MOTT MACDONALD

Explorer Street Precinct

Utilities & Infrastructure Servicing Assessment

July 2023

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Explorer Street Precinct

Utilities & Infrastructure Servicing Assessment

July 2023

Issue and Revision Record

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A	31/05/23	Aliye Bayhan	Winston Phan	Boon Soo	Preliminary Issue
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Executive Summary

This Utilities & Infrastructure Servicing Assessment has been undertaken to satisfy the associated planning requirements. The scope of this report is to:

- Summarise existing utility infrastructure and consider required relocations and/or upgrade works to service the proposed development
- Undertake high level utility demand forecasting based on the proposed development yield
- Provide sustainability initiative options that can be explored in future design stages
- Provide high level cost advice on infrastructure servicing

The utility planning requirements are summarised below along with the location where they have been addressed within this report. This report identifies preliminary development staging and utility authority consultation, the final staging and delivery of utility infrastructure will form part of subsequent design stages.

The site is currently serviced through the following means:

- **Stormwater:** Stormwater runoff flows into the Munni St Catchment.
- **Wastewater:** Wastewater servicing is provided by Sydney Water Corporation (SWC) which is transported to the Bondi Primary Wastewater Treatment plant before discharging into the deep-water ocean outfall.
- **Potable Water:** Drinking water is provided by SWC from Potts Hill Water Delivery System sourced from Warragamba Dam
- **Telecommunications:** Some telecommunications providers have assets in the vicinity of the site including Telstra, NBN Co, Optus, and TPG
- **Electrical:** Low voltage electrical supply is provided by AusGrid and NextGen.
- **Gas:** Gas supply is provided by Jemena.

Indicative building services demand modelling has been undertaken for the purpose of considering lead-in utility infrastructure requirements based on the latest available property development yields in Gross Floor Area (GFA). However, it is noted that these will change as part of the normal design development process. A summary of the servie demand values is shown in Table 1-1 below.

Table 1-1: Summary of Indicative Development Demand Values

Service Type	Total Demand Range[1]
Wastewater (L/s - Average Dry Weather Flow including BASIX)	0.9
Potable Water (kL/day - Maximum Daily Demand including BASIX)	202
Telecommunications	Unable to be calculated. Outcomes of the feasibility application to be incorporated into later revisions of the report.
Electrical (MVA - Peak Demand including 0.8 Diversity Factor)	1.27
Gas (m^3/day - Daily Demand including BASIX)	591

[1]Demand values provided in the table are accurate to within ±15% (although greater inaccuracies are possible due to the level of design). Demand values are to be updated when development yields are updated.

A high-level electrical distribution capacity network map indicates that there is sufficient capacity to service the electrical demand of the proposed development. Other utility service demand requirements will need to be assessed by the relevant utility authority through the feasibility application letters. The utility consultation will provide details into existing service infrastructure capacity, any servicing requirements such as upgrades or relocations for the proposed works at Explorer St.

A number of sustainability initiatives are being assessed for Explorer Street Precinct such as:

- Smart infrastructure
- Stormwater harvesting
- Recycled water

There is a strong case for Smart Infrastructure along with rainwater harvesting and recycled water. These precinct systems will continue to be explored in subsequent design stages based on feedback with council and utility authorities.

1 Introduction

1.1 Purpose

This Utilities & Infrastructure Servicing Assessment has been prepared by Mott MacDonald on behalf of The Department of Planning and Environment to support the rezoning package for Explorer St, Eveleigh. The Department is currently preparing a new Urban Design Study and Master Plan, which will inform the preparation of an Explanation of Intended Effects and a Design Guide.

The purpose of the utilities scope is to identify existing utility infrastructure with consideration for layout and capacity for new utilities to service expected demand generated by approximately 363 new apartments, including further detail on potential utility connection locations specific to the Explorer Street Precinct. This report will build upon the previous work by Land and Housing Corporation (LAHC) and will result in the preparation of a rezoning proposal for the site which will be placed on public exhibition later in 2023.

The scope of the report includes:

- Summarising the existing services infrastructure located within the Explorer Street Precinct.
- Servicing demand assessment for services based on the proposed development yield
- Provide a high-level cost analysis of lead-in infrastructure and servicing requirements (to be completed in next revision)
- Advises on opportunities and constraints; and
- Summarises next steps including site investigation to confirm the assumptions included in this report.

It should be noted that details of existing infrastructure found in this report are based on plan drawings and data provided by the relevant authorities. This information will need additional confirmation through site investigations prior to the commencement of detailed design. Further consultation with authorities will take place as part of this project.

1.2 Site Overview

The Department of Planning and Environment is preparing a rezoning package for Explorer St, Eveleigh which builds upon work previously undertaken by the LAHC.

Figure 1-1: Explorer St Precinct Subject Site

Explorer Street Precinct, Eveleigh falls under the City of Sydney Council district, and is approximately 2km from the Sydney Central Business District. The site is bounded the rail corridor and the Eveleigh Railway Workshops to the north, Australian Technology Park to the east, Henderson Road and Railway Parade to the south, Erskineville Station and workshops to the west. The site currently has 46 low density social housing dwellings. The extent of the investigation area is presented in Figure 1-1.

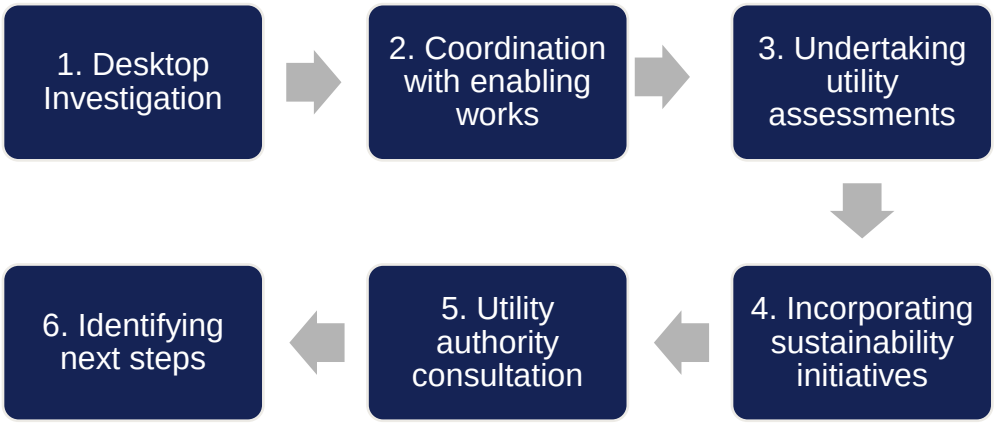
1.3 Staging

The exact staging of the proposed developments is still under consideration. The potential diversion and/or decommissioning of existing infrastructure (and any interim works that may be required to achieve this) is to be undertaken on the proposed development.

This report is primarily focused on the feasibility of servicing the redevelopment of the Site from an infrastructure capacity perspective. The individual staging of utility services layouts will be considered during the detailed design of each study area.

2 Assessment Methodology

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



Desktop investigation:

- Desktop investigation through 'Before You Dig Australia' enquiries and previous utility reports
- Review of utility information obtained from site surveys and previous authority advice
- Gap analysis and advice on further investigations required.

Undertaking utility assessments:

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

Incorporating sustainability initiatives:

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

Utility authority consultation:

- Development and submission of feasibility applications to each utility authority with projected demands
- Incorporation of utility agency advice around servicing options, routes, timings, costs, and timings for delivery.
- Continual coordination around any changes to demand assessments and detailing of any further assessments or studies required to confirm supply methods (e.g., water or wastewater modelling).

Identifying next steps:

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

2.1 Utility Consultation

Utility feasibility applications have been prepared and submitted to the following asset authorities:

- Sydney Water
- Ausgrid
- Jemena
- NBN Co

Feasibility application letters have been lodged with asset owners to provide details around the development proposal, high-level demand servicing requirements and information on any impacted or proposed utility relocation/connection works.

2.2 Master Plan Development Profile

Development profile based on the architectural targets have been provided to estimate the future servicing demand. The development profile for the Explorer St development are shown in Table 2-1 below.

Table 2-1: Demand Assessment Development Profiles

Explorer St	Residential Apartments (No.)	GFA (m2)
Final Reference Design	363	27,671

The development layout of the Explorer St precinct consists of Blocks A, B and C which are 13, 7 and 13 storeys high respectively. Figure 2-1 below shows the proposed development layout.

Figure 2-1: Development Layout

3 Desktop Investigation

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

- 'Before You Dig Australia' Enquires
- Utility Authority GIS systems
- Information provided by utility agencies.

Table 3-1 below shows a summary of the identified utility services adjacent to the Precinct:

Table 3-1: Summary of Identified Utility Services

Utility Type	Authority Name	Potential Impacts
Electrical	Ausgrid	Yes
Electrical	City of Sydney	Yes
Stormwater	City of Sydney	Yes
Gas	Jemena Gas	Yes
Telecommunications	NBN Co NswAct	Yes
Telecommunications	Nextgen NCC	No
Telecommunications	Optus	Yes
Electrical	Sydney Trains	Yes
Water and Wastewater	Sydney Water	Yes
Telecommunications	Telstra	Yes
Telecommunications	TPG Telecom	Yes

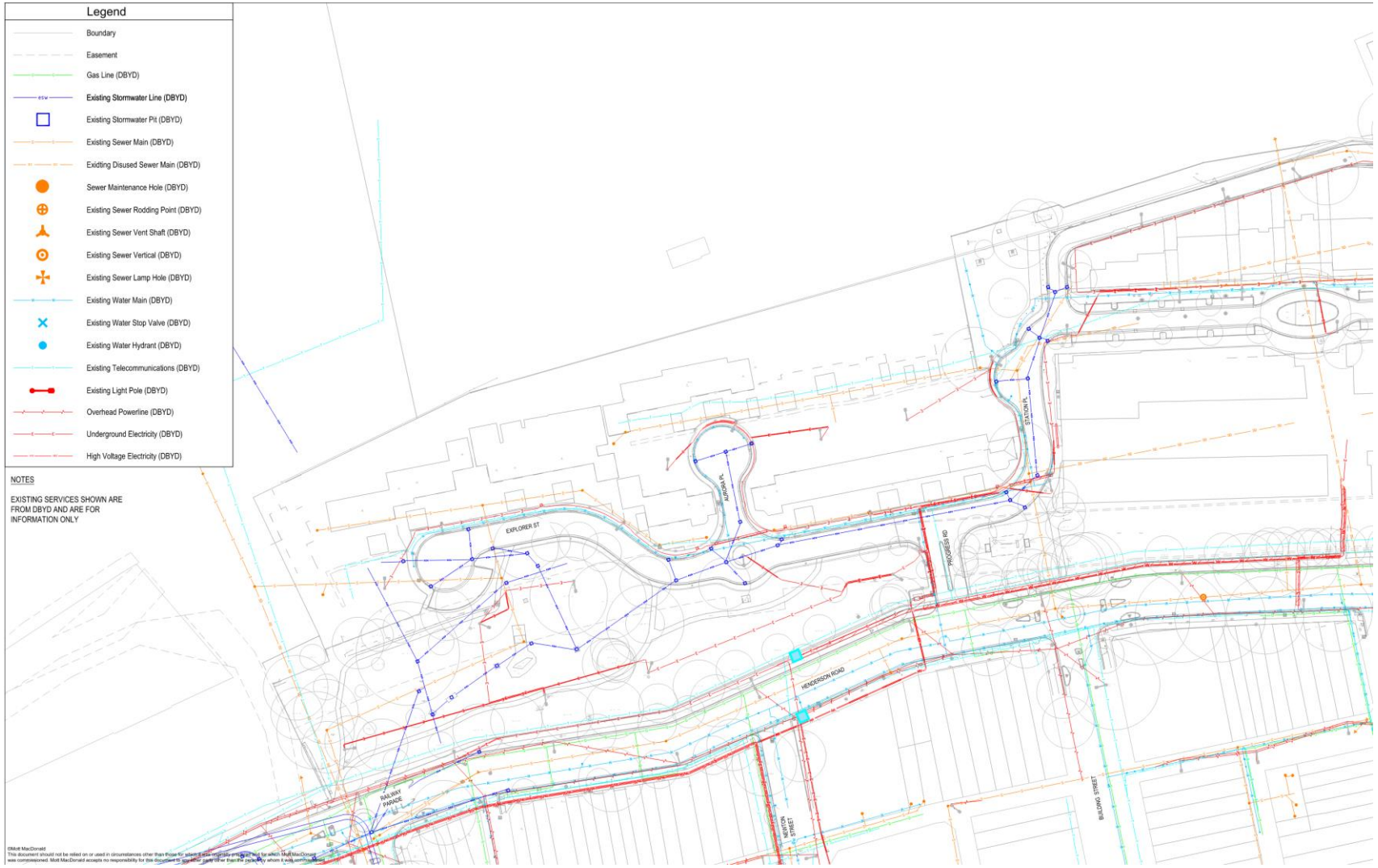
A combined services plan for the site has been developed in Figure 3-1 which shows:

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

Please note that these services are shown only schematically and are subject to further development in subsequent design phases as the architectural and services design develops.

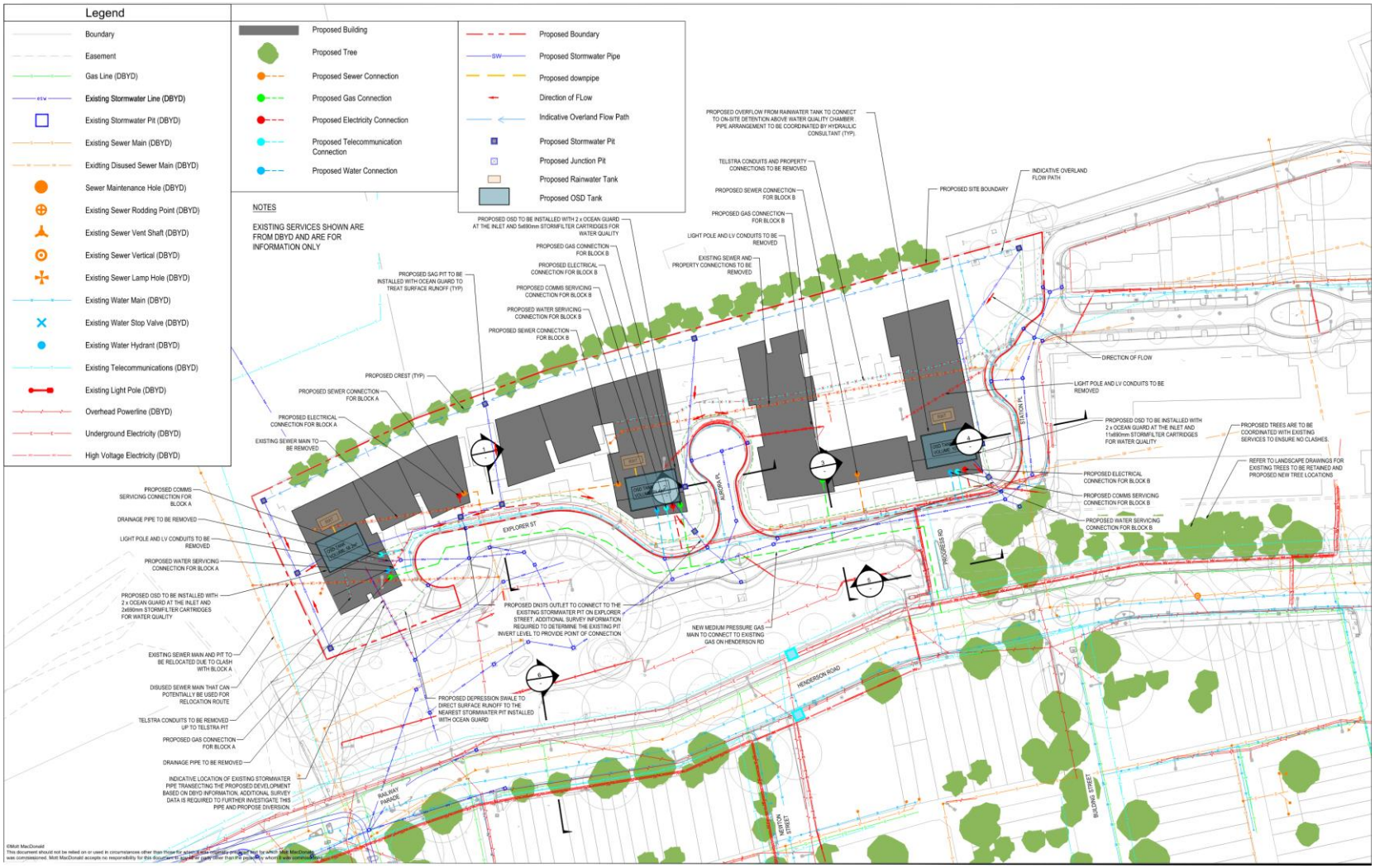
It is also important that this report has been developed to show potential servicing points and the number and type of utility connections to the building will depend on the ultimate ownership and stratum.

Figure 3-1 Combined Services Plan for Existing Utility Assets



3.1 Proposed Utility Connections

Figure 3-2: Proposed Utility Connections



4 Existing Services Infrastructure

The existing utilities assessment is primarily based on information received because of a Before You Dig Australia (BYDA) search. Further survey and asset identification should be undertaken at a later stage of design to confirm the assumptions made in this section and reduce the risk of asset striking.

The services information has been consolidated and displayed on several plans which can be found in Appendix B. The details shown on the plans should be considered as indicative only as the original BYDA information is not based on detailed survey data.

The following sections provide a commentary on the existing services within and adjacent to the site.

4.1 Potable Water

Potable water at the Explorer Street Precinct is currently supplied by Sydney Water through the Potts Hill Water Delivery System.

Figure 4-1-: Sydney Water Potable Water Map

The Potts Hill Water Delivery System is interconnected with the Woronora Water Delivery System and may also receive water from Sydney Desalination Plant during drought.

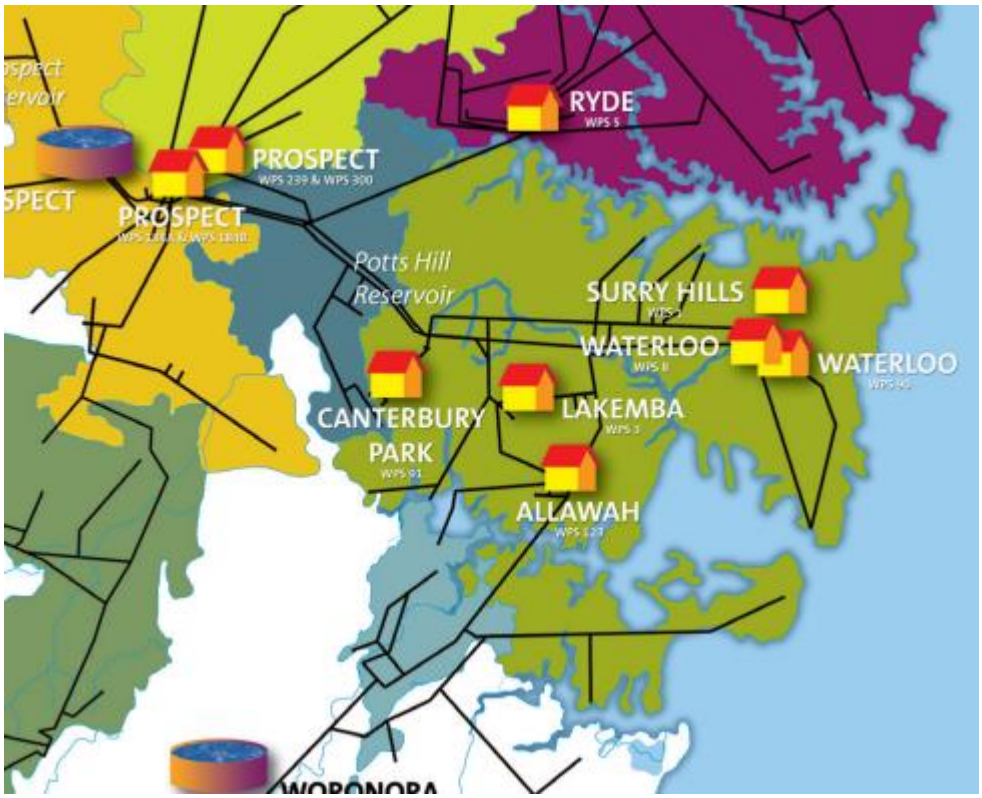
Water is sourced from several water sources including Coxs, Kowmung, Nattai, Wingecarribee, Wollondilly and Warragamba rivers which are stored at Warragamba Dam. The water is treated at the Prospect Water Filtration Plant before transported to Prospect South reservoirs where it is delivered to the local areas via city and pressure tunnels.

There are also three potable water pumping stations located within the system potentially supplying the Precinct, also seen in Figure 4-2:

- Crown Street WP1;
- Waterloo WP8; and
- Dowling Street WP90.

Sydney Water currently does not provide recycled water to the Explorer Street Precinct site. However, when required water from the Sydney Desalination Plant is provided. Future detailed developments may consider the opportunity to integrate initiatives from the City of Sydney Recycled Water Plan (2012) to utilize validate the Sustainable Sydney 2030 Vision.

Figure 4-2: WaterNSW Pumping Stations



4.1.1 Existing Assets

The desktop information indicates the presence of several Sydney Water potable water assets in the surrounding area, which include:

- DN100 DICL water main on the north side of Explorer St to Progress Rd intersection
- DN100 DICL water main on west side of Aurora Plc
- DN250 DICL water main on west side of Progress Rd
- DN250 DICL reticulation water main on northern footpath of Station Plc east of Progress Rd going north to Rowley St

- DN100 uPVC reticulation water main on northern footpath of Rowley St connecting to a DN150mm uPVC main and DN150mm DICL main on Alexander Street east of the Site.

The existing water infrastructure are shown in Figure 3-1.

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

It is noted that the above discussion only considers Sydney Water infrastructure. There is potential that private or other authority water infrastructure is present on the site; however, no records have been made available for this study or shown in BYDA plans.

4.1.2 Demand Assessment

A high-level demand assessment was undertaken based on the indicative building development yields detailed in Section 2. This development yield has been referenced for the purposes of utilities infrastructure assessments only and the final architectural designs should be used to confirm the building details.

The estimated potable water demand was calculated based on the standard unit rates summarised below in Table 4-1 and the development yields. The Net Lettable Area (NLA) was assumed to be 80% of the Gross Floor Area. The Explorer Street Eveleigh development has been classified as comprising 'high-density dwellings'.

Table 4-1: Potable Water Design Loading Criteria

Land Use	Design Criteria	Unit	Demand Rate	Source
Apartments – Multi-unit (30-60 units/net/ha)	Max Day Demand	kL/unit/day	1.35	WSA 03-2011
Apartments – Multi-unit (61-100 units/net/ha)	Max Day Demand	kL/unit/day	1.09	WSA 03-2011
Apartments – Multi-unit (>140 units/net/ha)	Max Day Demand	kL/unit/day	0.8	WSA 03-2011
BASIX reduction (apartments only)	N/A	%	40	Building Sustainability Index

Under the proposed development scenario, the total max day demand (kL/day) has been estimated to be approximately 202 kL/day including BASIX reduction. Considering a ±15% range in development yields, the total max day demand could range between 172 to 232 kL/

Aspirational targets of achieving a Water NABERS ratings and other sustainability initiatives are not reflected in the following demand assessment.

Table 4-2: Estimated Total Potable Max Day Demand

Total (kL / Day: Max Day Demand) - including BASIX for Residential	
Explorer St development	**(kL/day MDD)**
Potable Water	202

Note: Does not include carparks, lifts or impacts of ESD initiatives - recommend ±15% range

4.1.3 Proposed Water Servicing and Relocations

To allow for construction and servicing of the development, the following alteration works are potentially required as part of Precinct early works:

- New water servicing lead-in connections for each proposed development block connecting to the existing water mains on Explorer St. The size of the water supply connections will require coordination with a Hydraulic Engineer in future stages of design.
- There are currently no existing Sydney Water recycled water mains that can be connected to around the proposed precinct. However, to future-proof the proposed developments, it is recommended for the hydraulic design in future stages to include connection points for recycled water mains from the Sydney Water network.

The proposed potable water relocations and potential new building connections are shown in Figure 3-2. It is important to note that these designs are schematic only and further work is required in subsequent design phases to confirm the final relocations and servicing arrangements in consultation with Sydney Water.

Specific connection locations will be detailed following consultation with Sydney Water. Additional connection points would affect the building services spatial provisions within the development.

4.2 Stormwater

4.2.1 Existing stormwater assets

Stormwater assets in the area are maintained by City of Sydney Council and Sydney Water. The desktop information indicates the presence of several informal stormwater assets in the area. The main stormwater assets include:

- Drainage pit and pipes at the western end of Explorer St connecting into the drainage network within South Sydney Rotary Park
- Stormwater gross pollutant trap located within the South Sydney Rotary Park
- Drainage pit and pipes within South Sydney Rotary Park connecting upstream drainage from Explorer St, Station Place and part of Rowley St to the south on Park St
- Drainage pits and pipes within Aurora Place
- Drainage pits and pipes along Station Place

The existing stormwater assets are shown on drawing 426320-001-MMD-DA-XX-SKE-C-0010 and **Figure 3-1**.

4.2.2 Proposed stormwater works

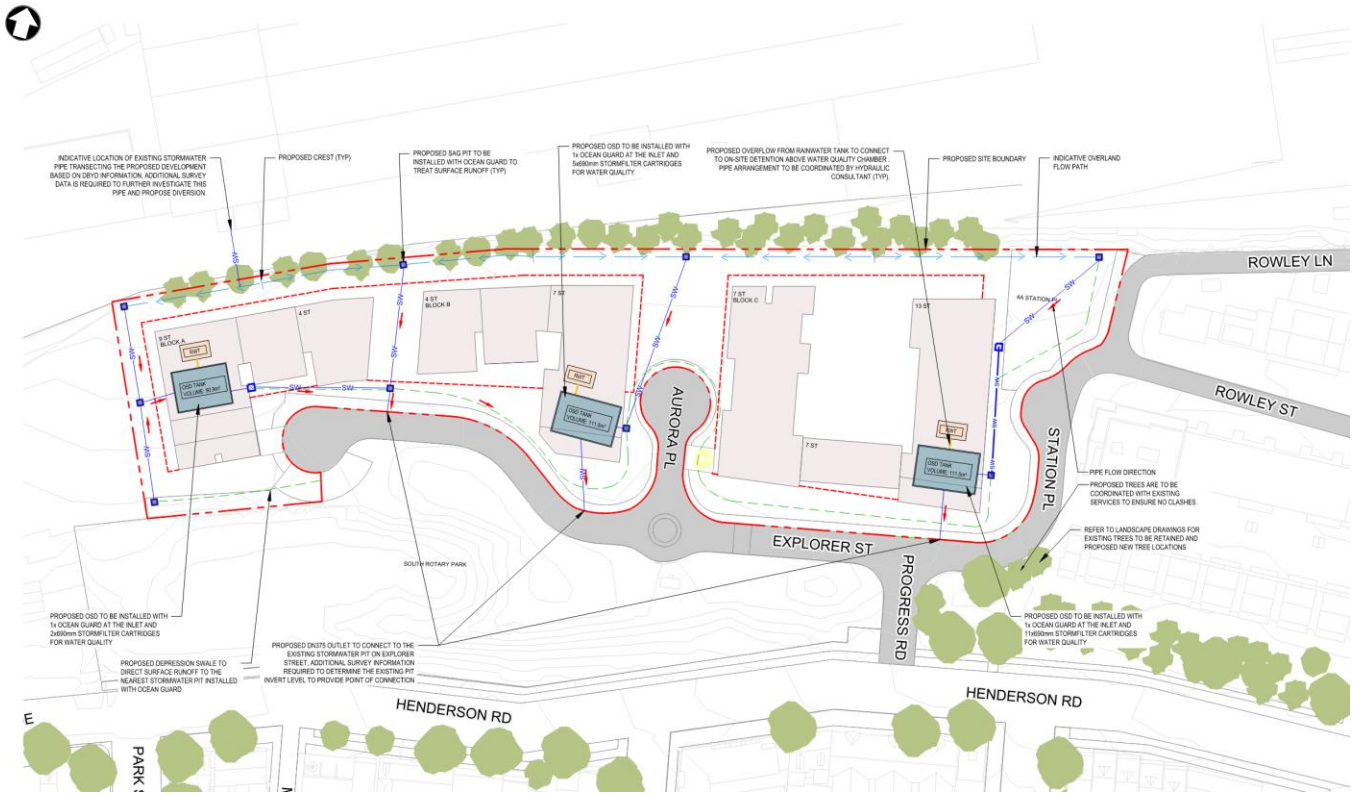
The proposed stormwater design is detailed in the Stormwater Management Report. A summary of potential stormwater works is summarised below:

- New OSDs for Block A, Block B and Block C discharging into the existing stormwater pits on Explorer St
- New stormwater pits and pipes west of Block A collecting overland flow from the north and swale from the south discharging into the proposed OSD tank within Block A.
- New stormwater pit and pipe between Block A and Block B collecting overland flow north of the proposed development lots. New pits and pipe connect to existing council pit on Explorer St
- New stormwater pit and pipe between Block B and Block C collecting overland flow north of the proposed development lots. New pits and pipe connect to proposed OSD tank under Block B.

- New pit and pipes west of Rowley Lane collecting runoff from overflow path north of Block C and connecting to OSD tank in Block C

The proposed stormwater layouts are shown on Figure 4-3. For more details refer to the Explorer Street Stormwater Management Report.

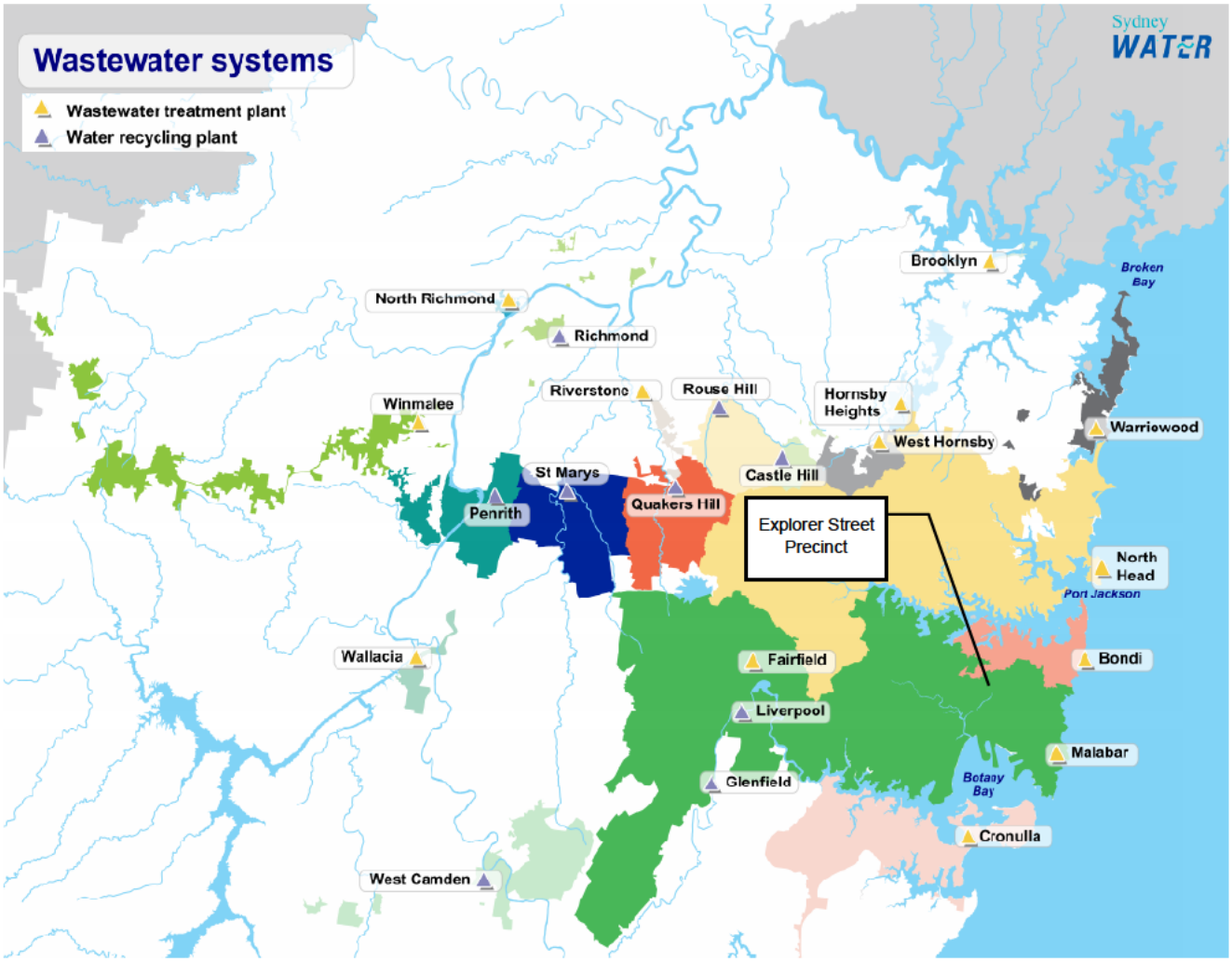
Figure 4-3: Proposed stormwater layout



4.3 Sewer

Wastewater servicing for the South Eveleigh Precinct is provided by Sydney Water and directed to the Malabar Sewerage Treatment Plant before discharging into the deep-water ocean outfall. The local sewer catchments are shown below in Figure 4-4.

Figure 4-4: Sydney Water Sewer Catchment Plan



The Malabar WWTP discharges ADWF 442 ML/day of municipal wastewater in 2016/17. This value had been estimated to increase to 513 ML/day by 2026 and 550 ML/day by 2036 (Malabar Wastewater Treatment Plant Report, 2021). Further investigations by Sydney Water in the Malabar WWTP include detailed investigations to determine the required investments for growth servicing based on the identified preferred system configuration.

4.3.1 Existing Assets

The desktop information indicates the presence of several Sydney Water sewage assets in the surrounding area, these are summarised in Table 4-3.

Table 4-3: Existing sewer assets

OWNER	HLFC	SIZE (DN)	MATERIAL/TYPE	LOCATION
Sydney Water	Sewer	150	PVC	Along Explorer St and east of Aurora Pl
Sydney Water	Sewer	150	PVC	Along Explorer St and west of Aurora Pl

Sydney Water	Sewer	150	PVC	Parallel to Explorer Street to the north, connecting Aurora Place and Station Place with a number of property connections.
Sydney Water	Sewer	375	PVC concrete encased	West end of Explorer Street connecting the DN300 sewer main from the rail corridor in the north
Sydney Water	Sewer	375	PVC concrete encased	West end of Explorer Street crossing the railway tunnel below into South Sydney Rotary Park
Sydney Water	Sewer	150	PVC concrete encased	West end of Explorer St with property connections from west of road culdesac
Sydney Water	Sewer	225	PVC	Along west side of Station Place going south connecting to existing sewer main on Henderson Rd
Sydney Water	Sewer	150	PVC	Along north side of Rowley St
Sydney Water	Sewer	225	Earthenware	Along Henderson Rd
Sydney Water	Sewer	300	Vitrified Clay	Along Alexander St
Sydney Water	Sewer	225	PVC	Parallel to Rowley St, north behind existing lots

Similar to the potable water network, the exact depths and positions of the existing reticulation mains are unknown. The existing sewer assets are shown on **Figure 3-1**and drawing 426320-001-MMD-DA-XX-SKE-C-0010.

It is important to note that wastewater is a gravity service and for the proposed servicing design to work hydraulically, the levels of manholes should be surveyed to confirm that the falls are achievable. This should be done as part of design development.

4.3.2 Demand Assessment

A high-level demand assessment was undertaken for the site based on the indicative building development yields detailed in Section 2. This development yield has been referenced for the purposes of utilities infrastructure assessments only and the final architectural designs should be used to confirm the building details.

The estimated wastewater demand was calculated based on standard unit rates summarised in Table 4-4 below and the indicative development yields. The Net Lettable Area (NLA) was assumed to be 80% of the GFA.

The design criteria used to forecast future wastewater loading has been taken from the Sydney Water Area *Planning Design Criteria Guide: WSA 02-2002-3.0 (Sewer Code of Australia)* which is expressed as an Equivalent Population for a particular land use. A BASIX reduction of 40% as per the Building Sustainability Index Targets has also been adopted.

Table 4-4: Sewer Design Loading Criteria

Land Use	Design Criteria	Unit	Demand Rate	Source
Residential – Single occupancy high density dwelling	Average Dry Weather Flow	EP/dwelling	2.5	Gravity Sewerage Code of Australia, WSA 02-2014
BASIX reduction (residential only)	N/A	%	40	Building Sustainability Index

The Explorer St Eveleigh development has been classified as comprising ‘high-density dwelling’.

Under the proposed development scenario, the mean ADWF has been estimated to be approximately 1.5 L/s. Considering a ±15% range in development yields, the ADWF could range between 0.8-1.1 L/s allowing for BASIX for residential dwellings only.

Aspirational targets of achieving a Water NABERS ratings and other sustainability initiatives are not reflected in the following demand assessment.

Table 4-5: Estimated Average Dry Weather Flow (ADWF)

Total (L/s: Average Dry Weather Flow) - including BASIX for Residential	
Explorer St Eveleigh	**L/s**
Estimated Demand*	0.9

Note: Does not include carparks, lifts or impacts of ESD initiatives - recommend ±15% range

4.3.3 Proposed Sewer Servicing and Relocations

To allow for construction and servicing of the development, the following alteration works are potentially required as part of Precinct early works for.

- Relocation of DN375 PVC concrete encased sewer main under the proposed Block A development.
- Removal of existing DN150 sewer main and property connections parallel to Explorer St north of the property lots connecting to sewer main on Station Pl
- Removal of sewer property connections along Explorer St
- DN150 sewer main along north side of Explorer St east of Aurora Pl to be assessed in next stage of design with QL-B utility survey on potential impacts of proposed development blocks. Sewer main to be relocated if impacted by proposed development.
- New sewer servicing lead-in connections for each proposed development block connecting to the existing sewer mains on Explorer St

The proposed wastewater relocations and potential new building connections are shown below in Figure 3-2. It is important to note that these designs are schematic only and further work is required in subsequent design phases to confirm the final relocations and servicing arrangements in consultation with Sydney Water.

Specific connection locations will be detailed following consultation with Sydney Water. Additional connection points would affect the building services spatial provisions within the development.

4.4 Electricity

Ausgrid is the supplier of electricity for the Site area as shown below in Figure 4-5. The study area is predominately serviced via feeders from the St Peters 132/11kV Zone Substation (ZN2568). Detailed lead-in infrastructure upgrades will need to be confirmed with Ausgrid as part of formal applications made as a part of detailed design.

Figure 4-5: Ausgrid network boundary map

4.4.1 Existing Assets

Electrical servicing is provided by Ausgrid and NextGen, the desktop information indicates the presence of several assets in the surrounding area. These are summarised in Table 4-6.

Table 4-6: Existing Electrical Assets

Asset Owner	Size & Material	Cover (m)	Type	Asset Description
Nextgen			Conduit	Along Explorer St
Ausgrid	-		LV Service Cable	LV service cables for property connections along the north side of Explorer St
Ausgrid	-	0.6	1 x LV Mains Cable	LV main cable along north side of Along Explorer St

Ausgrid	3x125 PVC	1.0	LV Mains Cable	LV mains cable along Explorer St crossing Aurora Pl
Ausgrid	1x50 PVC, 4x125 PVC	0.6	LV At Risk Mains Cable	LV main cables along north side of Henderson Rd approx. 0.8m from the property boundary
Ausgrid	100 PVC	0.6	LV Street Lighting Cable	Within South Sydney Rotary Park
Ausgrid	100 PVC	0.6	LV Street Lighting Cable	Along Explorer St
Ausgrid	-	0.5	LV Service Cable	LV service cables connecting to properties along Aurora Pl
Ausgrid	125 PVC	0.5	LV Mains Cable	LV mains cable along east and north side of Aurora Pl
Ausgrid	125 PVC	0.5	LV Service Cable	LV service cables within existing property lots for distribution east of Aurora Pl
Ausgrid	5x125 PVC	-	LV Street Lighting Cable x2	Two LV street lighting electrical cables shared trench with LV mains cable along west side of Progress Rd
Ausgrid		-	LV Mains Cable x2	Two LV main electrical cables shared trench with LV lighting cable along west side of Progress Rd
Ausgrid	4x125 PVC	1.2	HV Cable x6	HV cables crossing Henderson Rd and connecting into the local subs transmission kiosk which provides electrical distribution for Explorer St
Ausgrid	3x125 PVC	0.5	HV Cable x2	HV cables along south side of Henderson Rd
Ausgrid	-	0.6	LV At Risk Mains Cable	Along Henderson Rd
Ausgrid	-	-	Auxiliary Cable x2	Along Henderson Rd
Ausgrid	1x125 PVC	0.4	LV Mains Cable	Along west side of Station Pl
Ausgrid	1x125 PVC	0.5	LV Mains Cable	Along east side of Station Pl

Other electrical assets within the site vicinity include:

- LV pillar switches spaced between Explorer Street, Aurora Place, Station Place and Rowley Street;
- A kiosk substation located at the junction between Explorer Street, Progress Road and Henderson Road supplying the existing buildings and street lighting.

No major transmission cables have been identified inside the Site study area based on BYDA records. However, a number of significant electrical assets have been recorded in the surrounding area. These include;

- A ground substation located at Clara Street near Railway Parade; and
- A kiosk substation located at the eastern end of Ada Street near Park Lane.

The existing electrical assets are shown on Figure 3-1 and drawing 426320-001-MMD-DA-XX-SKE-C-0010. The exact depths and positions of the existing cable mains are unknown, thus further investigation as part of the detailed development applications is required to determine the exact layout. If any new 11kV reticulation is required within 4 metres of the existing HV cables, rating assessments are required to demonstrate to Ausgrid's satisfaction that there are no mutual heating issues between cables.

4.4.2 Demand Assessment

A high-level demand assessment was undertaken based on the indicative building development yield detailed in Section 2. This development yield was referenced for the purposes of utilities infrastructure assessments only and the final architectural designs should be used to confirm the building details.

The estimated electrical demand was calculated based on standard unit rates summarised in Table 4-7below and the development yields. The Net Lettable Area (NLA) was assumed to be 80% of the GFA.

Table 4-7 Electrical Design Loading Criteria

Land Use	Design Criteria	Unit	Demand Rate	Source
Residential - Apartments	Peak Demand	kVA/dwelling	3.5	Endeavour Energy Growth Servicing Plan 2019 - Table 1
• Diversity Factor	N/A	%	80	AS3000

The proposed total electrical demand based on the development profile is estimated to range between 1.1 MVA to 1.5 MVA , see estimated average demand in Table 4-8. Note the diversity factor of 0.8 is not applied to residential land use.

Table 4-8 Estimated Total Electrical Demand (MVA)

Estimated Total Electrical Demand Total (MVA)	
Explorer St Precinct	**MVA**
Estimated Demand*	1.3

Note: Does not include carparks, lifts or impacts of ESD initiatives - recommend ±15% range

The proposed electrical relocations and potential new building connections are shown below in Figure 3-2.

4.4.3 Available Zone Substation Capacity

The Explorer St Eveleigh development is located within the St Peters Zone Substation area owned by Ausgrid. According to the data from Energy Networks Australia shown on National Map Australia, the available distribution capacity at the proposed site is approximately 35 MVA from 2026. The available distribution capacity is determined by the firm substation capacity net the forecast peak demand at the zone substation level. The information provided is sourced from Ausgrid. The map and forecasted available distribution capacity at Eveleigh is shown in Figure 4-6.

Figure 4-6: National Map showing available electrical distribution capacity

As shown in Figure 4-6, there is sufficient electrical capacity to service to the proposed Explorer St precinct development. However, the information from National Map Australia is high-level data provided from Ausgrid and should not be relied upon solely. Further consultation with Ausgrid will be required to assess the actual electrical distribution capacity at Eveleigh.

4.4.4 Proposed Electricity Servicing and Relocations

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

- Removal of existing Ausgrid property connections north of properties facing Explorer St and west of Station Pl
- Removal of existing Ausgrid property connections on the north side of Explorer St
- New electrical servicing lead-in connections for each proposed development block connecting to the nearest LV electrical pillar on Explorer St
- Light pole and LV conduits to be removed clashing with Blocks A and C.

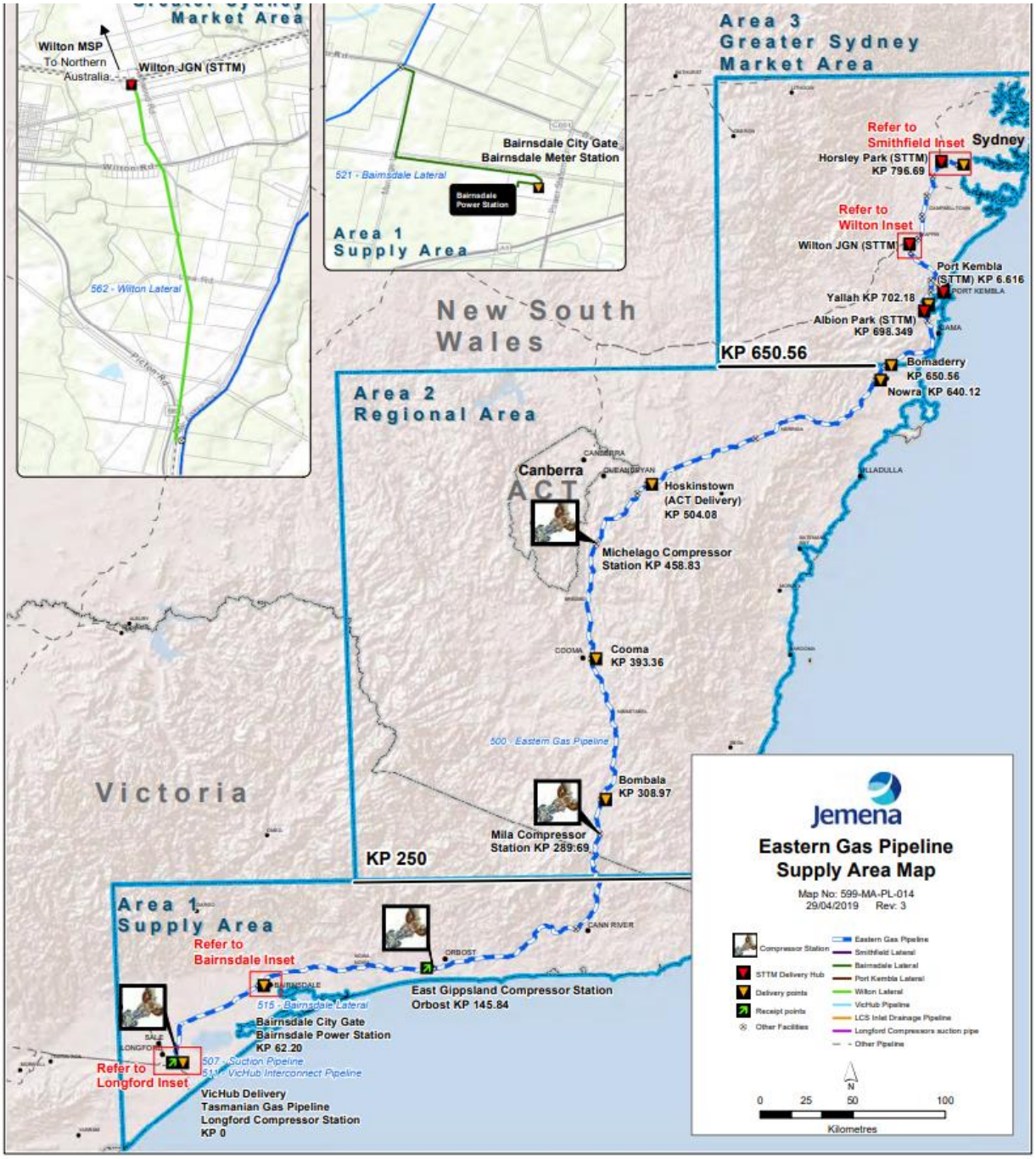
The proposed electrical development connections are shown in Figure 3-2. It is important to note that these designs are schematic only and further work is required in subsequent design phases to confirm the final relocations and servicing arrangements in consultation with Ausgrid.

Specific connection locations will be detailed following consultation with Ausgrid. Additional connection points would affect the building services spatial provisions within the development. It can be noted that the Ausgrid capacity in the network exceed the required demand from the high-level demands assessment conducted. The capacity of the existing network will be able to facilitate the upgraded demand requirements for the proposed development. This is subject to confirmation with Ausgrid in future design stages.

4.5 Gas

The Explorer St precinct area is supplied with natural gas through connection to the Jemena Network through the Eastern Gas Pipeline. 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. Figure 4-7 below shows the Greater Sydney Market Area receives gas supply through the Eastern Gas Pipeline sourced from Victoria.

Figure 4-7: Jemena Eastern Gas Pipeline



4.5.1 Existing Assets

Gas servicing is provided by Jemena, the desktop information indicates the presence of several Jemena assets in the surrounding area. These include:

- 50mm NY 210 kPa distribution main running along Henderson Road and extending to Railway Parade in the south-western boundary of the Site; and
- 32mm NY 210 kPa distribution mains running along the adjacent streets of Monks Lane, Newton Street, Brandling Street and Kingsclear Road in the southern boundary of the Site.

The existing gas assets are shown on **Figure 3-1** and drawing 426320-001-MMD-DA-XX-SKE-C-0010. 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 or amplifications required.

4.5.2 Demand Assessment

A high-level demand assessment was undertaken based on the indicative building development yield detailed in Section 0. This development yield was referenced for the purposes of utilities infrastructure assessments only and the final architectural designs should be used to confirm the building details.

The estimated gas demand was calculated based on standard unit rates summarised in Table 4-9 below and the development yields. The Net Lettable Area (NLA) was assumed to be 80% of the GFA.

Table 4-9 Gas Design Loading Criteria

Land Use	Design Criteria	Unit	Demand Rate	Source
Apartments	Daily Demand	m^3/day/dwelling	2.17*	Jemena Guidelines
BASIX reduction (apartments only)	N/A	%	25	Building Sustainability Index

**Based on 20GJ per year per apartment*

The proposed total gas demand based on the development profile is 591m^3/day including 25% BASIX reduction.

Table 4-10 Estimated Total Gas Demand – Including BASIX

Total Gas Demand (m^3/day) – Including BASIX	
Explorer St development	**m^3/day**
Estimated Demand*	591

**Note that 'Other GFA' was excluded from the demand assessment.*

4.5.3 Proposed Gas Servicing and Relocations

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

- Potential new medium pressure gas main connections to the existing Jemena main on Henderson Rd for each development block. A new main will need to be constructed within Explorer Street to connect to the existing Henderson Rd 50mm NY 210 kPa main. This assumption has been made to allow for the future potential connection of

gas to the site as there are currently no existing gas mains within the site. This will be clarified with Jemena once a response is heard regarding feasibility.

The proposed gas relocations and potential new building connections are shown below in Figure 3-2. It is important to note that these designs are schematic only and further work is required in subsequent design phases to confirm the final relocations and servicing arrangements in consultation with Jemena.

We note that gas is a non-renewable resource and there is a strong desire to avoid gas connections where possible for this Precinct, however for the purposes of the business-as-usual assessment we have shown a gas servicing network should it be required for future stages of development. There are also no existing gas reticulation mains/pipes in Explorer Street or Progress Road, connecting from Henderson Road. To provide gas servicing then new connections will need to be added and connected from Henderson Roads existing network.

Specific connection locations will be detailed following consultation with Jemena. Additional connection points would affect the building services spatial provisions within the development.

4.6 Telecommunications

4.6.1 Existing Assets

Telecommunications servicing is provided by Telstra, NBN Co, Optus, and TPG. The desktop information indicates the presence of several telecommunications assets in the surrounding area. These are summarised in Table 4-11.

Table 4-11: Existing telecommunication assets

OWNER	Type	SIZE (DN)	LOCATION
Telstra	Conduit	50, 80, 100	Along Explorer St
Telstra	Conduit	100	Along Progress Rd
Telstra	Conduit	100	Along Rowley St
Telstra	Conduit	50	Parallel to Explorer St, north of property lots
Telstra	Bank of Conduits	35, 50	Along South side of Henderson Rd
Telstra	Conduit	100	Along Station St
Telstra	Bank of Conduits	100	Along North side of Henderson Rd
NBN	Conduit	100	Along Rowley St
NBN	Conduit	50	From Station Pl/Rowley St intersection continuing north of Aurora Pl.
NBN	Conduit	100	North Side of Railway Pde
NBN	Conduit	100	South Side of Railway Pde
NBN	Conduit	50, 80, 100	Along Explorer St
NBN	Bank of Conduits	50, 100	Along Henderson Rd
Optus	Fibre Optics	-	Along Henderson Rd
TPG	Pipe Networks Duct	-	Along Railway Parade

The existing telecommunication assets are shown on **Figure 3-1** and drawing 426320-001-MMD-DA-XX-SKE-C-0010.

4.6.2 Demand assessment

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

telecommunications authorities. Telecommunication connections will be confirmed as the building services design develops and will be coordinated with service providers.

4.6.3 Proposed Telecommunications Servicing and Relocations

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

- Removal of existing Telstra property connections north of properties facing Explorer St and west of Station Pl
- Removal of existing Telstra property connections on the north side of Explorer St
- Removal of existing Telstra property connections on the east side of Explorer St, due to clash with Block A.
- New telecommunications servicing lead-in connections for each proposed development block connecting to the nearest Telstra pit on Explorer St

The proposed telecommunication relocations and potential new building connections are shown below in Figure 3-2. It is important to note that these designs are schematic only and further work is required in subsequent design phases to confirm the final relocations and servicing arrangements in consultation with Telstra.

5 Opinion of Probable Cost (OPC)

An Opinion of Probable Cost was developed based on the proposed development for Explorer Street precinct. The OPC provides an estimate of the proposed utility construction costs. The estimate includes costing for utility backfilling, trenching, fitting, and testing. These cost rates used are average industry rates to quantify the cost of utility works for the proposed development area. These rates are irrelevant of sizing and are fixed rates. As it is a high-level costing, it is not to be relied on and for accurate and detailed costing for the site.

Table 5-1 shows the high-level cost estimate for Explorer Street utility works.

Table 5-1: Opinion of Probable Cost for Explorer Street Precinct

Opinion of Probable Cost					
Infrastructure	**Works**	**Quantity**	**Unit**	**Rate**	**Cost ($)**
Potable Water	Street Connection	32	m	$750	$24,000
	Local Potable Water Diversion	0	m	$750	$0
Wastewater	Street Connection	34	m	$1,400	$47,600
	Local Wastewater Diversion	281	m	$1,400	$393,400
Electrical	Street Connection	59	m	$3,200	$188,800
	Local Electrical Diversion	104	m	$920	$95,680
Gas	Street Connection	233	m	$150	$34,950
	Gas Diversion	0	m	$150	$0
Communications	Street Connection	30	m	$1,340	$40,200
	Communications Diversion	153	m	$1,340	$205,020
Stormwater	Street Connection	261	m	$710	$185,310
	Stormwater Pit	13	No.	$9,000	$117,000
	Stormwater pipework to be removed	37	m	$130	$4,810
	Stormwater pit to be removed	0	No.	$780	$0
Total					$1,336,770

6 Sustainability Initiatives

Sustainability Initiatives allow to meet Green Star requirements, allow to reduce the developments environmental impacts, and reduce demands on existing utility services. Utilising sustainability initiatives are an integral part of future development, as there is increased importance on reducing climate change impacts. Some proposed in initiatives which may be used on the Explorer Street Precinct are listed below;

- Smart infrastructure
- Stormwater harvesting
- Recycled water
- Solar PV;
- Building orientation;
- Natural ventilation of common areas;
- Electric car charging;
- Centralised heat extraction system;
- Geothermal cooling;
- Smart metering;

The eventual use of any of these sustainability initiatives will potentially reduce the type and quantity of required utility servicing and may also be used to assist in offsetting utility supply constraints. These are to be further investigated in future design stages in coordination with the building services design.

6.1 Smart Infrastructure

As a part of the road network, it is recommended that sufficient space is allowed for future changes and improvements in telecommunications infrastructure beyond supplying building developments with internet connectivity.

Alongside the potential for public Wi-Fi, allowance for all street poles, bus shelters and Traffic Control Signals (TCS) posts will enable future use of this infrastructure to the public benefit. Incorporation of smart devices can also play a key role, aside from ensuring safe streets fibre-to-poles allows for future adaptability and could be incorporated into a potential early warning system for items such as floods, bushfires, or other events.

Including fibre to the pole also allows for a large amount of future flexibility, including uses we cannot envision now. Whether community wi-fi networks or future noticeboards, smart traffic systems, electronic wayfinding, adaptive lighting, or many others

One potential option that has been trialled in Boston is the establishment of a shared telecommunications utility corridor. This could potentially serve to “de-bundle” telecommunication providers from subducting with Telstra alone, democratises access to fibre for retailers and could be a shared access agreement to allow future start-ups or community fibre networks as shown in Figure 6-1 below.

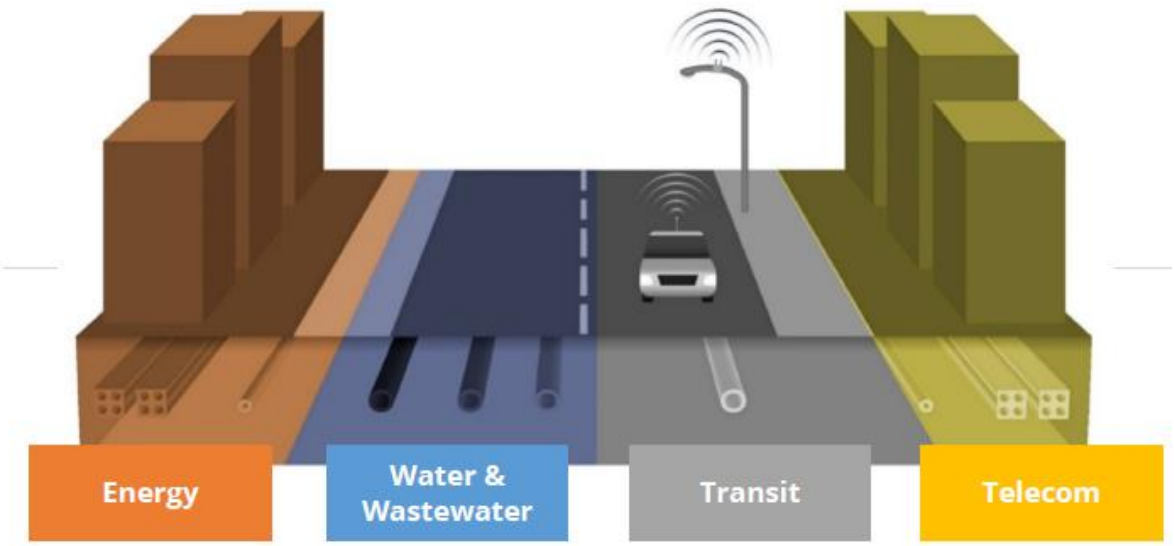


Figure 6-1 Example Boston Smart Utilities Section

As well as fibre to the pole, there are several recent examples of the use of smart technology to aid in evacuation planning and hazard detection. As there is significant flooding throughout the site, there is the opportunity to further explore smart systems that could detect flood events and provide visual wayfinding for flood evacuation routes – potentially paired with a community Wi-Fi that allows for push notifications in the event of natural disasters.

Some examples where smart infrastructure has been used in disaster planning are summarised below:

Bright SiteSmart Pole:

- Delivers wireless network connections e.g., 4G LTE, 5G, Wi-Fi, Lo-RA
- Smart microphones equipped with advanced pattern recognition which can be triggered by noises associated with anti-social behaviour such as shouting, car alarms, breaking glass, or even gunshots. They then automatically brighten the light, record audio and alert emergency services.
- Air quality detection and hazard warning
- Traffic and mobility sensor
- Display screens can offer emergency services messaging
- Contains wireless network connection and speaker system so likely can be configured as an early warning system.

ENE Hub Smart Node:

- Delivers wireless network connections e.g., 4G and 5G
- CCTV monitoring
- Electric vehicle charging
- Emergency and Help Assist button
- Public Wifi
- Street lighting

- Directions and wayfinding

Buenos Aires SAP HANA Flood detection system:

- Uses a series of IOT enabled radar sensors in drainage pits and pipes to monitor water levels
- Information fed back to the SAP HANA system which also analyses other real time information such as weather reports, status of garbage collection, and citizen complaints about blocked drains.
- Notifies residents of potential flooding and helps city authorities to respond to localized incidents.
- Post deployment – Buenos Aires as been able to clear all of its 30000 storm drains and the city has stayed flood free.

Explorer Street has the capability to incorporate Smart Infrastructure and have stormwater reuse potentials to be incorporated within the development. City of Sydney Council have already incorporated Smart Infrastructure within the council area. Incorporating smart infrastructure can enhance safety and productivity, it also allows to further align with sustainability goals and initiatives within the precinct and it is recommended to align with future proofing the precinct.

6.2 Recycled Water

Recycled water can be collected in several forms for several uses to benefit the sustainability of the site. Forms of recycled water includes rainwater collection, stormwater collection, greywater and treated effluent water.

Recycled water collected from rainwater capture can be used as toilet flushing, to water park grounds and public domain spaces plants to minimise potable water consumption. Greywater from sinks can be used for toilets flushing to recycle water within the building.

Where possible, rainwater and stormwater capture are to be incorporated in basement and plant rooms.

6.2.1 Stormwater and Rainwater Harvesting

Stormwater and Rainwater Harvesting involves collecting, treating, storing, and using stormwater runoff from urban areas. Stormwater Harvesting involves collecting water from stormwater drains, and Rainwater Harvesting is the runoff collected from roofs.

Utilising captured stormwater from the roof area can allow for water reuse sustainably without using potable water. Stormwater captured on site can be used to directly service South Sydney Rotary Park across the road from the proposed developments.

Our proposed development needs to allow for connections to potential future recycled water mains. Currently, there are no existing Sydney Water recycled water mains that can be connected to around the proposed precinct. However, to future-proof the proposed developments, it is recommended for the hydraulic design in future stages to include connection points for recycled water mains from the Sydney Water network.

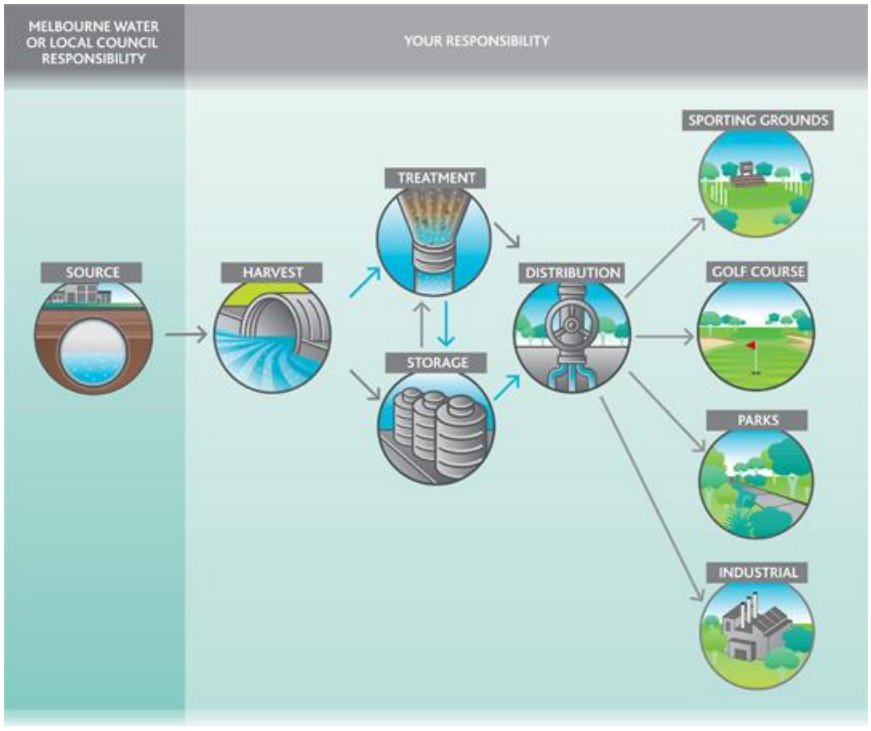


Figure 6-2: Source Melbourne Water, Stormwater Harvesting Lifecycle

6.2.2 Sustainability Strategies Explored

Some initiatives explored within Section 2.2 in the Sustainability Framework report, to be implemented withing the Explorer St Precinct include:

- Energy GHG Emissions:
  - Future proofing net-zero transition
  - All electric infrastructure
  - Rooftop solar
- Waste and Recycling:
  - Organic waste treatment
  - Waste separation and collection strategies
- Water Management:
  - Grey water diversion to site irrigation
  - Water efficient fittings
  - Rainwater collection and re-use
  - WSUD
- Highly efficient and Healthy buildings
  - Heat recovery ventilation
  - Healthy building materials
  - Energy efficient lighting and appliances
- Biodiversity Enhancement
  - Habitat restoration, creation and expansion
  - Improved links between existing sites, creating nature networks.
- Climate adaptation and resilience
  - Climate change mitigation strategies plan
- Community and active lifestyle
  - Community gardens

- Community amenities

The focus themes that surround sustainability are climate positivity, resilience and adaptability, green and regeneration, health and wellbeing, and inclusivity and vibrant community.

For more details on the proposed sustainability strategies refer to Section 2.2 and Tables 3.2 - 3.8 in the Sustainability Framework Report (Atelier Ten, Rev 1).

7 Conclusion and Next Steps

This building design is subject to further design development, future work that is required to ensure adequate servicing includes:

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

This Utilities & Infrastructure Servicing Assessment has concluded that servicing is available to the site with indicative connections for each service being:

- Relocation of multiple sewer mains and property connections, due to impacts of proposed development blocks.
- Removal of existing Ausgrid property connections to allow for new connections to new blocks.
- Light pole and LV conduits to be removed clashing with Blocks A, C and D.
- New medium press gas mains and ring-main network connecting Explorer St to the existing Jemena gas main on Henderson Rd
- Removal of multiple existing Telstra property connections to allow for reconnection with new block development

There is a strong case for Smart Infrastructure along with rainwater harvesting and recycled water. These precinct systems will continue to be explored in subsequent design stages based on feedback with council and utility authorities.

It should be noted that the above assessment will also continue to be developed in subsequent detailed design stages in consultation with the utility authority providers..

Appendix A - Combined Utilities Plan

Legend

- Boundary
- Easement
- Gas Line (DBYD)
- Existing Stormwater Line (DBYD)
- Existing Stormwater Pit (DBYD)
- Existing Sewer Main (DBYD)
- Exidting Disused Sewer Main (DBYD)
- Sewer Maintenance Hole (DBYD)
- Existing Sewer Rodding Point (DBYD)
- Existing Sewer Vent Shaft (DBYD)
- Existing Sewer Vertical (DBYD)
- Existing Sewer Lamp Hole (DBYD)
- Existing Water Main (DBYD)
- Existing Water Stop Valve (DBYD)
- Existing Water Hydrant (DBYD)
- Existing Telecommunications (DBYD)
- Existing Light Pole (DBYD)
- Overhead Powerline (DBYD)
- Underground Electricity (DBYD)
- High Voltage Electricity (DBYD)

- Proposed Building
- Proposed Tree
- Proposed Sewer Connection
- Proposed Gas Connection
- Proposed Electricity Connection
- Proposed Telecommunication Connection
- Proposed Water Connection

- Proposed Boundary
- Proposed Stormwater Pipe
- Proposed downpipe
- Direction of FLow
- Indicative Overland Flow Path
- Proposed Stormwater Pit
- Proposed Junction Pit
- Proposed Rainwater Tank
- Proposed OSD Tank

NOTES

EXISTING SERVICES SHOWN ARE FROM DBYD AND ARE FOR INFORMATION ONLY

PROPOSED OVERFLOW FROM RAINWATER TANK TO CONNECT TO ON-SITE DETENTION ABOVE WATER QUALITY CHAMBER . PIPE ARRANGEMENT TO BE COORDINATED BY HYDRAULIC CONSULTANT (TYP).

TELSTRA CONDUITS AND PROPERTY CONNECTIONS TO BE REMOVED

PROPOSED SEWER CONNECTION FOR BLOCK B

PROPOSED GAS CONNECTION FOR BLOCK B

LIGHT POLE AND LV CONDUITS TO BE REMOVED

EXISTING SEWER AND PROPERTY CONNECTIONS TO BE REMOVED

PROPOSED OSD TO BE INSTALLED WITH 2 x OCEAN GUARD AT THE INLET AND 5x690mm STORMFILTER CARTRIDGES FOR WATER QUALITY

PROPOSED GAS CONNECTION FOR BLOCK B

PROPOSED ELECTRICAL CONNECTION FOR BLOCK B

PROPOSED COMMS SERVICING CONNECTION FOR BLOCK B

PROPOSED WATER SERVICING CONNECTION FOR BLOCK B

PROPOSED SEWER CONNECTION FOR BLOCK B

PROPOSED SAG PIT TO BE INSTALLED WITH OCEAN GUARD TO TREAT SURFACE RUNOFF (TYP)

PROPOSED CREST (TYP)

PROPOSED SEWER CONNECTION FOR BLOCK A

PROPOSED ELECTRICAL CONNECTION FOR BLOCK A

EXISTING SEWER MAIN TO BE REMOVED

PROPOSED COMMS SERVICING CONNECTION FOR BLOCK A

DRAINAGE PIPE TO BE REMOVED

LIGHT POLE AND LV CONDUITS TO BE REMOVED

PROPOSED WATER SERVICING CONNECTION FOR BLOCK A

PROPOSED OSD TO BE INSTALLED WITH 2 x OCEAN GUARD AT THE INLET AND 2x690mm STORMFILTER CARTRIDGES FOR WATER QUALITY

EXISTING SEWER MAIN AND PIT TO BE RELOCATED DUE TO CLASH WITH BLOCK A

DISUSED SEWER MAIN THAT CAN POTENTIALLY BE USED FOR RELOCATION ROUTE

TELSTRA CONDUITS TO BE REMOVED UP TO TELSTRA PIT

PROPOSED GAS CONNECTION FOR BLOCK A

DRAINAGE PIPE TO BE REMOVED

INDICATIVE LOCATION OF EXISTING STORMWATER PIPE TRANSECTING THE PROPOSED DEVELOPMENT BASED ON DBYD INFORMATION, ADDITIONAL SURVEY DATA IS REQUIRED TO FURTHER INVESTIGATE THIS PIPE AND PROPOSE DIVERSION

PROPOSED DN375 OUTLET TO CONNECT TO THE EXISTING STORMWATER PIT ON EXPLORER STREET, ADDITIONAL SURVEY INFORMATION REQUIRED TO DETERMINE THE EXISTING PIT INVERT LEVEL TO PROVIDE POINT OF CONNECTION

PROPOSED DEPRESSION SWALE TO DIRECT SURFACE RUNOFF TO THE NEAREST STORMWATER PIT INSTALLED WITH OCEAN GUARD

NEW MEDIUM PRESSURE GAS MAIN TO CONNECT TO EXISTING GAS ON HENDERSON RD

PROPOSED SITE BOUNDARY

INDICATIVE OVERLAND FLOW PATH

DIRECTION OF FLOW

LIGHT POLE AND LV CONDUITS TO BE REMOVED

PROPOSED OSD TO BE INSTALLED WITH 2 x OCEAN GUARD AT THE INLET AND 11x690mm STORMFILTER CARTRIDGES FOR WATER QUALITY

PROPOSED TREES ARE TO BE COORDINATED WITH EXISTING SERVICES TO ENSURE NO CLASHES.

REFER TO LANDSCAPE DRAWINGS FOR EXISTING TREES TO BE RETAINED AND PROPOSED NEW TREE LOCATIONS

PROPOSED ELECTRICAL CONNECTION FOR BLOCK B

PROPOSED COMMS SERVICING CONNECTION FOR BLOCK B

PROPOSED WATER SERVICING CONNECTION FOR BLOCK B

EXPLORER ST

AURORA PL

STATION PL

PROGRESS RD

HENDERSON ROAD

RAILWAY PARADE

NEWTON STREET

BUILDING STREET

OSD TANK VOLUME: 74.4m³

OSD TANK VOLUME: 58.2m³

OSD TANK VOLUME: 10

RWT

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Rev	Date	Description	Ch'k'd	App'd
P2	31/07/2023	FINAL ISSUE	WP	BS
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SCALE
1:500 (0, 25m, 50m)

CLIENT
NSW GOVERNMENT | Planning, Industry & Environment

TITLE
Explorer St Precinct
Eveleigh, NSW 2015
Utilities Plan

DRAWING INFORMATION

Drawn:	P.Vu	Revision:	P2
Designed:	A.Bayhan	Status:	FOR INFORMATION
Checked:	W.Phan	Security:	STD
Approved:	B.Soo		

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Appendix B - Individual Utilities Plan

Legend

- Boundary
- Easement
- Gas Line (DBYD)
- Existing Stormwater Line (DBYD)
- Existing Stormwater Pit (DBYD)
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SCALE
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0 25m 50m

CLIENT
NSW GOVERNMENT | Planning, Industry & Environment

TITLE
Explorer St Precinct
Eveleigh, NSW 2015
Electricity Utilities Plan

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- Proposed OSD Tank

NOTES

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PROPOSED GAS CONNECTION FOR BLOCK B

PROPOSED GAS CONNECTION FOR BLOCK B

PROPOSED GAS CONNECTION FOR BLOCK A

NEW MEDIUM PRESSURE GAS MAIN TO CONNECT TO EXISTING GAS ON HENDERSON RD

RWT

OSD TANK VOLUME: 58.2m³

OSD TANK VOLUME: 71.4m³

OSD TANK VOLUME: 101.

EXPLORER ST

AURORA PL

STATION PL

PROGRESS RD

HENDERSON ROAD

RAILWAY PARADE

NEWTON STREET

BUILDING STREET

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0 25m 50m

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NSW GOVERNMENT Planning, Industry & Environment

TITLE
Explorer St Precinct
Eveleigh, NSW 2015
Gas Utilities Plan

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FILE LOCATION: C:\Users\PHA93153\Mott MacDonald\Bays West - flooding and storm - Do\Explorer St Precinct\04 Working\01 Drafting\Civil\Sketches\426320-001-MMD-DA-XX-SKE-C-0010.dwg Jul 31, 2023 - 10:49AM PHA93153

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- Existing Sewer Main (DBYD)
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- Sewer Maintenance Hole (DBYD)
- Existing Sewer Rodding Point (DBYD)
- Existing Sewer Vent Shaft (DBYD)
- Existing Sewer Vertical (DBYD)
- Existing Sewer Lamp Hole (DBYD)
- Existing Water Main (DBYD)
- Existing Water Stop Valve (DBYD)
- Existing Water Hydrant (DBYD)
- Existing Telecommunications (DBYD)
- Existing Light Pole (DBYD)
- Overhead Powerline (DBYD)
- Underground Electricity (DBYD)
- High Voltage Electricity (DBYD)

- Proposed Building
- Proposed Tree
- Proposed Sewer Connection
- Proposed Gas Connection
- Proposed Electricity Connection
- Proposed Telecommunication Connection
- Proposed Water Connection

- Proposed Boundary
- Proposed Stormwater Pipe
- Proposed downpipe
- Direction of FLow
- Indicative Overland Flow Path
- Proposed Stormwater Pit
- Proposed Junction Pit
- Proposed Rainwater Tank
- Proposed OSD Tank

NOTES

EXISTING SERVICES SHOWN ARE FROM DBYD AND ARE FOR INFORMATION ONLY

PROPOSED SEWER CONNECTION FOR BLOCK B

EXISTING SEWER AND PROPERTY CONNECTIONS TO BE REMOVED

PROPOSED SEWER CONNECTION FOR BLOCK B

PROPOSED SEWER CONNECTION FOR BLOCK A

EXISTING SEWER MAIN TO BE REMOVED

EXISTING SEWER MAIN AND PIT TO BE RELOCATED DUE TO CLASH WITH BLOCK A

DISUSED SEWER MAIN THAT CAN POTENTIALLY BE USED FOR RELOCATION ROUTE

RWT

OSD TANK VOLUME: 58.2m³

OSD TANK VOLUME: 71.4m³

OSD TANK VOLUME: 104.

EXPLORER ST

AURORA PL

STATION PL

PROGRESS RD

HENDERSON ROAD

RAILWAY PARADE

NEWTON STREET

BUILDING STREET

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Rev	Date	Description	Ch'k'd	App'd
P2	31/07/2023	FINAL ISSUE	WP	BS
P1	27/05/2023	DRAFT ISSUE FOR INFORMATION	WP	BS

SCALE
1:500
0 25m 50m

CLIENT
NSW GOVERNMENT Planning, Industry & Environment

TITLE
Explorer St Precinct
Eveleigh, NSW 2015
Sewer Utilities Plan

DRAWING INFORMATION

Drawn:	P.Vu	Revision:	P2
Designed:	A.Bayhan	Status:	FOR INFORMATION
Checked:	W.Phan	Security:	STD
Approved:	B.Soo		

DRAWING NUMBER
426320-001-MMD-DA-XX-SKE-C-Sewer

FILE LOCATION: C:\Users\PHA93153\Mott MacDonald\Bays West - flooding and storm - Do\Explorer St Precinct\04 Working\01 Drafting\Civil\Sketches\426320-001-MMD-DA-XX-SKE-C-0010.dwg Jul 31, 2023 - 10:50AM PHA93153

Legend

- Boundary
- Easement
- Gas Line (DBYD)
- Existing Stormwater Line (DBYD)
- Existing Stormwater Pit (DBYD)
- Existing Sewer Main (DBYD)
- Exidting Disused Sewer Main (DBYD)
- Sewer Maintenance Hole (DBYD)
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- Existing Sewer Vent Shaft (DBYD)
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- Existing Water Hydrant (DBYD)
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- Existing Light Pole (DBYD)
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- High Voltage Electricity (DBYD)

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- Proposed Electricity Connection
- Proposed Telecommunication Connection
- Proposed Water Connection

- Proposed Boundary
- Proposed Stormwater Pipe
- Proposed downpipe
- Direction of FLow
- Indicative Overland Flow Path
- Proposed Stormwater Pit
- Proposed Junction Pit
- Proposed Rainwater Tank
- Proposed OSD Tank

NOTES

EXISTING SERVICES SHOWN ARE FROM DBYD AND ARE FOR INFORMATION ONLY

PROPOSED OVERFLOW FROM RAINWATER TANK TO CONNECT TO ON-SITE DETENTION ABOVE WATER QUALITY CHAMBER . PIPE ARRANGEMENT TO BE COORDINATED BY HYDRAULIC CONSULTANT (TYP).

PROPOSED OSD TO BE INSTALLED WITH 2 x OCEAN GUARD AT THE INLET AND 5x690mm STORMFILTER CARTRIDGES FOR WATER QUALITY

PROPOSED SITE BOUNDARY

INDICATIVE OVERLAND FLOW PATH

DIRECTION OF FLOW

PROPOSED SAG PIT TO BE INSTALLED WITH OCEAN GUARD TO TREAT SURFACE RUNOFF (TYP)

PROPOSED CREST (TYP)

PROPOSED OSD TO BE INSTALLED WITH 2 x OCEAN GUARD AT THE INLET AND 11x690mm STORMFILTER CARTRIDGES FOR WATER QUALITY

PROPOSED TREES ARE TO BE COORDINATED WITH EXISTING SERVICES TO ENSURE NO CLASHES.

REFER TO LANDSCAPE DRAWINGS FOR EXISTING TREES TO BE RETAINED AND PROPOSED NEW TREE LOCATIONS

DRAINAGE PIPE TO BE REMOVED

PROPOSED OSD TO BE INSTALLED WITH 2 x OCEAN GUARD AT THE INLET AND 2x690mm STORMFILTER CARTRIDGES FOR WATER QUALITY

PROPOSED DN375 OUTLET TO CONNECT TO THE EXISTING STORMWATER PIT ON EXPLORER STREET, ADDITIONAL SURVEY INFORMATION REQUIRED TO DETERMINE THE EXISTING PIT INVERT LEVEL TO PROVIDE POINT OF CONNECTION

PROPOSED DEPRESSION SWALE TO DIRECT SURFACE RUNOFF TO THE NEAREST STORMWATER PIT INSTALLED WITH OCEAN GUARD

DRAINAGE PIPE TO BE REMOVED

INDICATIVE LOCATION OF EXISTING STORMWATER PIPE TRANSECTING THE PROPOSED DEVELOPMENT BASED ON DBYD INFORMATION, ADDITIONAL SURVEY DATA IS REQUIRED TO FURTHER INVESTIGATE THIS PIPE AND PROPOSE DIVERSION

EXPLORER ST
AURORA PL
STATION PL
PROGRESS RD
HENDERSON ROAD
RAILWAY PARADE
NEWTON STREET
BUILDING STREET
RWT
OSD TANK VOLUME: 58.2m³
OSD TANK VOLUME: 71.4m³
OSD TANK VOLUME: 101.4m³

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Rev	Date	Description	Ch'k'd	App'd
P2	31/07/2023	FINAL ISSUE	WP	BS
P1	27/05/2023	DRAFT ISSUE FOR INFORMATION	WP	BS

SCALE
1:500
0 25m 50m

CLIENT
NSW GOVERNMENT Planning, Industry & Environment

TITLE
Explorer St Precinct
Eveleigh, NSW 2015
Stormwater Utilities Plan

DRAWING INFORMATION
Drawn: P.Vu
Designed: A.Bayhan
Checked: W.Phan
Approved: B.Soo
Revision: P2
Status: FOR INFORMATION
Security: STD

DRAWING NUMBER
426320-001-MMD-DA-XX-SKE-C-Stormwater

FILE LOCATION: C:\Users\PHA93153\Mott MacDonald\Bays West - flooding and storm - Do\Explorer St Precinct\04 Working\01 Drafting\Civil\Sketches\426320-001-MMD-DA-XX-SKE-C-0010.dwg Jul 31, 2023 - 10:49AM PHA93153

Legend

- Boundary
- Easement
- Gas Line (DBYD)
- Existing Stormwater Line (DBYD)
- Existing Stormwater Pit (DBYD)
- Existing Sewer Main (DBYD)
- Exidting Disused Sewer Main (DBYD)
- Sewer Maintenance Hole (DBYD)
- Existing Sewer Rodding Point (DBYD)
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- Existing Sewer Vertical (DBYD)
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- Proposed Boundary
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- Proposed downpipe
- Direction of FLow
- Indicative Overland Flow Path
- Proposed Stormwater Pit
- Proposed Junction Pit
- Proposed Rainwater Tank
- Proposed OSD Tank

NOTES

EXISTING SERVICES SHOWN ARE FROM DBYD AND ARE FOR INFORMATION ONLY

TELSTRA CONDUITS AND PROPERTY CONNECTIONS TO BE REMOVED

PROPOSED COMMS SERVICING CONNECTION FOR BLOCK B

PROPOSED COMMS SERVICING CONNECTION FOR BLOCK A

TELSTRA CONDUITS TO BE REMOVED UP TO TELSTRA PIT

PROPOSED COMMS SERVICING CONNECTION FOR BLOCK B

RWT

OSD TANK VOLUME: 58.2m³

OSD TANK VOLUME: 71.4m³

OSD TANK VOLUME: 101.

AURORA PL

STATION PL

EXPLORER ST

PROGRESS RD

HENDERSON ROAD

RAILWAY PARADE

NEWTON STREET

BUILDING STREET

1 2 3 4 5 6

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P2	31/07/2023	FINAL ISSUE	WP	BS
P1	27/05/2023	DRAFT ISSUE FOR INFORMATION	WP	BS

SCALE
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CLIENT
NSW GOVERNMENT Planning, Industry & Environment

TITLE
Explorer St Precinct
Eveleigh, NSW 2015
Telecommunication Utilities Plan

DRAWING INFORMATION

Drawn:	P.Vu	Revision:	P2
Designed:	A.Bayhan	Status:	FOR INFORMATION
Checked:	W.Phan	Security:	STD
Approved:	B.Soo		

DRAWING NUMBER
426320-001-MMD-DA-XX-SKE-C-Telecommunication

FILE LOCATION: C:\Users\PHA93153\Mott MacDonald\Bays West - flooding and storm - Do\Explorer St Precinct\04 Working\01 Drafting\Civil\Sketches\426320-001-MMD-DA-XX-SKE-C-0010.dwg Jul 31, 2023 - 10:50AM PHA93153

Legend

- Boundary
- Easement
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- Sewer Maintenance Hole (DBYD)
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- Existing Water Stop Valve (DBYD)
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- Proposed OSD Tank

NOTES

EXISTING SERVICES SHOWN ARE FROM DBYD AND ARE FOR INFORMATION ONLY

PROPOSED WATER SERVICING CONNECTION FOR BLOCK B

PROPOSED WATER SERVICING CONNECTION FOR BLOCK A

PROPOSED WATER SERVICING CONNECTION FOR BLOCK B

RWT

OSD TANK VOLUME: 58.2m³

OSD TANK VOLUME: 71.4m³

OSD TANK VOLUME: 104.

AURORA PL

STATION PL

EXPLORER ST

PROGRESS RD

HENDERSON ROAD

RAILWAY PARADE

NEWTON STREET

BUILDING STREET

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P1	27/05/2023	DRAFT ISSUE FOR INFORMATION	WP	BS

SCALE
1:500
0 25m 50m

CLIENT
NSW GOVERNMENT Planning, Industry & Environment

TITLE
Explorer St Precinct
Eveleigh, NSW 2015
Water Utilities Plan

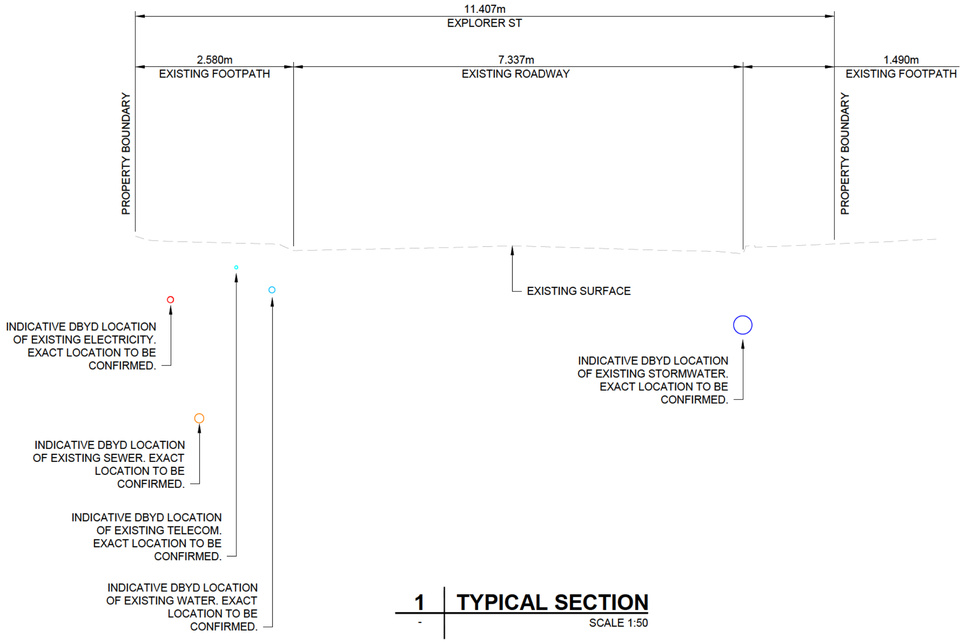
DRAWING INFORMATION

Drawn:	P.Vu	Revision:	P2
Designed:	A.Bayhan	Status:	FOR INFORMATION
Checked:	W.Phan	Security:	STD
Approved:	B.Soo		

DRAWING NUMBER
426320-001-MMD-DA-XX-SKE-C-Water

FILE LOCATION: C:\Users\PHA93153\Mott MacDonald\Bays West - flooding and storm - Do\Explorer St Precinct\04 Working\01 Drafting\Civil\Sketches\426320-001-MMD-DA-XX-SKE-C-0010.dwg Jul 31, 2023 - 10:50AM PHA93153

Appendix C – Utility Cross Sections



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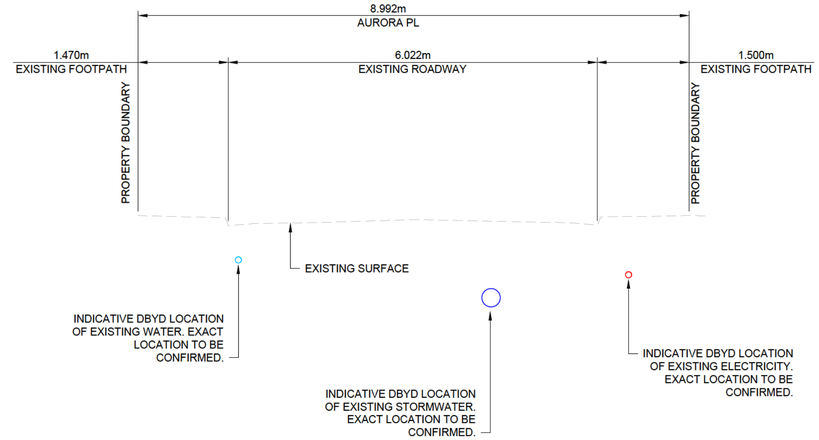
SCALE 1:50



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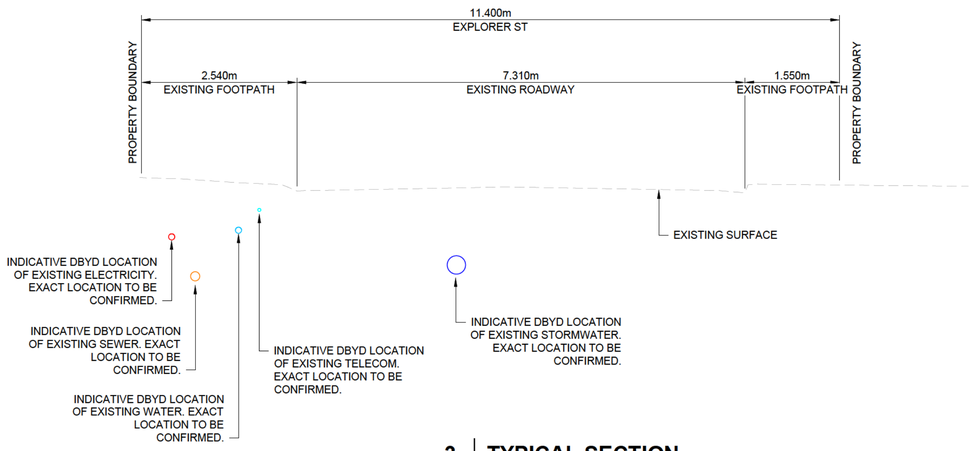

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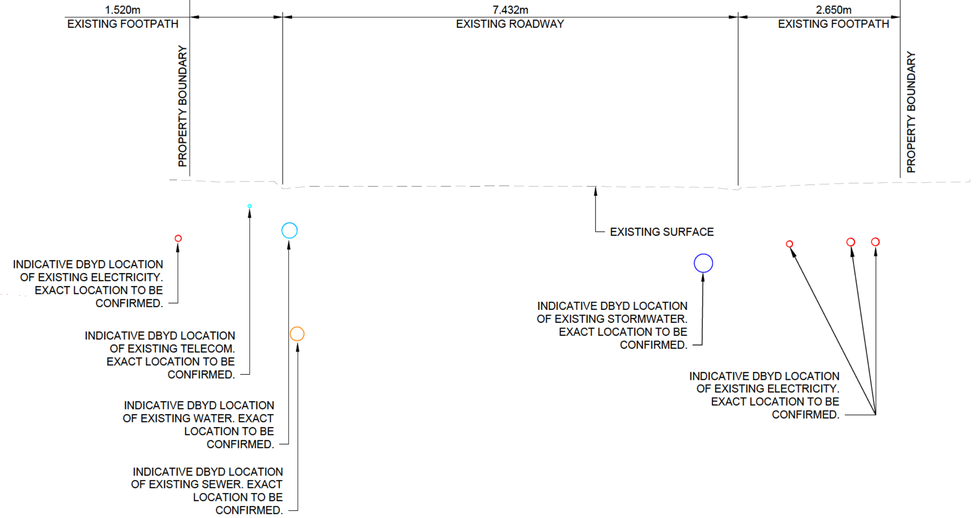

4 TYPICAL SECTION
SCALE 1:50

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P1	27/05/2023	DRAFT ISSUE FOR INFORMATION	WP	BS

SCALE
1:50 0 2500mm 5000mm

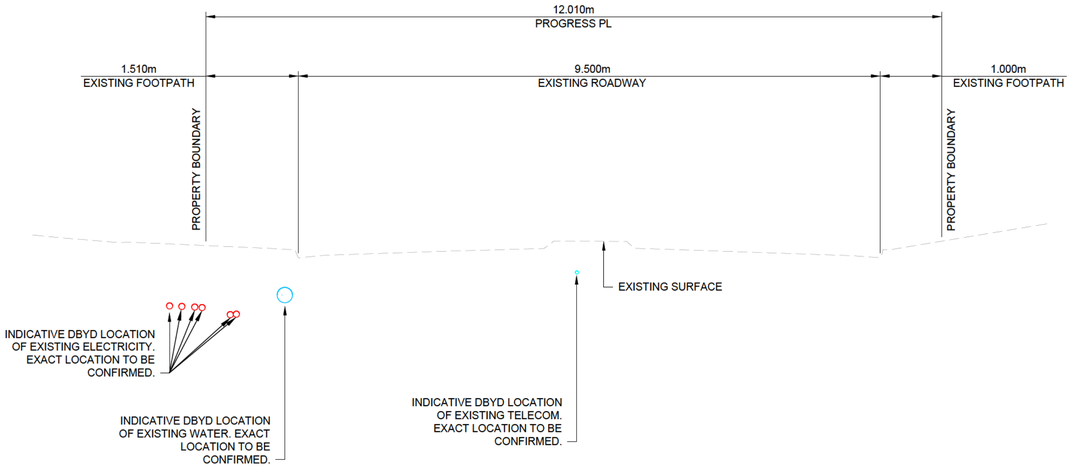
CLIENT
NSW GOVERNMENT Planning, Industry & Environment

TITLE
Explorer St Precinct
Eveleigh, NSW 2015
Utilities Cross Sections

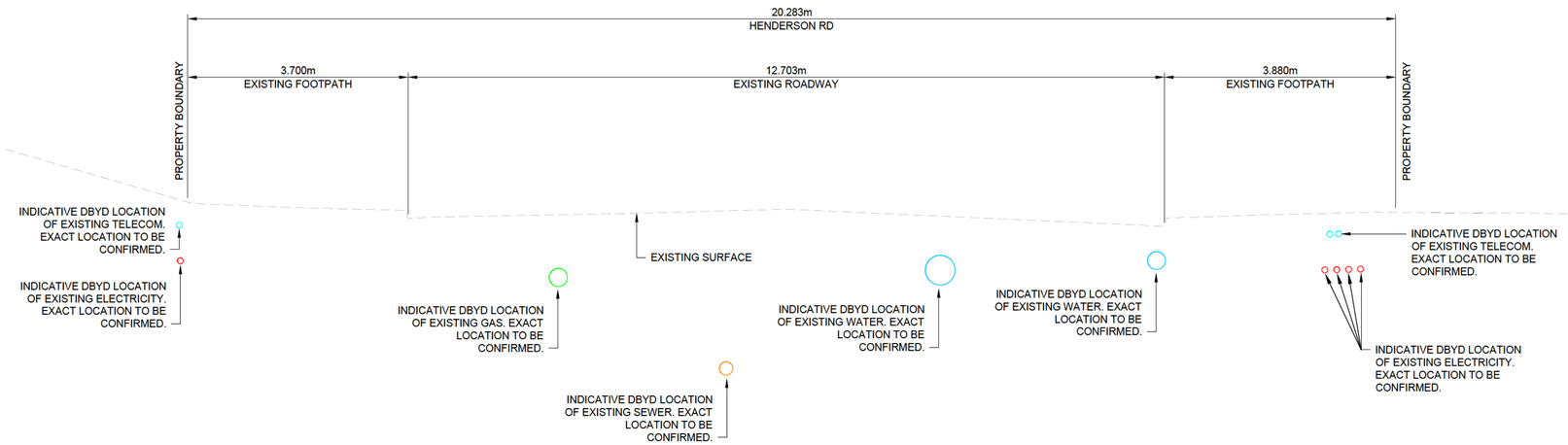
DRAWING INFORMATION
Drawn: P.Vu
Designed: A.Bayhan
Checked: W.Phan
Approved: B.Soo
Revision: P2
Status: FOR INFORMATION
Security: STD

DRAWING NUMBER
426320-001-MMD-DA-XX-SKE-C-0020

FILE LOCATION: C:\Users\PHA93153\Mott MacDonald\Bays West - flooding and storm - Do\Explorer St Precinct\04 Working\01 Drafting\Civil\Sketches\426320-001-MMD-DA-XX-SKE-C-0020.dwg Jul 31, 2023 - 10:50AM PHA93153



5 | **TYPICAL SECTION**
-
SCALE 1:50



6 | **TYPICAL SECTION**
-
SCALE 1:50

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SCALE
1:50 0 2500mm 5000mm

CLIENT
NSW GOVERNMENT Planning, Industry & Environment

TITLE
Explorer St Precinct
Eveleigh, NSW 2015
Utilities Cross Sections

DRAWING INFORMATION
Drawn: P.Vu
Designed: A.Bayhan
Checked: W.Phan
Approved: B.Soo
Revision: P2
Status: FOR INFORMATION
Security: STD

DRAWING NUMBER
426320-001-MMD-DA-XX-SKE-C-0021

FILE LOCATION: C:\Users\PHA93153\Mott MacDonald\Bays West - flooding and storm - Do\Explorer St Precinct\04 Working\01 Drafting\Civil\Sketches\426320-001-MMD-DA-XX-SKE-C-0020.dwg Jul 31, 2023 - 10:50AM PHA93153