

Utilities and Servicing Strategy

Redfern North-Eveleigh Precinct

June 2022
Redfern North-Eveleigh Precinct

Utilities and Servicing Strategy

Redfern North-Eveleigh Precinct

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Executive Summary

The NSW Government is investing in the renewal of the Redfern North Eveleigh Precinct to create a unique mixed-use development, located within the important heritage fabric of North Eveleigh. The strategic underpinning of this proposal arises from the Greater Sydney Region Plan and District Plan. These plans focus on the integration of transport and land use planning, supporting the creation of jobs, housing and services to grow a strong and competitive Sydney.

This report provides an assessment of existing utility infrastructure, proposes the required upgrades to cater for future development needs and addresses Section 10 of the Study Requirements issued by the Minister for Planning and Public Spaces in December 2020.

The Redfern North Eveleigh Precinct comprises three sub-precincts:

- The Paint Shop sub-precinct;
- The Carriageworks sub-precinct; and
- The Clothing Store sub-precinct.

There are a number of existing utility services in and around the site which are summarised below and discussed in detail in this report:

- **Potable Water:** Drinking water is provided by Sydney Water via the Potts Hill Trunk Delivery System;
- **Wastewater:** Wastewater facilities servicing is provided by Sydney Water through the Malabar Sewerage Treatment Plant Network ;
- **Electrical:** Electrical is provided by Ausgrid, via feeders from the St Peters Zone Substation and the Zetland Zone Substation;
- **Gas:** Jemena currently supplies gas to the area through existing gas mains; and
- **Data and Telecommunications:** Various telecommunications providers have assets in the vicinity of the site including Telstra and the NBN.
- **Waste –** solid household waste (both recyclable and non-recyclable as well as garden and food waste)

Preliminary investigation on the current utility servicing capacity to service all three sub-precincts within the site has been obtained from DBYD records and previous investigations in the surrounding area. A summary of each utility service to meet the proposed redevelopment is provided in Table 1.

Table 1: Summary of Existing Utility Services Infrastructure and Required Upgrades

Utility Service	Potable Water	Wastewater	Electrical	Gas	Data and Comms
Utility Authority Asset	Sydney Water	Sydney Water	Ausgrid	Jemena	The NBN and Telstra
Adequate Capacity for Proposed Development?	Yes*	Yes*	Yes*	Yes	Yes
Proposed Works	Local network amplifications	Local network amplifications	New feeder cables	N/A	N/A

*Current capacity and servicing requirements to be confirmed with relevant utility authority during the detailed design stage of the development.

Indicative building service loads are summarised below; however, it should be noted that these are provided to inform lead-in infrastructure requirements only and are subject to change as part of design development and staging:

- Demand calculations provide the following estimates based on development yields:
 - Potable water between **989 – 1,338 kL/day**
 - Sewer loading between **5.0– 6.8 L/s**
 - Electrical load between **15.4-20.9 MVA**
 - Gas demand between **828-1,120 m³/day**
 - Waste – approximately **650,000 litres / week**

Utility constraints that may affect the site development include:

- A concentration of potable water main, sewer main, electrical infrastructure and communications conduits running within the site which may need to be removed
- Transgrid services tunnel containing a 330kV transmission cable. The tunnel alignment travels from Little Eveleigh St south across the rail corridor;
- Aerial infrastructure within and adjacent to the site which may be abandoned or relocated underground pending City of Sydney approval;
- Utilities in the rail corridor that cannot be impacted and
- Lead-in feeder requirements.

1.0 Introduction

The NSW Government is investing in the renewal of the Redfern North Eveleigh Precinct to create a unique mixed-use development, located within the important heritage fabric of North Eveleigh. The strategic underpinning of this proposal arises from the Greater Sydney Region Plan and District Plan. These Plans focus on the integration of transport and land use planning, supporting the creation of jobs, housing and services to grow a strong and competitive Sydney.

The Redfern North Eveleigh Precinct is one of the most connected areas in Sydney, and will be a key location for Tech Central, planned to be Australia's biggest technology and innovation hub. Following the upgrading of Redfern station currently underway, the Precinct's renewal is aimed at creating a connected destination for living and working, and an inclusive, active and sustainable place around the clock.

The Redfern North Eveleigh Precinct comprises three Sub-Precincts, each with its own distinct character:

- The Paint Shop Sub-Precinct which is the subject of this rezoning proposal;
- The Carriageworks Sub-Precinct, reflecting the cultural heart of the Precinct where current uses will be retained; and
- The Clothing Store Sub-Precinct which is not subject to this rezoning proposal.

This State Significant Precinct (SSP) Study proposes amendments to the planning controls applicable to the Paint Shop Sub-Precinct to reflect changes in the strategic direction for the Sub-Precinct. The amendment is being undertaken as a State-led rezoning process, reflecting its status as part of a State Significant Precinct located within the *State Environmental Planning Policy (Precincts - Eastern Harbour City) 2021*.

The amended development controls will be located within the City of Sydney Local Environmental Plan. Study Requirements were issued by NSW Department of Planning and Environment (DPE) in December 2020 to guide the investigations to support the proposed new planning controls.

1.1 Purpose of this Report

The purpose of this report is to provide a detailed assessment of the utilities servicing requirements of the proposed changes, and consider any potential impacts that may result within and surrounding the Paint Shop Sub-precinct. This report addresses Study Requirement 3.2 – Utilities Servicing. The relevant Study Requirements, considerations and consultation requirements, and location of where these have been responded to is outlined in **Table 2** below.

Table 2 Study Requirements, Considerations and Consultation Requirements

Ref.	Study Requirement	Report Section	
Utilities Servicing			
Study Requirements			
10.1	<ul style="list-style-type: none"> Identifies the existing situation, including constraints, opportunities, key issues and existing network capacity; 	Section 4.2	(pg 15)
		Section 5.2	(pg 21)
		Section 6.2	(pg 28)
		Section 7.2	(pg 34)
		Section 8.2	(pg 39)
	<ul style="list-style-type: none"> Assesses the capacity of the relevant service infrastructure networks to service the Precinct, impacts on the networks resulting from the proposal and identify any augmentation and servicing options proposed to support the proposal; 	Section 4.3	(pg 16)
		Section 5.3	(pg 22)
		Section 6.3	(pg 29)
		Section 7.3	(pg 34)
		Section 8.3	(pg 40)
		Utility advice in Appendix A	
		Section 4.3	(pg 16)

	<ul style="list-style-type: none"> Assesses the implications of any proposed land use for local and regional infrastructure and service delivery; and 	Section 5.3	(pg 22)
		Section 6.3	(pg 29)
		Section 7.3	(pg 34)
		Section 8.3	(pg 40)
		Section 10.0	(pg 48)
	<ul style="list-style-type: none"> Informs and supports the preparation of the proposed planning framework including any recommended planning controls or DCP/Design Guideline 	Section 10.0	(pg 48)
		Section 10.2	(pg 49)
Considerations			
	<ul style="list-style-type: none"> Key service infrastructure including electricity, alternative energy systems, water, sewer, gas and telecommunications 	Sections 4.0	(pg 15 - 20)
		Section 5.0	(pg 21 - 27)
		Section 6.0	(pg 28 - 33)
		Section 7.0	(pg 34 - 38)
		Section 8.0	(pg 39 - 43)
	<ul style="list-style-type: none"> Digital and telecommunications infrastructure which is inclusive of and not limited to precinct-wide Wi-Fi, fibre to the premises and supporting data centres 	Section 8.0	(pg 39 - 43)
		NBN response in Appendix A	
	<ul style="list-style-type: none"> Forecast peak demand and generation forecasts based on proposed yields 	Sections 4.6	(pg 19)
		Section 5.6	(pg 26)
		Section 6.6	(pg 32)
		Section 7.6	(pg 37)
	<ul style="list-style-type: none"> On-site electricity generation and storage, facility site requirements, easement requirements and any asset locations required; 	Section 6.7	(page 32)
	<ul style="list-style-type: none"> Integrated water cycle management, alternative water supply, on-site generation and water recycling, end uses of drinking and non-drinking water. 	Sections 4.7	(pg 20)
		Section 5.7	(pg 27)
	<ul style="list-style-type: none"> The location of service assets in the precinct and outline how asset risk is managed; 	Section 10.0	(pg 48)
	<ul style="list-style-type: none"> Costs, timing and delivery 	Refer to QS report for costs	
		Sections 4.5	(pg 4.5)
		Section 5.5	(pg 26)
		Section 6.5	(pg 31)
		Section 7.5	(pg 37)
		Section 8.5	(pg 42)
Consultation			
	<ul style="list-style-type: none"> The Study is to demonstrate that it has been undertaken in consultation with Ausgrid and Sydney Water, digital infrastructure and telecommunications providers and any other relevant providers. 	Section 2.3 (pg 9), Section 3.6 (pg 12) and Appendix A	

1.2 Redfern North Eveleigh Precinct

The Redfern North Eveleigh Precinct is located approximately 3km south-west of the Sydney CBD in the suburb of Eveleigh (refer to Figure 1). It is located entirely within the City of Sydney local government area (LGA) on government-owned land. The Precinct has an approximate gross site area of 10.95 hectares and comprises land bounded by Wilson Street and residential uses to the north, an active railway corridor to the south, residential uses and Macdonaldtown Station to the west, and Redfern Station located immediately to the east of the Precinct. The Precinct is also centrally located close to well-known destinations including Sydney University, Victoria Park, Royal Prince Alfred Hospital, the University of Technology, Sydney and South Eveleigh, as part of the broader Tech Central District.

The Precinct is located within the State Heritage-listed area of Eveleigh Railway Workshops and currently comprises the Platform Apartments with 88 private dwellings, Sydney Trains infrastructure and key state heritage buildings including the Paint Shop, Chief Mechanical Engineer’s building, and the Carriageworks and Blacksmith Shop which provide shared community spaces for several events including the Carriageworks Farmers Markets.

A map of the precinct and relevant boundaries is illustrated in **Figure 2**.

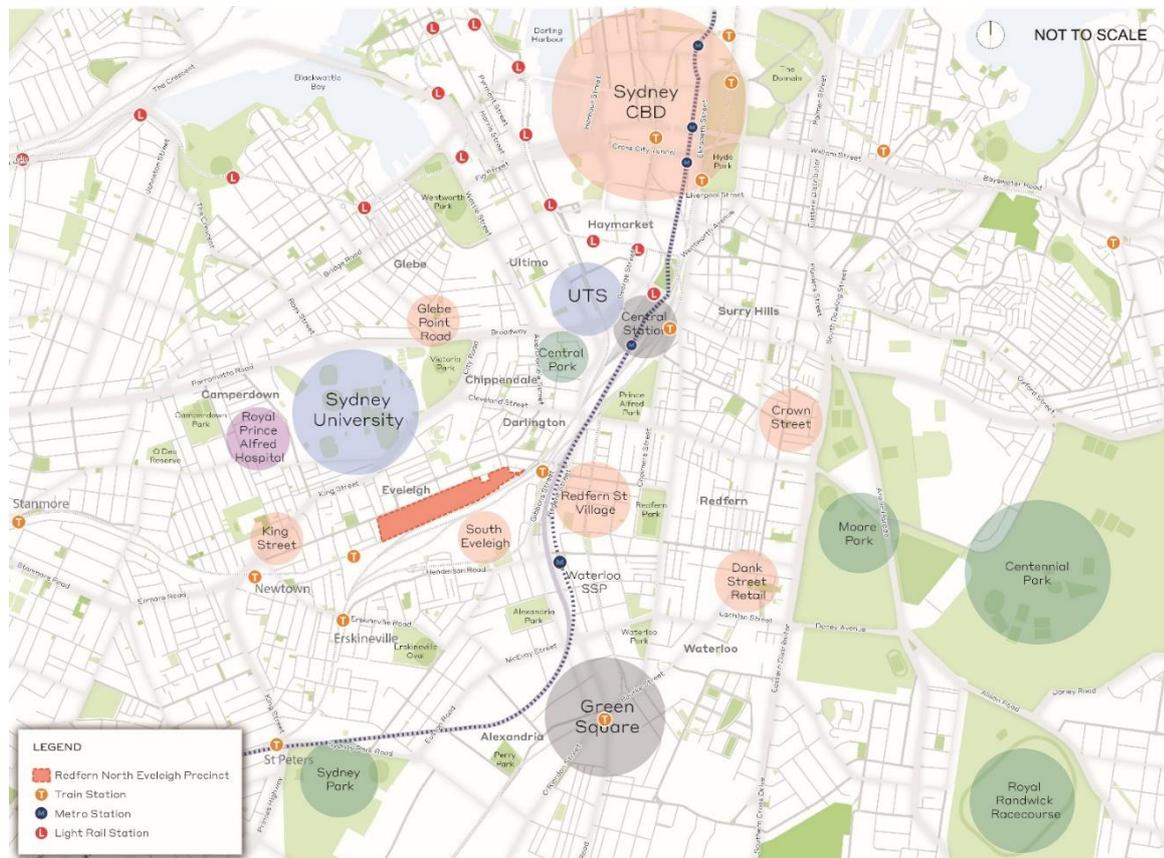


Figure 1 Location Plan of Redfern North Eveleigh Precinct (Source: Ethos Urban)

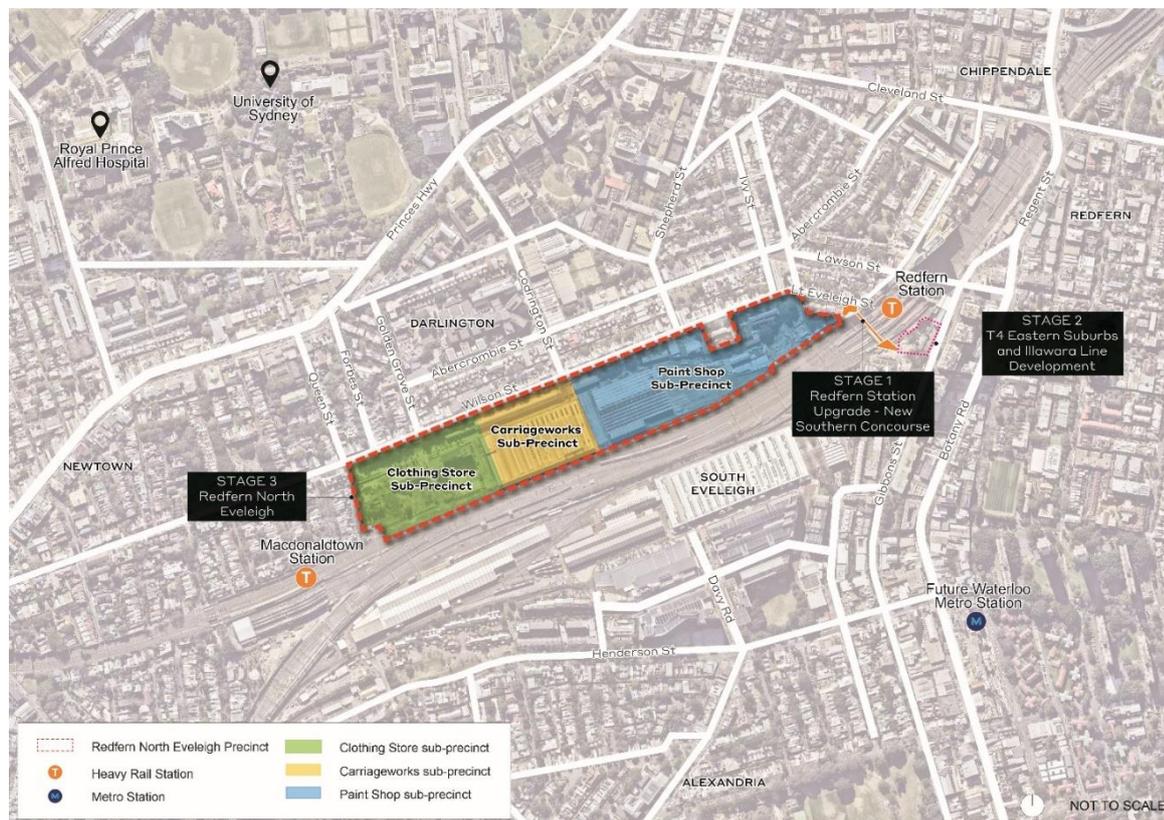


Figure 2 Redfern North Eveleigh and Sub-Precincts (Source: Ethos Urban)

1.3 Redfern North Eveleigh Paint Shop Sub-Precinct

The Redfern North Eveleigh Paint Shop Sub-Precinct is approximately 5.15 hectares and is bounded by Wilson Street to the north, residential terraces and Redfern station to the east, the Western Line rail corridor to the south and the Carriageworks Sub-Precinct to the west. The Sub-Precinct has a significant level change from a Reduced Level (RL) height of RL25 metres to RL29 metres on Wilson Street.

The Paint Shop Sub-Precinct currently hosts a number of items of heritage significance, including the Paint Shop Building, Fan of Tracks, Science Lab Building, Telecommunications Building, and Chief Mechanical Engineer’s Building. The Sub-Precinct has a number of disused spaces adjacent to the rail corridor as well as functioning Sydney Trains’ infrastructure, offices and operational space. Vehicle and pedestrian access to this area is used by Sydney Trains. The site has a clear visual relationship to South Eveleigh and the Eveleigh Locomotive Workshops across the active rail corridor.

A map of the Paint Shop Sub-precinct and relevant boundaries is illustrated in **Figure 2**.

1.4 Renewal Vision

The Redfern North Eveleigh Paint Shop Sub-Precinct will be a connected centre for living, creativity and employment opportunities that support the jobs of the future, as well as providing an inclusive, active and sustainable place for everyone, where communities gather.

Next to one of the busiest train stations in NSW, the Sub-Precinct will comprise a dynamic mix of uses including housing, creative and office spaces, retail, local business, social enterprise and open space. Renewal will draw on the past, adaptively re-using heritage buildings in the Sub-Precinct and will acknowledge Redfern’s existing character and particular significance to Aboriginal peoples, culture and communities across Australia. The Sub-Precinct will evolve as a local place contributing to a global context.

1.5 Project Description

An Urban Design and Public Domain Study has been prepared to establish the urban design framework for the Redfern North Eveleigh Paint Shop Sub-Precinct. The Urban Design and Public Domain Study provides a comprehensive urban design vision and strategy to guide future development of the Sub-Precinct and has informed the proposed planning framework of the SSP Study.

The Urban Design Framework for the Paint Shop Sub-Precinct comprises:

- Approximately 1.4 hectares of publicly accessible open space, comprising:
 - A public square – a 7,910 square metre public square fronting Wilson Street;
 - An eastern park – a 3,871 square metre park located adjacent to the Chief Mechanical Engineer’s Building and the new eastern entry from Platform 1 of the Redfern station; and
 - Traverser No1 - a 2,525 square metre public square edged by Carriageworks and the Paint Shop.
- Retention of over 90% of existing high value trees.
- An overall greening coverage of 40% of the Sub-Precinct.
- A maximum of 142,650 square metre gross floor area (GFA), comprising:
 - between 103,700 - 109,550 square metres of gross floor area (GFA) for employment and community facility floor space (minimum 2,500 square metres). This will support approximately 6,200 direct jobs on the site across numerous industries including the innovation, commercial and creative sectors.
 - between 33,100 - 38,950 square metres of GFA for residential accommodation, providing for between 381 and 449 new homes (including 15% for the purposes of affordable housing).
- New active transport infrastructure and routes to better connect the Paint Shop Sub-Precinct with other parts of Tech Central and the surrounding localities.
- Direct pedestrian connections to the new Southern Concourse at Redfern station.
- Residential parking rates, comprising:
 - Studio at 0.1 per dwelling
 - 1 Bed at 0.3 per dwelling
 - 2 Bed at 0.7 per dwelling
 - 3 Bed at 1.0 per dwelling
- Non-residential car parking spaces (including disabled and car share) are to be provided at a rate of 1 space per 700 square metres of GFA.
- 66 car spaces are designated for Sydney Trains maintenance and operational use.

The key features of the Urban Design Framework, include:

- The creation of a new public square with direct pedestrian access from Wilson Street to provide a new social and urban hub to promote outdoor gatherings that will accommodate break out spaces and a pavilion structure.
- An eastern park with direct access from Redfern station and Little Eveleigh Street, which will provide a high amenity public space with good sunlight access, comfortable wind conditions and community character.
- Upgraded spatial quality of the Traverser No1 yard, retaining the heritage setting, and incorporating complementary uses and good access along Wilson Street to serve as a cultural linkage between Carriageworks and the Paint Shop Building.
- The establishment of an east-west pedestrian thoroughfare with new public domain and pedestrian links.
- A range of Water Sensitive Urban Design (WSUD) features.
- Activated ground level frontages with commercial, retail, food and beverage and community and cultural uses.
- Adaptive reuse of heritage buildings for employment, cultural and community uses.
- New buildings for the Sub-Precinct, including:
 - Commercial buildings along the rail corridor that range between 3 and 26 occupied storeys;
 - Mixed use buildings along the rail corridor, comprising a three-storey non-residential podium with residential towers ranging between 18 to 28 occupied storeys;

- Mixed use buildings (commercial and residential uses) along Wilson Street with a four-storey street wall fronting Wilson Street and upper levels at a maximum of 9 occupied storeys that are set back from the street wall alignment;
- A commercial building on the corner of Wilson Street and Traverser No.1 with a four-storey street wall fronting Wilson Street and upper levels at a maximum of 8 occupied storeys that are set back from the street wall alignment. There is flexibility to allow this building to transition to a mixed-use building with active uses at ground level and residential uses above; and
- Potential options for an addition to the Paint Shop Building comprising of commercial uses. These options (all providing for the same GFA) include:
 - A 5-storey commercial addition to the Paint Shop Building with a 3m vertical clearance, with the adjacent development site to the east comprising a standalone 3-storey commercial building (represented in Figure 3);
 - A 3-storey commercial addition to the Paint Shop Building with a 3m vertical clearance which extends and connects to the commercial building on the adjacent development site to the east; and
 - No addition to the Paint Shop Building, with the adjacent development site to the east comprising a standalone 12-storey commercial building.
- Commitment to a 5 Star Green Star Communities rating, with minimum 5 Star Green Star Buildings rating.
- All proposed buildings are below the Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) to ensure Sydney Airport operations remain unaffected.

The proposed land allocation for the Paint Shop sub-precinct is described in Table 3 below.

Table 3 Breakdown of Land Allocation within the Paint Shop Sub-Precinct

Land allocation	Existing	Proposed
Developed area	15,723 sqm / 30% of total site area	20,824 sqm / 40% of total site area
Public open space	Area not publicly accessible	14,306 sqm / 28% of total site area
Other public domain areas (including streets, shared zones, pedestrian paths and vehicular zones)	Area not publicly accessible	15,149 sqm / 29% of total site area (Excludes privately accessible public links and private spaces ~ 3% of total site area)

The Indicative Concept Proposal for the Paint Shop sub-precinct is shown in Figure 3 below

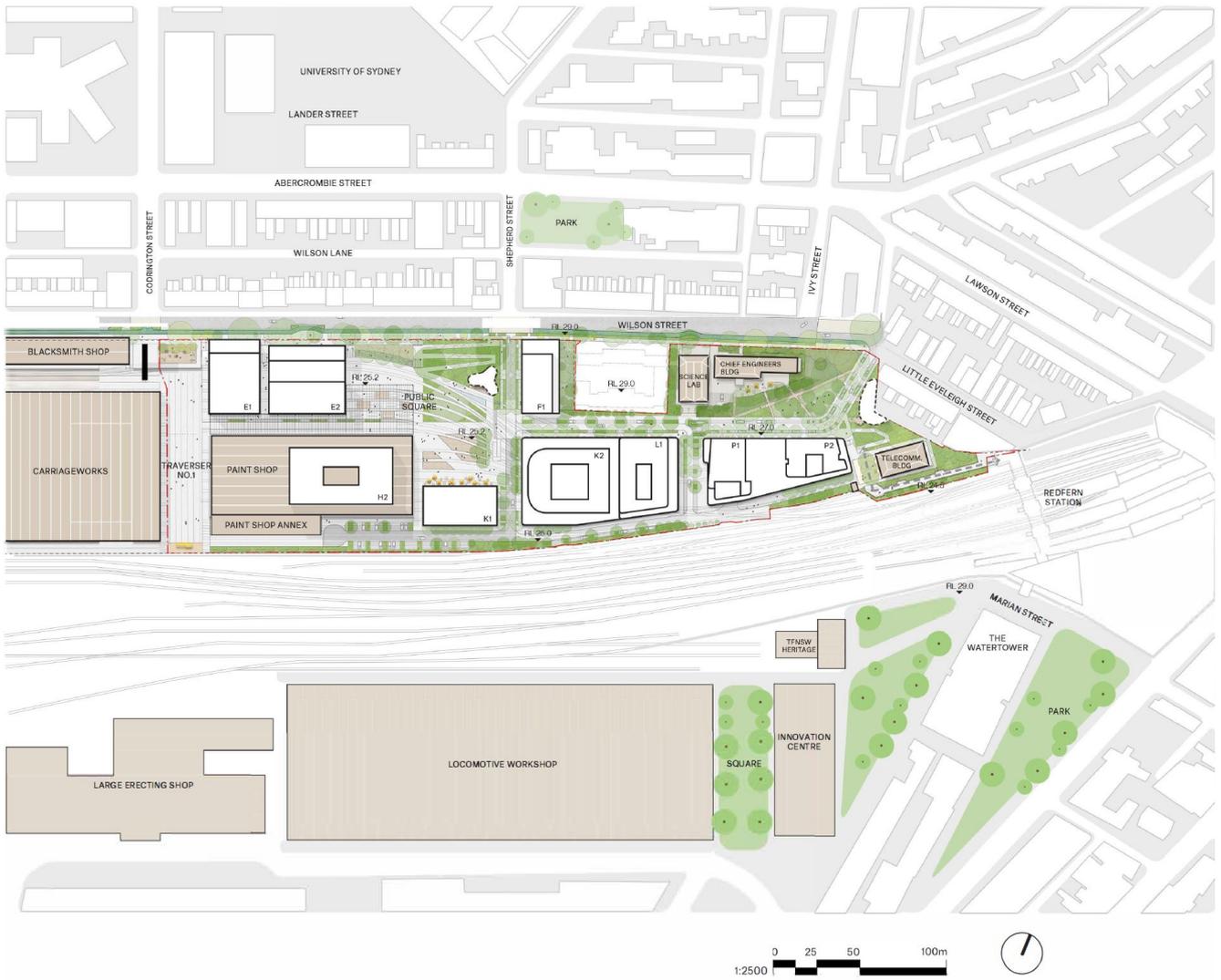


Figure 3 Indicative Concept Proposal (Source: Bates Smart and Turf)

2.0 Study Methodology

2.1 Information Gathering

The information gathering methodology undertaken is summarised below:

- Procurement of available information reflective of the existing services obtained from drawings, condition reports and master planning schemes to classify the importance of existing infrastructure and any potential gaps in the current system performance;
- Identification of other planned developments in the surrounding services catchments which may influence servicing arrangements; and
- A summary of utilities services infrastructure implications and constraints based on existing data and reports.

2.2 Demand Assessment

The demand assessment methodology undertaken is summarised below:

- Development of forecasting and profiles of the whole project and individual sub-precincts based on the development potential for residential, retail and commercial uses. It is noted that for the purposes of this SSP Study only the Paint shop is relevant;
- Development of a sensitivity analysis on the service demand profiles by considering a demand range;
- Consideration of a range of unit rates, applicable diversity rates and impacts of alternative supply sources/sustainability initiatives on demand; and
- Assessment of the impact of building sustainability initiatives on demand and the demand arising from similar Precincts as opposed to standard authority rates.

2.3 Stakeholder Engagement

The infrastructure assessment methodology undertaken is summarised below. A register of contact made in included in Appendix A.

- Contact was made with Sydney Water, Ausgrid, Jemena, Telstra and NBNSCo to ascertain their current capacity, planned upgrades and potential supply constraints, based on base estimation of the demand generated by the proposed increase in density;
- Consultation with strategic planners within each of these organisations, responsible for overall planning of infrastructure delivery to this area being conscious of the overall extent of development planned within the catchment;
- Submission of feasibility applications/requests to each utility service provider; and
- Consolidating feedback into the overall servicing strategy.

2.4 Infrastructure Assessment

The infrastructure assessment methodology undertaken is summarised below:

- Mapping the strategic infrastructure servicing the study area with catchments to highlight areas that are presently underserved, including key external supply points;
- Examination and review of the existing local utilities and system capacities to identify the optimal infrastructure connections;
- Identification of constraints and potential “showstoppers”; and
- Feedback to urban planners and service authorities to understand future infrastructure requirements and forecast demand.

2.5 Identifying Constraints and Potential Upgrades

The constraints and potential upgrades methodology undertaken is summarised below:

- Development of a robust plan for delivery of the infrastructure to the RNE area, considering regulatory requirements, physical constructability and delivery timeframes;
- Determination of infrastructure upgrades. These are population-based augmentation triggers that consider variable development production rates; and
- Identification of alternative strategies that may be applicable for the study area.

2.6 Alternative Demand and Supply Opportunities

The alternative demand and supply opportunities methodology undertaken is summarised below:

- Coordination with the Environmental Sustainability Report (Arup, 2021);
- Review of proposed Urban Forest and Greening Study and its impact on water demand; and
- Identification of potential cost-effective opportunities in the study area, particularly in line with staging and trunk infrastructure trigger points.

3.0 Information Gathering

3.1 Gathering Existing Utility Information

The preliminary information data has been gathered from a range of resources. These include Dial Before You Dig (DBYD) requests, master plans, existing drawings previous project experience with the area, and condition reports.

3.2 Dial Before You Dig (DBYD) Plans

DBYD requests were undertaken for the site area in April 2019. The DBYD report identifies a range of services present within the study area and is summarised in Table 4 below:

Table 4 Summary of Existing Services

Authority Name	Utility Type
AAPT (PowerTel)	Data and Telecommunications
AARNet	Data and Telecommunications
AusGrid	Electricity
City of Sydney	Other
Jemena	Gas
NBN	Data and Telecommunications
Nextgen	Data and Telecommunications
Optus	Data and Telecommunications
PIPE Networks	Data and Telecommunications
Primus Telecom	Data and Telecommunications
Transport for NSW Roads and Maritime Services	Other
Sydney Metro	Roads & Rail
Sydney Trains	Stormwater, Data and Telecommunications
Sydney Water	Water
Telstra NSW, Central	Data and Telecommunications
TransGrid	Electricity
Vocus Communications	Data and Telecommunications

The plans provided from these DBYD requests were assessed as a part of our condition and capacity review.

3.3 Utility Reports

Several annual reports and master plans that have been prepared by stakeholders provide information relevant to the study area. A list of the reports used in utilities and servicing strategy assessment is shown below:

- Illawarra Dives Drainage Stakeholder Update, John Holland, October 2021
- The Draft Greater Sydney Region Plan, Greater Sydney Commission, 2017
- Eastern Sydney Districts Plan, Greater Sydney Commission, 2018
- BASIX Monitoring Report - Electricity Consumptions for 2007-2009, NSW Department of Planning, 2010

- BASIX Water Savings Monitoring for 2010-11, Sydney Water, 2012
- The Sydney Innovation and Technology Precinct Panel Report, NSW Government, 2018
- Decentralised Energy – Advanced Waste Treatment Master Plan, City of Sydney, 2014
- Decentralised Energy – Renewable Master Plan, City of Sydney, 2013
- Decentralised Energy – Trigeneneration Master Plan, City of Sydney, 2013
- Decentralised Water – Master Plan, City of Sydney, 2012
- Development Control Plan – Ashmore Precinct Urban Design, City of Sydney, 2006
- Development Control Plan – Green Square Urban Design, City of Sydney, 2006
- Distribution and Transmission Annual Planning Report, Ausgrid, 2018
- Draft Metropolitan Strategy for Sydney To 2031, NSW Government, 2014
- Final Report, Projected Distribution System Limitations in the Southern Zetland Load Area, Ausgrid, 2012
- Growth Servicing Plan 2017 - 2022, Sydney Water, 2017
- Growth Servicing Strategy Wastewater Network Bondi System, Sydney Water, 2014
- North Eveleigh Concept Plan - Department of Planning, 2008
- NSW Long Term Transport Master Plan, NSW Government, 2014
- NSW Transmission Annual Planning Report, TransGrid, 2018
- Wastewater Systems, Sydney Water, 2014

3.4 Development Context

The proposed Redfern North-Eveleigh renewal forms part of Tech Central, an innovation and technology precinct located in the heart of Sydney's CBD.

Tech Central is envisioned to be a place where world-class universities, ambitious start-ups, high-tech giants and the community collaborate to solve problems, socialise and spark ideas that change our world. The long-term goal for the precinct is to create 25,000 innovation jobs and encourage 25,000 new students to focus on STEM and life sciences studies. The Precinct will be underpinned by high quality physical and digital infrastructure.

3.5 Combined Services Plan

A combined services plan has been developed through a combination of existing DBYD information and utility GIS database for the whole RNE precinct (which include the Paint Shop Precinct) which identifies utility service locations and routes to the Precinct.

All services are shown schematically and are subject to changes during subsequent design stages and further inputs from relevant utility authorities. Schematic layouts for each existing utility service are outlined in individual sections of this report.

The Combined Services Plan sheet is shown below in Figure 4.

Proposed services augmentations are all generally considered 'local' infrastructure upgrades. Regional or sub-regional upgrades to large scale plant and assets do not form part of this review and are generally considered to be undertaken by services authorities as part of network upgrades.

3.6 Consultation with Authorities

As part of this study AECOM has submitted feasibility applications to relevant Utilities Authorities. A summary of correspondence is provided in Table 5 below with full correspondences provided in Appendix A.

Table 5: Summary of Consultation with Authorities

Authority	Response
NBN (communications);	NBN can deliver FTTP (Fibre to the Premise) and EE (Enterprise Ethernet) to this development.
Sydney Water (Water and Wastewater);	Sewer and Water are available with adequate capacity, there is no recycled water available but <i>'Provisional Recycled water opportunities are currently being considered in Sydney Waters sub-regional study'</i> .
Ausgrid (Energy);	Ausgrid confirms TfNSW has engaged with Ausgrid to establish the preferred servicing strategy for the RNE precinct. Ausgrid has offered to undertake a detailed feasibility assessment to identify options and required augmentations to best service the site.
Jemena (Gas)	Network has current capacity to supply this proposal and can augment with new network extensions and district regulator stations should they be required.

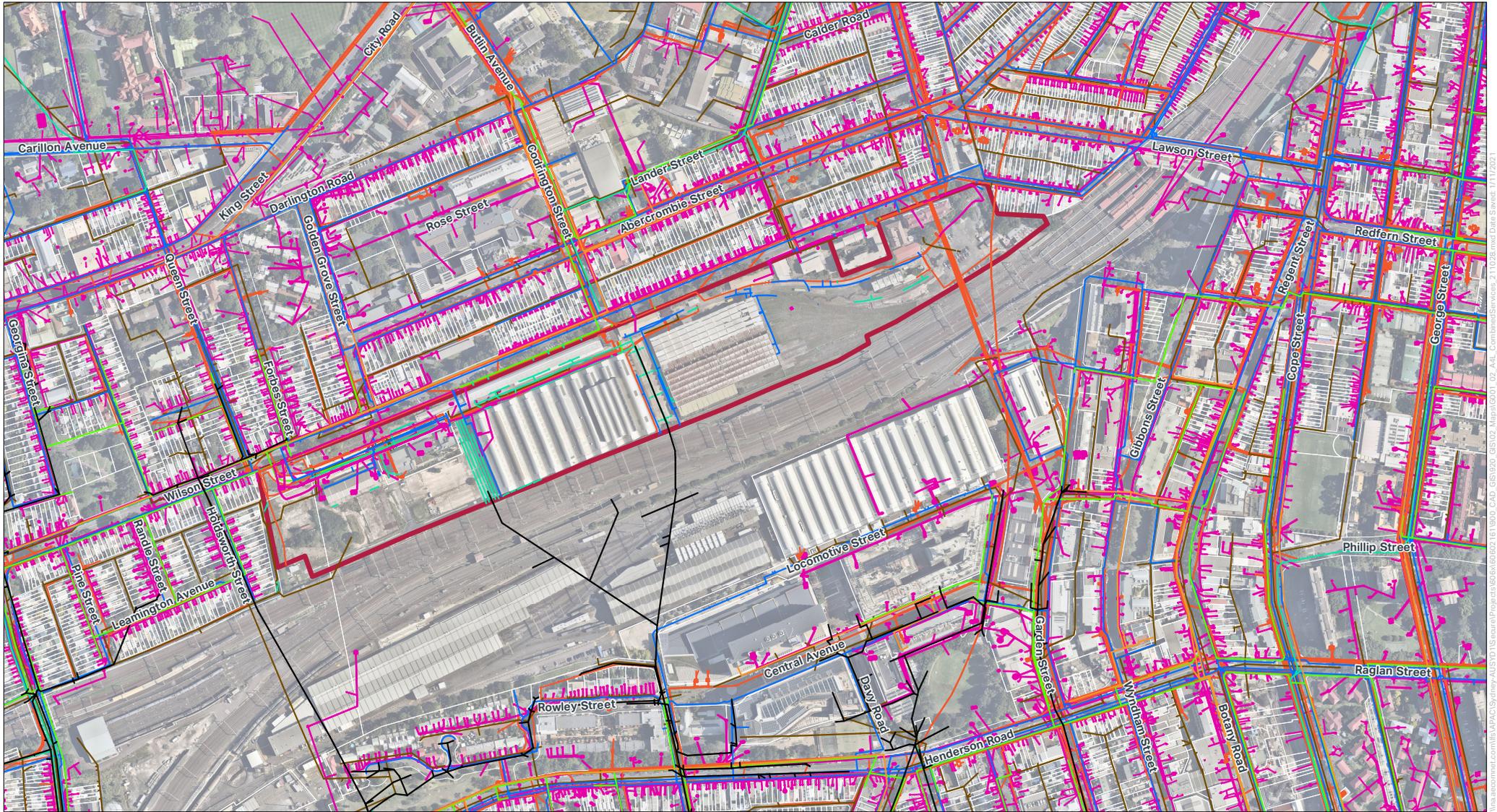


FIGURE 4
 REDFERN/NORTH EVELEIGH - COMBINED SERVICES PLAN

- Indicative Precinct Boundary
- Potable Water
- Stormwater
- Telstra
- Electrical
- Gas
- Wastewater
- Existing Drainage
- Communications

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4.0 Potable Water

4.1 Background

Sydney Water supplies potable water to the RNE Precinct from the Prospect/Potts Hill and Sydney Desalination Plant Systems as shown below in Figure 5.



Figure 5 Potable Water Supply (Sydney Water Corporation, accessed online at <https://www.sydneywater.com.au/water-the-environment/how-we-manage-sydneys-water/water-network.html> , 2022)

This water is supplied via the Potts Hill Trunk Delivery System incorporating the Potts Hill Reservoirs and Crown Street Reservoir. There are also three potable water pumping stations within the system:

- Crown Street WP0001;
- Waterloo WP0008; and
- Dowling Street WP0090.

The potable water system sits within the Petersham/Ashfield Sydney Water potable water zones. There is currently no Sydney Water provided recycled or non-potable water supply within the RNE Precinct; however, some recycled water reticulation pipes are located at the Australian Technology Park near the site.

4.2 Existing On-Site Utility Infrastructure

The existing Sydney Water potable water network on the RNE site has been identified based on DBYD records. These records indicate the presence of numerous potable water mains within and adjacent to the Precinct boundaries.

The existing potable network primarily consists of the following:

- An external DN375 CICL main running along the northern side of Wilson Street adjacent to the site;
- An internal DN200 SCL and DN150 DICL reticulation mains running along the northern side of Carriageworks Way, connecting to the DN375 CICL main on Wilson Street;
- A DN600 CICL main along the Lawson Street bridge over the rail corridor;
- A DN450 CICL main along Cope Street east of the Precinct;
- A DN150 CICL main joining Gibbons Street and Rosehill Street; and

- DN150 CICL and DN225 CICL mains along the south-east of Redfern Station.

The depths and position of the existing reticulation mains are unknown, further investigation is required during detailed design to determine the exact existing layout.

Additionally, while Sydney Water have previously indicated that the trunk mains should have sufficient capacity to service the projected demand, the smaller reticulation mains may require amplification once Section 73 applications are lodged to secure supply. Further advice has been sought from Sydney Water via a feasibility application (lodged 28/07/2021).

It is noted that the above discussion only considers Sydney Water infrastructure, it is likely that a range of private or other authority water infrastructure is present on the site (particularly on the TfNSW land). It is not expected these will ultimately service the development – with these services being made redundant or relocated as part of the final works.

4.3 Potential Lead-in Infrastructure Requirements

As noted previously, the scope of external infrastructure upgrades and lead-in works is to be confirmed based on hydraulic modelling to be undertaken during detailed design. In advance of this detail potential connection points could include:

- North-Eveleigh West: An existing DN375 CICL external main on Wilson Street; and
- North-Eveleigh East: An existing DN375 CICL external main on Wilson Street.

The current potable water network is below in Figure 6. The potable water reticulation network will also likely require new hydrants within the streets however these will be confirmed during detailed design.

It is noted that Sydney Water will generally not provide a lot connection until an application is made by that developer for a service and sub-division of lots is required prior to submitting applications to Sydney Water.

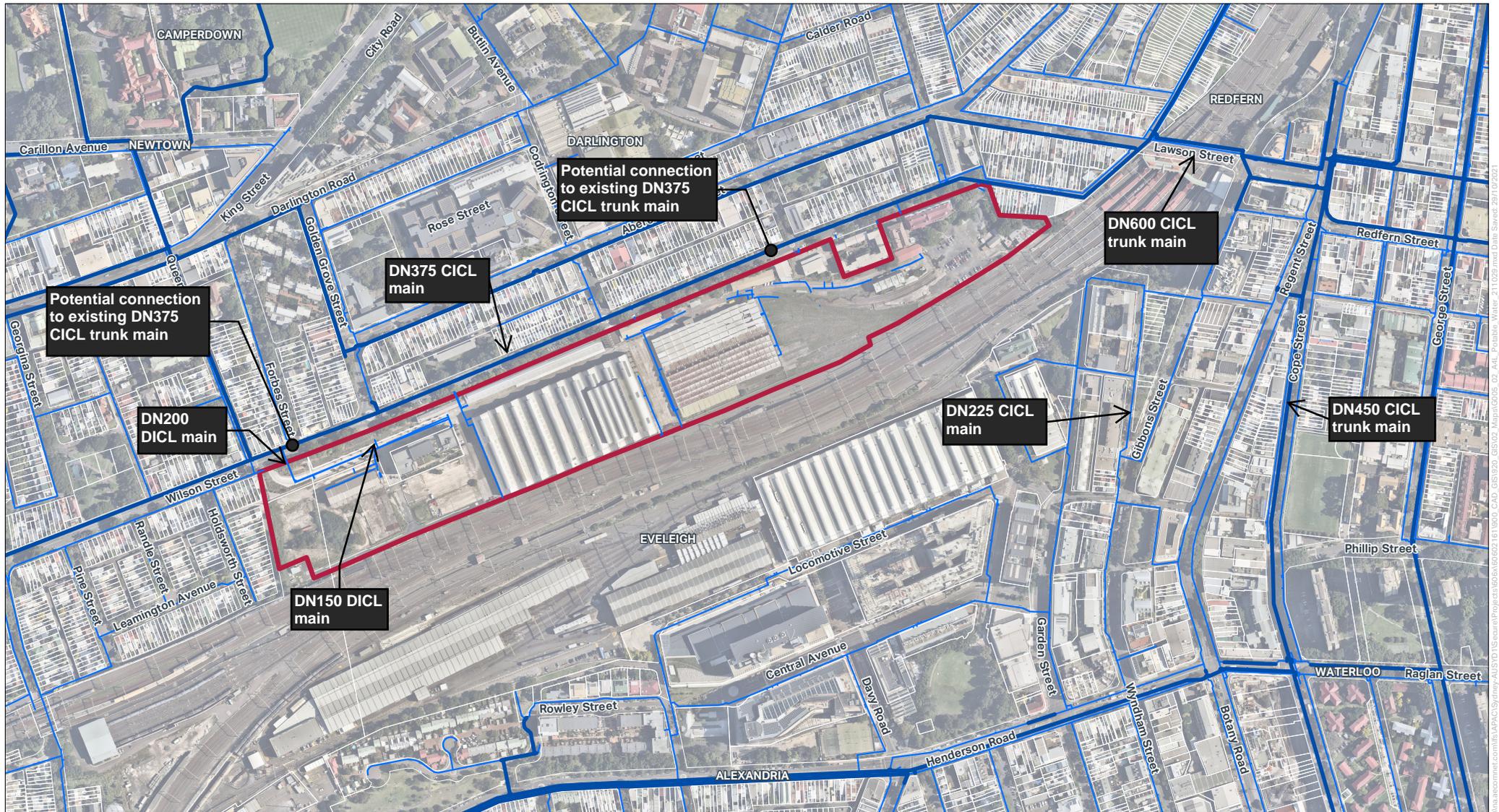


FIGURE 6
 REDFERN/NORTH EVELEIGH - POTABLE WATER PLAN

Legend

- Indicative Precinct Boundary
- Trunk Potable Water
- Potable Water



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4.4 Coordination of Potable Water Infrastructure with Other Services

Coordination of the proposed potable water infrastructure with other services in the proposed street network would generally be based on the Streets Opening Conference standards (NSW Streets Opening Conference (SOC), 2009). These details are attached in Section 10.

In addition, Section 5.12.5.2 of the Water Services Association of Australia codes (WSA 03-2011-3.1, Sydney Water Edition – 2012) states that the clearance requirements for water mains from other service utility assets shall not be less than the minimum vertical and horizontal clearances as summarised in **Error! Reference source not found.**

CLEARANCES BETWEEN WATER MAINS AND UNDERGROUND SERVICES

Utility (Existing or proposed service)	Minimum horizontal clearance mm		Minimum vertical clearance ¹ mm
	New main size		
	≤DN 200	>DN 200	
Water mains ² >DN 375	600	600	300
Water mains ≤DN 375	300 ³	600	150
Gas mains	300 ³	600	150
Telecommunication conduits and cables	300 ³	600	150
Electricity conduits and cables	500	1000	225 ⁷
Stormwater drains	300 ³	600	150 ⁴
Sewers – gravity	1000 ⁵ /600	1000 ⁵ /600	500 ⁴
Sewers – pressure and vacuum	600	600	300
Kerbs	150	600 ⁶	150 (where possible)

NOTES – see over

NOTES:

- Vertical clearances apply where water mains cross one another and other utility services, except in the case of sewers where a vertical separation shall always be maintained, even when the main and sewer are parallel. *The main should always be located above the sewer to minimise the possibility of backflow contamination in the event of a main break.*
- Water mains includes mains supplying drinking water and non-drinking water.
- Clearances can be further reduced to 150 mm for distances up to 2 m where mains are to be laid past installations such as concrete bases for poles, pits and small structures, providing the structure will not be destabilised in the process. *The clearance from timber poles should be at least 200 mm and preferably 300 mm.*
- Water mains should always cross over sewers and stormwater drains. For cases where there is no alternative and the main must cross under the sewer, the design shall nominate an appropriate trenchless construction technique in accordance with [Clause 5.5](#) or other water main construction and protection treatment, effectively joint-free in the vicinity of the sewer. [Refer to Standard Drawings WAT-1211-V and WAT-1255-S.](#)
- Where a parallel sewer is at the minimum vertical clearance lower than the water main (500 mm), maintain a minimum horizontal clearance of 1000 mm. *This minimum horizontal clearance can be progressively reduced to 600 mm as the vertical clearance is increased to 750 mm.*
- Clearance from kerbs shall be measured from the nearest point of the kerb. *For water mains ≤DN 375 clearances from kerbs can be progressively reduced until the minimum of 150 mm is reached for mains ≤DN 200.*
- An additional clearance from high voltage electrical installations should be maintained above the conduits or cables to allow for a protective barrier and marking to be provided.

Figure 7: Sydney Water Clearances between Water Mains and Underground Services (WSA 03-2011-3.1, Sydney Water)

4.5 Demand Assessment

An assessment of the estimated increase in potable water demand generated from the Redfern-North Eveleigh precinct yield has been conducted to determine the required infrastructure upgrades. Individual project areas have been based on the average number of dwellings and proposed Gross Floor Area (GFA) for retail and commercial development outlined in the demand assessment yields presented in Section 0.

Demand estimates for potable water have been calculated using the Water System Planning Guideline (Sydney Water, Version 1, September 2014) and is based on Maximum Daily Demand. The BASIX reduction has been taken from the Building Sustainability Index targets.

A summary of the water demand unit rates is presented below in Table 6. AECOM has adopted the Suburban Commercial demand profile as it best represents the expected demand profile (as compared to 'Large Shopping Complex').

Table 6 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 System Planning Guide line (Sydney Water, Version 1, September 2014), Section 3, Table 3-2
Suburban Commercial	Max Day Demand	kL/ha/day	41	Water System Planning Guide line (Sydney Water, Version 1, September 2014), Section 3, Table 3-2
BASIX Reduction		%	40	Building Sustainability Index Targets

4.6 Forecast Demand

An estimate of the future potable water demand for each precinct has been calculated based on development yields provided in the Urban Design and Public Domain Study (see Section 0). These figures provide information on the estimated number of dwellings for residential use and GFA for non-residential developments. The site has been classified as comprising of 'high density dwelling' and 'local commercial development'.

The study area has been classified as 'multi-unit > 140 unit/net ha developments based on housing density with an equivalent potable water demand rate of 0.8 kL/unit/day. The commercial density has been estimated on an equivalent potable water demand rate 41 kL/ha/day for all precincts as shown in Table 6.

In accordance with BASIX requirement, new residential developments are required to reduce mains-supplied potable water consumption by 40% (since the BASIX amendment was introduced in 2006) compared to the average NSW dwelling. Commercial demands have not had a BASIX reduction applied as per BASIX information guidelines. The cumulative Maximum Daily Demand (MDD) of each precinct when assuming BASIX compliance is summarised below in Table 7.

Table 7 Estimated Cumulative Maximum Daily Potable Water Demand

Sub-Precinct	Water Demand – kL/day		
	Residential (inc BASIX)	Non-Residential	Total
Clothing Store (as per 2008 Masterplan)	341	-	341
Carriageworks (as per 2008 Masterplan)	-	142	142
Paint Shop	183	497	680
TOTAL			1,163 kL/day

Considering a $\pm 15\%$ range in development yields, the Maximum Day Demand (MDD) could vary between **989-1,338 kL/day**.

4.7 Potential Sustainability Initiatives

Increases in water demand could be mitigated through incorporation of water sustainability initiatives and provision of a non-potable water supply. It is estimated that such initiatives could reduce potable water demand by up to 50% for new dwellings.

While this report shows “baseline” water demands it is recommended that key sustainability initiatives that have the potential to reduce mains potable water demand and are recommended for further investigation as part of subsequent development applications:

- Onsite rainwater reuse;
- Splitting of potable and non-potable demands;
- Provision of green walls and green roofs;
- High efficiency water fixtures; and
- Stormwater harvesting and water recycling (whether by onsite treatment or by regional recycled system).

4.8 Approvals and Next Steps

Sydney Water formal approvals are typically provided as a part of a Section 73 process, these will likely be required for each lot. However, site wide strategy drawings can be submitted to Sydney Water as a part of the applications to establish a Head Deed.

As described in Section 4.3, the final potable water strategy is to be confirmed through hydraulic modelling, with separate reports outlining the modelling outcomes to be submitted to Sydney Water.

The key next steps in progressing the delivery of potable water infrastructure through detailed design, including the formal approval process for Sydney Water infrastructure consists of the following:

1. Undertake hydraulic modelling to confirm the extent of any lead-in infrastructure upgrades required;
2. Undertake site investigations to confirm the layout and extent of existing on-site infrastructure (including non-Sydney Water infrastructure);
3. Develop an overall water master plan for the Precinct including staging considerations and agree this with Sydney Water;
4. Develop diversion strategy (including any interim works to suit staging) and protection/build-over requirements for infrastructure that cannot be diverted;
5. Establish a Head Deed to be signed by required parties (Sydney Water, Designer, Water Services Coordinator (WSC), Developer, Constructor);
6. Submit application/s for individual detailed design packages to be submitted to Sydney Water with drawing of proposed works in stages, Section 73;
7. Sydney Water to issue of Notice of Requirements (NOR) with their requirements for water main layout, sizing and funding matters confirmed; and
8. Detailed design to be progressed based on the NOR and submitted to Sydney Water for approval. It is noted that the above is for delivery of the water network through the new street network, it is expected that the buildings will still need to make separate applications for connection.

5.0 Wastewater

5.1 Background

Sydney Water currently services the site area through the Malabar Sewerage Treatment Plant Network (Botany) which has a capacity of 416 ML/d and services an area of approximately 627km², from the Tasman Sea to Glenfield. Flow is transferred to treatment plants via a series of sewer pumping stations.

The sewer catchments are shown in Figure 8.

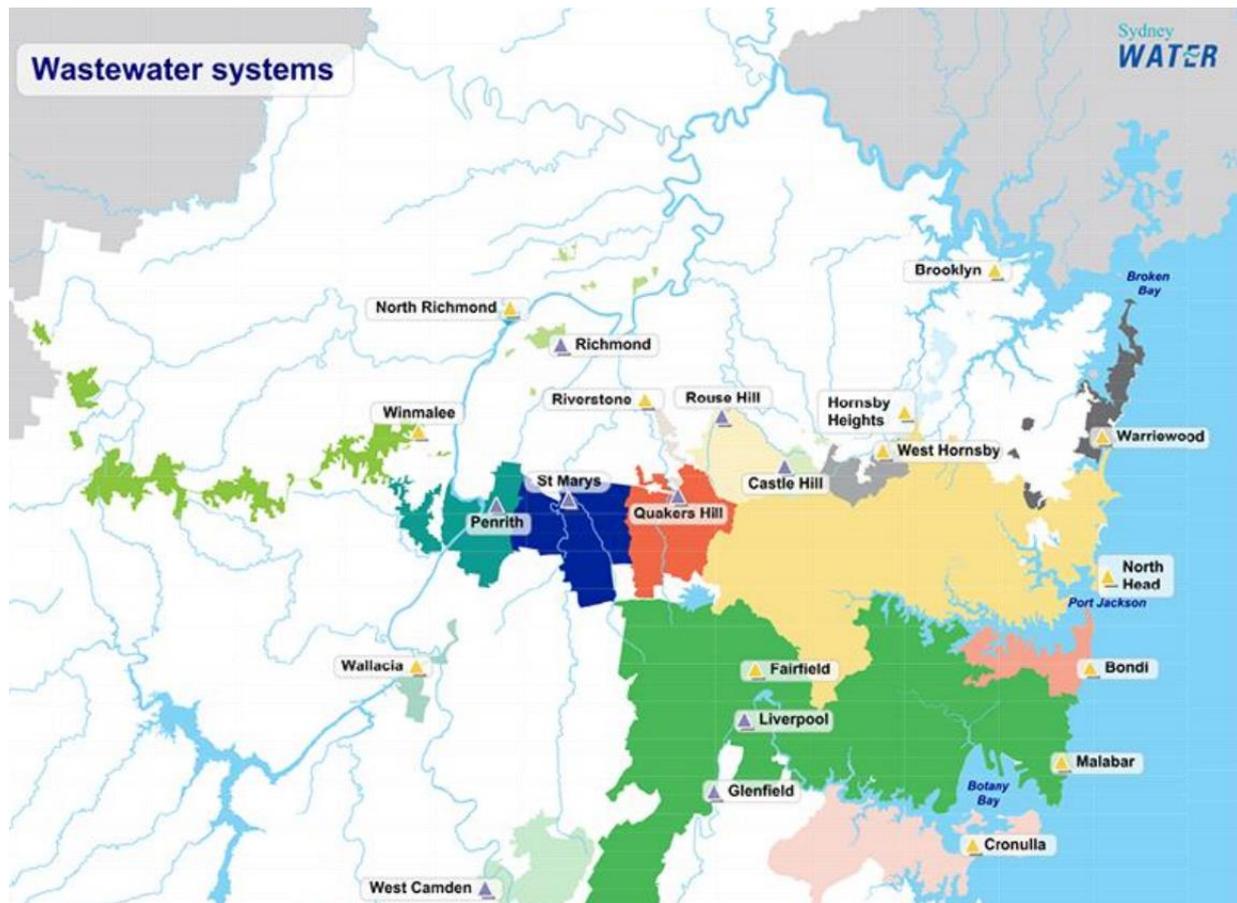


Figure 8: Sydney Water Sewer Catchment (Sydney Water, 2020)

There are also four private onsite sewage recycling plants near the site area, located at the following locations:

- Central Square;
- UTS Broadway;
- Chifley Square;
- Central Park; and
- The Green Square Town Centre

5.2 Existing On-Site Utility Infrastructure

The existing Sydney Water wastewater network has been identified on DBYD records. These indicate several existing wastewater mains throughout the RNE Precinct.

The RNE Precinct is located within the Malabar catchment, with wastewater directing flows towards the Malabar Wastewater Treatment Plant to the south-east.

The existing wastewater network primarily consists of the following:

- An external and internal DN225 PVC pipe running along the eastern side of Ivery's Lane and then into the site along Carriageworks Way;
- A DN225 SGW pipe that enters the site via the railway corridor on the sites south border;
- A disused external reticulation main on Ivery's Lane.
- DN225 VC and DN225 SGW mains entering the rail corridor from surrounding streets;
- A DN225 VC main entering from the intersection of Wilson Street and Shephard Street;
- A DN225 VC servicing the Carriageworks building and entering the North Eveleigh West site; and
- Various DN225 wastewater mains within streets surrounding the precinct.

Similar to the potable water network, it has been assumed that most existing wastewater services will either be retained or upgraded in order to adequately serve the proposed precinct as per previous masterplan options.

Mains servicing upstream catchments will likely need to be upgraded and a new gravity system installed to support the proposed development. This assumption is to be confirmed during detailed design of the precinct with opportunities for the re-use of existing potable water assets considered.

5.3 Potential Lead-in Infrastructure Requirements

The scope of external infrastructure upgrades is to be confirmed based on hydraulic modelling to be undertaken during detailed design, key existing infrastructure is summarised below:

- North-Eveleigh West: An existing DN375 CICL external main on Wilson Street; and
- North-Eveleigh East: An existing DN375 CICL external main on Wilson Street.

The current wastewater network is shown below in Figure 9 while potential lead-in infrastructure requirements are identified in Figure 10. It is expected that with appropriate asset augmentation and/or extension there will be a single (or multiple) connection points to meet wastewater demand for the Paint Shop site. Sydney Water's feasibility response will confirm and provide details on the preferred connection strategy.

Each lot is required to be serviced with a single sewer connection with detailed requirements nominated in the Sydney Water Notice of Requirements. Sub-division of lots is required prior to submitting applications to Sydney Water.

It is noted that sewer connections are usually provided at the lowest point on a lot; hence final connection points will require review when final site gradings have been developed.

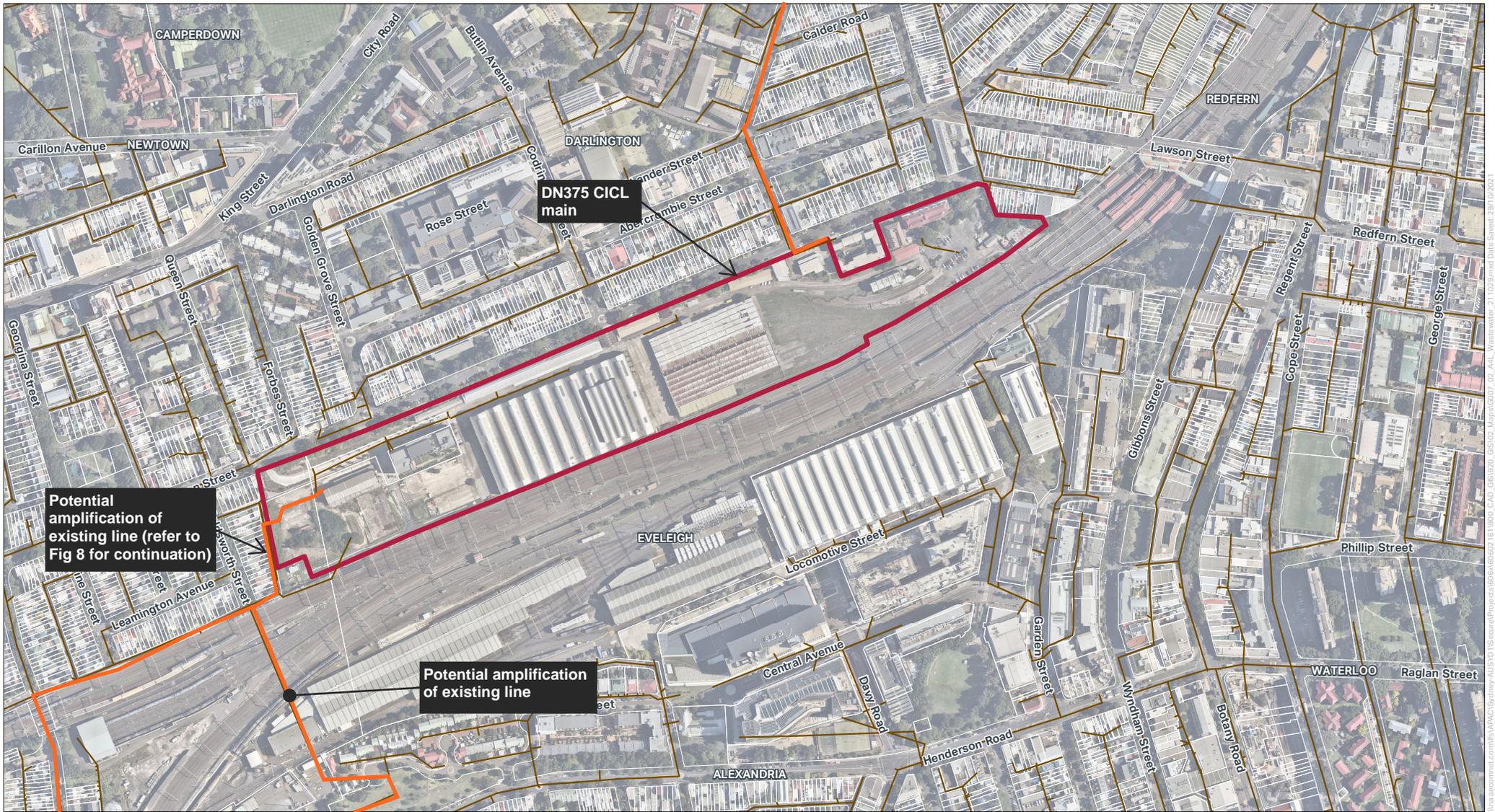


FIGURE 9
 REDFERN/NORTH EVELEIGH - WASTEWATER PLAN

- Legend
- Indicative Precinct Boundary
 - Wastewater



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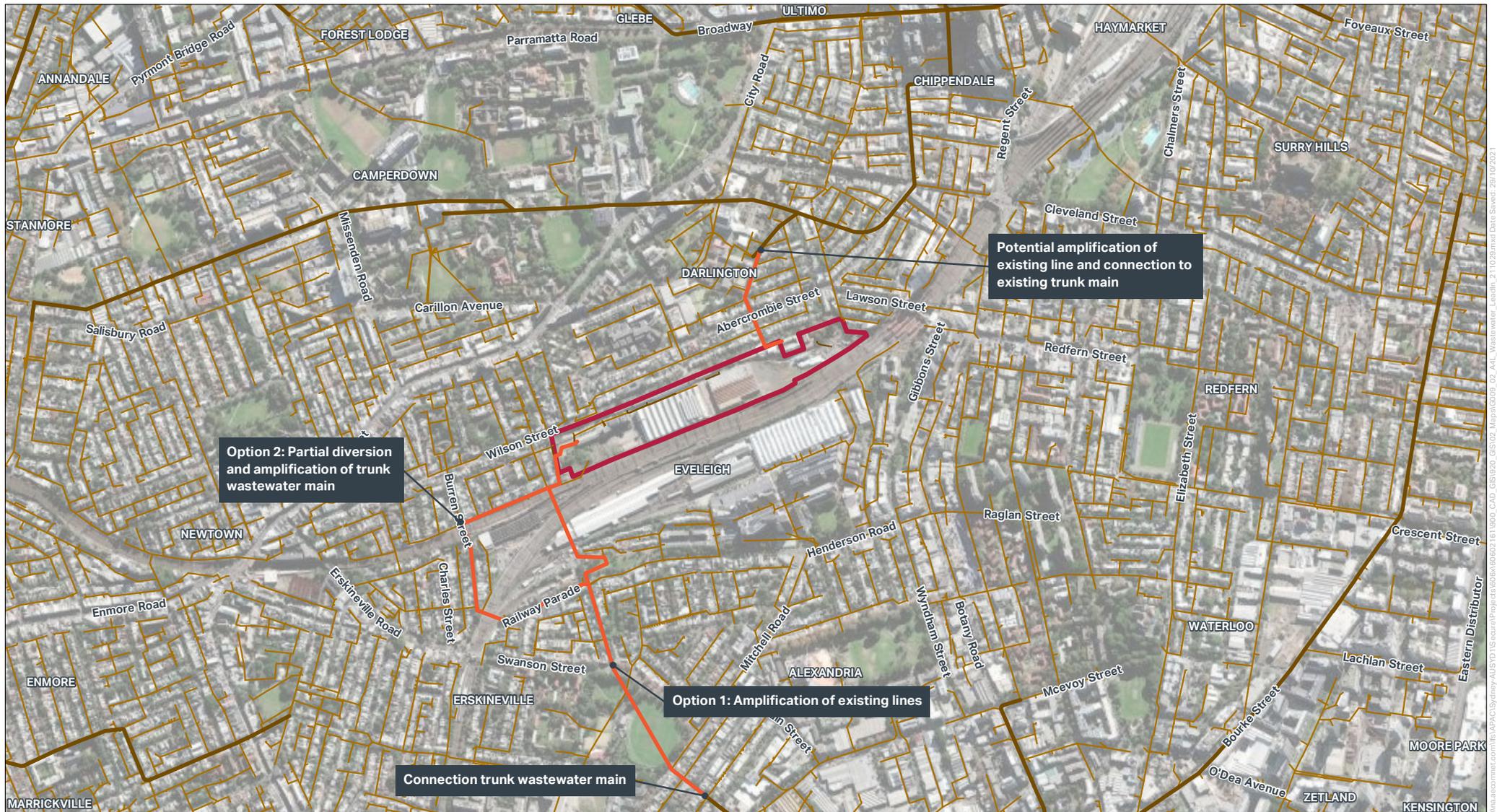


FIGURE 10
 REDFERN/NORTH EVELEIGH - WASTEWATER LEAD-IN PLAN

Legend

- Indicative Precinct Boundary
- Wastewater
- Existing Trunk Wastewater
- Potential New Trunk Wastewater

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Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

5.4 Coordination of Wastewater Infrastructure with Other Services

Coordination of the proposed wastewater infrastructure with other services in the proposed street network would generally be based on the Streets Opening Conference standards (NSW Streets Opening Conference (SOC), 2009). These details are attached in Section 10.

In addition, Section 4.4.5.2 of Water Services Association of Australia codes (WSA 02-2002-2.2, Sydney Water Edition – Version 3) states the clearance requirements for sewers in Table 4.2, as summarised below in Figure 11.

TABLE 5.4
CLEARANCES BETWEEN SEWERS AND OTHER UNDERGROUND SERVICES

Utility (Existing service)	Minimum horizontal clearance mm		Minimum vertical clearance ¹ mm
	New sewer size		
	≤DN 300	>DN 300	
Sewers ≤DN 300	300	600	150 ² /300
Sewers >DN 300	600	600	300
Gas mains	300 ³	600	150 ² /300
Telecommunication conduits and cables	300 ³	600	150 ² /300
Electricity conduits and cables	500	1000	225 ² /300
Stormwater drains ⁴	300 ³	600	150 ² and ⁵ /300 ⁵
Water mains	1000 ⁶ /600	1000 ⁶ /600	500 ⁵
Kerbs	150 ⁷	600 ⁷	N/A

NOTES:

- Vertical clearances apply when sewers cross one another, except in the case of water mains when a vertical separation shall always be maintained, even when the sewer and water main are parallel. The sewer should always be located below the water main to minimise the possibility of backflow contamination in the event of a main break.*
- A minimum vertical clearance of 300 mm applies if the size of either the existing service or proposed sewer is >DN 300.*
- Clearances can be further reduced to 150 mm for distances up to 2 m when passing installations such as poles, pits and small structures, providing the structure is not destabilised in the process.*
- A sewer to be constructed under an existing or proposed stormwater pipe or channel ≥DN 375 may be concrete encased. Concrete encase sewers crossing under brick barrel drains or unlined open drain or channel. The concrete encasement shall extend at least 1 m each side of the stormwater pipe or channel. Clearances between the sewer and other services shall be measured from the outer surface of the concrete encasement.*
- Sewers should always cross under water mains and stormwater drains. If this requirement cannot be met, consult the Water Agency in respect of alternatives such as adjusting the water main or stormwater drain. Where a sewer crosses a water main at or close to 90°, the vertical clearance may be reduced subject to Water Agency requirements.*
- When the sewer is at the minimum vertical clearance below the water main (500 mm) maintain a minimum horizontal clearance of 1000 mm. This minimum horizontal clearance can be progressively reduced to 600 mm as the vertical clearance increases to 750 mm.*
- Clearance from kerbs shall be measured from the nearest point of the kerb.*

Figure 11 Sydney Water Clearances between Sewers and Other Underground Services (WSA 02-2002-2.2, Sydney Water

5.5 Demand Assessment

An assessment of the estimated increase in sewer loading generated from the Redfern-North Eveleigh precinct yield has been conducted to determine the required infrastructure upgrades. Individual project areas have been based on the average number of dwellings and proposed Gross Floor Area (GFA) for retail and commercial development outlined in the demand assessment yields presented in Section 0.

The design criteria used to forecast future sewer loading are taken from Gravity Sewerage Code of Australia, WSA 02-2014- (Water Services Association, Version 3.1, 2014) and is expressed as an Equivalent Population for a particular land use. The BASIX reduction has been taken from the Building Sustainability Index targets; these are summarised below in Table 8.

Table 8 Sewer Design Loading Criteria

Land Use	Units	Wastewater Demand	Sources
High Density Multi Storey	Equivalent Population/dwelling	2.5	Gravity Sewerage Code of Australia, WSA 02-2014- (Water Services Association, Version 3.1, 2014), Appendix B
Local Commercial	Equivalent Population /ha	75	
Average Dry Weather Flow	L/s	0.0021	Gravity Sewerage Code of Australia, WSA 02-2014- (Water Services Association, Version 3.1, 2014), Appendix C
BASIX Reduction	%	40	Building Sustainability Index Targets

5.6 Forecast Demand

An estimate of the future wastewater loading for each precinct has been calculated based on development yields provided in the Urban Design and Public Domain Study (see Section 0). These figures provide information on the estimated number of dwellings for residential use and GFA for non-residential developments.

In accordance with the WSA 02-2014 Gravity Sewerage Code of Australia criteria guide, the Site has been classified as comprising of 'high density dwellings' and 'local commercial' with an Equivalent Population (EP) per dwelling/ha. The Average Dry Weather Flow (ADWF) per Equivalent Population (EP) has been taken as 150 L/day or 0.0017 L/s (ADWF (L/s) = 0.0017 * EP).

Under BASIX requirement, new residential developments are required to reduce wastewater loading by 40% (since the BASIX amendment was introduced in 2006) compared to the average NSW dwelling. Under this new scenario, the ADWF allowing for BASIX for each precinct is summarised below in Table 9:

Table 9: Estimated Average Dry Weather Flow (ADWF) including BASIC (L/s)

Sub-Precinct	Wastewater – ADWF (L/s)		
	Residential (inc BASIX)	Non-Residential	Total
Clothing Store (as per 2008 Masterplan)	2.24	-	2.24
Carriageworks (as per 2008 Masterplan)	-	0.54	0.54
Paint Shop	1.20	1.91	3.11
TOTAL			5.9L/s

Considering a ±15% range in development yields, the ADWF could vary between **5.0-6.8 L/s**.

5.7 Potential Sustainability Initiatives

While this report shows “baseline” wastewater demands and servicing, there are key sustainability initiatives that are recommended for further investigation as part of subsequent development applications:

- Onsite rainwater reuse;
- Blackwater / greywater use including split system; and
- Wastewater harvesting and water recycling (whether by onsite treatment or by regional recycled system).

It is noted that these would have an impact on the final wastewater demand and associated infrastructure upgrade requirements.

5.8 Approvals and Next Steps

Sydney Water formal approvals are typically provided as a part of a Section 73 process, these will likely be required for each building lot. However, site wide strategy drawings can be submitted to Sydney Water as a part of the applications to establish a Head Deed.

The sewer strategy is to be confirmed through hydraulic modelling, with separate reports outlining the modelling outcomes to be submitted to Sydney Water.

The key next steps in progressing the delivery of sewer infrastructure through detailed design including the formal approval process for Sydney Water infrastructure consists of the following:

1. Undertake hydraulic modelling to confirm extent of any lead-in infrastructure upgrades required;
2. Undertake site investigations to confirm the layout and extent of existing on-site infrastructure (including non-Sydney Water infrastructure);
3. Develop an overall wastewater master plan for the Precinct including staging considerations and agree these with Sydney Water. Being a gravity service, this will need to include consideration of the depth of the existing sewer infrastructure to be maintained and/or connected to (based on manhole survey) and proposed grading of the site;
4. Develop a diversion strategy (including any interim works to suit staging) and protection/build-over requirements for infrastructure that cannot be diverted;
5. Establish a Head Deed to be signed by required parties (Sydney Water, Designer, WSC, Developer, Constructor);
6. Submit application/s for individual detailed design packages to be submitted to Sydney Water with drawing of proposed works in stages, Section 73;
7. Sydney Water to issue of Notice of Requirements (NOR) with their requirements for water main layout, sizing and funding matters confirmed; and
8. Detailed design to be progressed based on the NOR and submitted to Sydney Water for approval.

It is noted that the above is for delivery of the wastewater network through the new street network, it is expected that the buildings will need to make separate applications for connection. It is expected that with appropriate asset augmentation and/or extension there will be a single (or multiple) connection points to meet wastewater demand for the Paint Shop site. Sydney Waters feasibility response will confirm and provide details on the preferred connection strategy.

6.0 Electricity

6.1 Background

Ausgrid is the main electrical supplier to the Redfern North Eveleigh area and the Paint Shop Precinct as shown in Figure 12.



Figure 12 Electrical Suppliers in NSW

Projections indicate that there will be a substantial increase in electrical demand on the Paint Shop Precinct site. It is expected that there will be sufficient capacity within the local zone substation to supply the proposed demand for the site.

The Precinct is predominately serviced via feeders from the St Peters Zone Substation (ZN2568) and the Zetland Zone Substation (ZN188).

Detailed lead-in infrastructure upgrades will need to be confirmed with Ausgrid as part of formal applications made as a part of detailed design. In addition, street lighting supply may comprise a separate City of Sydney network (with the supply taken from the local Ausgrid Low Voltage (LV) network). This will need to be confirmed with City of Sydney through detailed design, however if this is the case, separate City of Sydney infrastructure will also be required.

6.2 Existing On-Site Utility Infrastructure

The existing Ausgrid electrical infrastructure on the site has been identified based on DBYD records. There are existing underground electrical assets within the site boundary, in particular:

- Transgrid services tunnel containing a 330kV transmission cable. The tunnel alignment travels from Little Eveleigh St south across the rail corridor;
- Ausgrid transmission/distribution line crossing the rail corridor from Wilson St to Locomotive St;
- Ausgrid distribution infrastructure along various streets bordering the precinct;
- Ausgrid infrastructure adjacent to the Carriageworks building;
- Sydney Trains HV infrastructure along the rail corridor; and
- City of Sydney electrical infrastructure in adjacent streets.

The exact depths and positions of the existing reticulation mains are unknown thus further investigation is required to determine the exact existing layout.

It is expected that all existing aerial infrastructure within the site would be abandoned or relocated underground. Furthermore, City of Sydney will likely require undergrounding of existing aerial infrastructure in the streets bounding the site. Wilson Street is likely to require new conduits under the existing footpath to enable the transition from aerial to underground cabling.

The existing Ausgrid infrastructure is outlined above, while potential lead-in requirements have been detailed in Figure 13. It is noted that these plans only consider Ausgrid infrastructure and private electrical infrastructure may be present on the site.

6.3 Potential Lead-in Infrastructure Requirements

As noted previously, the scope of external infrastructure upgrades and lead-in works will be confirmed when formal Ausgrid applications are made as part of detailed design.

Potential lead-in requirements include:

- North-Eveleigh West: New connection to existing 11kV feeders on Wilson Street; and
- North-Eveleigh East: Potential new feeders to St Peters Zone Substation (ZN2568).

The exact connection requirements will depend on the timing and staging of the development as well as consultation with Ausgrid. It has been assumed that any new internal road layouts will be dedicated to the City of Sydney and that easements will not be required where the electrical assets pass through public land or roads.

As noted previously, ownership of the street lighting will need to be confirmed as part of detailed design. Alternatively, if City of Sydney assets this would be fed from a private City of Sydney LV network which would take a supply from the external Ausgrid LV network. The layout of City of Sydney LV infrastructure is not included in the plans below.

It is noted that the recent lighting on Carriageworks Way was constructed to the Ausgrid standard and for consistency it may be preferable to maintain this structure for the remainder of the precinct.

6.4 Coordination of Electrical Infrastructure with Other Services

Coordination of the proposed electrical infrastructure with other services in the proposed street network would generally be based on the Streets Opening Conference standards (NSW Streets Opening Conference (SOC), 2009). These details are attached in Section 10.

Ausgrid's specification "NS130: Specification for Laying of Underground Cables up to 22kV" does not provide specific information on clearances from other services. If the electrical services are installed within the standard allocation, the separations given by the other services provider should apply for all crossings. Where a reduced allocation is proposed, separations should be determined in consultation with Ausgrid.



FIGURE 13
 REDFERN/NORTH EVELEIGH - ELECTRICAL LEAD-IN PLAN

- Legend
- Indicative Precinct Boundary
 - ▲ Zone substation
 - Electrical

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Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

6.5 Demand Assessment

An assessment of the estimated increase in electrical demand generated from the Redfern-North Eveleigh precinct yield has been conducted to determine the required infrastructure upgrades. Individual project areas have been based on the average number of dwellings and proposed Gross Floor Area (GFA) for retail and commercial development outlined in the demand assessment yields presented in Section 0.

Electrical demands based on Endeavour Energy Growth Servicing After Diversity Maximum Daily (ADMD) demand unit rates and Table C3 of AS3000:2018 - Electrical installations were used and summarised in Table 10 and Table 11.

Table 10: Endeavour Energy Growth Servicing Plan 2019 - Table 1 - ADMD by application

Level of Network	Residential Dwelling Type	ADMD kVA	Example Application
Distribution Substation and Low Voltage network	Detached House	5 (medium) 6.5 (large)	Size Distribution Transformer
	Apartments	3.5	
11kV feeders	Detached House	4	Area Studies
	Apartments	3	
Zone Substation	Detached House	3.2	Summer Demand Forecast
	Apartments	2.4	
	Detached House	4	Area Planning
	Apartments	3	

Table 11: AS3000 - Table C3 Maximum Demand – Energy Demand Method for Non-Domestic Installations

Type of occupancy		Energy demand	
		Range, VA/m ²	Average, VA/m ²
Offices	Light and power	40–60	50
	Airconditioning:		
	— Cooling	30–40	35
	— Reverse cycle	20–30	25
	— Zonal reheat	40–60	50
— Variable volume	20	20	
Carparks	Open air	0–10	5
	EV charging	5–15	10
	Basement	10–20	15
	EV charging	10–30	20
Retail shops	Light and power	40–100	70
	Airconditioning	20–40	30
Warehouses	Light and power	5–15	10
	Ventilation	5	5
	Special equipment	(use load details)	
Light industrial	Light and power	10–20	15
	Ventilation	10–20	15
	Airconditioning	30–50	40
	Special equipment	(use load details)	
Taverns, licensed clubs	Total	60–100	80
Theatres	Total	80–120	100

NOTE: EV charging relates to charging equipment associated with electric vehicles and should be considered in addition to all other energy demands.

The following load ranges were adopted based on a combination of defined unit rates from Endeavour Energy, AS3000 and past AECOM experience with building developments in Table 12 below. The rates from Endeavour Energy are assumed to be inclusive of diversity while the AS3000 rates are assumed not to include diversity.

Table 12 Adopted Maximum Electrical Demand Unit Rates

Electrical Loads	Unit	kVA/unit	Diversity Factor	kVA/unit (incl. Diversity Factor)	Source
Residential	dwelling	3.0	-	3.0	<i>Endeavour Energy Growth Servicing Plan 2019 – Table 1</i>
Commercial	m ²	0.1	0.8	0.08	<i>AS3000 – Table C3</i>
Electric Vehicle Charging	space	-	0.6	4.2	<i>NSW Electric and Hybrid Vehicle Plan – Future Transport 2056 (inclusive of diversity factor)</i>
BASIX Reduction	%		40		<i>Building Sustainability Index Targets</i>

6.6 Forecast Demand

Table 13 below summarises the total maximum electrical demands for each precinct based on the development yields provided in the Urban Design and Public Domain Study (see Section 0). The sum total value accounts for the inclusion of 1,600 total (500 for Paint Shop and 1,100 for the balance of the site) parking spaces with 50% of these Electric Vehicle (EV) charging spaces.

Table 13: Estimated Maximum Electrical Demand by Sub-Precinct

Electrical Load	Electrical Demand - ADMD (kVa)		
	Clothing Store	Carriageworks	Paint Shop
Residential	1,278	-	686
Commercial	-	2,767	10,050
Electric Vehicle Charging	2,310	-	1,050
Subtotal	3,588	2,767	11,786
TOTAL	18,141kVa		

Considering a $\pm 15\%$ range in development yields, the ADMD could vary between **15.4-20.9 MVA**.

The impact of Photo Voltaic (PV) cells have not been accounted for in this electrical demand estimation as environmentally sustainable development options will be subject to further design development. However, PV systems have the ability to reduce electrical demand and assist in managing peak demand. The extent of this reduction is dependent on the PV array size and associated operational losses.

While a gas connection has been allowed for and indicative gas demand rates have been developed, the above table reflects electrical cooktops and heating in apartments to assist in meeting net 0% Carbon 2050.

6.7 Potential Sustainability Initiatives

While this report shows “baseline” energy demands, there are key sustainability initiatives that are recommended for further investigation as part of subsequent development applications:

- Solar PV;
- Natural ventilation of common areas (for as far as practicable);
- Electric car charging (beyond 50% readiness target);
- Centralised heat extraction system;

- Geothermal cooling;
- Smart metering; and
- Glazing options to improve thermal comfort and reduce heating and cooling loads.

It is noted that these would have an impact on the final electrical peak demand and associated infrastructure upgrade requirements.

6.8 Approvals and Next Steps

Ausgrid formal approvals are usually provided for individual detailed design packages. It is possible to submit precinct wide drawings to establish a Case for the entire area with Ausgrid.

The key next steps in progressing the delivery of electrical infrastructure through detailed design including the formal Ausgrid approval process consists of the following:

1. Undertake site investigations to confirm the layout and extent of existing services (including non-Ausgrid assets);
2. Confirm arrangements for supply and ownership of street lighting and SMART poles;
3. Confirm extent of existing infrastructure that can be abandoned and/or requires diversion;
4. Develop duct masterplan and make submission to set up case with Ausgrid;
5. Develop staged designs for delivery of the new infrastructure;
6. Liaise with City of Sydney to confirm requirements for undergrounding of existing infrastructure;
7. Ausgrid to provide detailed requirements;
8. Ausgrid to issue Design Information Pack (DIP), Design Contract and Deed of Agreement; and
9. Submit detailed design of individual packages for approval.

These steps will occur post-masterplan adjustment approval. It is noted that the above is for delivery of the duct network through the new street network, it is expected that the buildings will need to make separate applications for connection, including installation of new feeders.

It is expected that there will be sufficient capacity within the local zone substation to supply the proposed demand for the site.

7.0 Gas

7.1 Background

Gas servicing the RNE Precinct will be provided by Jemena. In order to meet the Net 0 Carbon by 2050 commitment set out in the Environmental Sustainability Report (Arup, 2022), it is anticipated that ultimately there will be no or little gas servicing to the site and that where gas is required this will ultimately be reserved for early releases and/or special uses (e.g. hospitality). AECOM has based our demand assessment on gas provision to the whole site as a conservative approach to understanding the lead-in requirements. Whilst there is a substantial distribution network in the area, it is predominately comprised of small connections providing supply at a low pressure which is likely sufficient for the intended use. However, higher demand uses such as industrial kitchens may require a higher-pressure supply.

7.2 Existing On-Site Utility Infrastructure

There is currently a network of predominately low volume supplying pipes within the RNE Precinct, in particular:

- Several medium pressure DN75, 210kPa external network mains throughout streets surrounding the Precinct; and
- A secondary gas main 1,050 kPa located along Margaret Street.

These existing services are shown below in Figure 14. The exact depths and positions of the existing reticulation mains have not been confirmed and further investigations will likely be required to determine the extent of diversions required.

7.3 Potential Lead-in Infrastructure Requirements

A preliminary response from Jemena received 21 July 2021 from a feasibility application has indicated that the network has current capacity to supply the proposed development and can augment with new network extensions and district regulator stations as required. The medium pressure 210kPa network would be used to connect to each building. Currently, Jemena have no plans to augment the existing network and will be done once a formal application is submitted. Jemena is also engaged with other proposals in the area; however, these are of a confidential nature.

Based on the current gas information potential connection points include:

- North-Eveleigh West: Connection to existing gas trunk main on Wilson Street; and
- North-Eveleigh East: Connection to existing gas trunk main on Wilson Street.

7.4 Coordination of Gas Infrastructure with Other Services

Coordination of the proposed gas infrastructure with other services in the proposed street network would generally be based on the Streets Opening Conference standards (NSW Streets Opening Conference (SOC), 2009). These details are attached in Section 10.

Jemena provide guidance on horizontal and vertical clearances, the minimum separations between electrical and natural gas mains are provided in Table 1.0 of "Natural Gas Requirements for Developer Provided Trench" as summarised in Table 14.

Table 14 Jemena minimum separation between utilities

Utility	Minimum Separation	
	Gas Mains up to 75mm diameter	Gas Mains up to 75mm diameter
Telecommunication cables and/or conduits	150mm	300mm
Protected ² Low Voltage electricity cables	150mm	300mm

Utility	Minimum Separation	
	Gas Mains up to 75mm diameter	Gas Mains up to 75mm diameter
Protected ² High Voltage electricity cables	300mm	300mm

1. Separations relate to distances between conduits/cables peripheries
2. "Protected" refers to mechanical protection of the cables, which usually takes the form of either polymeric strips (at least 3 mm thick) or clay brick
3. The above table is considered to provide desirable minimum separations. Consideration should be given for the need to access for future maintenance of services when determining the required separations

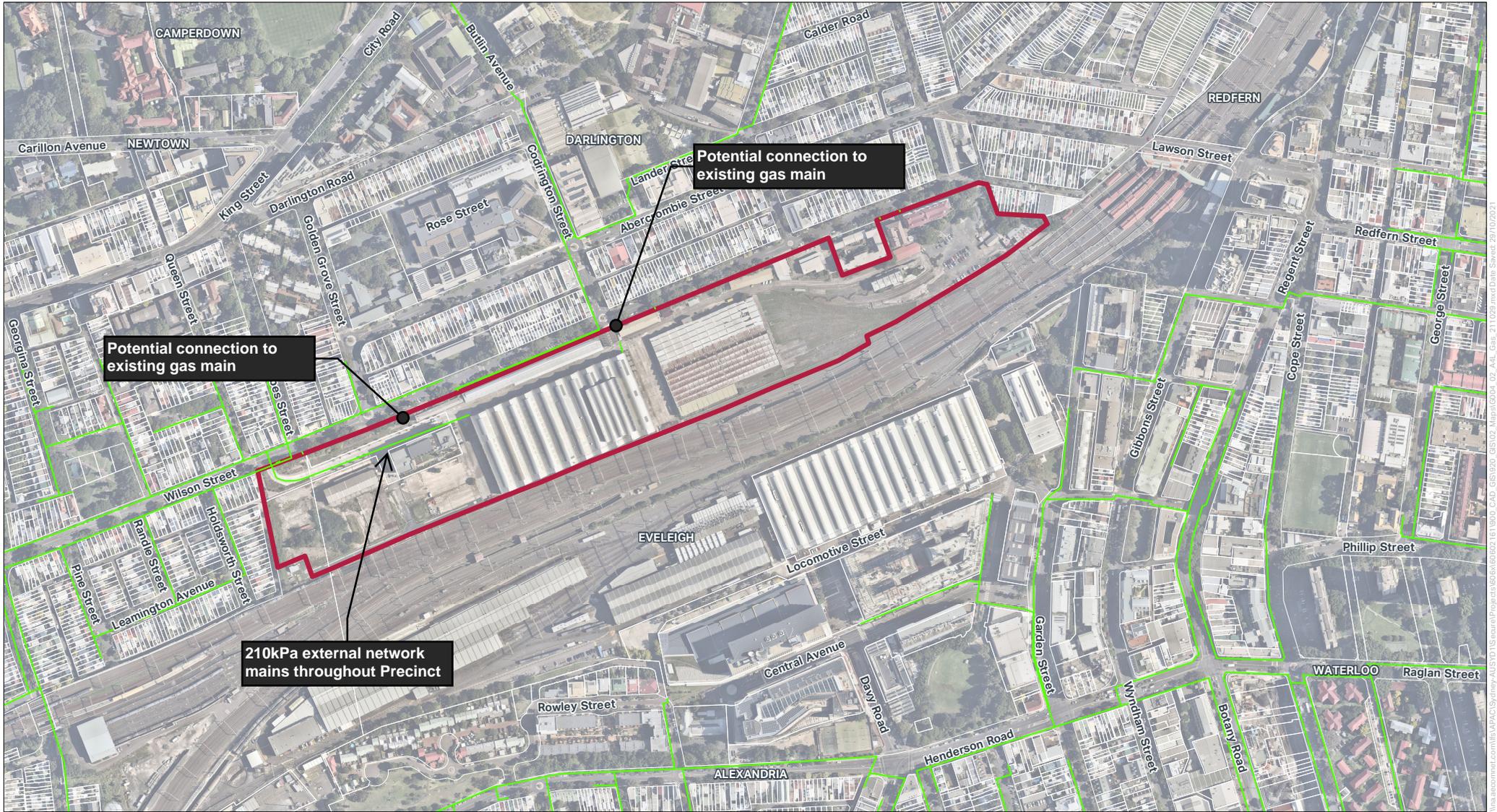


FIGURE 14
 REDFERN/NORTH EVELEIGH - GAS PLAN

- Legend
- Indicative Precinct Boundary
 - Gas

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7.5 Demand Assessment

An assessment of the estimated increase in gas demand generated from the Redfern-North Eveleigh precinct yield has been conducted to determine the required infrastructure upgrades. Individual project areas have been based on the average number of dwellings and proposed Gross Floor Area (GFA) for retail and commercial development outlined in the demand assessment yields presented in Section 0.

The City of Sydney LGA has an average annual household consumption of 17.05 gigajoules (GJ) per year for natural gas in residential dwellings as referenced in the 2020 Calendar Year Average Consumption by LGA (Jemena, 2020). This usage rate typically equates to a natural gas hot water tank, cook top and heating point. Peak demand and annual gas demand are also dependent on the plant supplying the project area.

Jemena have confirmed that different rates are to be used for commercial spaces but were unable to confirm estimated rates. The demand from commercial land use is expected to be substantially less than from residential usage and considering an ultimate drive for Net Zero Carbon has been assumed to be met under decreasing residential demand. This assumption should be confirmed through subsequent load application to Jemena. It should be noted that the gas demands do not account for alternative supply scenarios such as trigeneration.

Table 15 below outlines the rates used to derive the estimated gas demand within the study area, applied to residential dwellings and hospitality venues.

Table 15 Gas Demand Unit Rates

	Units	Rate	Source
City of Sydney LGA Average Household Consumption	MJ/year	17,050	Jemena Gas Network – Average Consumption by LGA (2020)
Conversion Factor	MJ/m ³	39.1	Natural Gas: Energy for the New Millennium (Parliament of Australia, December 1998)
Peak Demand Rate (Residential)	M ³ /day per dwelling	1.19	N/A
BASIX Reduction	%	25	Building Sustainability Index Targets

7.6 Forecast Demand

Table 16 presents the estimated natural gas usage for each precinct, assuming supply to residential properties only. A BASIX reduction of 25% has been applied to the gas demand.

While gas usage can increase under BASIX to offset electrical demand, gas prices have a much greater effect on demand. Due to this variability, it has been assumed that there is no net increase or reduction consequent of BASIX compliant dwellings.

Table 16 Estimated Cumulative Gas Demand Assessment

Sub-Precinct	No. of Units	Peak Demand Rate Residential – (m ³ /day/dwelling)	BASIX Reduction Factor (%)	Gas – m ³ /day Total (inc. BASIX)
Clothing Store	710	1.19	25	634
Paint Shop	381	1.19	25	340
TOTAL				974 m ³ /day

Considering a ±15% range in development yields, the gas demand could vary between **828-1,120 m³/day**.

7.7 Approvals and Next Steps

Jemena does not have a formal approval process, with supply arrangements being confirmed by Jemena as part of their quotation for construction to be provided following submission of applications for connection.

The formal approval process for provision of Jemena infrastructure to be progressed through detailed design processes consist of the following main steps:

1. Undertake site investigations to confirm the layout and extent of existing services (including non-Jemena infrastructure);
2. Submit masterplan including staging of delivery to Jemena for agreement;
3. Submit application for design to Jemena for individual detailed design packages (to include proposed alignment); and
4. Jemena will provide a quote for construction works.

It is noted that the above information is for delivery of the Jemena network through the new street network, it is expected that the buildings will need to make separate applications for connection. Previous advice from Jemena indicates they have sufficient capacity to supply gas to the precinct however formal confirmation will require the finalisation of the masterplan and further consultation with Jemena.

Jemena – in their email from the 21st of July 2021 has confirmed there will be sufficient capacity – subject to appropriate augmentation of the network.

8.0 Data and Telecommunications

8.1 Background

Several communication providers have assets around the RNE Precinct:

- AARNet;
- AMCom;
- National Broadband Network (NBN);
- Nextgen;
- Optus;
- PIPE Networks;
- Primus Telecom;
- Telstra;
- Uecomm; and
- Vocus Communications

However, only NBN, Optus, Telstra, and Uecomm services which border or intersect with the site are shown on plan in Figure 16.

Due to the scale of development expected on the site, it is expected that the new telecommunications servicing will be provided by the NBN, with the developer responsible for designing and installing pit infrastructure to the NBN's guidelines and requirements (or a third party provider as appropriate).

8.2 Existing On-Site Utility Infrastructure

There is substantial data and communications infrastructure present throughout the study area. A plan indicating the locations of existing communications infrastructure is shown in Figure 16 below.

8.2.1 Telstra

Underground Telstra infrastructure is located extensively throughout the RNE Precinct, along the streets adjacent to and within the study area. It has been assumed at this stage that the existing Telstra services are to be retained to continue servicing the site's existing buildings, and to provide connection points for the new reticulation required to service the proposed buildings within the Precinct. This will need to be confirmed as part of the detailed design.

8.2.2 Uecomm

Uecomm has underground assets located near the Precinct boundary, running along the northern side of Wilson Street. The exact location of this service has not been confirmed and may not require confirmation as its location is unlikely to interfere with proposed works on or adjacent to the site.

No connections to the Uecomm network are proposed as part of the RNE Renewal works.

8.2.3 NBN

The National Broadband Network (NBN) is currently upgrading the existing fixed phone and internet network infrastructure in several parts of the study area. A map showing the current rollout of the NBN network in the area is shown below in Figure 15.

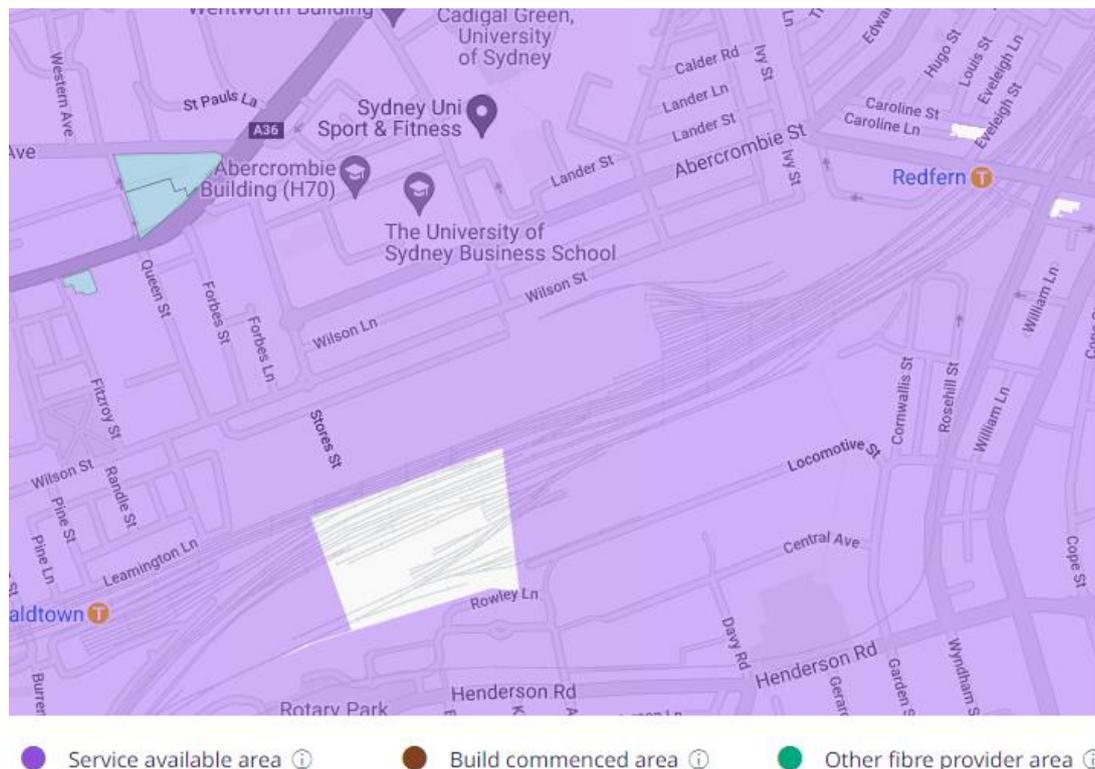


Figure 15 NBN Rollout Map

8.2.4 Optus

Underground Optus infrastructure is present throughout streets near the site. A fibre optic cable of national significance is located along Ivy Street, Lawson Street and Redfern Street.

8.2.5 Other Telecommunications Infrastructure

Various other telecommunications providers listed in Section 8.1 have infrastructure within the vicinity of the RNE Precinct.

8.3 Potential Lead-in Infrastructure Requirements

Advice from NBN received on 16 August 2021 has indicated that capacity will be reserved and ensure that Fibre to the Premises (FTTP) for residential and Enterprise Ethernet (EE) for commercial can be delivered to the development upon formal development agreements. No backhaul costs will be required to bring services to the site boundary. The timeframe for undertaking these works and any costs to be recovered from the developer will be confirmed when a formal application is submitted.

Additional ducts are likely required in the following locations to provide service reticulation to proposed developments within the site:

- North-Eveleigh West: Connection to existing conduits on Wilson Street; and
- North-Eveleigh East: Connection to existing conduits on Wilson Street.

These would require confirmation during detailed design.

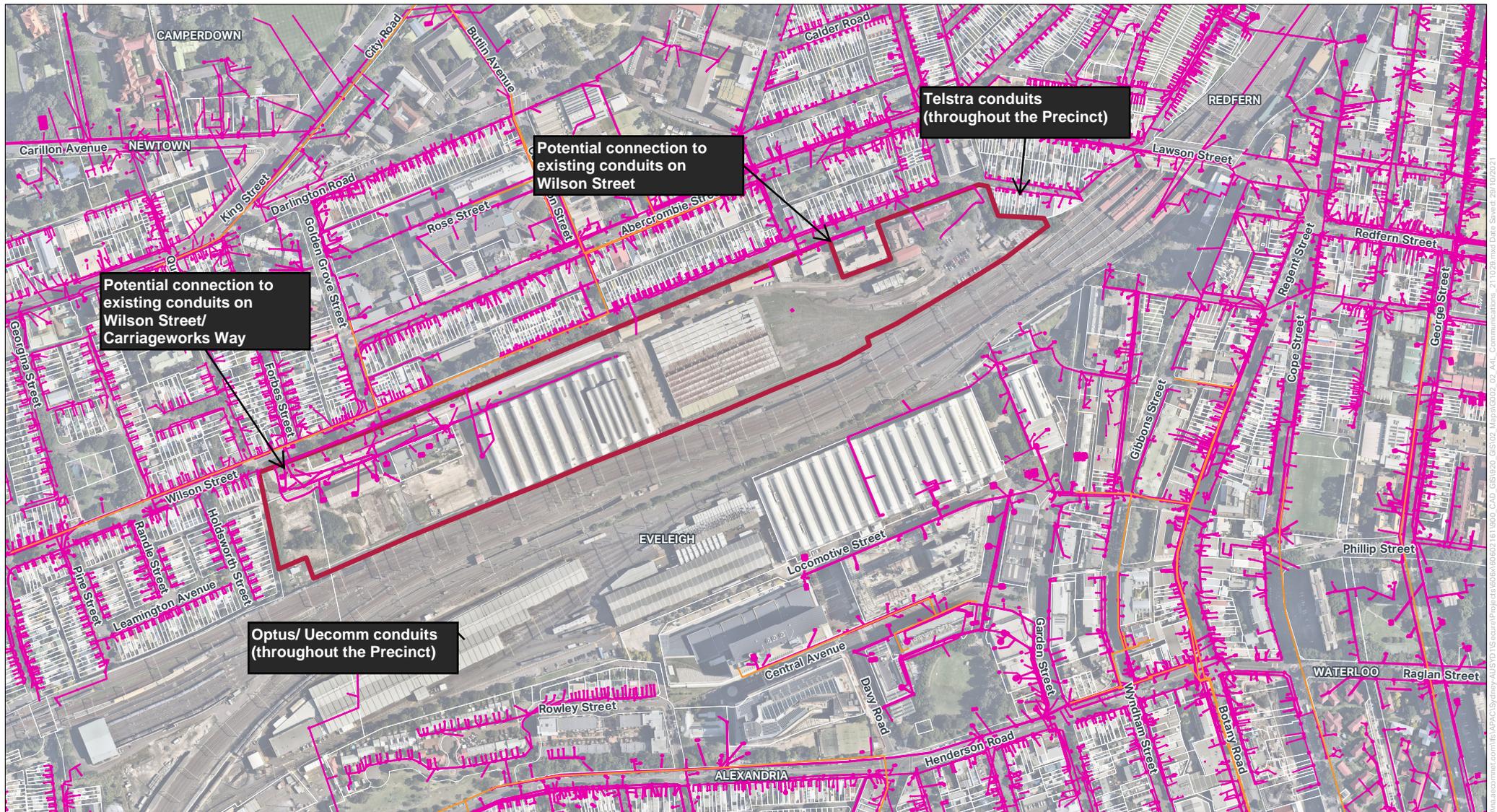


FIGURE 16
 REDFERN/NORTH EVELEIGH - COMMUNICATIONS PLAN

- Legend
- Indicative Precinct Boundary
 - Communications
 - Telstra



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8.4 Coordination of Telecommunications Infrastructure with Other Services

Coordination of the proposed communications infrastructure with other services in the proposed street network would generally be based on the Streets Opening Conference standards (NSW Streets Opening Conference (SOC), 2009). These details are attached in Section 10.

The clearances for NBN services from other utilities is given in Section 5.2.13 of “New Development: Deployment of the NBN Conduit and Pit Network – Guidelines for Developers”, these requirements are presented in Figure 17.

Table 17 Clearance from other carriers and services

Service Item		Minimum Radial Clearances ¹
Gas Pipe	Over 110mm	300mm
	110mm or less	150mm
Power	High Voltage	300mm
	Low Voltage	100mm ²
Water Mains	High Pressure/ Capacity	300mm
	Local Reticulation	150mm
Sewer	Main	300mm
	Connection Pipe	150mm
Other Telecommunications	100mm ¹	

1: Reduced separation is possible where all parties (including the NBN) are consulted and agreement is reached.

2: Only where protection barriers are used, for example: conduit, bedding, marker tape and cover batten.

Figure 17 NBN Clearances from Other Carriers and Underground Services

8.5 Smart Infrastructure Policies

There are several federal, state, and local Smart City related policies that require any new or existing project to be in alignment in order to ensure consistency with wider smart infrastructure and network strategies. A closer review of specific initiatives will need to be considered in order to unlock funding streams for implementation of both physical and digital infrastructure.

The following include relevant policies for consideration:

- Federal Government:
 - **The Australian Government – Smart Cities Plan:** All major existing projects to integrate smart technology solutions into existing projects while ensuring alignment with broader smart city precinct outcomes. Australian government as major contributor to smart infrastructure funding as part of the Australian Infrastructure Plan.
- State Government:
 - **NSW Government’s Smart Infrastructure Policy:** Sets minimum requirements for smart technology to be embedded in all new and upgraded infrastructure from 2020. Outlines best practices for ensuring connected communities through planning, design, build, and operation strategies to ensure smart asset get optimal return on Government’s \$97.3 billion infrastructure commitment. This is part of a suite of policies, strategies, and frameworks developed by the NSW Government to enable ‘Smart Places’.
 - **NSW Government – Smart Places Strategy:** Describes the ‘building blocks’ necessary to realise smart places and informs the decisions and actions by the state government and place owners to implement ‘smart’ solutions for problems in their cities, towns, suburbs, and communities. This includes embedding sensors

technology, capturing urban data, and communicating information and insights. As part of the policy is the Smart Places Acceleration Program, a \$45M fund to assist place owners and local governments to deliver digital infrastructure. This fund is part of the Digital NSW restart fund of \$500M.

- **NSW Government – Digital Government Strategy and Designing Beyond Digital:** Aims to improve community engagement to changing needs through data and insights. The digital strategy sets standards to ensure digital innovation, data insights used to improve public services, while ensuring digital by design is embedding across various sectors in projects.
- Local Government/ Council:
 - **City of Sydney – Smart City Strategic Framework:** Provides an overarching approach to how technology and data can work to enhance quality of life and enable better decision making and overall asset management withing the City. The strategy outlines seven guiding principles: community-first, flexible and adaptive, collaborative, secure and ethical by design, innovative, inclusive, and problem-driven, evidence-based.

8.6 Approvals and Next Steps

Confirmation is required from NBN Co that the site is eligible for supply from their network as defined in Figure 15. Following this an initial application is required and a formal agreement entered between The NBN and TfNSW prior to construction works commencing (this does not prevent designs from being approved).

The formal approval process for the NBN infrastructure to be progressed through the detailed design processes consists of the following main steps:

1. Undertake site investigations to confirm the layout and extent of existing services (including private infrastructure associated with previous land-uses);
2. Liaise with Telstra and Optus to confirm the requirement for diversion and/or relocation of their existing infrastructure;
3. Confirm proposed infrastructure master plan (including staging) and in principle supply arrangements with the NBN or another provider;
4. Initial application submitted to the NBN for supply of the site from their network;
5. The NBN to confirm supply can be provided and provide draft agreement;
6. Revisions of agreement where required;
7. TfNSW to sign NBN agreement;
8. Liaise with Telstra and Optus for quote for diversions or abandonments including any interim works; and
9. Prepare Smart Infrastructure Roadmap that includes policy and operating models, smart and ICT infrastructure, and smart district services.
10. Submit detailed design of individual packages for approval.

NBN – in their email from the 16th of August 2021 has confirmed NBN can deliver FTTP (Fibre to the Premise) and EE (Enterprise Ethernet) to this development.

9.0 Waste

The purpose of this section is to identify and implement waste management strategies.

9.1 NSW State Requirements

9.1.1 Protection of the Environment Operations Act 1997

The NSW waste regulatory framework is set by the *Protection of the Environment Operations Act 1997* (PoEO Act). An objective of the PoEO Act is to:

- Reduce risks to human health and prevent the degradation of the environment using mechanisms that promote the following:
 - Pollution prevention and cleaner production;
 - The reduction to harmless levels of the discharge of substances likely to cause harm to the environment;
 - The elimination of harmful wastes;
 - The reduction in the use of materials and the re-use, recovery or recycling of materials;
 - The making of progressive environmental improvements, including the reduction of pollution at source; and
 - The monitoring and reporting of environmental quality on a regular basis.

The PoEO Act defines 'waste' for regulatory purposes and establishes management and licensing requirements along with offence provisions to deliver environmentally appropriate outcomes. The PoEO Act also establishes the ability to set various waste management requirements via the *Protection of the Environment Operations (Waste) Regulation 2014* (PoEO Waste Regulation).

9.1.2 Protection of the Environment Operations (Waste) Regulation 2014

The PoEO Waste Regulation sets out provisions that cover the way waste is managed in terms of classification and transportation as well as reporting and record keeping requirements for waste management facilities.

9.1.3 Waste Avoidance and Resource Recovery Act 2007

The *Waste Avoidance and Resource Recovery Act 2007* (WARR Act) includes the majority of NSW's over-arching objectives and guiding principles to encourage beneficial re-use and resource recovery.

The WARR Act promotes waste avoidance and resource recovery by providing a framework for the development of strategies and programs. It defines the waste hierarchy which is a set of priorities for the efficient use of resources which underpin the objectives of the WARR Act. The waste hierarchy ensures that resource management options are considered against the following priorities:

1. **Avoidance** including action taken to reduce the amount of waste generated, to maximise efficiency and avoid unnecessary consumption;
2. **Resource recovery** including reuse, recycling, reprocessing and energy recovery. Where avoiding and reducing waste is not possible, the next most preferred option is to re-use the materials without further processing, avoiding the costs of energy and other resources required for recycling; and
3. **Disposal** including management of all disposal options in the most environmentally sensitive manner. Disposal is the least preferred option and is appropriate for materials such as asbestos that cannot be safely reused or recycled.

9.1.4 Waste Avoidance and Resource Recovery Strategy 2014-2021

The *Waste Avoidance and Resource Recovery Strategy 2014-2021* (WARR Strategy) provides the strategic direction for future waste management and resource recovery activities in NSW. The priorities for waste reform were determined by the NSW Government in the *NSW 2021: A plan to make NSW number one*.

The WARR Strategy aims to drive the efficient use of resources, reduce the environmental impact of waste and improve the well-being of the NSW environment, community and economy. The WARR Strategy sets out long-term targets and provides a framework for the development of various implementation plans. The WARR Strategy sets the following targets for 2021–22 which are applicable to the Project:

- Increasing recycling rates to 70% for solid municipal waste; and
- Increasing waste diverted from landfill to 75%.

The WARR Strategy provides a clear framework for waste management to 2021-22 and provides an opportunity for NSW to continue to increase recycling across all waste streams. The Project will aim to meet the objectives of the WARR Strategy and implement measures to manage waste in a way which minimises the impact waste has on the environment.

9.2 Local Government Requirements

9.2.1 City of Sydney Local Environmental Plans (LEP)

Sydney LEPs guide planning decisions for local government areas through zoning and development controls. The definition of Ecologically Sustainable Development in the LEPs takes the same meaning as in the *Protection of the Environment Administration Act 1991* and the *Environmental Planning and Assessment Regulation 2000*.

The LEPs are superseded by State Environment Protection Policy (State and Regional Development) 2011. However, for the purposes of the context study, the principal development standards, provisions, and/or schedules, where relevant, will be considered to ensure the feasibility of sustainable initiatives and actions, e.g. permitted or prohibited development, land uses, local provisions, height of buildings and overshadowing and Schedule 5 Environmental Heritage which lists all the properties of State significance.

9.2.2 Development Control Plans (DCPs)

The Sydney DCP 2012 is a consolidation of the previously separate DCPs and policies in force within the City of Sydney LGA. The Sydney DCP does not apply to the Redfern North-Eveleigh Precinct as it is preceded by State Environment Protection Policy (State and Regional Development) 2011. However, the RNE Precinct is surrounded land that is bound by the Sydney DCP. To enable connection with the surrounding urban fabric, considerations will be made to the general provisions as detailed in the Sydney DCP 2012 in recognition that the RNE Precinct interface with the City of Sydney LGA.

9.3 Guidelines

The following guidelines have been used in preparation of the waste strategy. Relevant waste management practices have been extracted from these guidelines for incorporation into this waste strategy.

9.3.1 NSW EPA (2012) Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities

This guide provides advice to help architects, developers, council staff and building managers to incorporate better waste management practice into the design, establishment, operation and ongoing management of waste services in commercial and industrial developments.

9.3.2 Department of Environment & Climate Change NSW (2008) Better Practice Guide for Waste Management in Multi-unit Dwellings

This guide has been developed to assist council staff; architects, residential developers and building management incorporate better practice in the design, establishment, operation and ongoing management of waste services in residential multi-unit developments. It outlines various essential points to be considered when designing a waste management system for medium or high-density residential, mixed-use and integrated housing developments.

9.4 Waste Management Objectives

The objectives for the management of waste generated by the RNE Precinct are summarised below:

- To maximise opportunities for re-use through source separation and on-site storage;
- To minimise waste generation and maximise re-use and recycling; and
- To ensure efficient collection, storage and transport and disposal of waste in an environmentally friendly manner.

These objectives are in line with the WARR Strategy, Sydney DCP 2012 and industry best practice.

9.5 Potential Environmental Impacts

If not managed responsibly, waste generated by the operation of the RNE Precinct has the potential to cause the following impacts:

- Land and surface water contamination as a result of spills or inappropriate storage, handling, transportation and disposal of waste;
- Noise impacts associated with waste collection, movement and transport;
- Odours and vermin resulting from improper storage and treatment putrescible wastes;
- Visual amenity impacts resulting from waste storage and movements at the site (e.g. bins storage, collection and transport); and
- Off-site land and water pollution due to windblown wastes following inappropriate storage, handling, and transportation of wastes.

9.6 Waste Management Strategy

The operational waste management strategy has been developed by adopting the waste hierarchy as a framework for waste management practices to achieve the best environmental outcomes. The preferred order of adoption is as follows:

- **Avoid** the potential of waste generation;
- **Reduce** waste during operations;
- **Re-use** waste where applicable;
- **Recycle** waste whenever possible;
- **Recovery** of waste materials; and
- **Disposal** of waste when there is no reuse or recycling potential.

Where residential developments and commercial (retail) developments occupy the same site, the waste handling, storage and collection system for residential and commercial waste are to be separate and self-contained, with separate centralised waste and recycling areas.

9.7 Operations Waste Generation

The key activities associated with the operational works expected to generate waste has been based residential dwellings and commercial areas from the Paint Shop concept masterplan and the waste generation rates from the City of Sydney's Guidelines for Waste Management in New Developments.

Table 18: Anticipated Waste Generation (CoS Waste Management in New Developments)

Broad Land Use	Paint Shop	Waste (Litres per week)			
		Waste	Recycling	Garden Organics	Food Waste
Residential* (per unit)	381	45,720	45,720	45,720**	N/A
Non-Residential*** (m ² GFA / 100m ²)	1095	115,024	191,707	N/A	38,341
Community (m ² GFA/ 100m ²)	25	3,525	8,813	N/A	881
Retail**** (m ² GFA/ 100m ²)	93	16,322	130,578	N/A	9,793
Total		180,591	376,818	45,720	49,015

*Only applies to multi-residential dwellings that generate garden organics (e.g. garden prunings and leaves).

**Assumed to be multi-unit Residential Developments (see. Reference A, Guidelines for Waste Management in New Developments)

***Assumed to be commercial offices (see. Reference A, Guidelines for Waste Management in New Developments)

****Assumed to be general retailing (see Reference A, Guidelines for Waste Management in New Developments)

Overall anticipated waste from the fully developed Paint Shop Precinct is approximately 650,000 litres / week.

9.8 Waste Management Measures

The identification and separation of solid waste would be carried out at the point of generation to aid the maximum re-use and recycling of materials. All waste materials generated during the operation would be identified and classified in line with the *Waste Classification Guidelines* (EPA, 2014) prior to separation. Waste management guidelines during the operation phase should generally comply with Section E of the *Guidelines for Waste Management in New Developments* (City of Sydney)

Appropriate containers and bins would be provided on all levels across the site during operation for garbage and reusable/recyclable materials. These containers would be clearly marked and identifiable to staff/caretakers (where applicable), residents and the public to encourage correct waste separation. All containers and bins would be placed in allocated waste storage areas which provide adequate capacity to store all waste generated between collection cycles. Waste and recycling areas are to be located in a position that is convenient for both users and waste collection staff, promotes source separation and reduces contamination.

The following waste streams will be source-separated at the proposed development:

- General waste;
- Comingled recyclables (including paper and cardboard); and
- Organic (food) waste.

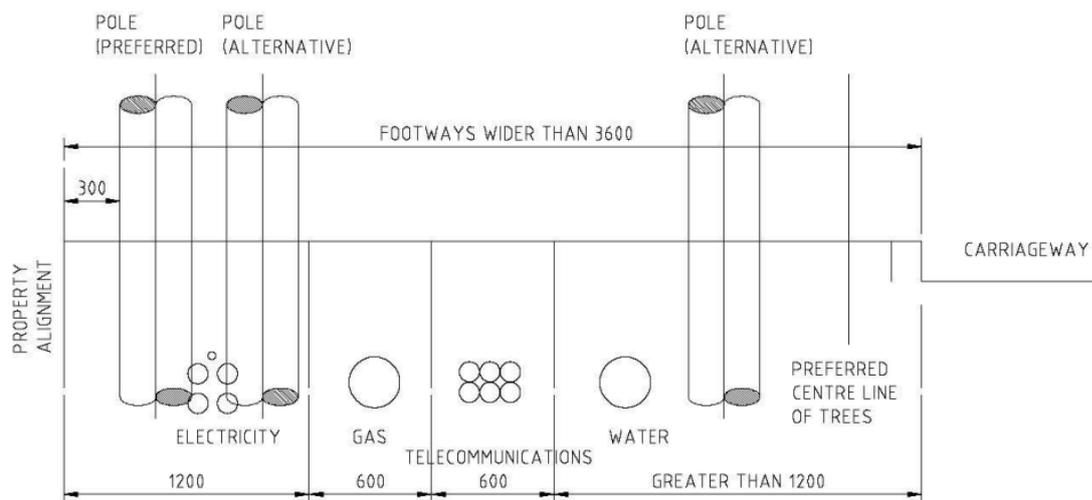
Specific waste management and waste collection options shall be developed as part of the detailed design and approval.

10.0 Utility Service Planning

10.1 Street Openings Conference Service Corridors

The “NSW Streets Opening Coordination Council Guides, 2018”, provides guidelines for service allocations within the footpath. It has been assumed that the majority of new utility infrastructure for the North Eveleigh West Site will be within new footpaths, these should follow the allocations shown below in Figure 18.

It is noted that City of Sydney generally requires the street lighting to be located adjacent to the kerb line, particularly if it is their asset.



Notes:

1. If installing assets in regional areas contact the local council for council specific requirements.
2. Where a utility/service provider providing underground services wishes to encroach on space allocated to another utility/service provider, it should consult and seek agreement with the other. Both utility/service providers should record such encroachments on their respective mapping systems.
3. The narrower water allocation shown may not be sufficient to include recycled water mains.
4. The preferred position for poles or street lighting columns is within 300mm of the property alignment. Some alternative positions are shown but location should be consistent with minimising the overall cost to the public while considering safety requirements
5. Where the erection of power poles in the 0-1200mm allocation is impracticable, these may be located in the water allocation by agreement with the appropriate Public Authority.
6. No specific allocation for trees can be identified for footpaths up to 3600mm wide. Consultation with utility/service providers is required and due regard must be given to tree species as outlined in *6.5 Street Trees*
7. Pillars/pedestals/Service pits etc. should be located in a position that is set back from street intersections.
8. See *Section 6.6* for guidance on new poles and pole replacements.
9. Sewer pressure mains to be laid in water allocation deeper than water mains.
10. Vacuum sewers typically laid in property but could also be in water allocation.
11. For structures to be erected over the electrical distributors footpath allocation for underground mains the electrical distributor must be consulted in accordance with Clause 5.3 Customer's Structure - Service and Installation Rules of New South Wales.
12. If both footpaths are able to be used, the assets should be able to be better distributed across both sides of the roadway so that there is space to install infrastructure at the most appropriate location with respect to minimising overall cost to the customers.

Figure 18 Streets dedicated after 1 January 1991 (SOC, 2009)

Where narrow footpaths between 2-3m are required, then shared trench arrangements may be used as detailed in Figure 19 below.

Again, it is noted that City of Sydney generally requires the street lighting to be located adjacent to the

kerb line, particularly if it is their asset.

Footways of width less than 3000mm require special consideration to accommodate services.

Notes:

- The preferred position for poles, pillars, cabinets and street lighting columns is within 300mm of the property alignment.
- The preferred position for street lighting columns is adjacent to the property alignment or centred to the property. Where the erection of power poles in the close to property alignment, is impractical these may be located in an alternative allocation by agreement with the appropriate utility/service provider. Power pole location should be consistent with minimising the overall cost to the public while considering safety requirements.
- No specific allocation for trees can be identified for footways up to 2000mm wide. Consultation with utility/service providers is required and due regard must be given to tree species. Refer *Section 6.5*.
- Pillars/pedestals/service pits etc should be located in a position that is set back from street intersections.
- See *Section 6.6* for guidance on new poles and pole replacements.

Figure 19 Notes for allocation of space in narrow footways (SOC, 2009)

A shared trenching arrangement is generally not considered appropriate where main/trunk services such as potential HV electrical feeders are required; however, it is feasible if separation clearances are maintained (e.g. 300mm from 11kV feeders). Furthermore, while Ausgrid has shared trench agreements with Telstra, no such agreement exists with the NBN therefore shared trenching is not considered desirable for the RNE site.

Further consultation will also be required with the City of Sydney to confirm if street lighting will be separate from the electricity supply, if so the standard allocation may require revision.

10.2 DCP, planning and engineering controls

As utilities and waste are generally expected to be owned and operated by the relevant utility authorities it is anticipated all utilities designed and sized in accordance with relevant standards of the following Authorities: The below presents a summary of the relevant codes and specification. It is not exhaustive and relevant versions should be considered at time of detailed design:

- Sydney Water:
 - Water Supply Code of Australia (Sydney Water Edition);
 - Gravity Sewerage Code of Australia (Sydney Water Edition);
- Ausgrid:
 - Network Standards Specifications and Technical Drawings;
- Jemena
 - Jemena Network Operator Rules;
- Communications;
 - NBN Building Engineering and Design Standard – New Developments;
 - Smart Infrastructure Policies noted in Section 8.5.
- City of Sydney (Waste);
 - Guidelines for Waste Management in New Developments

11.0 Summary and Conclusions

There is significant existing utility infrastructure surrounding the Redfern North-Eveleigh Precinct. Previous investigations and other utility reports indicate that local amplifications to potable water, wastewater, electrical and gas delivery systems may be required to service increased demand from the redevelopment of the site. Feasibility advice from Jemena and NBN have indicated capacity in the current network to supply augmentation to the whole site (including the Paint Shop Precinct). Upgrades to the local zone substations may also be required subject to confirmation by Ausgrid.

Utility constraints that may affect the site development include:

- Demand calculations provide the following estimates based on $\pm 15\%$ range in development yields:
 - Potable water between **989-1,338 kL/day**
 - Sewer loading between **5.0-6.8 L/s**
 - Electrical load between **15.4-20.9 MVA**
 - Gas demand between **828-1,120 m³/day**
 - Waste – approximately **650,000 litres / week**
- A concentration of electrical infrastructure running within the site including
 - Transgrid services tunnel containing a 330kV transmission cable. The tunnel alignment travels from Little Eveleigh St south across the rail corridor;
 - Ausgrid transmission/distribution line crossing the rail corridor from Wilson St to Locomotive St;
 - Various disused Sydney Trains HV infrastructure along the rail corridor; and
 - Aerial infrastructure within and adjacent to the site which may be abandoned or relocated underground pending City of Sydney approval.

Opportunities and needs to support the precinct include:

- Lead-in infrastructure upgrades for water, wastewater and electrical supply are likely;
- Gas and telecommunication networks have adequate capacity to provide upgrades pending formal applications; and
- Planned developments in surrounding areas like Tech Central could enable sharing of sustainable utility infrastructure and potential recycled water networks.

Future work that is required includes:

- Coordination with the Urban Design team to understand development staging scenarios and limit the impact on the existing trunk utilities;
- Investigation of potential utility amplification to areas of increased density;
- Further coordination with utility authorities to confirm lead-in infrastructure requirements and routes;
- Potential hydraulic modelling in detailed design to confirm potable and wastewater lead-in infrastructure upgrades; and
- Further opportunities for alternative utility supply requiring further investigation as part of this ongoing study.

A summary of the anticipated upgrades is provided below.

Table 19: Summary of Existing Utility Services Infrastructure and Required Upgrades

Utility Service	Potable Water	Wastewater	Electrical	Gas	Data and Comms
Utility Authority Asset	Sydney Water	Sydney Water	Ausgrid	Jemena	The NBN and Telstra
Adequate Capacity for Proposed Development?	Yes*	Yes*	Yes*	Yes	Yes
Proposed Works	Local network amplifications	Local network amplifications	New feeder cables	N/A	N/A

*Current capacity and servicing requirements to be confirmed with relevant utility authority during the detailed design stage of the development.

Appendix A – Authority Consultation

December 2, 2021

Transport For NSW
c/- AECOM AUSTRALIA PTY LTD

Feasibility Letter

Developer: Transport For NSW
Your reference: 60660346
Development: Lot 1 DP4209 Rosehill St, Redfern
Development Description: The Redfern North-Eveleigh precinct renewal has 5 concept plans that will consist of majority residential units with commercial and business units on the lower levels. These concept plans consist of several 6-8 level buildings with open space.
Your application date: August 6, 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.

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. Developer Works Deed

After the WSC has submitted your new application, they'll receive the our Notice and Developer Works Deed. You and your accredited Developer Infrastructure Providers (Providers) will need to sign and lodge both copies of the Deed with your nominated Coordinator. After we've signed the documents, one copy will be returned to the WSC.

The Deed sets out for this project:

- your responsibilities
- our responsibilities
- the Provider's responsibilities.

You must do all the things that we ask you to do in that Deed. This is because your development does not have water, recycled water and sewer services and you must construct and pay for the following works extensions under this Deed to provide these services.

Note: The Coordinator must be fully authorised by us for the whole time of the agreement.

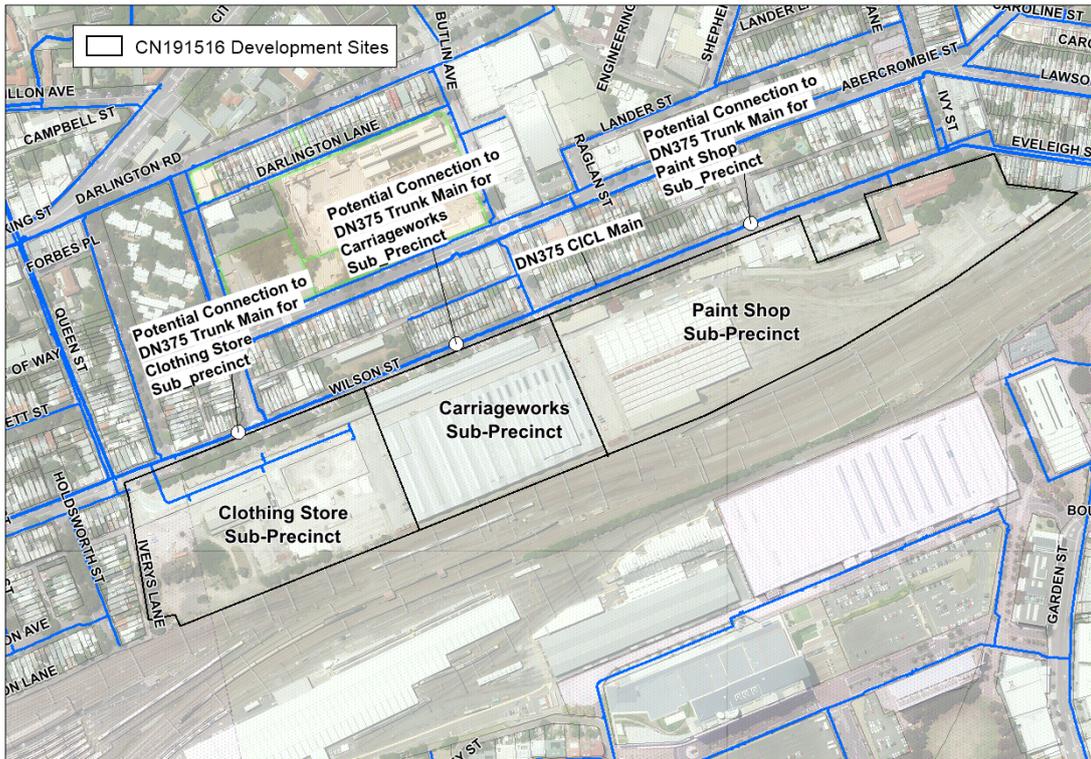
4. Water and Sewer Works

4.1 Water

Your development must have a frontage to a water main that is the right size and can be used for connection.

We've assessed your application and found that:

- Strategic investigation shows that the trunk water system has adequate capacity to service this development area. The estimated maximum daily potable water demand is 1,321 kL/day.
- To service the proposed sites, a number of connections to the existing Sydney Water DN375 CICL main will be required, as shown in the figure below.
- When the Section 73 application is lodged, your WSC can assess your proposal to advise you of any amplification requirements based on the proposed building heights, connection points and corresponding discharge. More information about the Section 73 application process is available on our web page in the *Land Development Manual*.

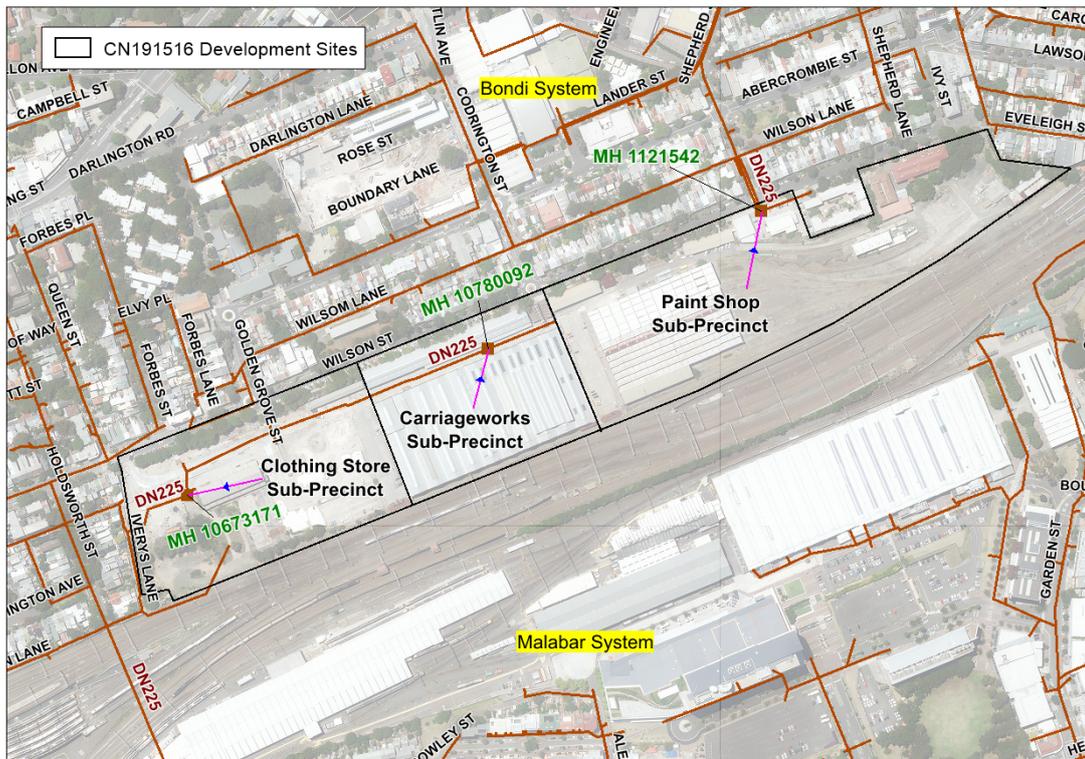


4.2 Sewer

Your development must have a sewer main that is the right size and can be used for connection. That sewer must also have a connection point within your development's boundaries.

We've assessed your application and found that:

- Strategic investigation shows that the trunk wastewater system has adequate capacity to service this development area.
- To service the sites, a number of connections to the existing Sydney Water DN225 sewers will be required as shown in the figure below.
- When the Section 73 application is lodged, your WSC can assess your proposal to advise you of any amplification requirements based on the proposed building heights, connection points and corresponding discharge. More information about the Section 73 application process is available on our web page in the *Land Development Manual*.



4:3 Recycled Water

- Currently Sydney Water does not have any recycled water services in this area.
- Provisional Recycled water opportunities are currently being considered in Sydney Waters sub-regional study.
- In order to progress the recycled water opportunities for the development in question, Sydney Water will request additional information on the development and an inception meeting to identify required collaboration to set up a possible recycled water offering.
- For further information please contact Cassie Perente – email: Cassie.perente@sydneywater.com.au or Grant Macdonnell – email: grant.macdonnell@sydneywater.com.au

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.

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.

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 will be available, once you have completed your drinking and recycled water main construction 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

Roeffen, Gijs

From: Melida Rodriguez <MRodriguez@ausgrid.com.au>
Sent: Tuesday, 30 November 2021 3:55 PM
To: Roeffen, Gijs
Cc: Jonothan Clarke
Subject: [EXTERNAL] Feasibility Study for Redfern Precinct Development

Hi Gijs,

As discussed in previous meeting, TfNSW has engaged with Ausgrid to establish the preferred servicing strategy for the RNE precinct.

Ausgrid has offered to undertake a detailed feasibility assessment to identify options and required augmentations to best service the site.

Please let us know when you are ready to start the feasibility study.

Regards,

Melida Rodriguez

MSc, MIEAust, CPEng, NER - Contestable Project Coordinator | Connections | Customer & Partner Experience



☎: (02) 9477 8325 📠 0409 864 745
Level 12, 24-28, Campbell Street, Sydney NSW 2000
mrodriguez@ausgrid.com.au



I acknowledge and pay my respects to the traditional owners and custodians of the land in which I work, walk and live.

Please consider the environment before printing this email.

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This e-mail may contain confidential or privileged information. If you have received it in error, please notify the sender immediately via return e-mail and then delete the original e-mail. If you are the intended recipient, please note the change of sender email address to @ausgrid.com.au. Ausgrid has collected your business contact details for dealing with you in your business capacity. More information about how we handle your personal information, including your right of access is contained at <http://www.ausgrid.com.au/>

Wong, William

From: Kareena Prado <kareenaprado@nbnc.com.au>
Sent: Monday, 16 August 2021 4:39 PM
To: Wong, William
Cc: Roeffen, Gijs; Kondos, Alexandra [C]; Luong, Anna
Subject: [EXTERNAL] nbn New Development application confirmation: DEV-00147610 - Redfern North Eveleigh

Hello William,

Thank you for speaking with me.

I can confirm nbn can deliver FTTP (Fibre to the Premise) and EE (Enterprise Ethernet) to this development.

There is no backhaul costs associated to this site.

Please do not hesitate to contact me

Kind regards,
Kareena Prado

Senior Business Development Manager, NSW/ACT | New Developments, Business Enterprise & Government
| M +61 4 2853 7208 | E kareenaprado@nbnc.com.au

Visit our New Developments site: www.nbn.com.au/newdevelopments
Remember to submit all Pre-Construct and As-Built designs for review via the [new upload tools](#).
For all existing application updates please use the [tracker](#)

business nbn™



From: Wong, William <William.Wong2@aecom.com>
Sent: Friday, 16 July 2021 5:17 PM
To: Kareena Prado <kareenaprado@nbnc.com.au>
Cc: Roeffen, Gijs <gijs.roeffen@aecom.com>; Kondos, Alexandra <alexandra.kondos@consultant.aecom.com>; Luong, Anna <Anna.Luong@aecom.com>
Subject: [External] RE: [EXTERNAL] Your nbn™ New Development application confirmation: STG-W000197297

EXTERNAL SENDER – Be cautious opening Links and Attachments

Hi Kareena,

TfNSW in partnership with UrbanGrowth NSW has engaged AECOM to undertake an infrastructure and utilities assessment to provide advice to inform the redevelopment of the Redfern North Eveleigh (RNE) Precinct. As part of this process, we would like to submit a feasibility application to NBN requesting for high level commentary on telecommunications infrastructure servicing the proposed RNE site area.

Attached is the original feasibility application letter detailing the proposed development and requested items with site plans and demand forecasts enclosed.

The development will not be expected to go ahead until 2025.

Please let me know if you require any additional information.

Regards,

William Wong

Civil Engineer

M +61 466 297 222

William.Wong2@aecom.com

AECOM

Level 21, 420 George Street, Sydney, NSW 2000

PO Box Q410, QVB PO, Sydney, NSW, 1230

T +61 2 8934 0000 F +61 2 8934 0001

www.aecom.com

Please consider the environment before printing this email.

From: Developer Liaison <developerliaison@nbnc.com.au>

Sent: Friday, 16 July 2021 5:11 PM

To: Wong, William <William.Wong2@aecom.com>

Subject: [EXTERNAL] Your nbn™ New Development application confirmation: STG-W000197297



Dear William Wong,

Thank you for your recent application.

Your development reference is: STG-W000197297

The development address submitted is : 4 , Lawson Street , Eveleigh , NSW,2015

Latitude: -33.8954261

Longitude: 151.1941017

The preferred name submitted for this development is: Redfern North Eveleigh

What's next?

nbn will start a technical assessment of your application to confirm our charges and how to deliver the nbn™ broadband access network to your development.

We will contact you within 20 business days.

Your application details

Application details submitted

Building type: Mixed residential and commercial use

Development work type: Other (Apartment building (or highrise) and community titles)

Council reference number:

Estimated occupancy date: 1/01/2025

Build type: Pit and Pipe

Contact details submitted

Your details

William Wong

0466297222

william.wong2@aecom.com

Contract Signatory

Same as your details

Billing Information

ABN: 20093846925

Registered entity name: AECOM AUSTRALIA PTY LTD

Preferred business name: AECOM AUSTRALIA PTY LTD

Billing Contact

Same as your details

Accounts payable Contact

Same as your details

Thank you and regards,
nbn™ New Developments team.

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For specific enquiries about your application, contact us on 1800 687 626

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Wong, William

From: Neale Hilton <Neale.Hilton@jemena.com.au>
Sent: Wednesday, 21 July 2021 10:32 AM
To: Wong, William
Subject: [EXTERNAL] FW: Redfern North Eveleigh - Jemena Feasibility Application
Attachments: 2021.07.13 Redfern North Everleigh Feasibility Application - Jemena.pdf

William

Thank you for your detailed report regarding the potential re-development of Redfern North Eveleigh. Jemena appreciates being involved in the forward planning of the proposal and looks forward to providing Natural Gas for consumer benefits.

Below are the responses to the specific requests on the report:

- Jemena confirms that the attached report accurately identifies current Natural Gas network within the nominated areas
- Network has current capacity to supply this proposal and can augment with new network extensions and district regulator stations should they be required. Jemena advises that the medium pressure 210kPa network would be used to connect each building based on historical gas loads. Please note that Jemena does not reserve capacity for any individual project.
- There are no current plans to augment the existing network to support this proposal. This will be done once building construction is imminent with a site construction organisation after formal application is made to Jemena via our Portal with nominated hourly gas loads. Urban Growth have not previously engaged Jemena directly to fund, construct and connect buildings as predominately D&C arrangements occur in the marketplace.
- Jemena has been engaged with other proposals in this area which are of a confidential nature.
- Jemena seeks to make connections offers within our Regulatory requirements as set out by the Australian Energy Regulator(AER). Jemena can augment its network prior to development taking place via funding from third parties, however this does not include any pioneer schemes.
- Depending on timing, Jemena would required a minimum of 12 weeks to mobilise construction.
- As each building will have an individual connection, Jemena may be in a position to delay any augmentation as construction progresses.

Regards

Neale Hilton

Network Development Specialist –
Residential Medium Density/High Rise

Jemena

Level 14, 99 Walker Street, North Sydney, NSW 2060
M 0402 060 151

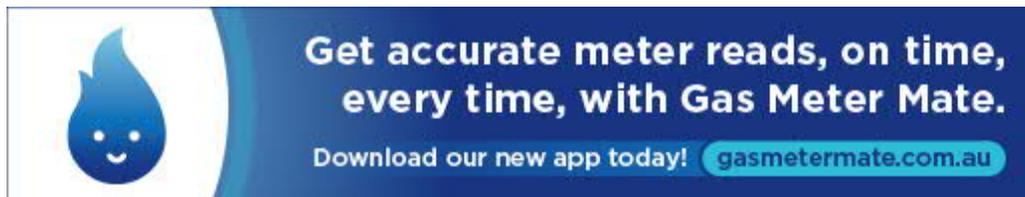
neale.hilton@jemena.com.au | www.jemena.com.au



From: Stephen Angel <Stephen.Angel@jemena.com.au>
Sent: Monday, 19 July 2021 11:13 AM

To: Neale Hilton <Neale.Hilton@jemena.com.au>
Subject: FW: Redfern North Eveleigh - Jemena Feasibility Application

Stephen Angel
Network Development Manager
Jemena
Level 14, 99 Walker Street, North Sydney, NSW 2060
PO Box 1220, North Sydney 2059
(02) 9867 7034
stephen.angel@jemena.com.au | www.jemena.com.au



From: Wong, William <William.Wong2@aecom.com>
Sent: Friday, 16 July 2021 4:28 PM
To: Stephen Angel <Stephen.Angel@jemena.com.au>
Cc: Kondos, Alexandra <alexandra.kondos@consultant.aecom.com>; Luong, Anna <Anna.Luong@aecom.com>;
Roeffen, Gijs <gijs.roeffen@aecom.com>
Subject: Redfern North Eveleigh - Jemena Feasibility Application

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Hi Stephen,

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Attached is a feasibility application letter detailing the proposed development and requested items with site plans and demand forecasts enclosed.

Let me know if you require additional information which may assist with this application.

Regards,

William Wong
Civil Engineer
M +61 466 297 222
William.Wong2@aecom.com

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www.aecom.com

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