 2019 - Table 1
Commercial – Office – Electrical reheat zonal	Peak Demand	kVA/m ²	0.11	Ausgrid NS109 - Table 4 Guide to Typical Load Densities
Retail – Shops air conditioned	Peak Demand	kVA/m ²	0.10	Ausgrid NS109 - Table 4 Guide to Typical Load Densities
Diversity Factor (commercial and retail only)	N/A	%	80	AS3000

Projected Electrical Demand

Estimates for the electrical maximum demand were developed using the development yields outlined in Table 1 and unit rates outlined in Table 2 for each station development. A diversity factor of 80% has been applied to commercial and retail uses.

Table 3 summarises the estimate of the electrical maximum demand. Please note that, as the design is still evolving, we believe it is appropriate to apply a $\pm 15\%$ factor to these numbers.

Table 3: Estimated Electrical Maximum Demand Including Diversity

Development		Estimated Electrical Demand (MVA) (2024-2032)		Total (MVA)
		Residential	Commercial and Retail (Incl. Diversity)	
1.	Westmead	0.9	2.8	3.7
2.	Parramatta	0.9	14.4	15.3
3.	Clyde MSF	N/A	N/A	N/A
4.	Sydney Olympic Park	3.5	2.9	6.4
5.	North Strathfield	N/A	N/A	N/A
6.	Burwood North	0.7	1.2	1.9
7.	Five Dock	0.1	0.4	0.5
8.	The Bays	1.9	2.5	4.4

Unclassified

9.	Pymont	0.6	0.6	1.2
10.	Hunter Street (Sydney CBD)	N/A	13.0	13.0

The above demand estimates do not allow for reductions resulting from the demolition of existing land uses. Furthermore, changes to these demand estimates from potential ecologically sustainable development (ESD) initiatives have not been considered. Any future impacts will be communicated to electrical authorities.

Feasibility Assessment Request

As demonstrated in the demand estimate, there is projected to be a significant impact on the electrical infrastructure at the proposed developments. As such, Sydney Metro seeks to actively engage with utility stakeholders to ensure the appropriate planning measures are implemented.

This request seeks to initiate the consultation and planning process by providing the initial electrical demand estimates. Additionally, as part of this consultation and planning process, the investigation of opportunities for reuse of construction power supplies (where applicable) for servicing of the future developments is requested to be undertaken with the electrical utility authorities.

We welcome further discussion and collaboration as part of the precinct planning and are happy to meet with electrical utilities authorities to discuss the implications of this feasibility application.

Attachments

Attachment	Title
A	Sydney Metro West – Indicative Site Extents

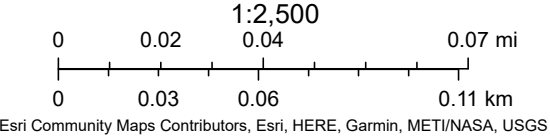
Westmead



Figure 2. Potential Westmead Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Parramatta

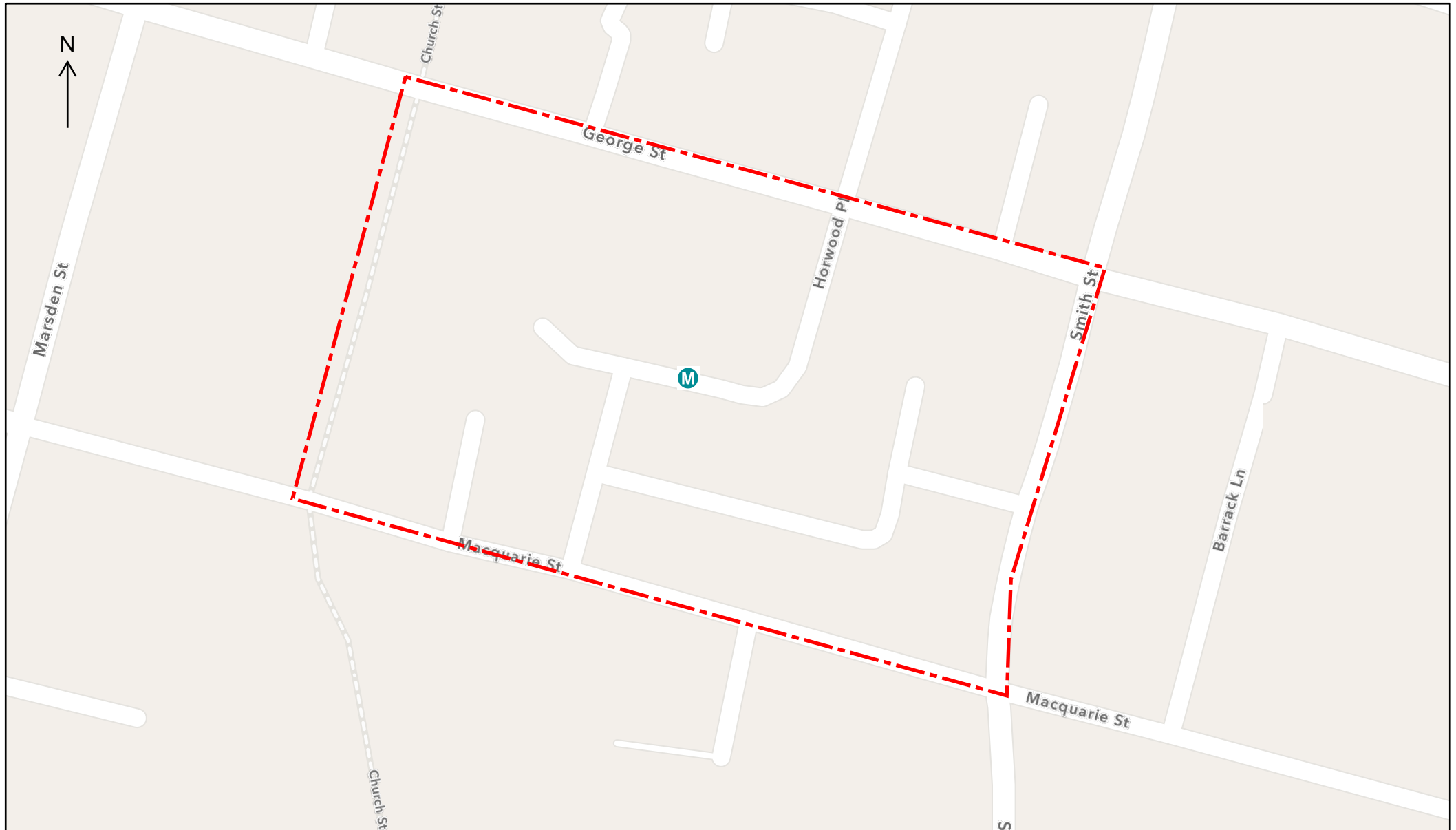
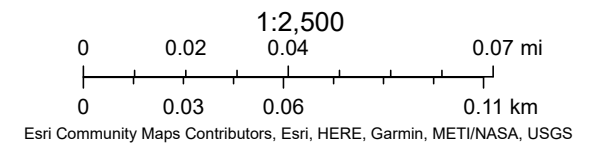


Figure 3. Potential Parramatta Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Clyde MSF



Figure 4. Potential Clyde MSF Site Extent

Legend:
- - - Potential Site Extent

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0 0.07 0.15 0.3 km
Esri Community Maps Contributors, Esri, HERE, Garmin, METI/NASA, USGS

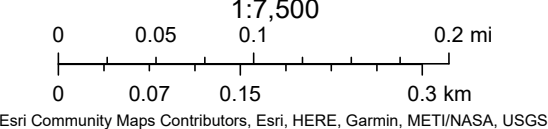
Sydney Olympic Park



Figure 5. Potential Sydney Olympic Park Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



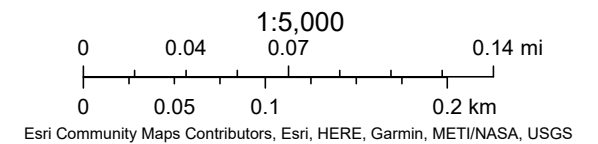
Strathfield North



Figure 6. Potential Strathfield North Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Burwood North

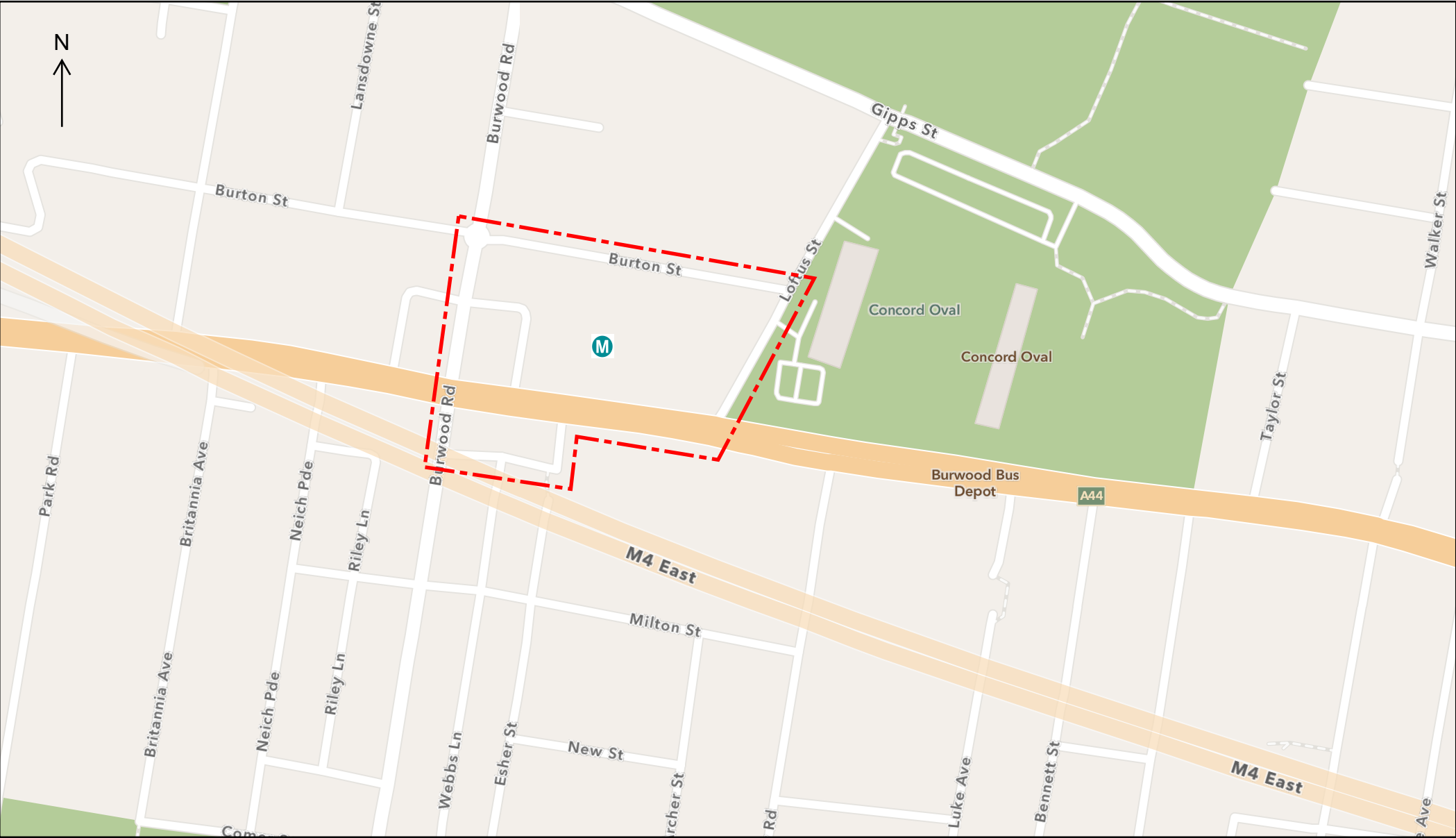
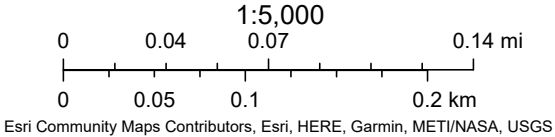


Figure 7. Potential Burwood North Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



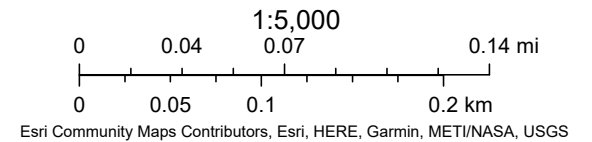
Five Dock



Figure 8. Potential Five Dock Site Extent

Legend:

- - - Potential Site Extent
- M Proposed Metro Station Location



The Bays

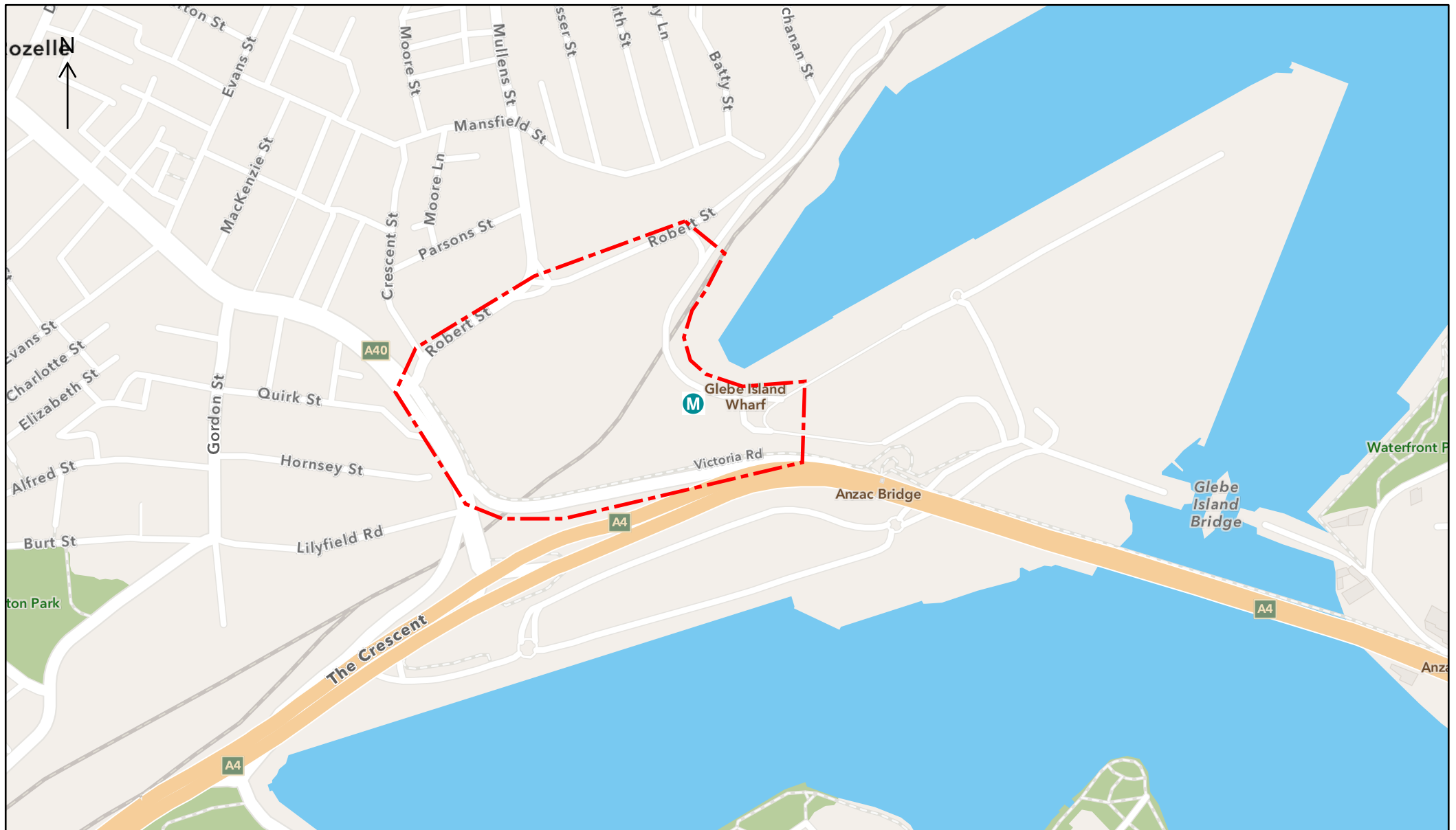
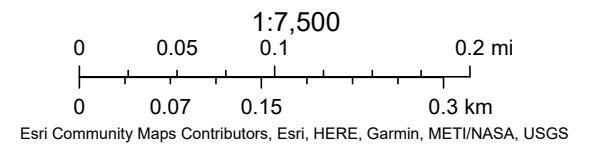


Figure 9. Potential The Bays Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Pymont

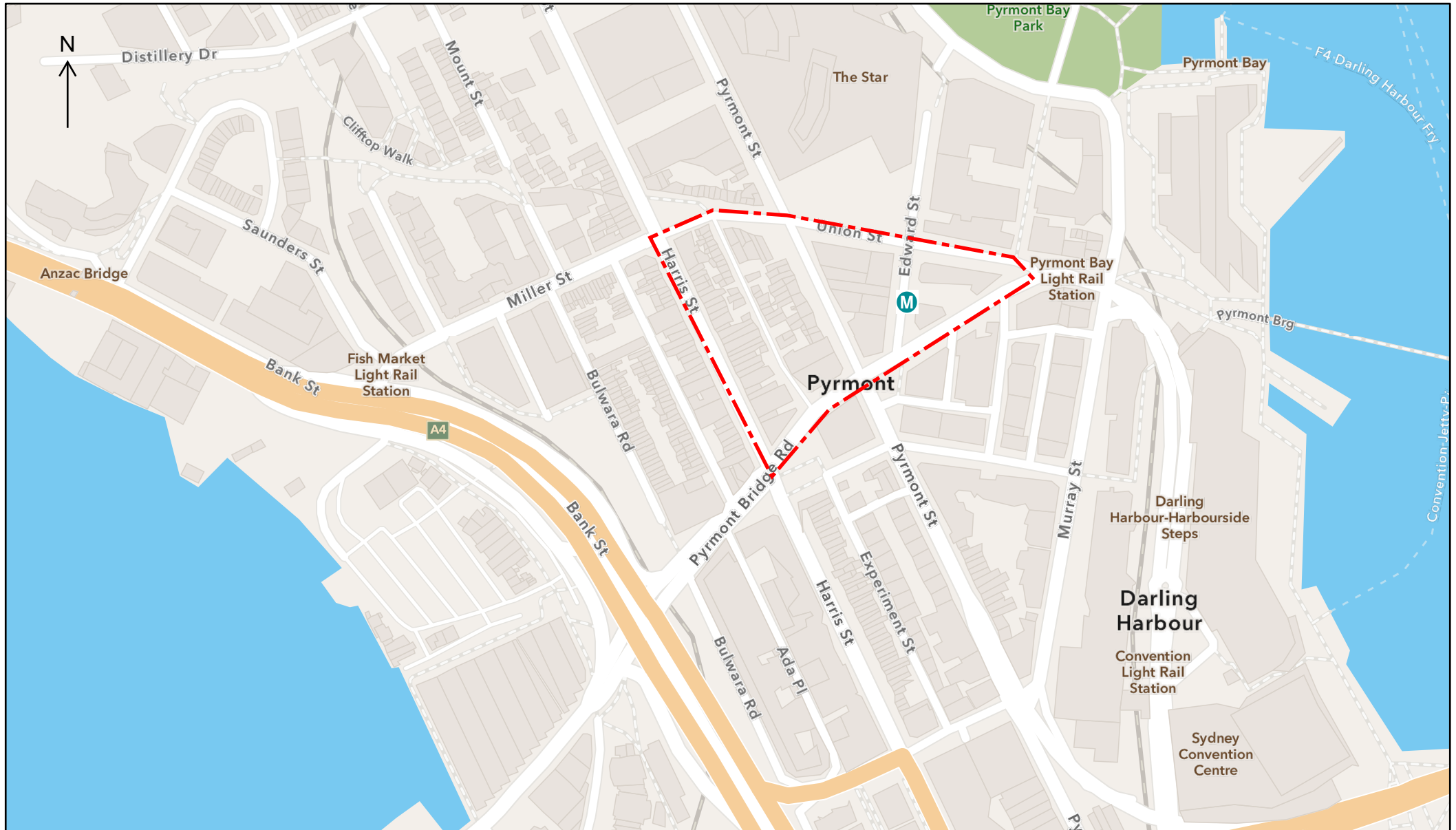
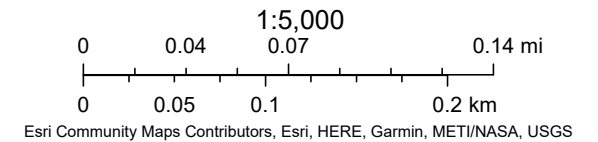


Figure 10. Potential Pymont Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Hunter Street (Sydney CBD)

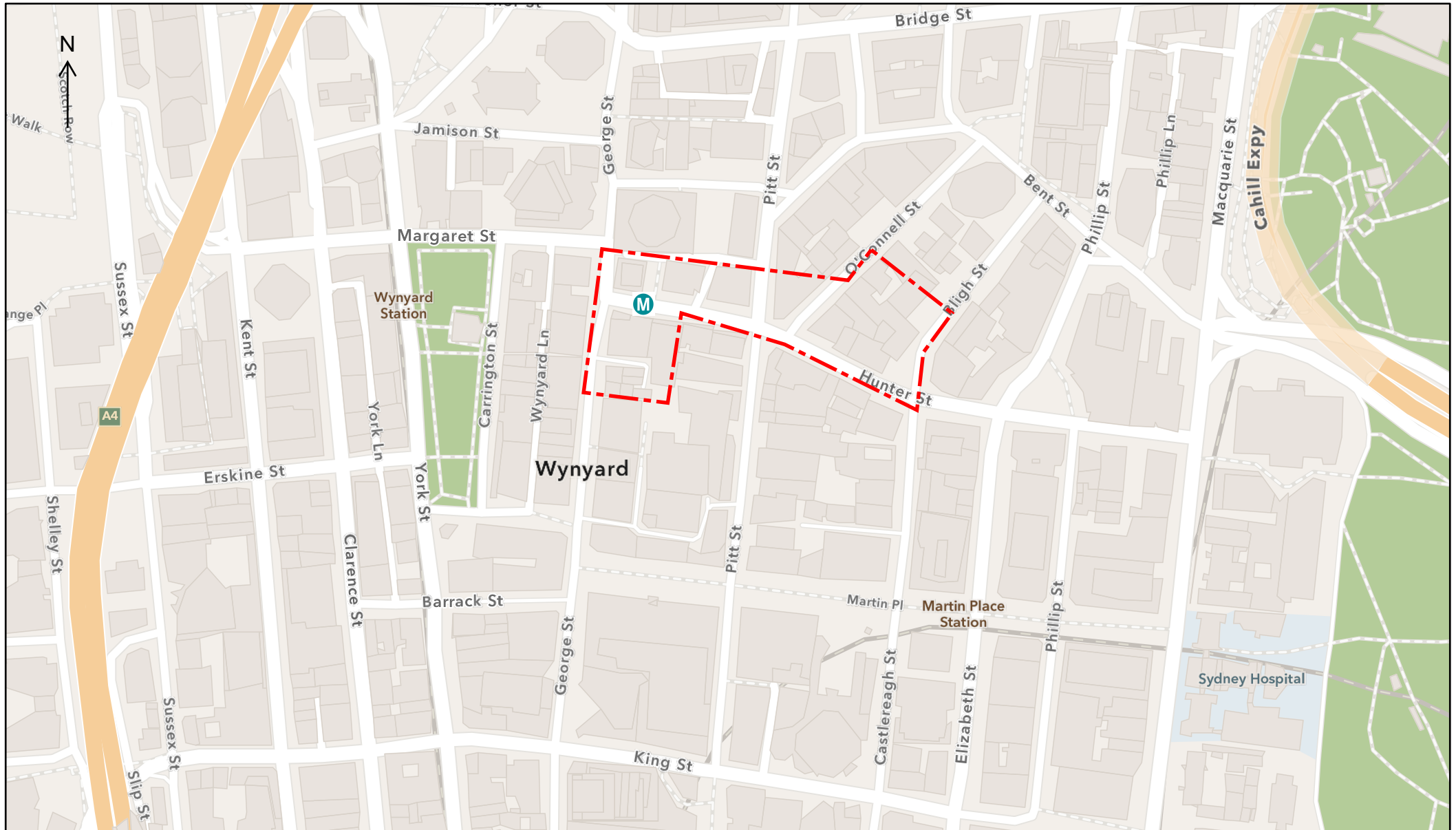
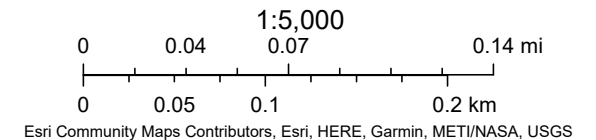


Figure 11. Potential Hunter Street (Sydney CBD) Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Memorandum



Subject: Sydney Metro West Integrated Station Development Electrical Feasibility Application

[REDACTED]	[REDACTED]
[REDACTED]	Date: 22/06/2021
[REDACTED]	[REDACTED]

Introduction

Sydney Metro West is a fully segregated new Metro line connecting seamlessly with other existing transport modes. Sydney Metro West is principally a 'greenfield' development that does not rely on the expansion or repurposing of existing infrastructure (excepting the development of existing concourses at Westmead and North Strathfield Stations), providing the opportunity to develop the next evolution of the metro product.



Figure 1: Sydney Metro West Context

A summary of the key elements of the Sydney Metro West configuration and operating concept is provided below for the purposes of this application:

Unclassified

- Approximately 24km of twin underground rail tunnels from Westmead to the Sydney CBD
- Nine new underground Metro stations at Westmead, Parramatta CBD, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and Hunter Street (Sydney CBD) and the provisioning for the sale of air space over stations and surplus land for property development
- Integrated Station Developments at Parramatta, Sydney Olympic Park, Hunter Street (Sydney CBD) and potentially The Bays
- A combined maintenance and stabling facility and Operations Control Centre at Clyde
- Passenger interchanges at Westmead and North Strathfield to the Sydney Trains T1 Western and T9 Northern lines
- Tunnel ventilation services facilities at Rosehill, Silverwater and Lilyfield.

Table 1 below provides a breakdown of the latest approximate development yields for each Metro station site, including a breakdown of dwellings, commercial and retail space. Figures 2 to 11 in Attachment A show indicative extents for each site development. Please note this application is for the property developments only and excludes the metro station itself due to differences in development staging timeframes. Furthermore, the details provided as part of this application have been provided to facilitate preliminary infrastructure studies only and are subject to change as the designs develop.

Table 1 Indicative Development Growth (18th June 2021)¹

Investigation Area		Residential Apartments ³ (No.)	Indicative Commercial Space GFA ² (m ²)	Indicative Retail Space GFA ² (m ²)	Development Timeframe (Year)
1.	Westmead	250	40,000	4,500	2028 - 2032
2.	Parramatta	250	150,000	20,000	2024 - 2028
3.	Clyde MSF	N/A	N/A	N/A	2024 - 2028
4.	Sydney Olympic Park	1,000	35,000	8,000	2024 - 2028
5.	North Strathfield	N/A	N/A	N/A	2024 - 2028
6.	Burwood North	210	11,000	6,000	2024 - 2028
7.	Five Dock	21	5,000	900	2024 - 2028
8.	The Bays	550	32,450	6,150	2024 - 2028
9.	Pyrmont	180	8,000	500	2024 - 2028
10.	Hunter Street (Sydney CBD)	0	160,000	2,000	2024 - 2028

Note:

¹Apartment numbers and commercial/retail space figures are assumptions only and are subject to review. They are provided for the infrastructure capacity analysis only.

²An assumed 0.8 conversion factor from gross floor area (GFA) to net lettable area (NLA) has been applied.

³One apartment = 100 m² of Residential GFA.

Electrical Demand Rates

A high-level demand assessment was undertaken based on the indicative building development yield. This development yield was used for the purposes of electrical infrastructure assessments only and the final architectural designs should be used to confirm the building details.

The demand assessment considered the unit rates and peaking factors summarised in Table 2 below.

Table 2: Electrical Demand Unit Rates

Land Use	Design Criteria	Unit	Demand Rate	Source
Residential - Apartments	Peak Demand	kVA/dwelling	3.5	Endeavour Energy Growth Servicing Plan 2019 - Table 1
Commercial – Office – Electrical reheat zonal	Peak Demand	kVA/m ²	0.11	Ausgrid NS109 - Table 4 Guide to Typical Load Densities
Retail – Shops air conditioned	Peak Demand	kVA/m ²	0.10	Ausgrid NS109 - Table 4 Guide to Typical Load Densities
Diversity Factor (commercial and retail only)	N/A	%	80	AS3000

Projected Electrical Demand

Estimates for the electrical maximum demand were developed using the development yields outlined in Table 1 and unit rates outlined in Table 2 for each station development. A diversity factor of 80% has been applied to commercial and retail uses.

Table 3 summarises the estimate of the electrical maximum demand. Please note that, as the design is still evolving, we believe it is appropriate to apply a $\pm 15\%$ factor to these numbers.

Table 3: Estimated Electrical Maximum Demand Including Diversity

Development		Estimated Electrical Demand (MVA) (2024-2032)		Total (MVA)
		Residential	Commercial and Retail (Incl. Diversity)	
1.	Westmead	0.9	2.8	3.7
2.	Parramatta	0.9	14.4	15.3
3.	Clyde MSF	N/A	N/A	N/A
4.	Sydney Olympic Park	3.5	2.9	6.4
5.	North Strathfield	N/A	N/A	N/A
6.	Burwood North	0.7	1.2	1.9
7.	Five Dock	0.1	0.4	0.5
8.	The Bays	1.9	2.5	4.4

9.	Pymont	0.6	0.6	1.2
10.	Hunter Street (Sydney CBD)	N/A	13.0	13.0

The above demand estimates do not allow for reductions resulting from the demolition of existing land uses. Furthermore, changes to these demand estimates from potential ecologically sustainable development (ESD) initiatives have not been considered. Any future impacts will be communicated to electrical authorities.

Feasibility Assessment Request

As demonstrated in the demand estimate, there is projected to be a significant impact on the electrical infrastructure at the proposed developments. As such, Sydney Metro seeks to actively engage with utility stakeholders to ensure the appropriate planning measures are implemented.

This request seeks to initiate the consultation and planning process by providing the initial electrical demand estimates. Additionally, as part of this consultation and planning process, the investigation of opportunities for reuse of construction power supplies (where applicable) for servicing of the future developments is requested to be undertaken with the electrical utility authorities.

Specifically related to the development at Five Dock, the following additional information is requested:

- a) Is Ausgrid able to confirm if S63388 or S7533 can be re-used for any future development works?
- b) Is Ausgrid able to confirm capacity details or MDI readings for the above referenced substations?

We welcome further discussion and collaboration as part of the precinct planning and are happy to meet with electrical utilities authorities to discuss the implications of this feasibility application.

Attachments

Attachment	Title
A	Sydney Metro West – Indicative Site Extents

June 22, 2021

Andrew Haigh
Jemena
Level 12, 99 Walker Street
North Sydney, NSW 2060

Reference: [REDACTED]
Sydney Metro West Integrated Station Development Gas Feasibility
Application

Dear Mr. Haigh,

Introduction

Sydney Metro West is a fully segregated new Metro line connecting seamlessly with other existing transport modes. Sydney Metro West is principally a 'greenfield' development that does not rely on the expansion or repurposing of existing infrastructure (excepting the development of existing concourses at Westmead and North Strathfield Stations), providing the opportunity to develop the next evolution of the metro product.



Figure 1: Sydney Metro West Context

A summary of the key elements of the Sydney Metro West configuration and operating concept is provided below for the purposes of this application:

Sydney Metro

Level 43, 680 George Street, Sydney NSW 2000 | PO Box K659, Haymarket NSW 1240
T 02 8265 9400 | sydneymetro.info | ABN 12 354 063 515

- Approximately 24km of twin underground rail tunnels from Westmead to the Sydney CBD
- Nine new underground Metro stations at Westmead, Parramatta CBD, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and Hunter Street (Sydney CBD) and the provisioning for the sale of air space over stations and surplus land for property development
- Integrated Station Developments at Parramatta, Sydney Olympic Park, Hunter Street (Sydney CBD) and potentially The Bays
- A combined maintenance and stabling facility and Operations Control Centre at Clyde Passenger interchanges at Westmead and North Strathfield to the Sydney Trains T1 Western and T9 Northern lines
- Tunnel ventilation services facilities at Rosehill, Silverwater and Lilyfield.

Table 1 below provides a breakdown of the latest approximate development yields for each Metro station site, including a breakdown of dwellings, commercial and retail space. Figures 2 to 11 in Attachment A show indicative extents for each site development. Please note this application is for the property developments only and excludes the metro station itself due to differences in development staging timeframes. Furthermore, the details provided as part of this application are to facilitate preliminary infrastructure studies only and are subject to change as the designs develop.

Table 1: Indicative Development Growth (18th June 2021)¹

Investigation Area		Residential Apartments ³ (No.)	Indicative Commercial Space GFA ² (m ²)	Indicative Retail Space GFA ² (m ²)	Development Timeframe (Year)
1.	Westmead	250	40,000	4,500	2028 - 2032
2.	Parramatta	250	150,000	20,000	2024 - 2028
3.	Clyde MSF	N/A	N/A	N/A	2024 - 2028
4.	Sydney Olympic Park	1,000	35,000	8,000	2024 - 2028
5.	North Strathfield	N/A	N/A	N/A	2024 - 2028
6.	Burwood North	210	11,000	6,000	2024 - 2028
7.	Five Dock	21	5,000	900	2024 - 2028
8.	The Bays	550	32,450	6,150	2024 - 2028
9.	Pyrmont	180	8,000	500	2024 - 2028
10.	Hunter Street (Sydney CBD)	0	160,000	2,000	2024 - 2028

Note:

¹Apartment numbers and commercial/retail space figures are assumptions only and are subject to review. They are provided for the infrastructure capacity analysis only.

²An assumed 0.8 conversion factor from gross floor area (GFA) to net lettable area (NLA) has been applied.

³1 apartment = 100 sqm of Residential GFA

Gas Demand Rates

A preliminary assessment has been undertaken of the potential gas demand associated with each proposed development.

Demand forecasting and profiles were developed for the ISDs and development precincts based on the number of dwellings. Please note, this excludes commercial usage as we understand the rates can vary widely for different uses.

For the purposes of this assessment we used an energy demand of 20 gigajoules (GJ) per year (equating to 2.17m³/day/dwelling) to estimate the average annual domestic usage of natural gas for residential dwellings. We also included a BASIX reduction target of 25% to the residential

dwellings.

A factor of 39.6 m³/GJ was then used to convert the estimated usage into a volume of gas (Parliament of Australia, Natural Gas: Energy for the New Millennium, 2015).

Projected Gas Demand

Using the development yields outlined in Section 1 and the demand rates in Section 2, estimates for the cumulative residential gas usages were developed as shown in Table 2. Please note that, as the design is still evolving, we believe it is appropriate to apply a ±15% factor to these numbers.

Table 2: Gas Demand Rates

Development		Estimated Gas Demand (m ³ /day) (2024-2032)		Total (m ³ /day)
		Residential (incl. BASIX)	Commercial and Retail	
1.	Westmead	407	TBA ¹	407
2.	Parramatta	407	TBA ¹	407
3.	Clyde MSF	N/A	TBA ¹	N/A
4.	Sydney Olympic Park	1800	TBA ¹	1800
5.	North Strathfield	N/A	TBA ¹	N/A
6.	Burwood North	342	TBA ¹	342
7.	Five Dock	34	TBA ¹	34
8.	The Bays	895	TBA ¹	895
9.	Pymont	293	TBA ¹	293
10.	Hunter Street (Sydney CBD)	N/A	TBA ¹	N/A

Notes:

¹ Commercial and Retail usage excluded for the purposes of this estimate due to varying demand. Facility uses are currently under discussion as part of the design development process and demand estimates will be communicated to Jemena when made known.

The above demand estimates do not allow for reductions in existing demand resulting from the demolition of existing land uses. Furthermore, changes to these demand estimates from potential ecologically sustainable development (ESD) initiatives have not been considered. Any future impacts will be communicated to Jemena.

Feasibility Assessment Request

As demonstrated in the demand estimate, there is projected to be a significant impact on the gas infrastructure. As such, Sydney Metro seeks to actively engage with utility stakeholders to ensure the appropriate planning measures are implemented.

Additionally, we seek the following information:

- Confirmation of existing Jemena infrastructure within and adjacent to the sites;
- Identification of the existing capacity of the gas to service the projected growth and any augmentations that may be required to Jemena's network;
- Details of any planned infrastructure works to support development within the catchments which could be expanded to support the developments;

- Other major developments currently allowed for in the development areas as part of Jemena's infrastructure planning;
- Funding arrangements for infrastructure upgrades to meet the increased gas demand;
- Guidance on timeframes for forward planning of infrastructure works; and
- Advice on any alternative supply strategies that might be feasible for Jemena to implement for the proposed developments.

We welcome further discussion and collaboration with Jemena as part of the precinct planning and are happy to meet with Jemena and Sydney Metro to discuss the implications of this feasibility application.

Should you have any queries in relation to this application please do not hesitate to contact the undersigned. We look forward to working with Jemena on the next stages of the developments.

Yours sincerely

Jennine Finlayson
Principal Water Engineer

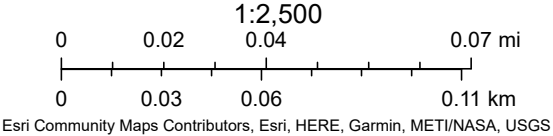
Attachment: *Sydney Metro West – Indicative Site Extents*

Westmead



Figure 2. Potential Westmead Site Extent

- Legend:**
- Potential Site Extent
 - M Proposed Metro Station Location



Parramatta

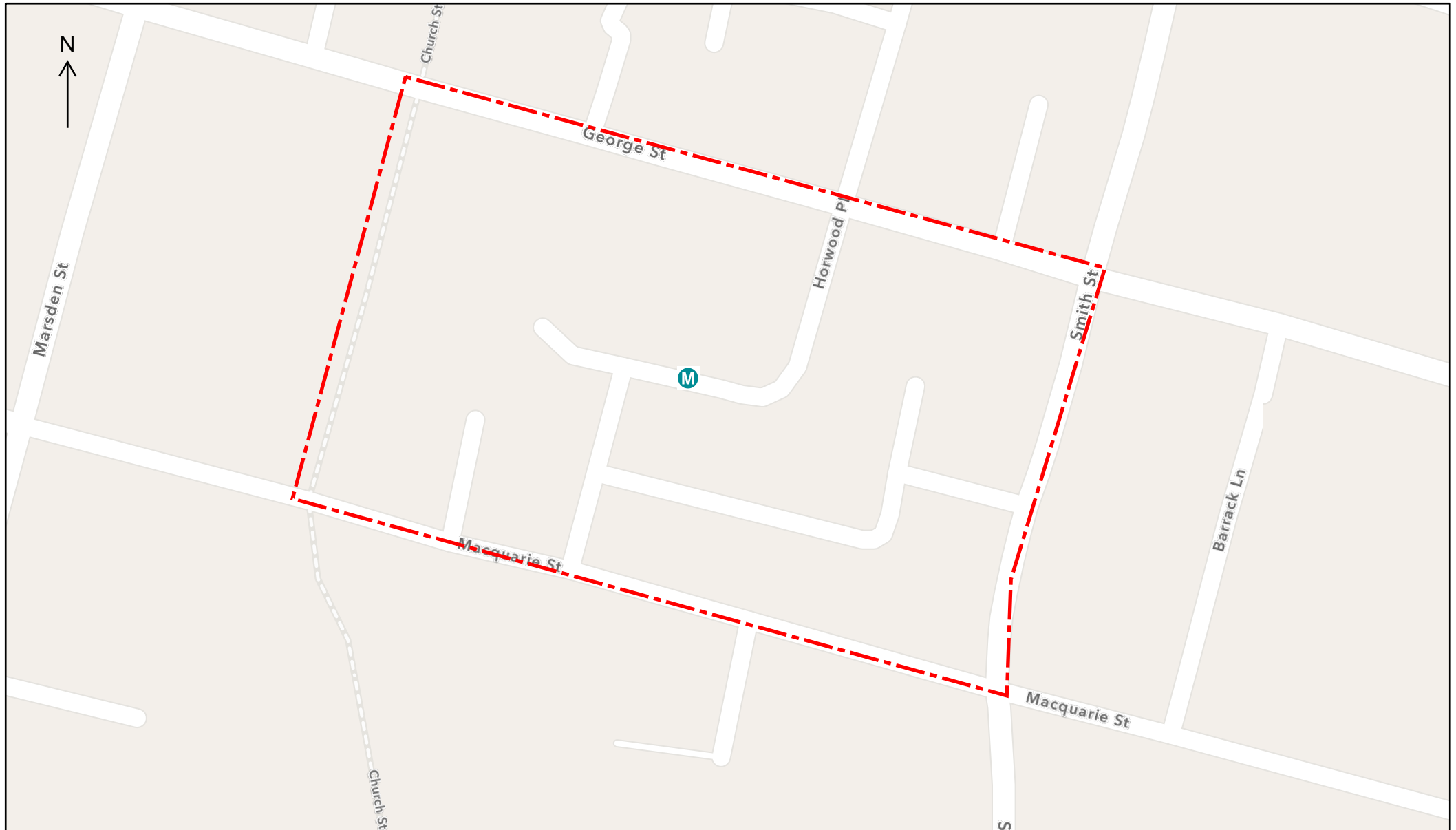
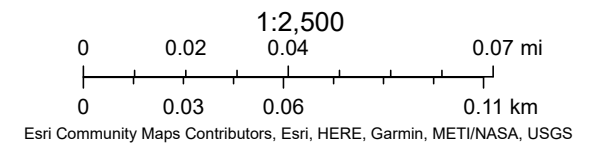


Figure 3. Potential Parramatta Site Extent

Legend:

- - - Potential Site Extent
- M Proposed Metro Station Location



Clyde MSF



Figure 4. Potential Clyde MSF Site Extent

Legend:
- - - Potential Site Extent

1:7,500
0 0.05 0.1 0.2 mi
0 0.07 0.15 0.3 km
Esri Community Maps Contributors, Esri, HERE, Garmin, METI/NASA, USGS

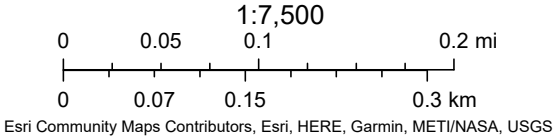
Sydney Olympic Park



Figure 5. Potential Sydney Olympic Park Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



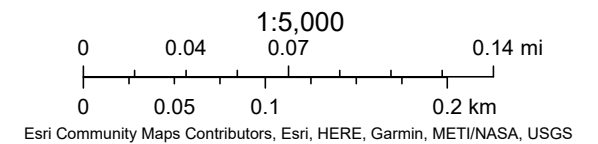
Strathfield North



Figure 6. Potential Strathfield North Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Burwood North

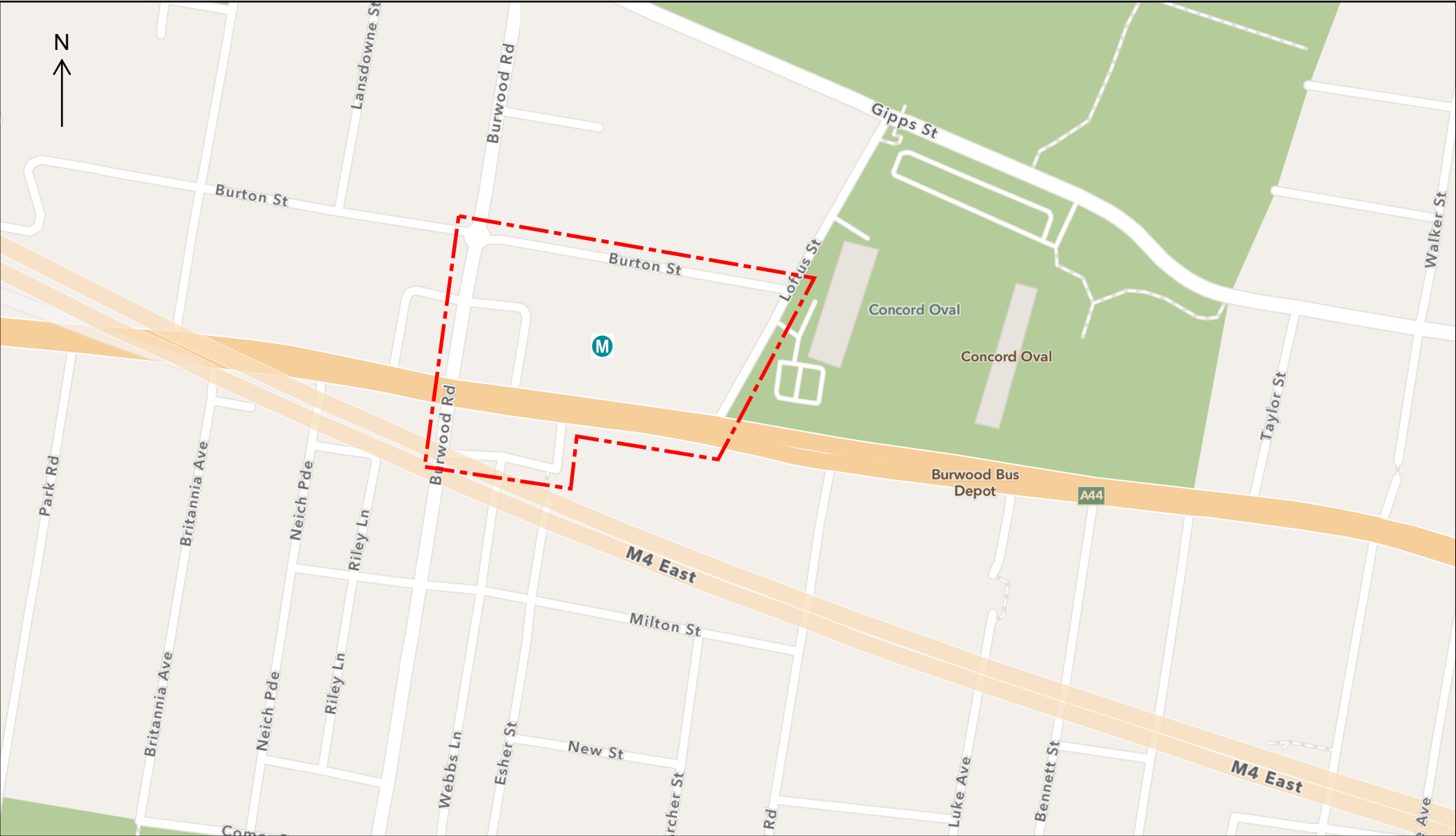
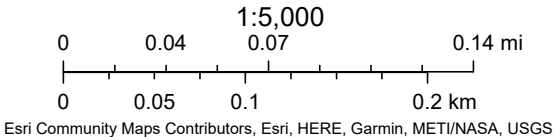


Figure 7. Potential Burwood North Site Extent

Legend:

- - - Potential Site Extent
- M Proposed Metro Station Location



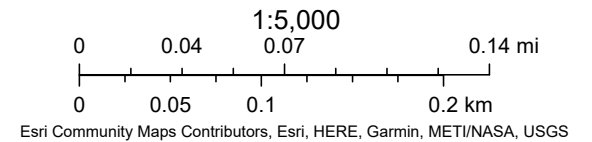
Five Dock



Figure 8. Potential Five Dock Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



The Bays

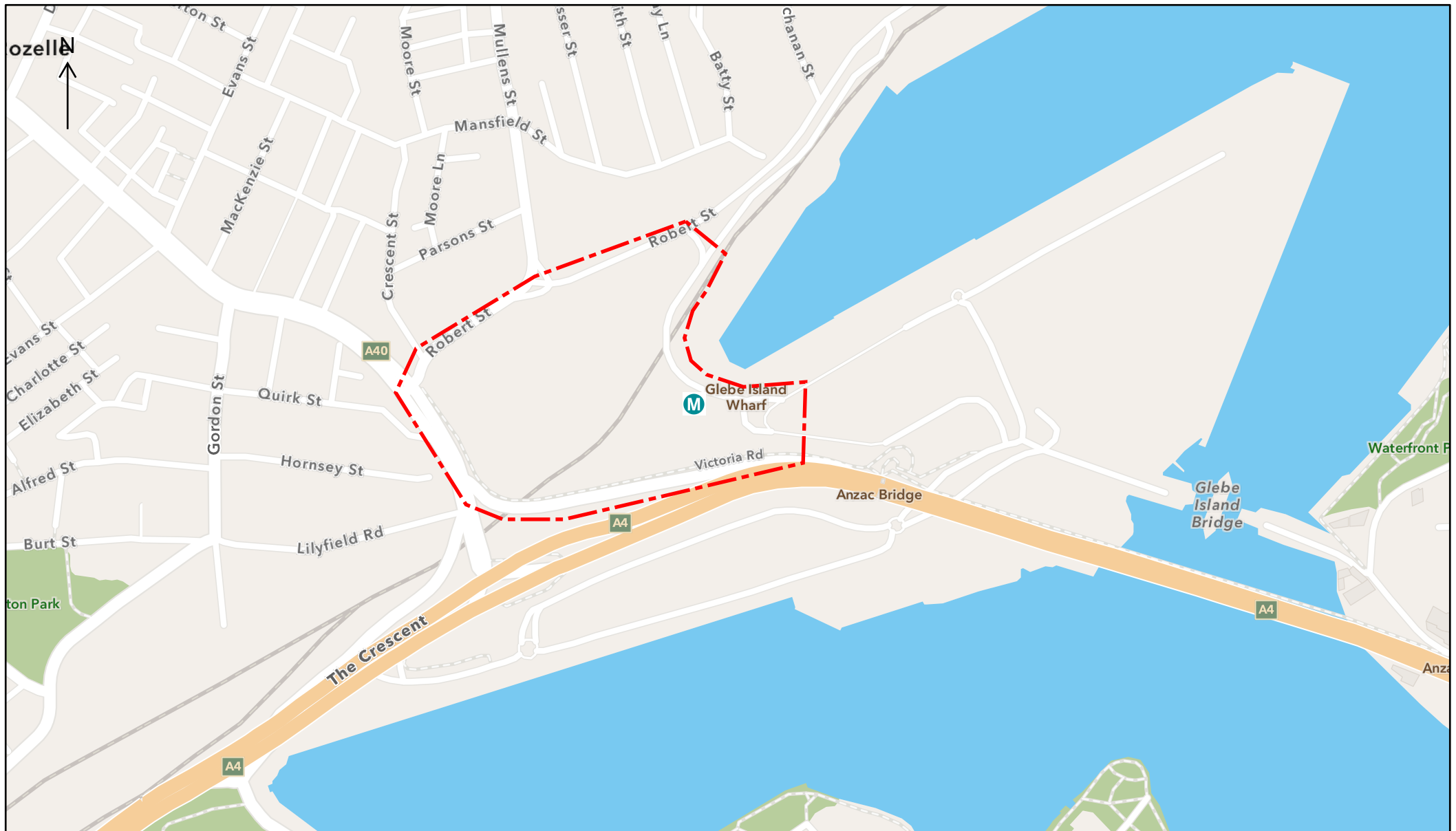
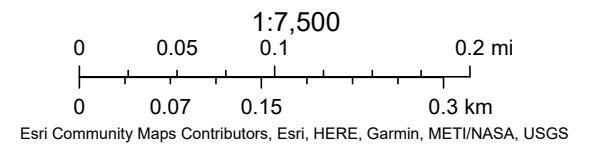


Figure 9. Potential The Bays Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Pymont

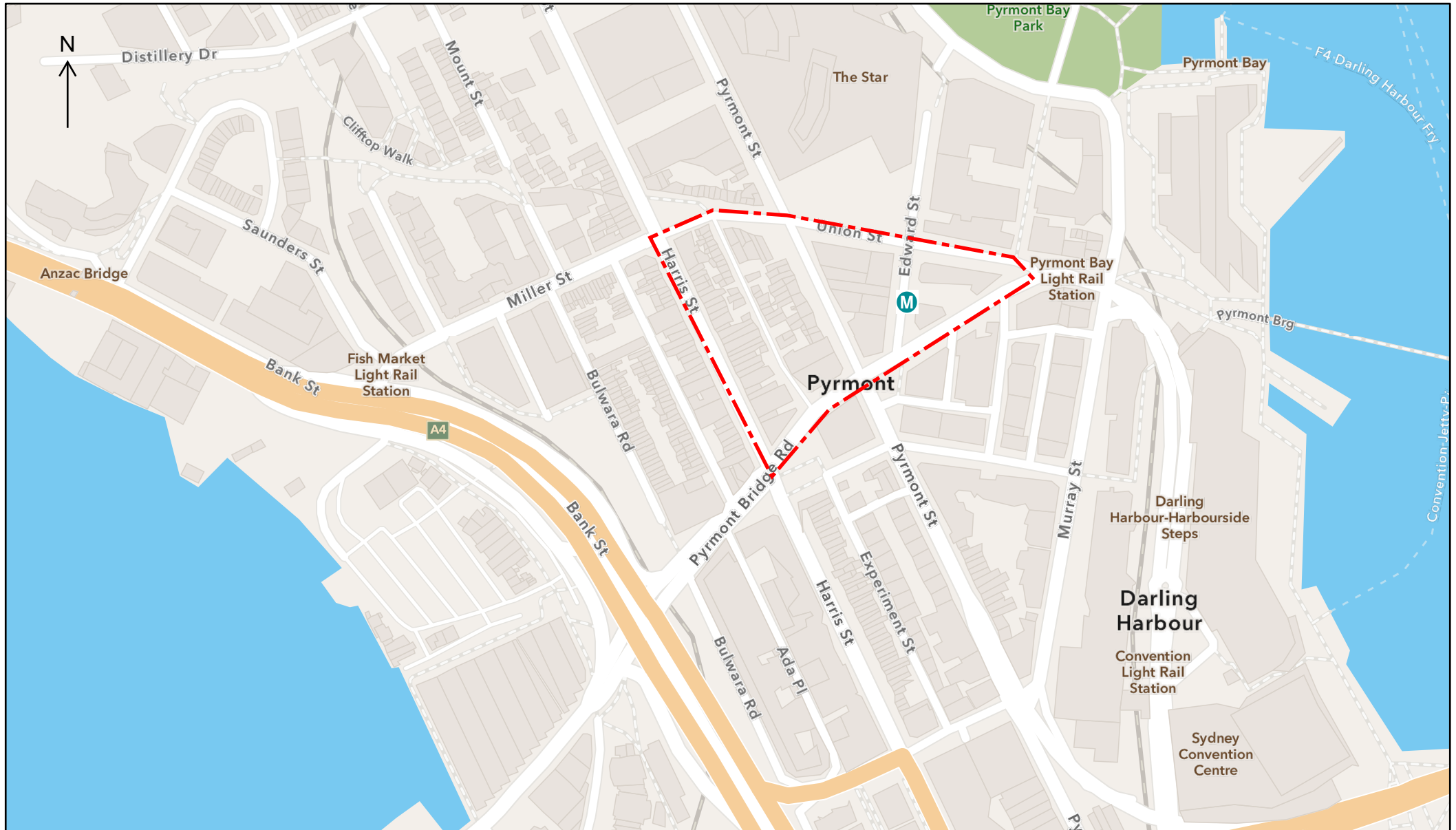
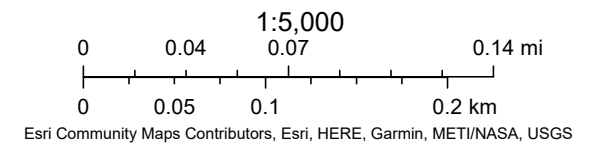


Figure 10. Potential Pymont Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location



Hunter Street (Sydney CBD)

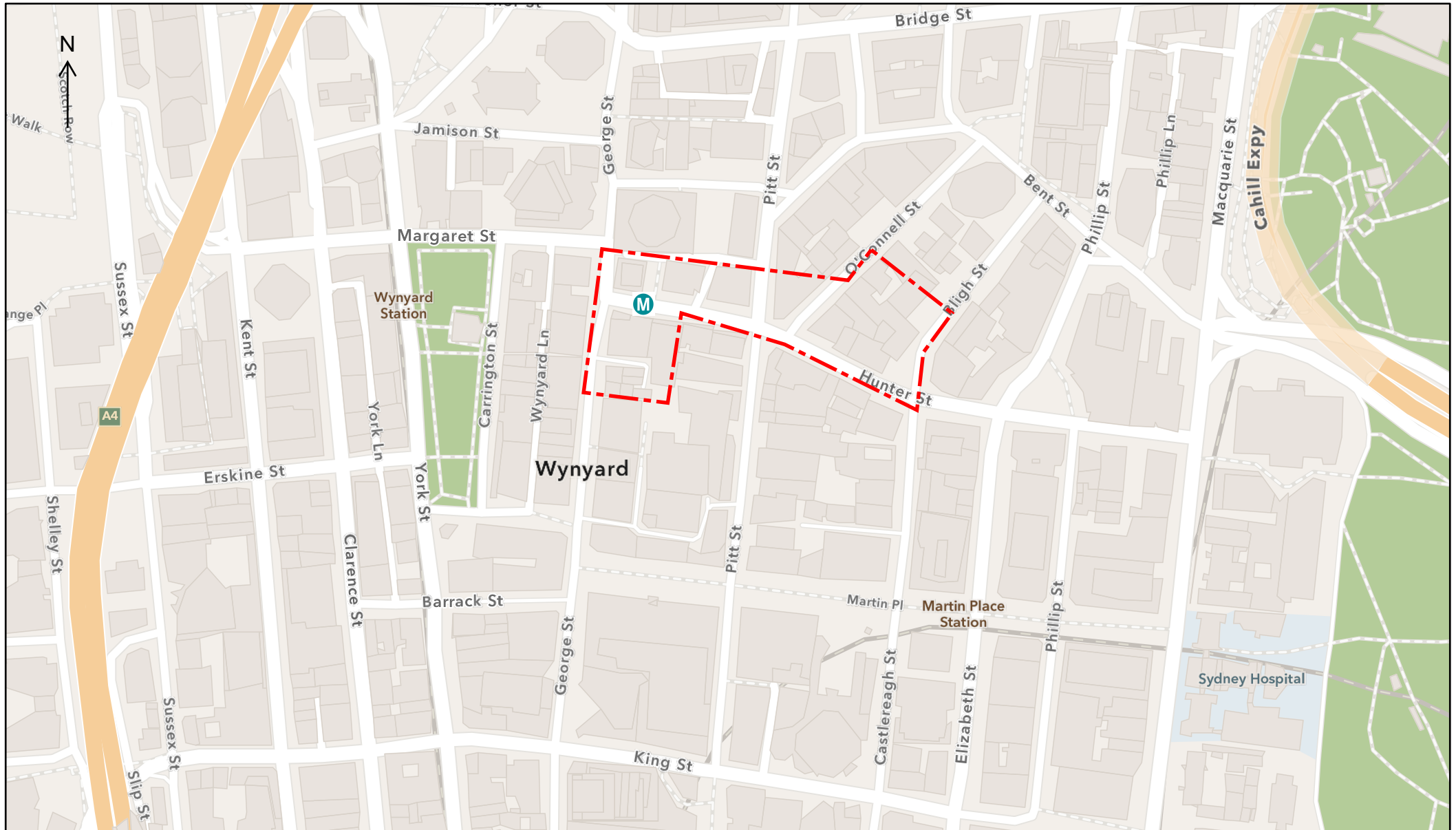
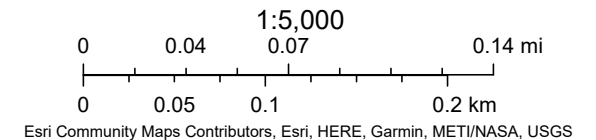


Figure 11. Potential Hunter Street (Sydney CBD) Site Extent

Legend:

- Potential Site Extent
- M Proposed Metro Station Location





Jemena Gas Networks (NSW) Ltd

Jemena
Sydney Metro West Integrated Station
Development
Gas Servicing Assessment



An appropriate citation for this paper is:

Jemena
Sydney Metro West Integrated Station Development
Gas Servicing Assessment

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North Sydney NSW 2060
Ph: (02) 9867 7000
Fax: (02) 9867 7010

Overview

The aim of this document is to provide a preliminary assessment of Jemena's existing infrastructure and outline Jemena Gas Network's capacity to service the new developments around Sydney Metro Stations. Where there is insufficient capacity to service the development then a gas reinforcement or network extension is specified. Gas loads that are supplied by Sydney Metro for the following Sydney Metro Stations; Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and Hunter Street.

Recommendations on route selection and reinforcements are subject to change with a detailed review of the proposed gas supply options.

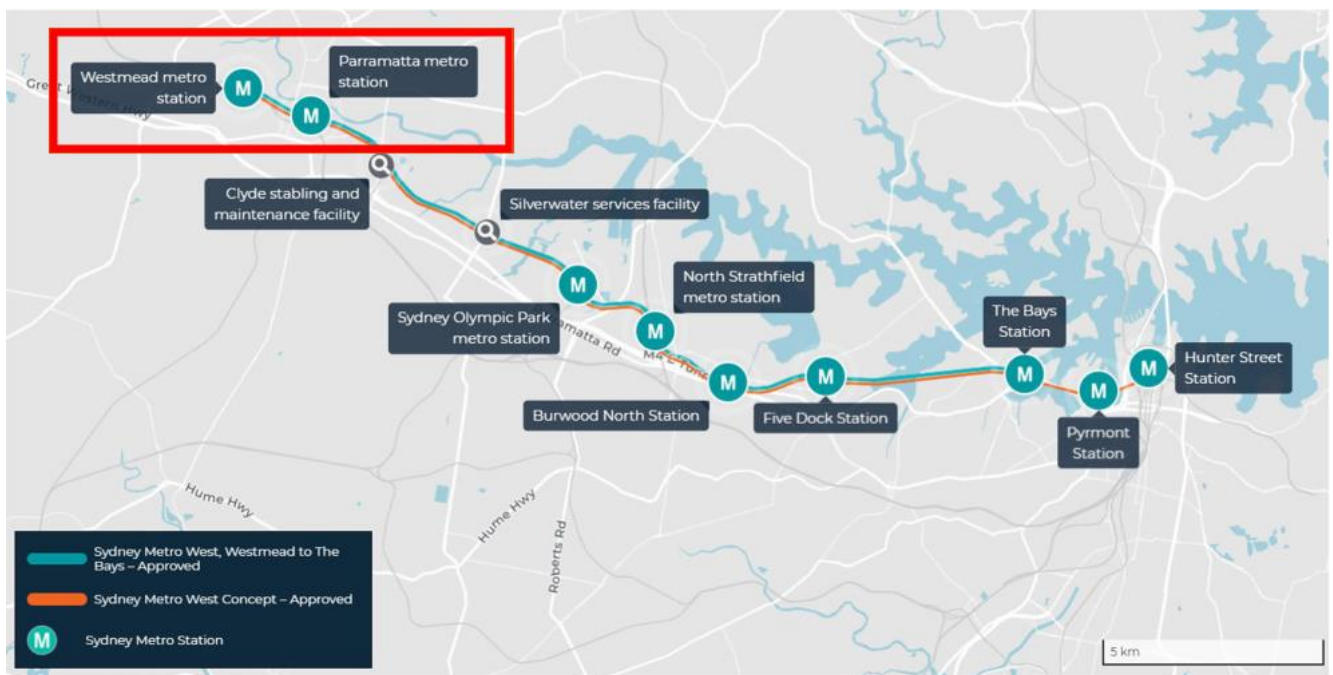


Figure 1-1: Sydney Metro West stations

1. Commercial Feasibility

Natural Gas is available in the vicinity of some of these developments and may be able to supply these proposals.

Our policy is to supply all developments wherever possible, depending upon economic viability.

In consideration of our shareholders' interests and under NSW regulation, Jemena Gas Networks (NSW) Ltd is required to ensure that any connection to the natural gas distribution system is commercially viable and therefore must assess each request for supply on an individual basis.

Upon the provision of the final layout and load configurations for the developments a full economic evaluation can be undertaken to determine the viability of supplying natural gas to the site, as a contribution may be required to assist in the economic viability of the proposal.

There will be costs associated with disconnections and any relocation works that are required.

To assist in the planning of supply to these development I can advise that;

- The sites to be developed are either reticulated with gas;
 - Where the existing network in an area does not have sufficient capacity to supply the additional load a network reinforcement will be required, and a contribution may be required.
 - Costs will be associated with any works that require Jemena to relocate, provision with additional assets / or extend the existing gas network.
 - See below for an assessment for each site.
-

2. Gas Loads

The table provided by Sydney Metro is used for modelling the loads at the aforementioned locations:

Investigation Area		Residential Apartments ³ (No.)	Indicative Commercial Space GFA ² (m ²)	Indicative Retail Space GFA ² (m ²)	Development Timeframe (Year)
1.	Westmead	250	40,000	4,500	2028 - 2032
2.	Parramatta	250	150,000	20,000	2024 - 2028
3.	Clyde MSF	N/A	N/A	N/A	2024 - 2028
4.	Sydney Olympic Park	1,000	35,000	8,000	2024 - 2028
5.	North Strathfield	N/A	N/A	N/A	2024 - 2028
6.	Burwood North	210	11,000	6,000	2024 - 2028
7.	Five Dock	21	5,000	900	2024 - 2028
8.	The Bays	550	32,450	6,150	2024 - 2028
9.	Pymont	180	8,000	500	2024 - 2028
10.	Hunter Street (Sydney CBD)	0	160,000	2,000	2024 - 2028

2.1 Assumptions

2.1.1 Gas Loads – Residential Apartments

Based on the information provided, an energy demand of 2.17m³/day/dwelling is used for the residential apartments. Modelling is based on peak consumption. Therefore, it is assumed that two thirds of the load is consumed during the peak periods of the day. The peak period for residential gas consumption is from 6 am to 8 am, and 4 pm to 8 pm. A total of 8 hours / day for peak usage.

As an example, the load for 723 residential apartments in Westmead is as follows:

$$\begin{aligned} &250 \text{ apartments} \times (2.17\text{m}^3/\text{day}/\text{dwelling}) \times 2/3 \\ &= 362 \text{ m}^3/\text{peak period of 8 hours} \end{aligned}$$

The model requires the load to be provided as an hourly rate. Therefore, $362 \text{ m}^3/8 = \sim 45 \text{ m}^3/\text{hr}$ (1.7 GJ/hr)

By this method, the following table is assumed for these sites:

Metro Location	Hourly Consumption (m ³ /hr)
Westmead	45
Parramatta	45

2.1.2 Gas Loads - Commercial & Retail

Commercial and Retail gas demand profiles were not advised by Sydney Metro. However, an estimated gas usage has been assumed for the purposes of modelling.

The following commercial and retail loads are implemented into the modelling:

Metro Location	Commercial (m³/hr)	Retail (m³/hr)
Westmead	400	50
Parramatta	1500	200

As the demand profiles become known, Jemena will be able re-evaluate the networks, and consider alternative reinforcement options if required.

3. Westmead

Medium pressure Gas Distribution Networks (JGN) exist within the footprint advised by Sydney Metro. The predominant feeder mains are found along Hawkesbury road (DN 75mm NY in 4" Cast iron conduit), and Alexandra Ave (DN 75mm NY in 4" Cast iron conduit).

Currently, there is a feasibility study to relocate sections of main in the proposed metro footprint. Namely along Alexandra Avenue. In order for this to be considered, existing mains in the adjoining roads will require sizing considerations. The advised load has been modelled on these considerations.

There is sufficient capacity to support the development in the advised footprint. However, should the mains from Alexandra Avenue be required to be isolated, reinforcements may be required.

Refer to Figure 2, specifying mains upgrades required based on the advised isolation.

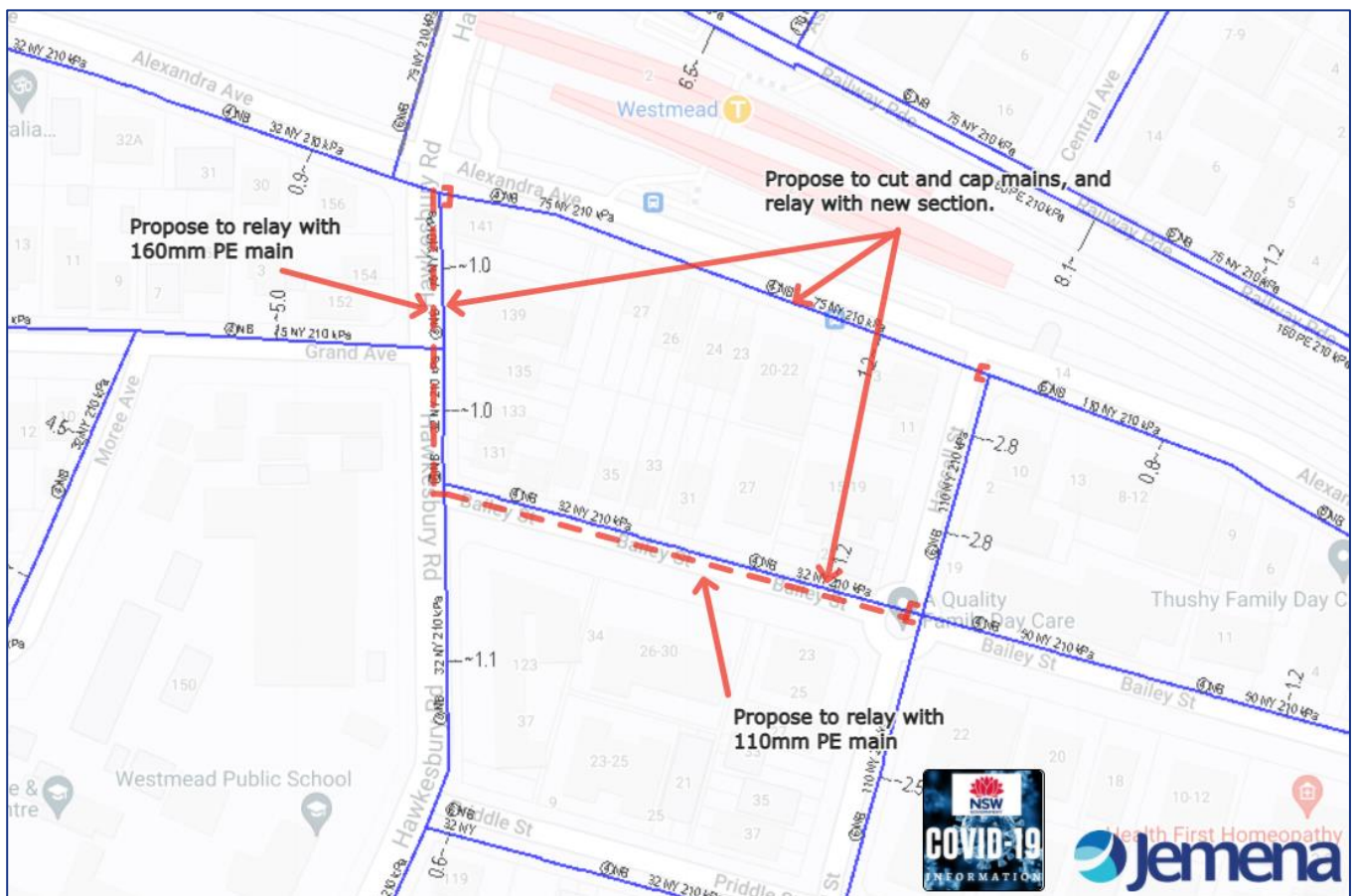


Figure 3-1: Westmead area Gas distribution network

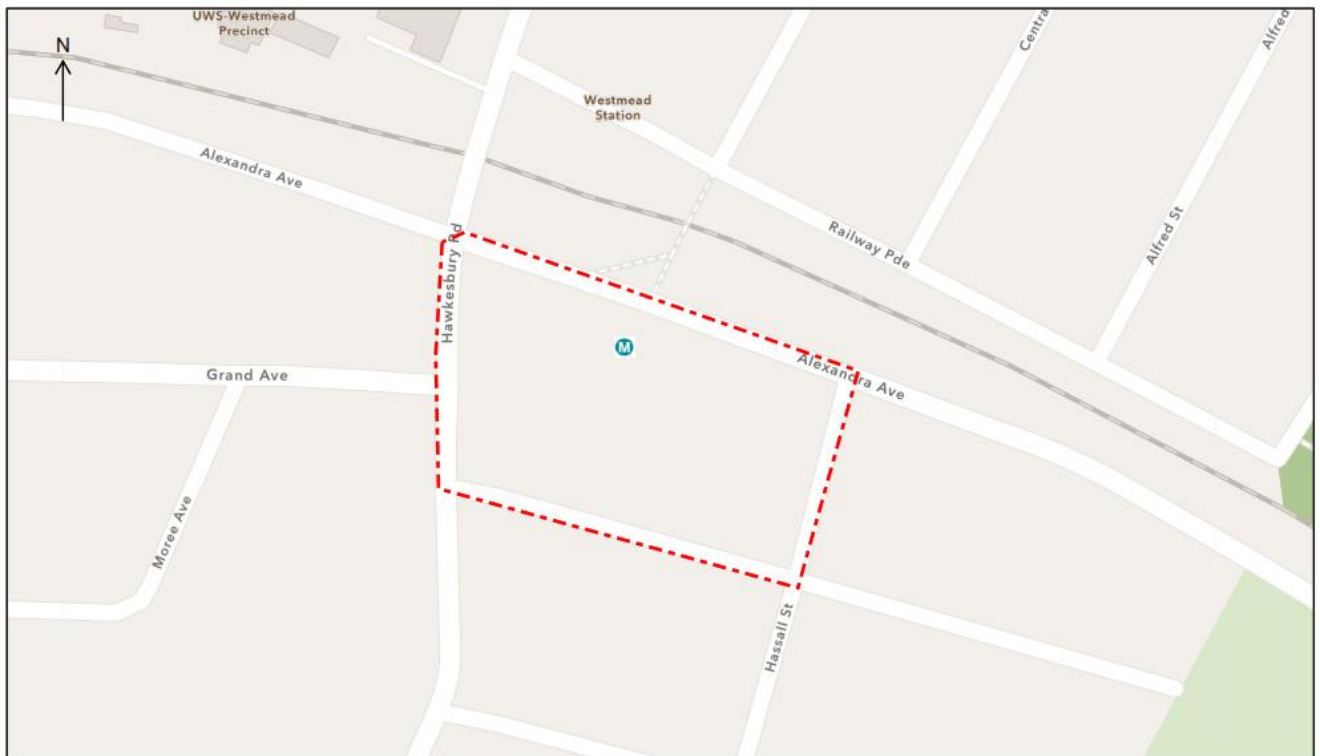


Figure 3-2: Westmead Metro Development advised by Sydney Metro

4. Parramatta

Both Secondary (denoted by the green lines within the map below), and Low pressure (denoted by the magenta coloured lines within the map below) Gas Distribution Networks (JGN) exist within the footprint advised by Sydney Metro. The predominant feeder mains are found along Macquarie street (DN160mm PE), and Smith street (DN 150 ST).

4.1 Proposed connection strategy

Similar to the proposed Westmead Metro station, there is a feasibility study to consider sections of gas main to be relocated / isolated within the proposed footprint of the Parramatta metro station. Namely, Horwood Place.

In assessing the load requirements, there is insufficient capacity in the Low pressure network to support the development load within the block. However, as the secondary pressure network traverses along Smith street, dedicated mains, or services may be able connect indirectly to this network.

Depending on the development and load requirements, Jemena will be able to assess the design requirements in order to provision the load of the proposed development.

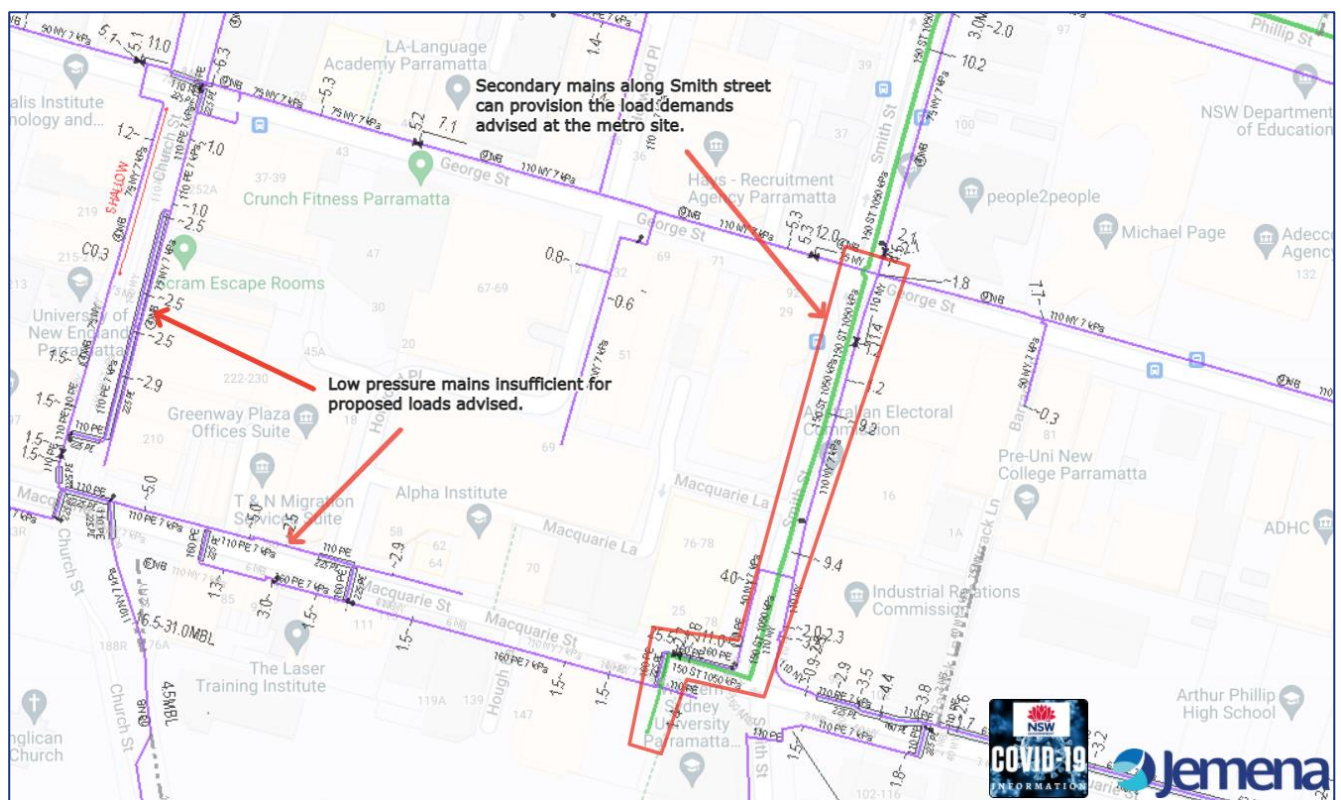


Figure 4-1: Mains for the Parramatta Sydney Metro Development

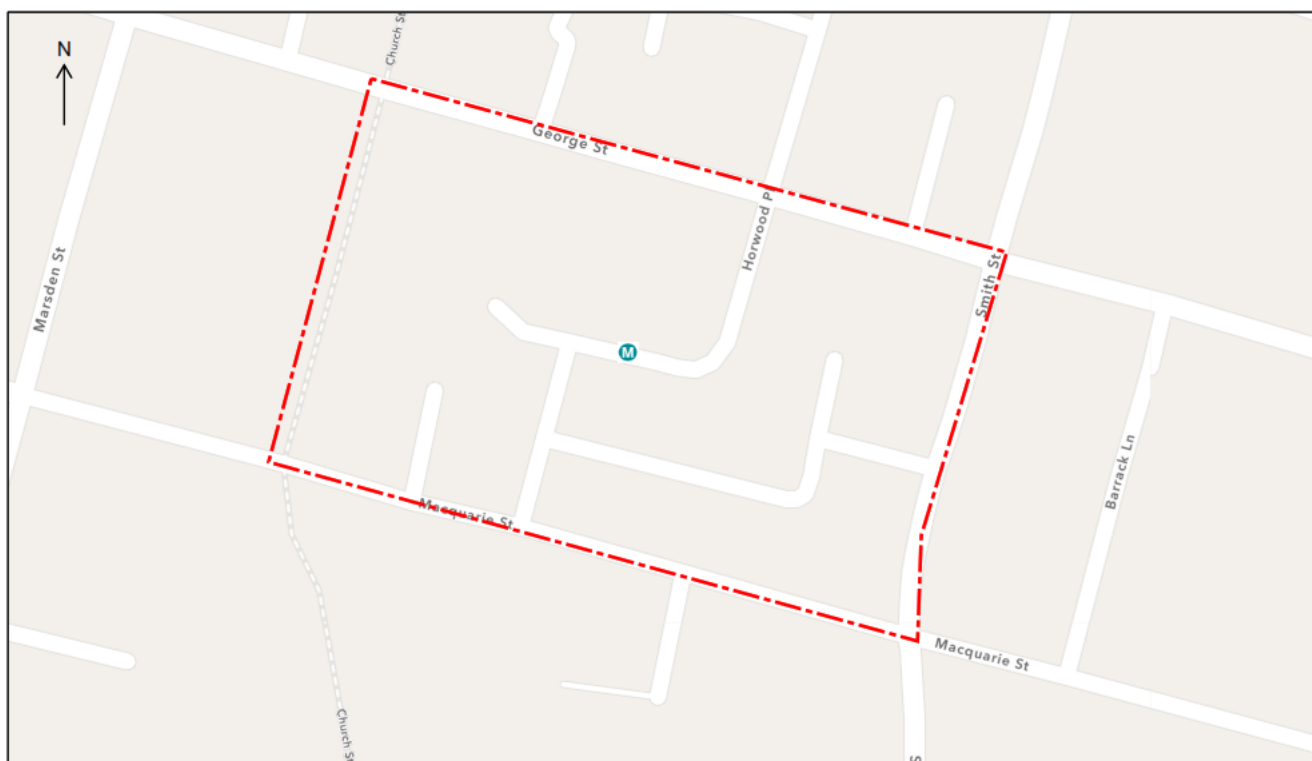


Figure 4-2: Parramatta Metro Development advised by Sydney Metro

5. Sydney Olympic Park

5.1 Existing Jemena network

Potential site extent may impact Jemena high pressure (green) and medium pressure (blue) assets and a secondary regulator set at the corner of Herb Elliott Ave and Olympic Blvd. Also, high pressure primary main (pink) is in the vicinity. Detailed clash assessment will be required to identify extent of actual impact

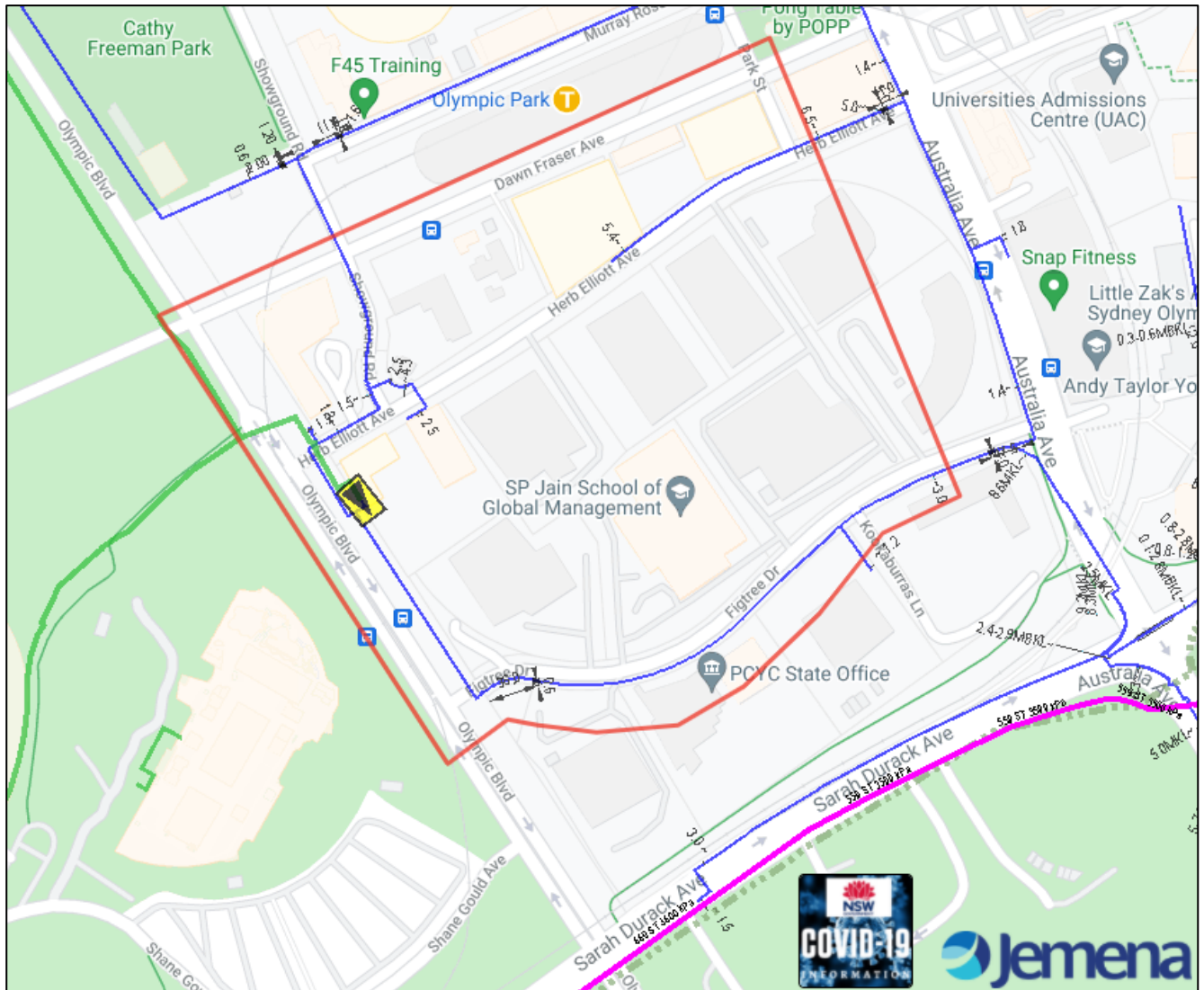


Figure 5-1 Sydney Olympic Park – Existing Jemena Network

5.2 Gas Loads

There will be a total of 1000 residential apartments with 35000sqm of commercial space and 8000sqm of retail space. The load details provided by Sydney Metro did not specify where they are located. Therefore the load has been split over the entire area.

5.3 Proposed connection strategy

To cater the proposed demand, new regulator set will be required. Also, one 110mm PE main interconnection in Herb Elliott Ave and one main upgrade in Olympic Blvd is also required. Refer to Figure 5-2 for details.



Figure 5-2 Mains upgrade plan for Sydney Olympic Park Sydney Metro Development

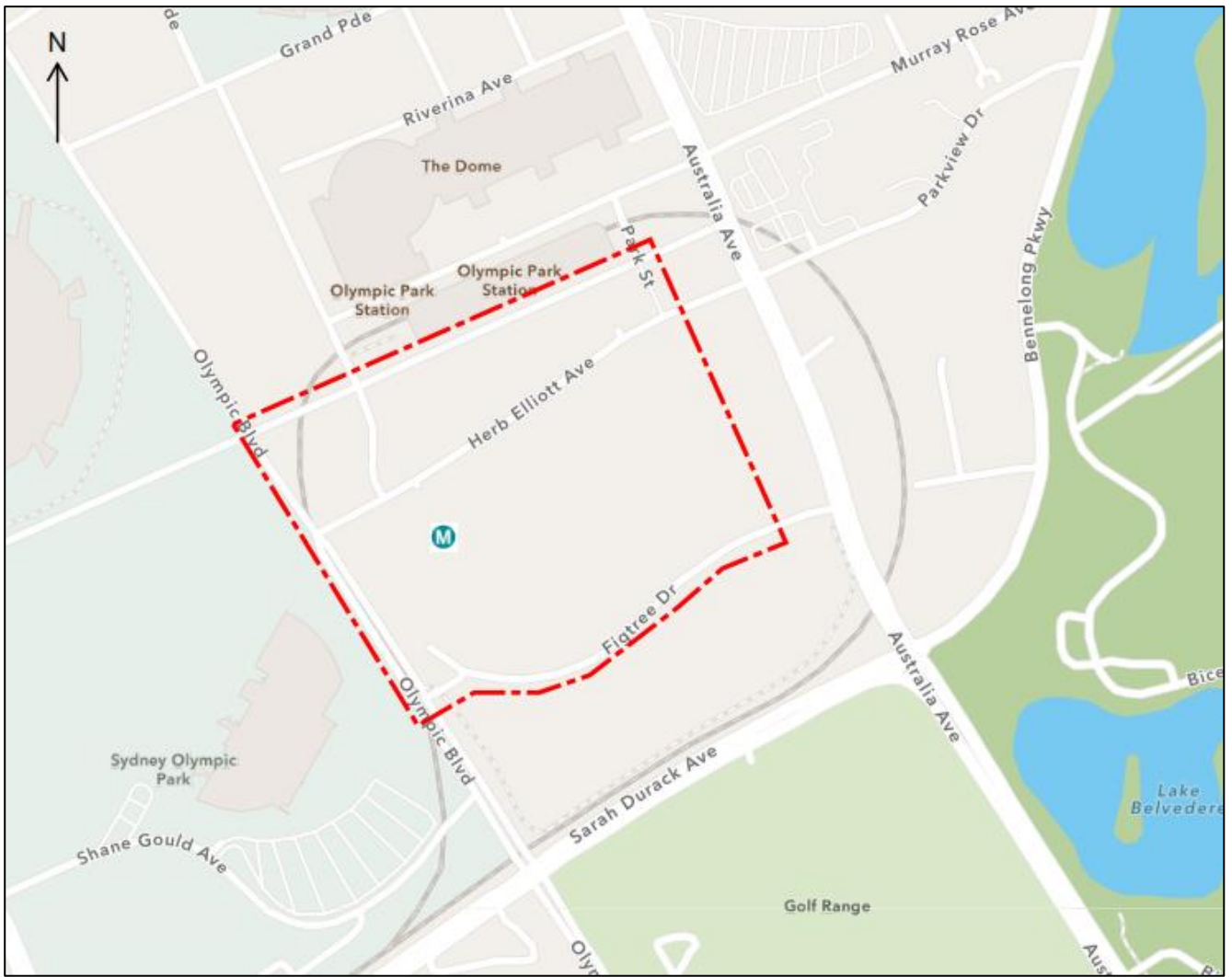


Figure 5-3 Sydney Olympic Park Metro Development advised by Sydney Metro

6. North Strathfield

6.1 Existing Jemena network

Potential site extent may impact Jemena high pressure (green) and medium pressure (blue) assets. Detailed clash assessment will be required to identify extent of actual impact.

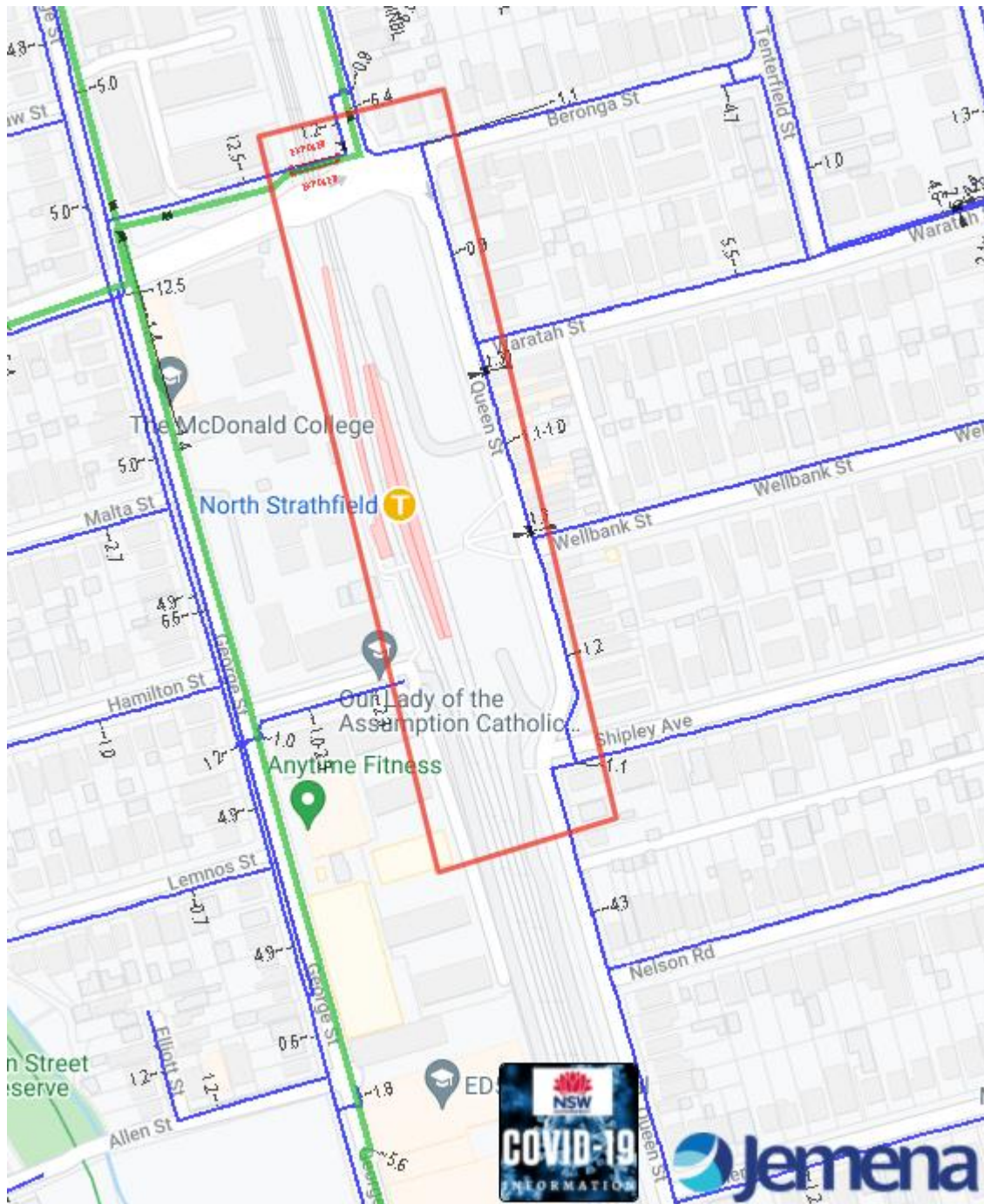


Figure 6-1 North Strathfield – Existing Jemena Network

6.2 Gas Loads

No gas load.

6.3 Proposed connection strategy

Capacity assessment not required as there is no demand requirement.

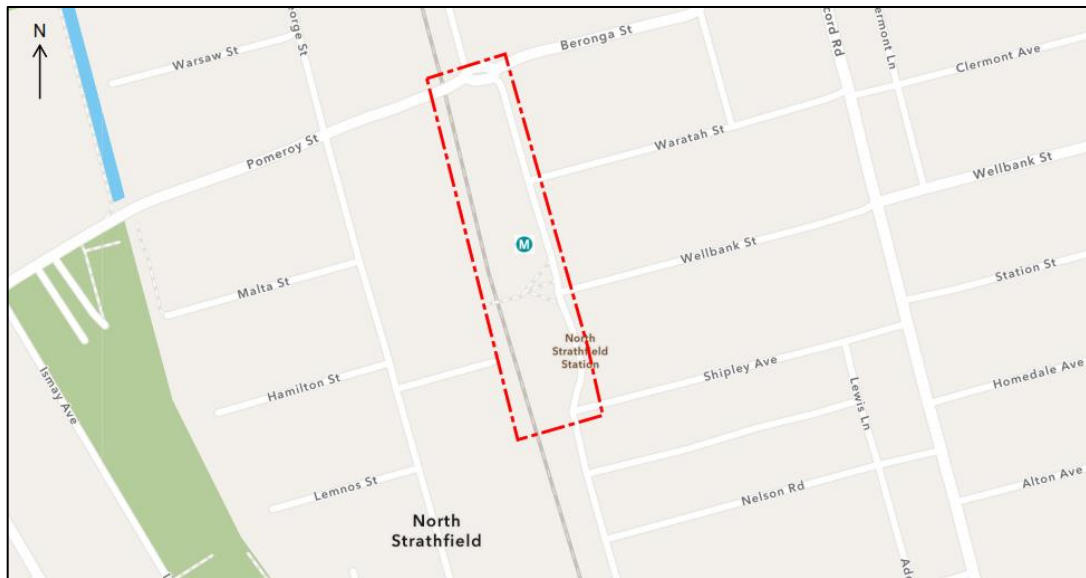


Figure 6-2 North Strathfield Metro Development advised by Sydney Metro

7. Burwood North

7.1 Existing Jemena network

Potential site extent may impact Jemena medium pressure (blue) and low pressure (magenta) assets. Detailed clash assessment will be required to identify extent of actual impact.

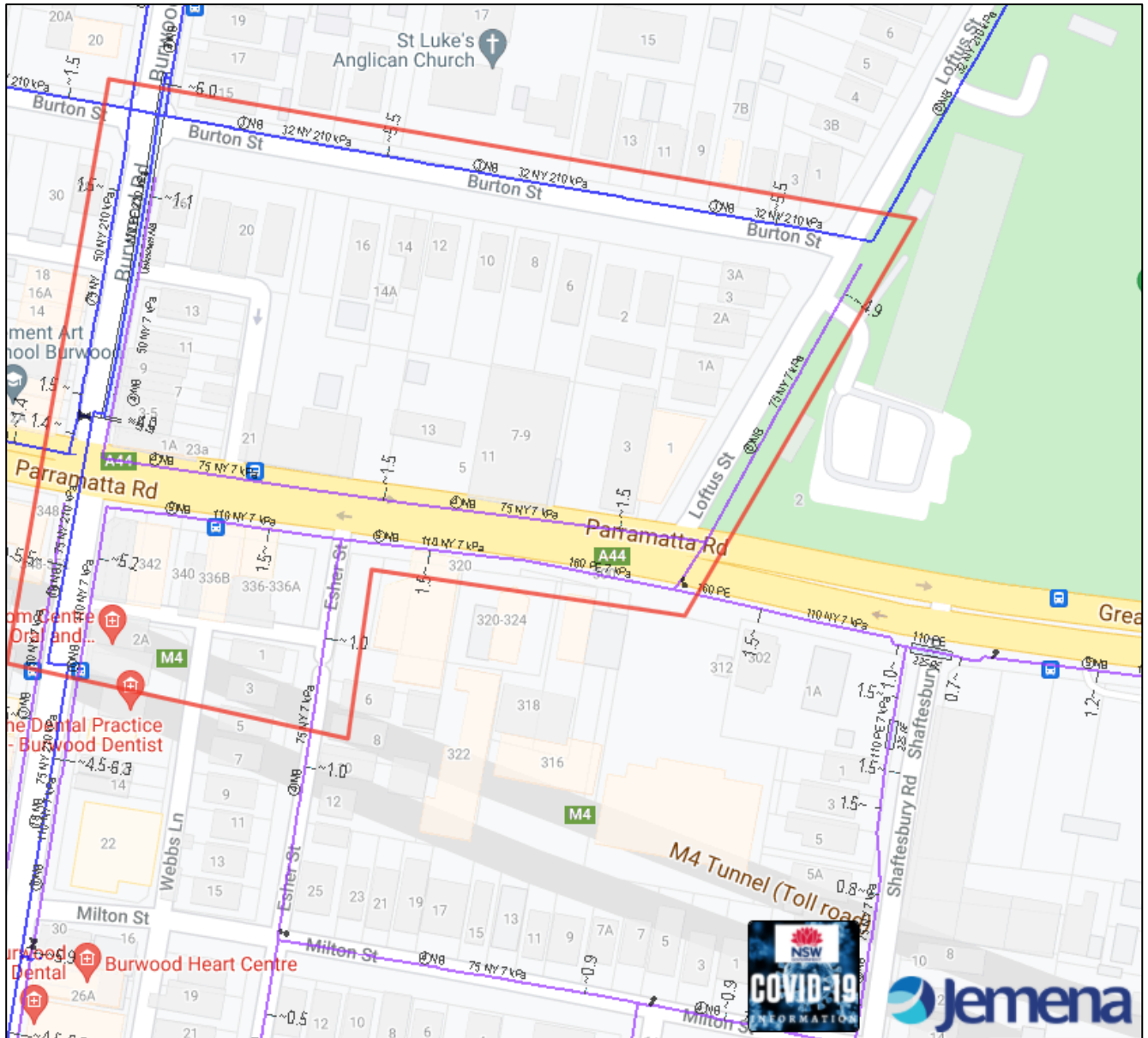


Figure 7-1 Burwood North – Existing Jemena Network

7.2 Gas loads

There will be a total of 1000 residential apartments with 35000sqm of commercial space and 8000sqm of retail space. The load details provided by Sydney Metro did not specify where they are located.

7.3 Proposed connection strategy

Medium pressure and low pressure Gas Distribution Networks (JGN) exist within the footprint advised by Sydney Metro. The predominant feeder mains are found along Burwood road (110mm PE in 36" Cast iron conduit). This main will be difficult to access in order supply to the proposed station.

However, if the supply point is to come from adjoining streets (Burton Street and Loftus St), pipe size upgrade will be required due to smaller diameter mains.

There is sufficient capacity in the medium pressure network to support the development in the advised footprint. However, low pressure network does not have sufficient capacity. If the supply is to come from streets with low pressure, medium pressure mains extension will be required. Refer to Figure 7-2 for details.

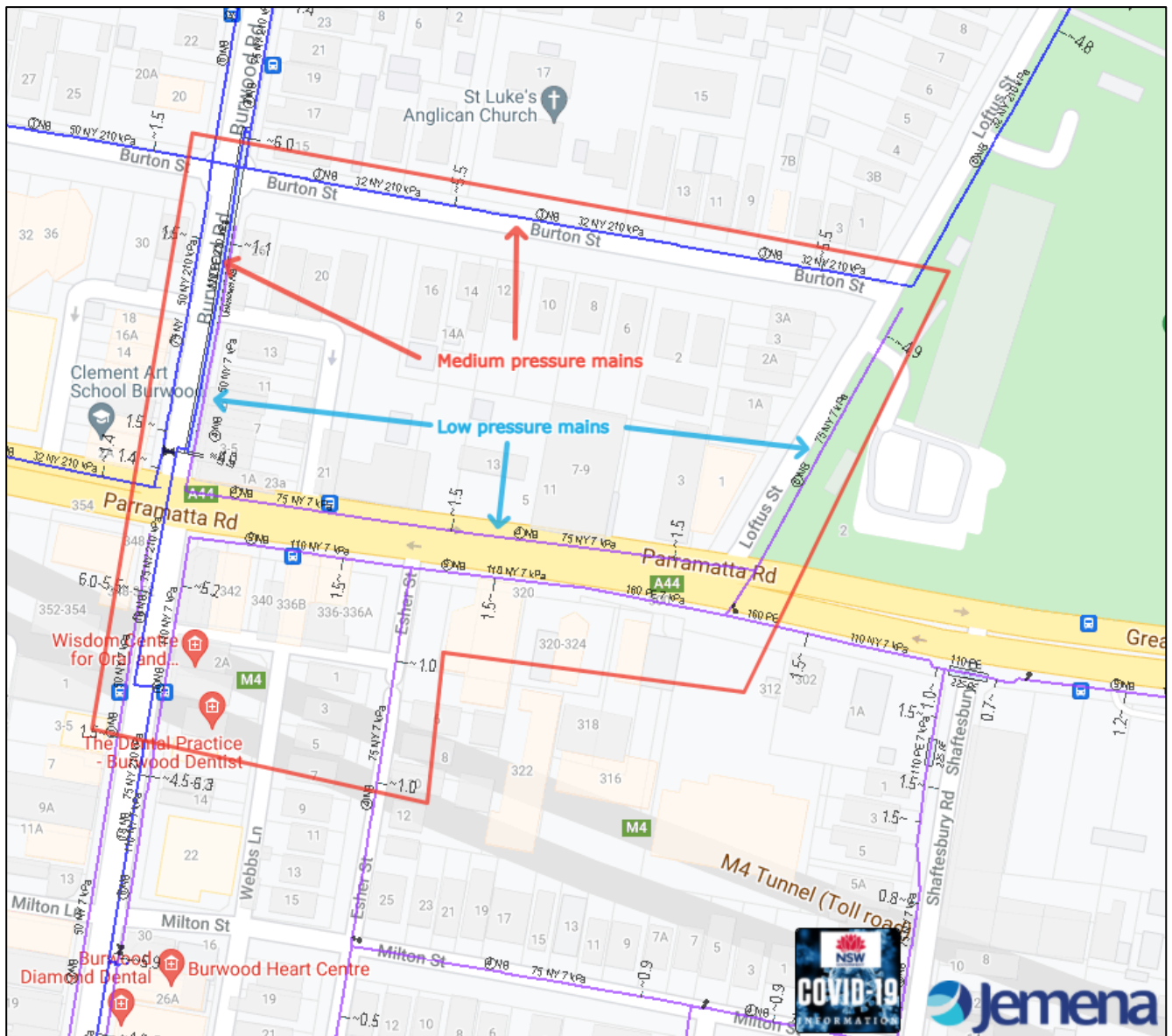


Figure 7-2 Mains for the Burwood North Sydney Metro Development

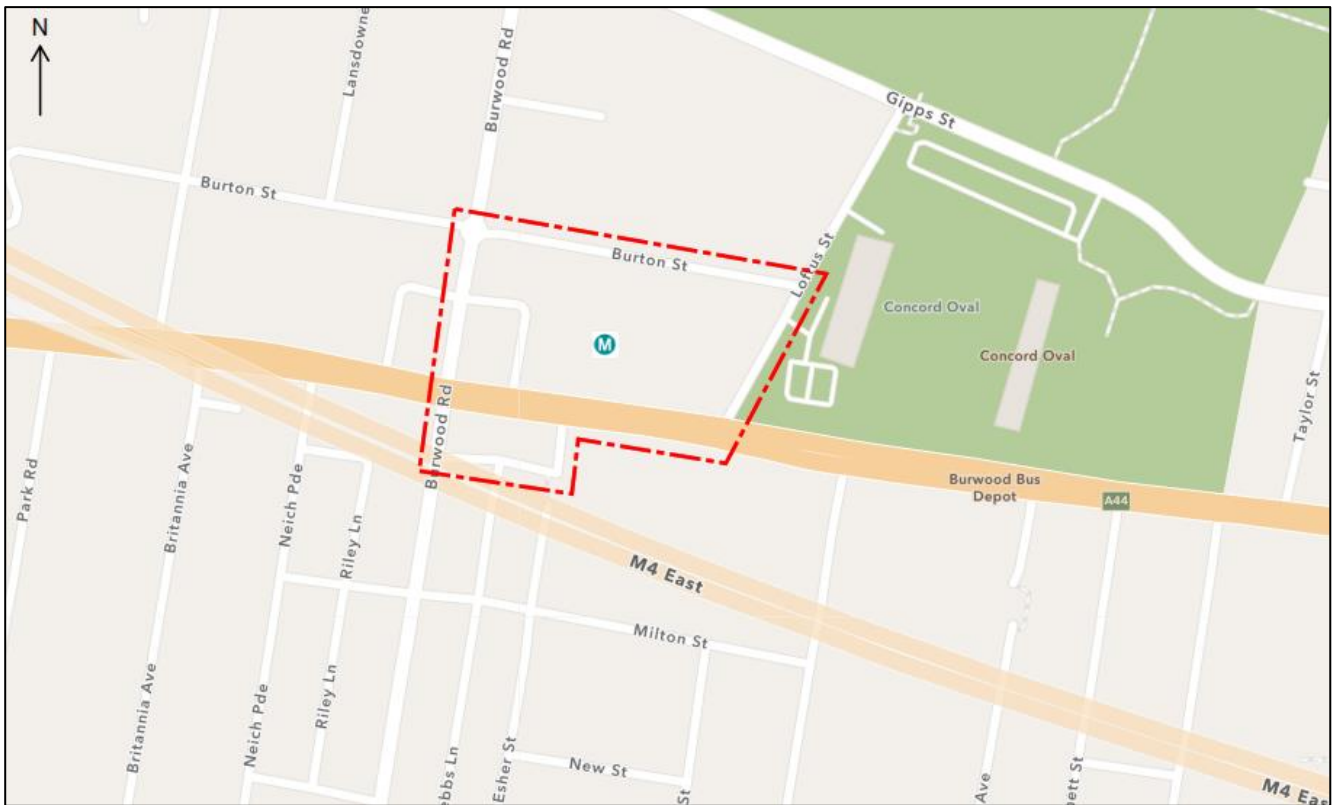


Figure 7-3 Burwood North Metro Development advised by Sydney Metro

8. Five Dock

8.1 Existing Jemena network

Potential site extent may impact Jemena medium pressure (blue) and low pressure (magenta) assets. Also, high pressure primary main (pink) is in the vicinity. Detailed clash assessment will be required to identify extent of actual impact.

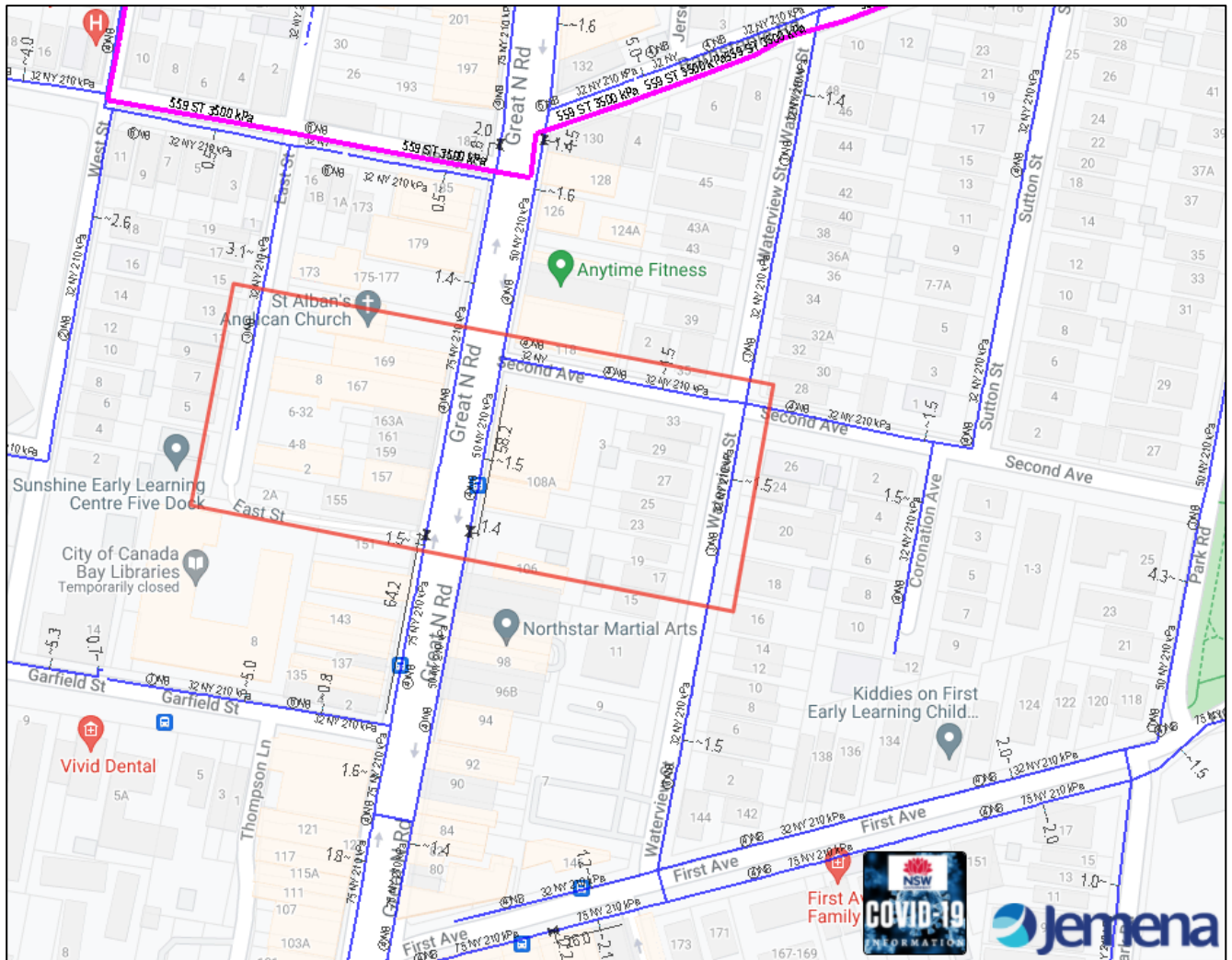


Figure 8-1 Five Dock – Existing Jemena Network

8.2 Gas loads

There will be a total of 210 residential apartments with 11000sqm of commercial space and 6000sqm of retail space. The load details provided by Sydney Metro did not specify where they are located.

8.3 Proposed connection strategy

Medium pressure Gas Distribution Networks (JGN) exist within the footprint advised by Sydney Metro. The predominant feeder main is along Great North Road (75mm NY in 4" Cast iron conduit).

There is sufficient capacity in the medium pressure network to support the development in the advised footprint.

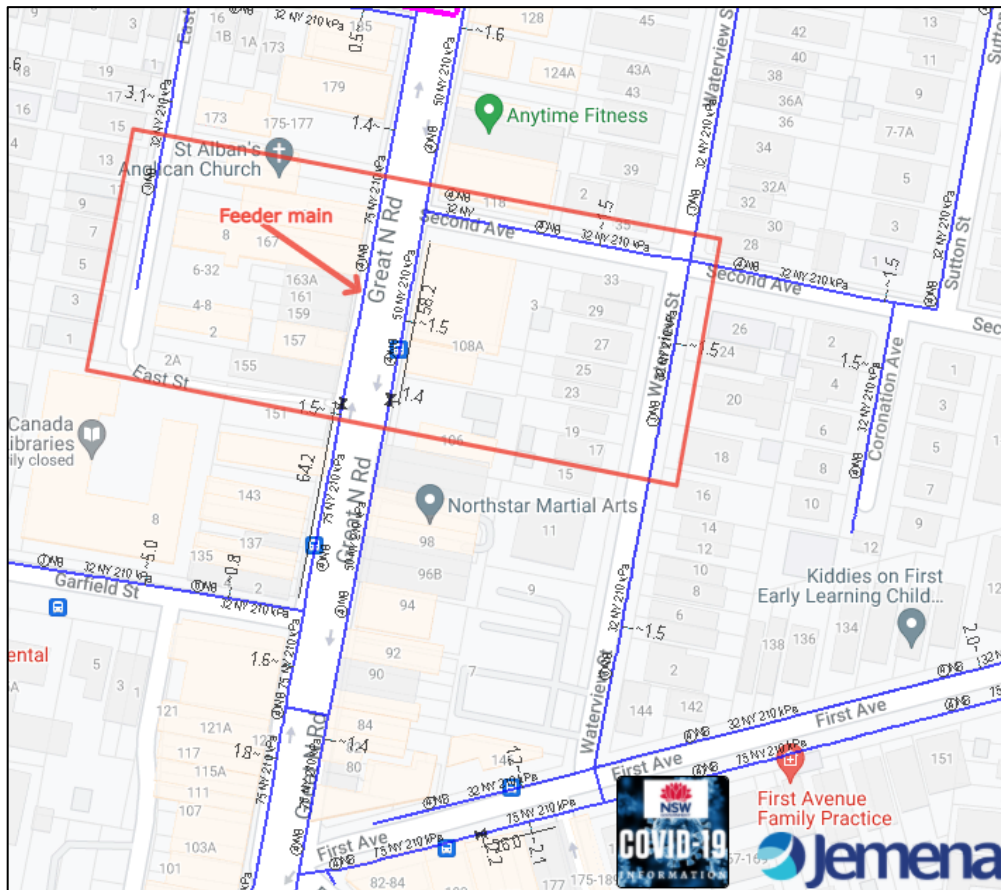


Figure 8-2 Mains for the Five Dock Sydney Metro Development

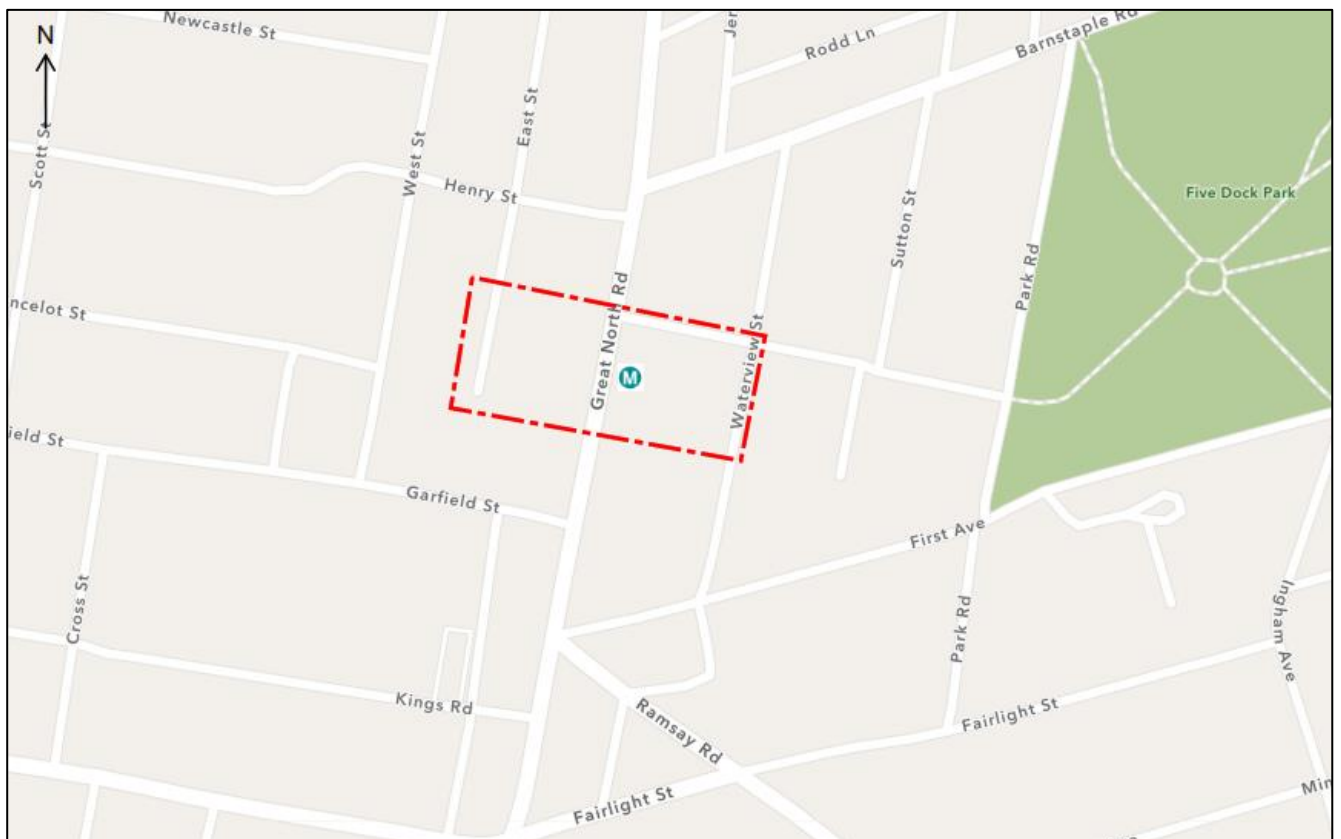


Figure 8-3 Five Dock Metro Development advised by Sydney Metro

9. The Bays

9.1 Existing Jemena network

Potential site extent may impact Jemena medium pressure (blue) assets. Detailed clash assessment will be required to identify extent of actual impact



Figure 9-1 The Bays – Existing Jemena Network

9.2 Gas loads

There will be a total of 550 residential apartments with 32450sqm of commercial space and 6150sqm of retail space. The load details provided by Sydney Metro did not specify where they are located.

9.3 Proposed connection strategy

Medium pressure Gas Distribution Networks (JGN) exist within the footprint advised by Sydney Metro. The predominant feeder main is along Robert St, Victoria Rd and Anzac Bridge Access Rd (160mm PE part of it in 225mm PE conduit).

There is sufficient capacity in the medium pressure network to support the development in the advised footprint.



Figure 9-2 Mains for The Bays Sydney Metro Development

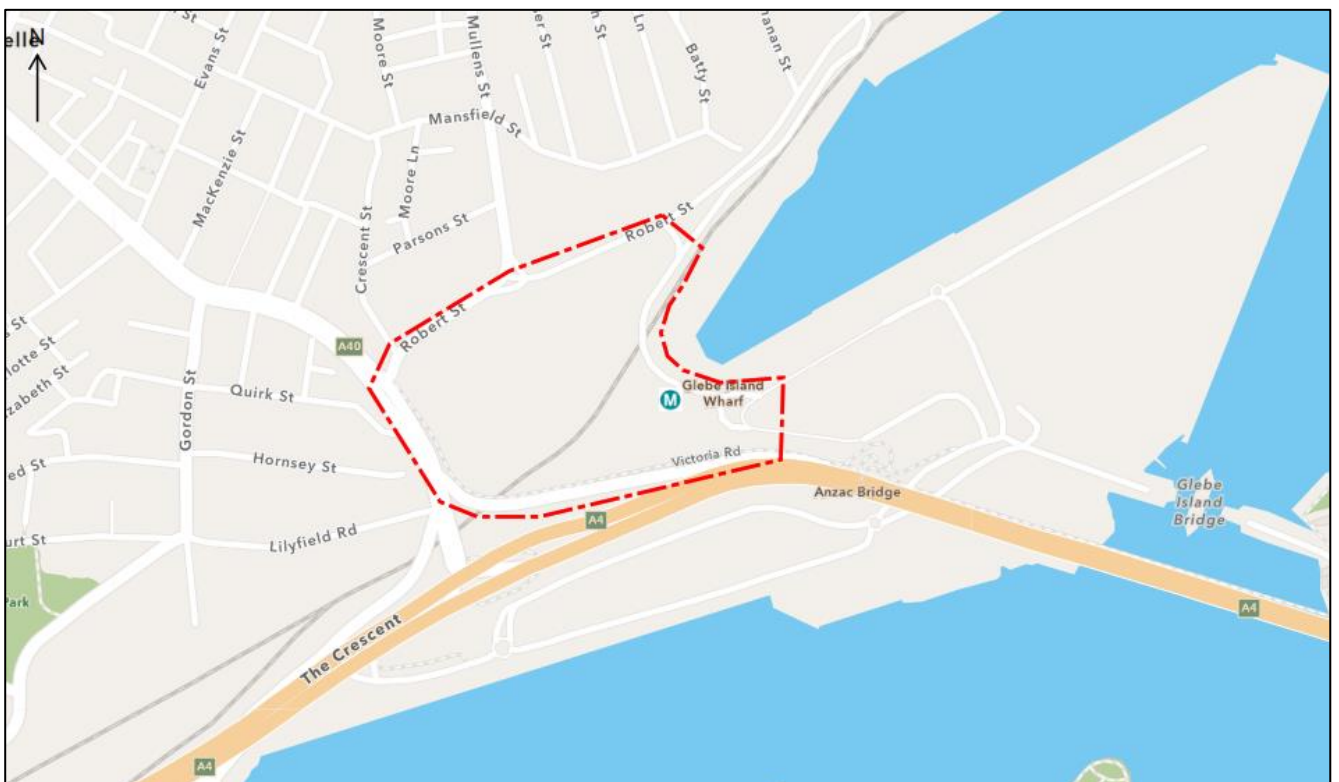


Figure 9-3 The Bays Metro Development advised by Sydney Metro

10. Pyrmont

10.1 Existing Jemena network

Potential site extent may impact Jemena high pressure (green) and medium pressure (blue) assets. Detailed clash assessment will be required to identify extent of actual impact.

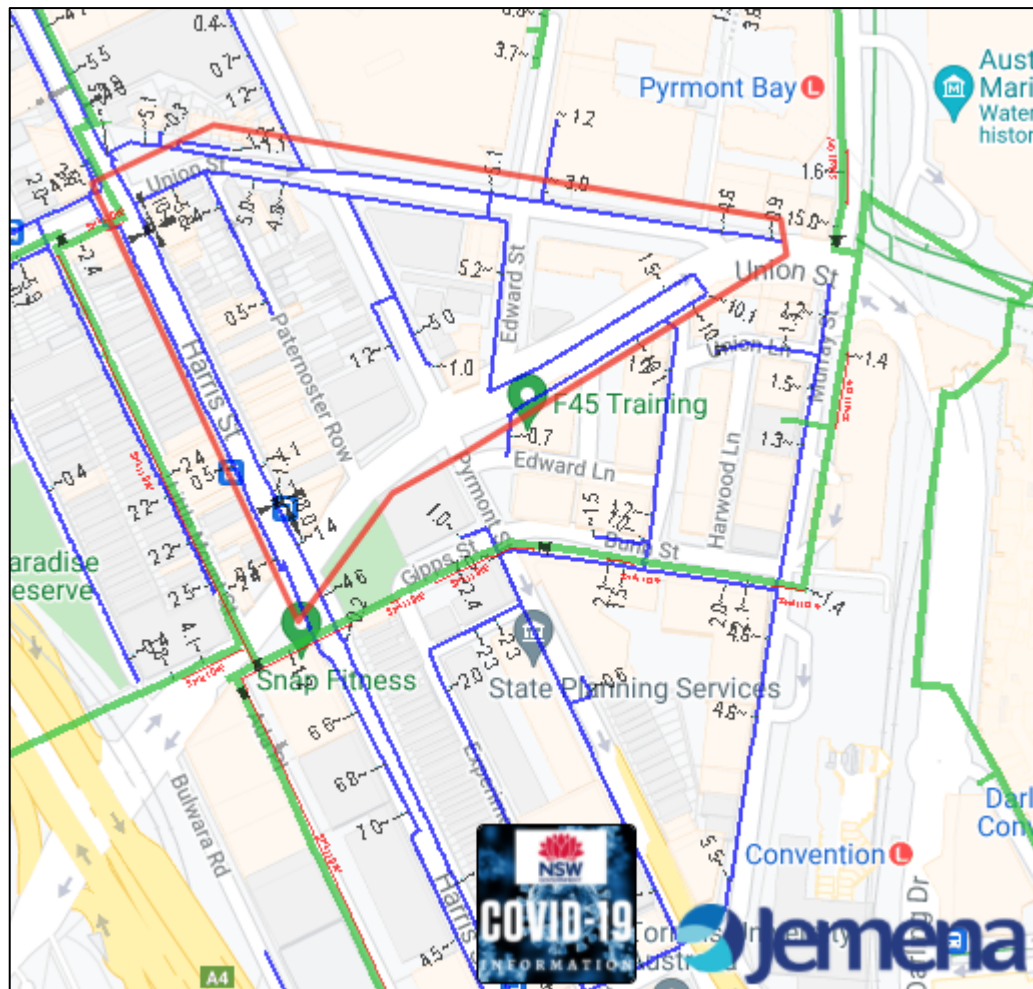


Figure 10-1 Pyrmont – Existing Jemena Network

10.2 Gas loads

There will be a total of 180 residential apartments with 8000sqm of commercial space and 500sqm of retail space. The load details provided by Sydney Metro did not specify where they are located.

10.3 Proposed connection strategy

Medium pressure and low pressure Gas Distribution Networks (JGN) exist within the footprint advised by Sydney Metro. The predominant feeder mains are found along Harris St (110mm NY).

There is sufficient capacity in the medium pressure network to support the development in the advised footprint. However, if the supply point is to come from adjoining streets with smaller diameter mains, pipe size upgrade or a road crossing reinforcement will be required.

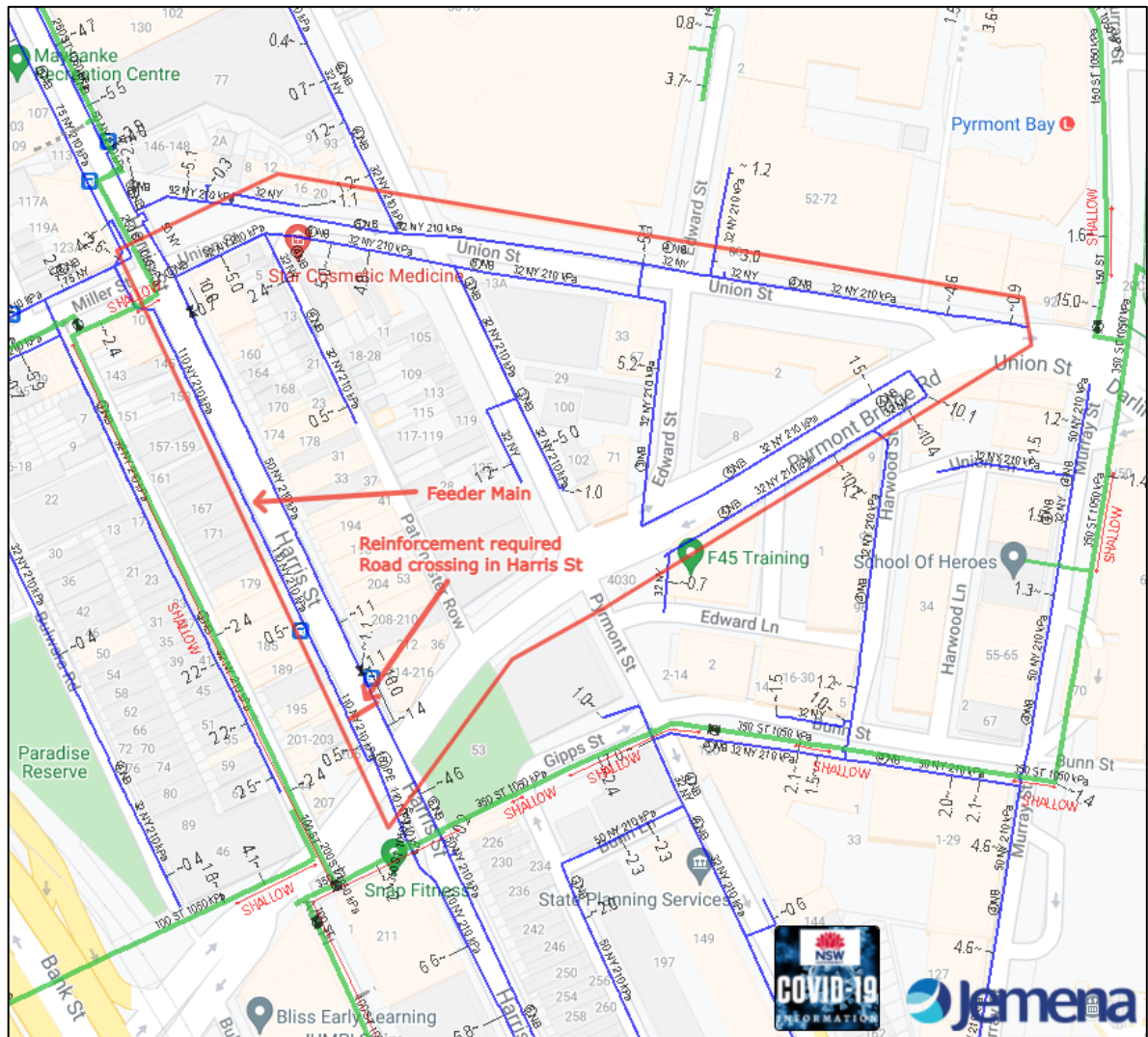


Figure 10-2 Mains for Pyrmont Sydney Metro Development

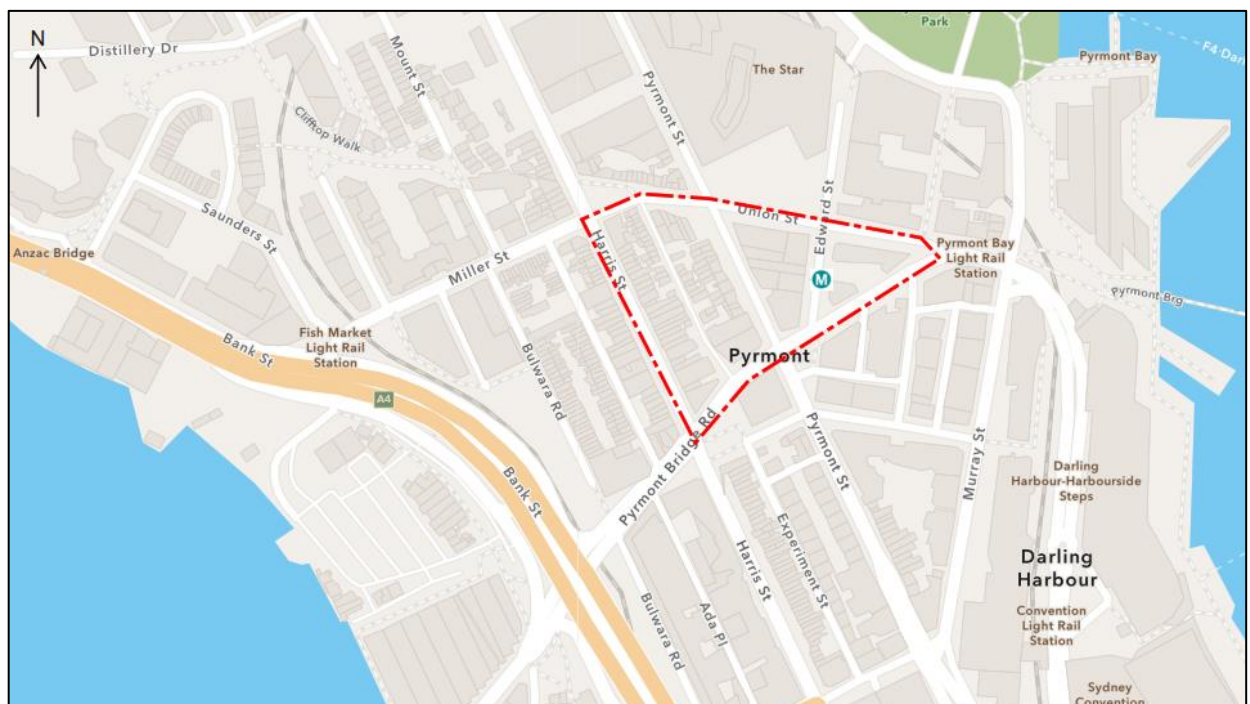


Figure 10-3 Pyrmont Metro Development advised by Sydney Metro

11. Hunter Street (Sydney CBD)

11.1 Existing Jemena network

Potential site extent may impact Jemena high pressure (green) and low pressure (magenta) assets. Detailed clash assessment will be required to identify extent of actual impact

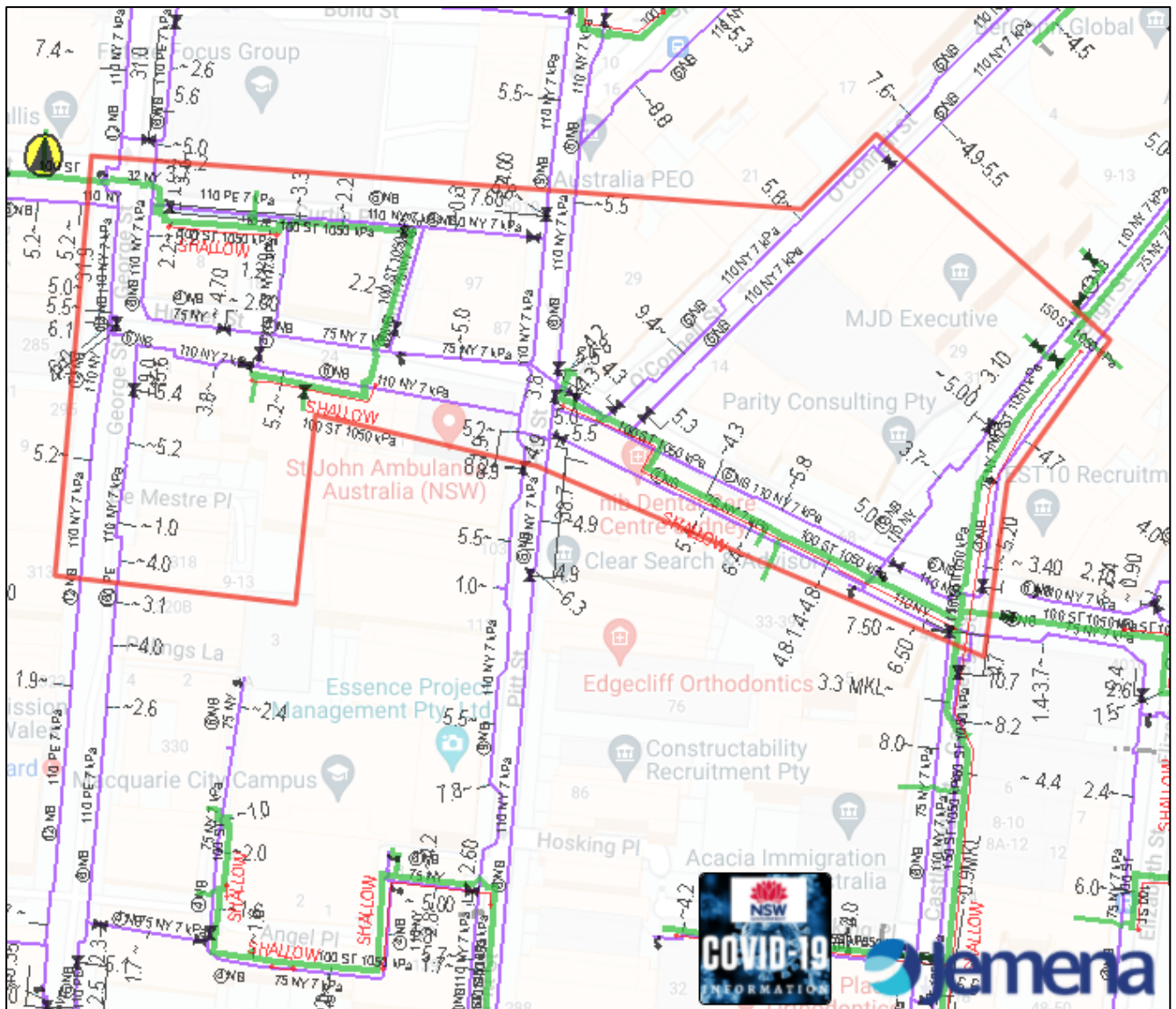


Figure 11-1 Hunter Street – Existing Jemena Network

11.2 Gas loads

There will be a total of 160000sqm of commercial space, 2000sqm of retail space and no residential apartments. The load details provided by Sydney Metro did not specify where they are located.

11.3 Proposed connection strategy

High pressure and medium pressure Gas Distribution Networks (JGN) exist within the footprint advised by Sydney Metro. Low pressure network does not have sufficient capacity to supply the demand.

There is sufficient capacity in the high pressure network to support the development in the advised footprint.

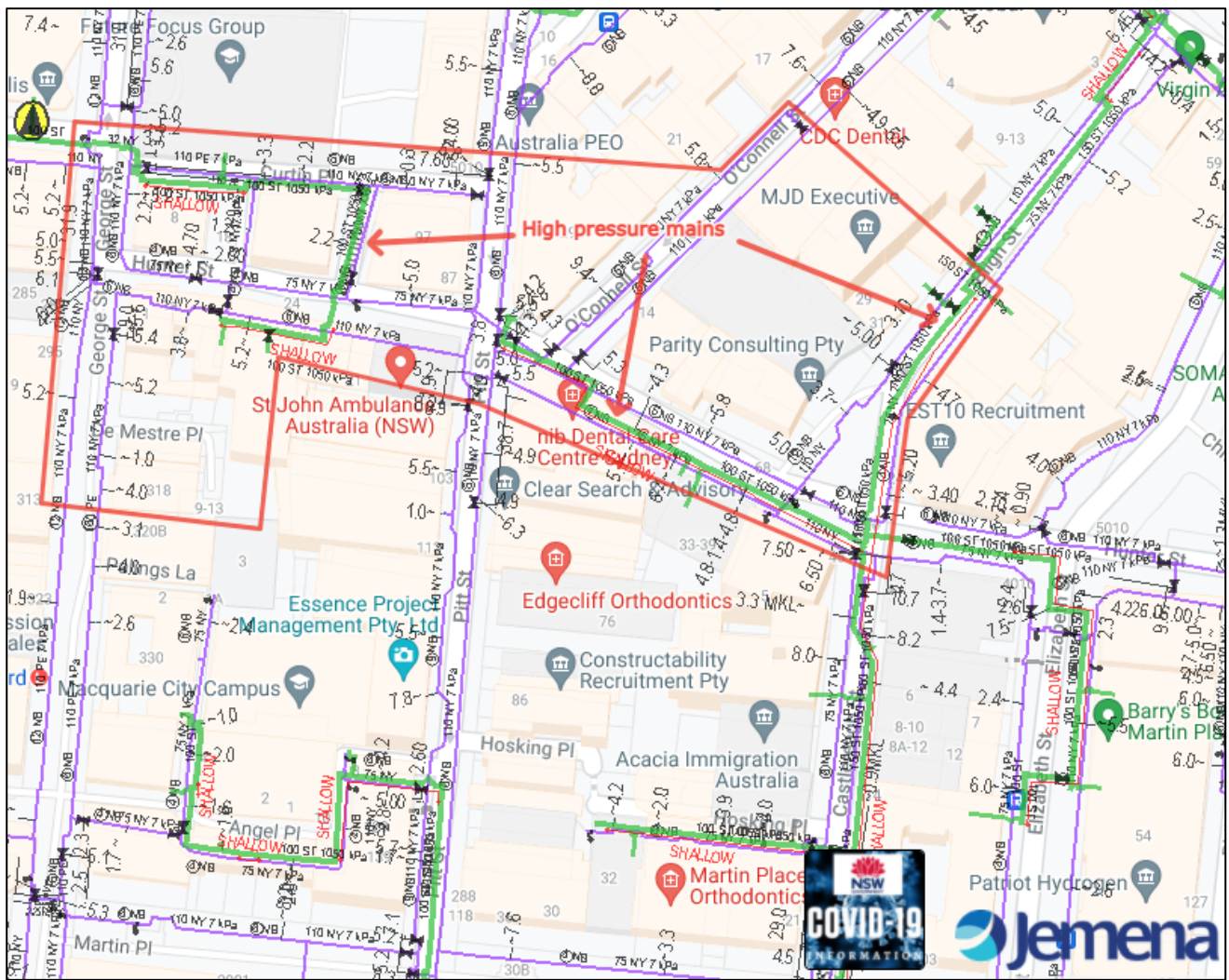


Figure 11-2 Mains for Hunter Street Sydney Metro Development

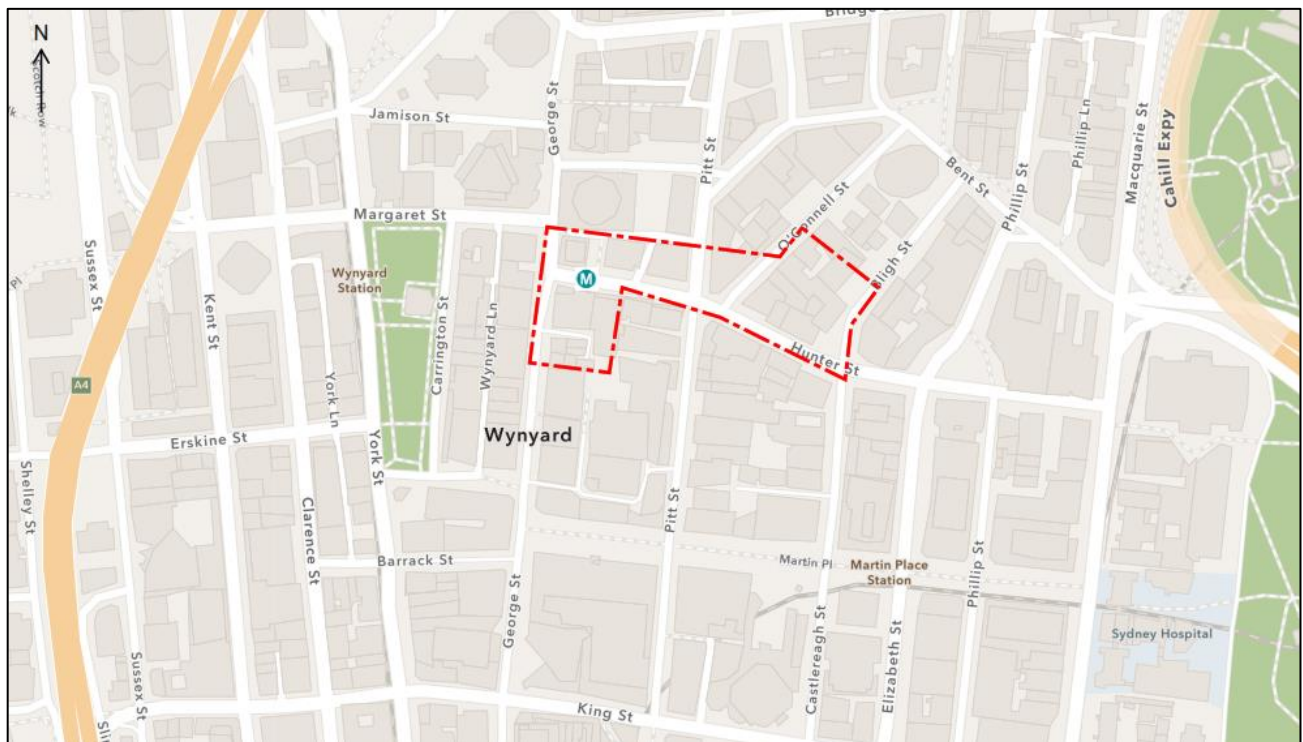


Figure 11-3 Hunter Street Metro Development advised by Sydney Metro

Appendix B Utility feedback

Case Number: 193096

April 1, 2022

SYDNEY METRO

c/- WARREN SMITH & PARTNERS PTY LTD

Feasibility Letter

Developer: SYDNEY METRO
Your reference: 6739000
Development: Lot 5 Figtree Drive, Sydney Olympic Park
Development Description: Proposed construction of an Over Station Development at Sydney Metro Sydney Olympic Park Station.
Your application date: October 9, 2021

Dear Applicant

This Feasibility Letter (Letter) is a guide only. It provides general information about what our requirements could be if you applied to us for a Section 73 Certificate (Certificate) for your proposed development. **The information is accurate at today's date only.**

If you obtain development consent for that development from your consent authority (this is usually your local Council) they will require you to apply to us for a Section 73 Certificate. You will need to submit a new application (and pay another application fee) to us for that Certificate by using your current or another Water Servicing Coordinator (WSC).

We'll then send you either a:

- Notice of Requirements (Notice) and Developer Works Deed (Deed)
- or
- Certificate.

These documents will be the definitive statement of our requirements.

There may be changes in our requirements between the issue dates of this Letter and the Notice or Certificate. The changes may be:

- if you change your proposed development eg the development description or the plan/site layout, after today, the requirements in this Letter could change when you submit your new application
- if you decide to do your development in stages then you must submit a new application (and pay another application fee) for each stage.

No warranties or assurances can be given about the suitability of this document or any of its provisions for any specific transaction. It does not constitute an approval from us and to the extent that it is able, we limit its liability to the reissue of this Letter or the return of your application fee. You should rely on your own independent professional advice.

What You Must Do To Get A Section 73 Certificate In The Future.

To get a Section 73 Certificate you must do the following things. You can also find out about this process by visiting [Plumbing, building & developing](#) page on our website.

- 1. Obtain Development Consent from the consent authority for your development proposal.**
- 2. Engage a Water Servicing Coordinator (WSC).**

You must engage your current or another authorised WSC to manage the design and construction of works that you must provide, at your cost, to service your development. If you wish to engage another WSC (at any point in this process) you must write and tell us.

You'll find a list of WSC's at [Listed providers](#) on our website.

The WSC will be your point of contact with us. They can answer most questions that you might have about the process and developer charges and can give you a quote or information about costs for services/works (including our costs).

3. Case Information sheet

After the Coordinator has submitted your new application, they will receive the Case Information Sheet. As this application is part of the Sydney Metro Project, it is covered by the Sydney Metro Program – Sydney Water Interface Deed. You and your accredited Developer Infrastructure Providers (Providers) will need to provide your business names and ABNs to be lodged by your nominated Coordinator.

4. Water, Sewer and Recycled Works

4.1 Water

The proposed development is within Silverwater Gravity water supply zone and part of the Greater Parramatta and the Olympic Peninsula (GPOP) corridor.

The current trunk system suggests having capacity to service the development in the short term. The proposed development has the option to connect to a DN250 either along Herb Elliott Avenue

or along Olympic Boulevard. However, if any reticulation amplification is required beyond 2026, planning will be reassessed as part of S73 application.

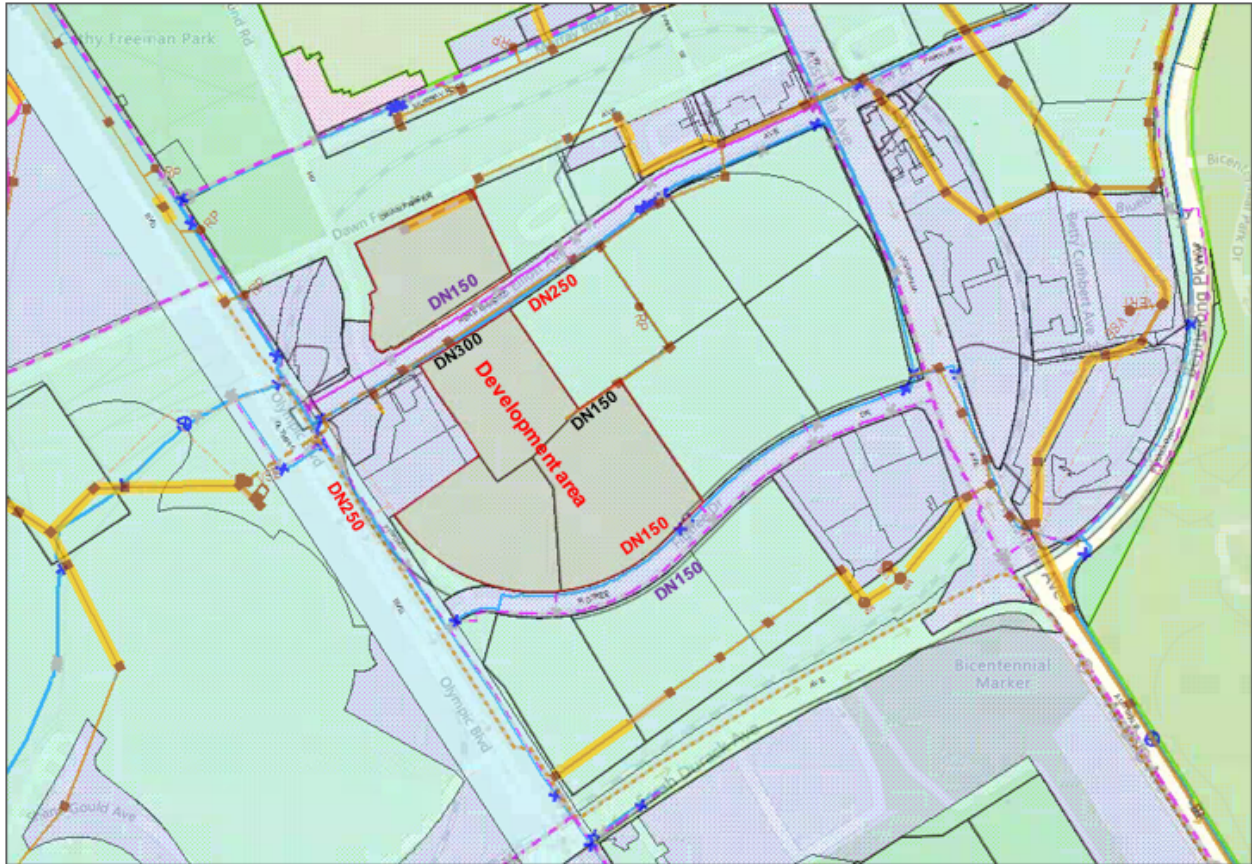


Figure 1 – Location Map

4.2 Sewer

The proposed development lies in Homebush SCAMP. The development can be serviced by two sewer mains.

- DN300 in Herb Elliot Ave which has been adjusted and deviated under CN187469 to facilitate the connection for proposed construction of the Sydney Metro West - Sydney Olympic Park Station
- Existing DN150 sewer main within the development required to be upsized

The system has the capacity to service the proposed development in short term, however if any network amplification is required beyond 2026, planning will reassess at S73 stage.

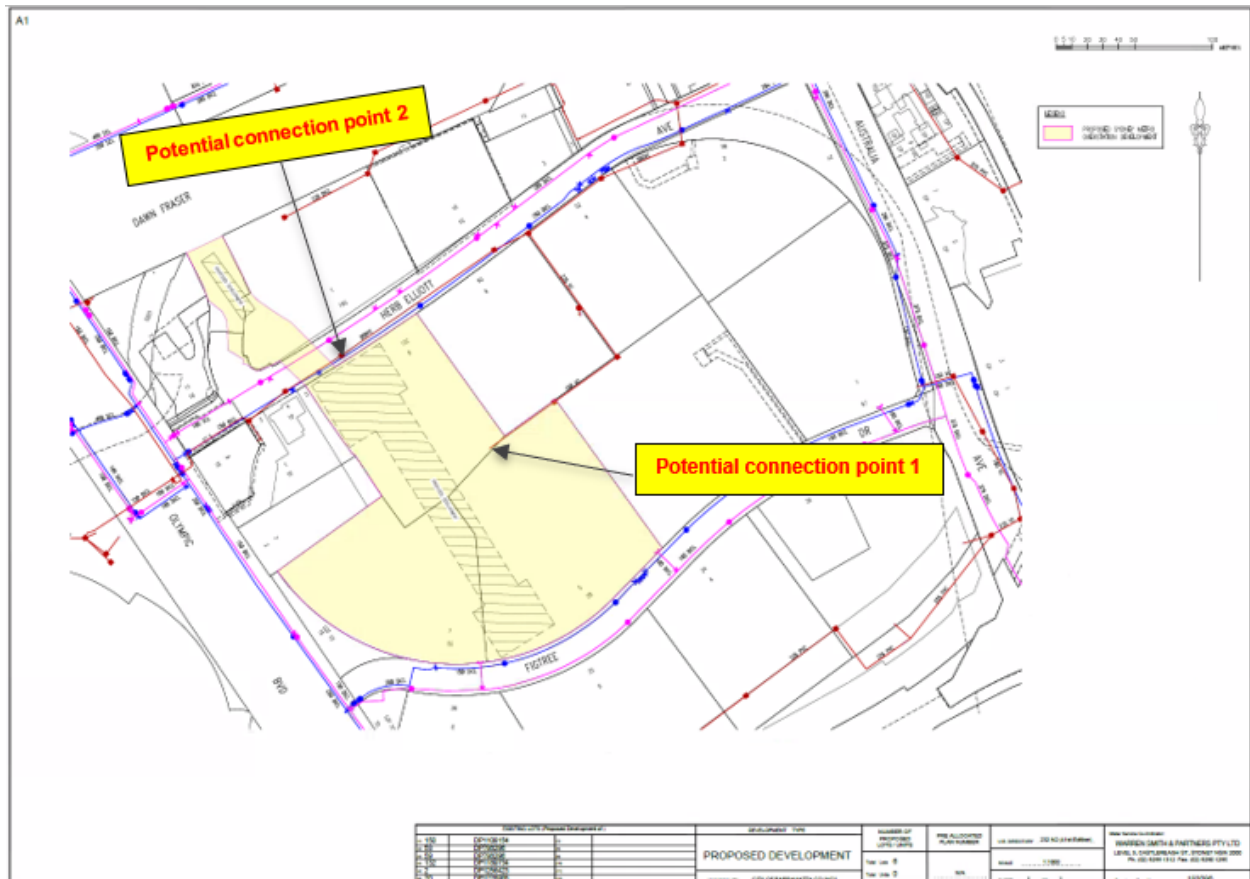


Figure 2 – Sewer main adjust and deviation in Herb Eliot Ave

4.3 Recycled water

Sydney Water is assessing the viability of recycled water servicing for the Greater Parramatta and the Olympic Peninsula (GPOP), in line with the Greater Sydney Commission's draft Phase 1.

It is recommended that integrated water management provision via dual-pipe controls are investigated for this development in line with the wider GPOP recycled water initiatives.

5. Ancillary Matters

5.1 Asset adjustments

After we issue this Notice (and more detailed designs are available), we may require that the water main/sewer main/stormwater located in the footway/your property needs to be

adjusted/deviated. If this happens, you'll need to do this work as well as the extension we have detailed above at your cost. The work must meet the conditions of this Notice and you will need to complete it **before we can issue the Certificate**. We'll need to see the completed designs for the work, and we'll require you to lodge a security. The security will be refunded once the work is completed.

5.2 Entry onto neighbouring property

If you need to enter a neighbouring property, you must have the written permission of the relevant property owners and tenants. You must use our **Permission to Enter** form(s) for this. You can get copies of these forms from your WSC or on our website. Your WSC can also negotiate on your behalf. Please make sure that you address all the items on the form(s) including payment of compensation and whether there are other ways of designing and constructing that could avoid or reduce their impacts. You will be responsible for all costs of mediation involved in resolving any disputes. Please allow enough time for entry issues to be resolved.

5.3 Costs

Construction of these **future** works will require you to pay project management, survey, design, and construction costs **directly to your suppliers**. Additional costs payable to us may include:

- water main shutdown and disinfection
- connection of new water mains to our system(s)
- design and construction audit fees
- contract administration, Operations Area Charge & Customer Redress prior to project finalisation
- creation or alteration of easements etc
- water usage charges where water has been supplied for building activity purposes prior to disinfection of a newly constructed water main.

Note: Payment for any Goods and Services (including Customer Redress) provided by Sydney Water will be required prior to the issue of the Section 73 Certificate or release of the Bank Guarantee or Cash Bond.

Your WSC can tell you about these costs.

6. Special Requirements

Multi-level individual metering requirements

Your development must either allow for or provide individual metering. This means that you must:

1. comply at all times and in all respects with the requirements of our “*Multi-level Individual Metering Guide*”. You can find this in the [Meters & metered standpipes](#) page on our website.
2. provide and install plumbing and space for individual metering in accordance with our “*Multi-level Individual Metering Guide*”.
3. if and when you implement a strata/ stratum plan (or strata/ stratum subdivide) you must:
 - a. engage an Accredited Metering Supplier (“**AMS**”) to provide individual metering in accordance with the “*Multi-level Individual Metering Guide*” and meet the cost of the meters and metering system.
 - b. transfer the meters and metering system to us once the Testing Certificate has been issued by us to the AMS and the AMS has confirmed that payment for the meters and metering system has been paid in full.

Before the Section 73 Certificate can be issued, you will be required to sign an undertaking to show that you understand and accept these metering requirements and associated costs.

Visit [Meters & metered standpipes](#) to see the *Multi-level individual metering guide* and find out more.

OTHER THINGS YOU MAY NEED TO DO

Shown below are other things you need to do that are NOT a requirement for the Certificate. They may well be a requirement from us in the future because of the impact of your development on our assets. You must read them before you go any further.

Approval of your building plans

Please note that the building plans must be approved when each lot is developed. This can be done at in our Tap in™ system [Sydney Water Tap in™](#).

This is not a requirement for the Certificate, but the approval is needed because the construction/building works may affect our assets (e.g. water, sewer, and stormwater mains).

If our stormwater channel, pipe, or culvert is located within ten (10) metres of your development site it must be referred to us for a detailed review.

Your Coordinator can tell you about the approval process including:

- Possible requirements
- Their costs
- Timeframes.

If your building plans need to be referred to us for detailed review you will be required to pay us for the costs associated with the detailed review.

Note: You must obtain our written approval before you do any work on our systems. We'll take action to have work stopped on the site if you do not have that approval. We will apply Section 44 of the *Sydney Water Act 1994*.

Disused Sewerage Service Sealing

Please do not forget that you must pay to disconnect all disused private sewerage services and seal them at the point of connection to our sewer main. This work must meet our standards in the Plumbing Code of Australia (the Code) and be done by a licensed drainer. The licensed drainer must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this.

Soffit Requirements

Please be aware that floor levels must be able to meet our soffit requirements for property connection and drainage.

Requirements for Business Customers for Commercial and Industrial Property Developments

If this property is to be developed for Industrial or Commercial operations, it may need to meet the following requirements:

Trade Wastewater Requirements

If this development is going to generate trade wastewater, the property owner must submit an application requesting permission to discharge trade wastewater to Sydney Water's sewerage system. You must wait for approval of this permit before any business activities can commence.

The permit application should be emailed to Sydney Water's Business Customer Services at businesscustomers@sydneywater.com.au

It is illegal to discharge Trade Wastewater into the Sydney Water sewerage system without permission.

A **Boundary Trap** is required for all developments that discharge trade wastewater where arrestors and special units are installed for trade wastewater pre-treatment.

If the property development is for Industrial operations, the wastewater may discharge into a sewerage area that is subject to wastewater reuse. Find out from Business Customer Services if this is applicable to your development.

Backflow Prevention Requirements

Backflow is when there is unintentional flow of water in the wrong direction from a potentially polluted source into the drinking water supply.

All properties connected to Sydney Water's supply must install a testable **Backflow Prevention Containment Device** appropriate to the property's hazard rating. Property with a high or medium hazard rating must have the backflow prevention containment device tested annually. Properties identified as having a low hazard rating must install a non-testable device, as a minimum.

Separate hydrant and sprinkler fire services on non-residential properties, require the installation of a testable double check detector assembly. The device is to be located at the boundary of the property.

Before you install a backflow prevention device:

1. Get your hydraulic consultant or plumber to check the available water pressure versus the property's required pressure and flow requirements.
2. Conduct a site assessment to confirm the hazard rating of the property and its services.
Contact PIAS at NSW Fair Trading on **1300 889 099**.

For installation you will need to engage a licensed plumber with backflow accreditation who can be found on the Sydney Water website:

<http://www.sydneywater.com.au/Plumbing/BackflowPrevention/>

Water Efficiency Recommendations

Water is our most precious resource and every customer can play a role in its conservation. By working together with Sydney Water, business customers are able to reduce their water consumption. This will help your business save money, improve productivity and protect the environment.

Some water efficiency measures that can be easily implemented in your business are:

- Install water efficiency fixtures to help increase your water efficiency, refer to WELS (Water Efficiency Labelling and Standards (WELS) Scheme, <http://www.waterrating.gov.au/>
- Consider installing rainwater tanks to capture rainwater runoff, and reusing it, where cost effective. Refer to <http://www.sydneywater.com.au/Water4Life/InYourBusiness/RWTCalculator.cfm>
- Install water-monitoring devices on your meter to identify water usage patterns and leaks.
- Develop a water efficiency plan for your business.

It is cheaper to install water efficiency appliances while you are developing than retrofitting them later.

Contingency Plan Recommendations

Under Sydney Water's [customer contract](#) Sydney Water aims to provide Business Customers with a continuous supply of clean water at a minimum pressure of 15meters head at the main tap. This is equivalent to 146.8kpa or 21.29psi to meet reasonable business usage needs.

Sometimes Sydney Water may need to interrupt, postpone or limit the supply of water services to your property for maintenance or other reasons. These interruptions can be planned or unplanned.

Water supply is critical to some businesses and Sydney Water will treat vulnerable customers, such as hospitals, as a high priority.

Have you thought about a **contingency plan** for your business? Your Business Customer Representative will help you to develop a plan that is tailored to your business and minimises productivity losses in the event of a water service disruption.

For further information please visit the Sydney Water website at:

<http://www.sydneywater.com.au/OurSystemsandOperations/TradeWaste/> or contact Business Customer Services on **1300 985 227** or businesscustomers@sydneywater.com.au

Fire Fighting

Definition of fire fighting systems is the responsibility of the developer and is not part of the Section 73 process. It is recommended that a consultant should advise the developer regarding the fire fighting flow of the development and the ability of our system to provide that flow in an emergency. Sydney Water's Operating Licence directs that our mains are only required to provide domestic supply at a minimum pressure of 15 m head.

A report supplying modelled pressures called the Statement of Available pressure can be purchased through [Sydney Water Tap in](#)™ and may be of some assistance when defining the fire fighting system. The Statement of Available pressure may advise flow limits that relate to system capacity or diameter of the main and pressure limits according to pressure management initiatives. If mains are required for fire fighting purposes, the mains shall be arranged through the water main extension process and not the Section 73 process.

Large Water Service Connection

A water main are available to provide your development with a domestic supply. The size of your development means that you will need a connection larger than the standard domestic 20 mm size.

To get approval for your connection, you will need to lodge an application with [Sydney Water Tap in](#)™. You, or your hydraulic consultant, may need to supply the following:

- a plan of the hydraulic layout

- a list of all the fixtures/fittings within the property
- a copy of the fireflow pressure inquiry issued by us
- a pump application form (if a pump is required)
- all pump details (if a pump is required).

You'll have to pay an application fee.

We don't consider whether a water main is adequate for fire fighting purposes for your development. We can't guarantee that this water supply will meet your Council's fire fighting requirements. The Council and your hydraulic consultant can help.

Disused Water Service Sealing

You must pay to disconnect all disused private water services and seal them at the point of connection to our water main. This work must meet our standards in the Plumbing Code of Australia (the Code) and be done by a licensed plumber. The licensed plumber must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this.

Other fees and requirements

The requirements in this Notice relate to your Certificate application only. We may be involved with other aspects of your development and there may be other fees or requirements. These include:

- plumbing and drainage inspection costs
the installation of backflow prevention devices;
- trade waste requirements
- large water connections and
-
- council fire fighting requirements. (It will help you to know what the fire fighting requirements are for your development as soon as possible. Your hydraulic consultant can help you here.)

No warranties or assurances can be given about the suitability of this document or any of its provisions for any specific transaction. It does not constitute an approval from us and to the extent that it is able, we limit its liability to the reissue of this Letter or the return of your application fee. You should rely on your own independent professional advice.

END

