



Robert Bird Group

EXALLOS GROUP

SPECIALIST ENGINEERING

Site Services Report for

Cnr Water and Brunswick Street, Fortitude Valley

Lot 1 on RP42507, Lots 1, 5, 6 & 13 on RP81335, Lot 1 on
RP10553 & Lots 11 & 12 on RP10552.

Prepared For: Metro Property Development Pty Ltd

24th May 2012

Job No.: 11720C

Issue - B

**PLANS AND DOCUMENTS
referred to in the ULDA**

APPROVAL dated 30 / 8 / 2012



ISO 9001:2008
FS 520893



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1.0 Purpose of Document

This document has been prepared on behalf of Metro Property Development Pty Ltd as part of a Development Application submission to the Urban Land Development Authority (ULDA) for a proposed mixed-use development located at the corner of Water Street and Brunswick Street, Fortitude Valley.

The purpose of this report is to address the engineering infrastructure that will be required to service the proposed development.

This report was prepared using information obtained from the following sources:

- Part detail survey, drawing No. 107919-2 prepared by RPS Group, dated 6th October 2011.
- Architectural Plans of the proposed development prepared by Bureau Proberts Architects.
- Brisbane City council eBimap information.
- Dial-Before-You-Dig (DBYD) services.
- NearMap aerial images.
- Site visit.

2.0 Introduction

The proposed development is on land described as Lot 1 on RP42507, Lots 1, 5, 6 & 13 on RP81335, Lot 1 on RP10553 & Lots 11 & 12 on RP10552.

The site is bound by Water Street on the southern side, Brunswick Street on the western side, a multi storey building and tennis court on the northern side and a multi unit residential complex on the eastern side. Diggles Close also terminates at the north eastern corner of the site.

The site is located approximately 2km to the north of the Brisbane GPO. Under the City Plan Area Classification, the site is classified as medium density residential.

The site is currently in use. Approximately half the site is covered by a sealed on-grade carpark and the remaining half of the site is occupied by numerous small buildings located around the eastern part of the site, a heritage listed timber drill-hall building and three (3) retail/commercial buildings that front Brunswick Street.

Total site area:	12,849m ²
Area classification:	Multi-purpose Centre MP2 - Major Centre (CP-MP2)
Local Plan:	Bowen Hills Urban Development Area (CP-UDA2)

Proposal Details

The Development Application can be described as follows:

- Development Permit for a Material Change of Use for multi-unit dwellings and commercial/retail.
- Building Works (Preliminary Approval).
- Reconfiguration of a lot - ROL.

The proposed development comprises a mixed use development incorporating multi storey residential buildings which will provide a mix of one and two bedroom units, ground floor retail and some commercial.

The project will be constructed over two phases with four stages in phase one and three stages in phase two. The first phase will be the eastern half of the site and stage one of the development located in the far south eastern corner.

Please refer to the Architect's design statement and their area schedule for GFA breakdown and final figures of development schedule for stage 1.

Vehicle Access and Parking

Currently vehicles can access the site from Water Street to the on-grade asphalt car parking area on the site.

Proposed vehicle access to the site and carpark will be from Water Street and proposed extended Diggles Close.

Pedestrian access to the development is proposed to be from Water Street, Brunswick Street and Diggles Close.

Proposed four car parking levels with a total of 679 car parking spaces are provided to the development.

2.1 Location

The street address for the site is 332-342 Water Street and 62-68 Brunswick Street, Fortitude Valley.

Figure 2.1 - Site Location

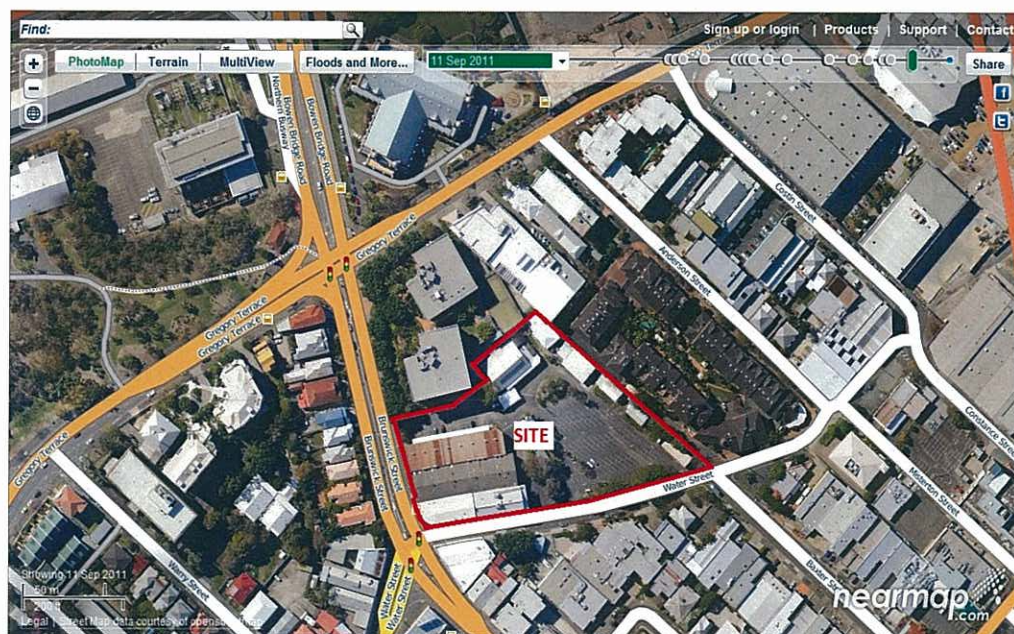


Image by NearMap

3.0 Density

Currently half the site is covered by sealed on grade carparking areas and the remaining half of the site is occupied by numerous small buildings scattering the eastern portion of the site and 3 retail/commercial buildings which front Brunswick Street.

It is understood that the overall development will ultimately comprise 1,080 residential units with an average gross floor area of 62.5m²/unit totalling 67,500m². There will also be approximately 400m² of commercial or retail space.

This report is prepared for final density of the overall development.

Table 3.1 below provides a summary of the proposed land usage of the site and the likely Equivalent Persons (EP's) generated by the future overall development.

Table 3.1: Estimated Equivalent Persons (EP's)

Development Type	Final Gross Floor Area (m ²)	EP Conversion Rate (EP/ha)	Total EP's
Residential	67,500	180	1,215
Retail / Commercial	400	150	6
Total			1,221

*Note: EP's have been calculated using Queensland Urban Utilities Water and Sewer Technical Standards.

4.0 Water Supply

4.1 Existing Infrastructure

Appendix A provides a copy of Brisbane City Council's eBimap showing water infrastructure in the immediate vicinity of the site. The details of the existing water reticulation mains are recorded below in Table 4.1 below.

Table 4.1: Existing Water Reticulation Infrastructure

Size	Material	Council ID No.	Location
150mm	CISL	RS27152	Along northern side of Water Street
225mm	CISL	RS27557	Along eastern side of Brunswick Street
150mm	CICL	RS27554	Along western side of Brunswick Street

According to Council's eBimap information the water is fed from the Green Hill Reservoir 1&2 / Lloyd Street pumps.

According to eBimap information there are 2 (two) existing 100mm diameter property connections servicing the site from Water Street.

4.2 Proposed Demand

In accordance with the current Water Supply Code of Australia, WSA-03-2002-2.3 Table 2.1 the peak hour demand for the proposed development is estimated as follows:

Residential (high density)

1,080 units x 6l/s / 100 Units
= 64.8l/s

Retail / Commercial
0.04ha x 0.4l/s
= 0.02l/s

Potable Water Demand (Peak hour)
= 64.82l/s

Fire flow is estimated to be 55l/s.

Therefore total peak flow is 55l/s + 2/3 x 64.82 = **98.21l/s**.

The site will require suitable property connection/s installed to meet the water supply demands for a multi storey mixed use development.

It could be reasonable to expect that a booster pump may be required to be installed on the potable water and fire mains supply to assist with the pressure requirements for fire fighting demands due to the height of the buildings.

The project's hydraulics services consultant will address these specific requirements during the design development stage

4.3 Point of Connection

From the preliminary discussion with Queensland Urban Utilities (QUU), QUU have advised that the existing water main has sufficient capacity to cater for the proposed development. Therefore no upgrade is required for the existing water main.

Liaison with QUU and the hydraulics consultant will be required in the future to determine the site's requirements and to discuss the staging of the project.

This will also be subject to flow and pressure testing of the existing mains.

Further details will be provided at the Operational Works stage

5.0 Sewerage

5.1 Existing Infrastructure

Appendix A provides a copy of Brisbane City Council's eBimap showing sewer infrastructure in the immediate vicinity of the site. The following is a summary of the sewer information:

1. A 150mm diameter earthenware gravity sewer main runs along the western side of Brunswick Street. This runs in a southerly direction and discharges into a sewer maintenance hole located at the intersection of Brunswick and Water Street.
2. From the abovementioned sewer maintenance hole, a 225mm diameter earthenware sewer gravity main runs eastwards along Water Street. This sewer main continues along Water Street and eventually discharges into a 300mm diameter main located in the RNA Exhibition grounds.

The existing sewerage infrastructure is recorded in Table 5.1 below.

Table 5.1: Existing Sewerage Reticulation Infrastructure

Size	Material	Council ID No.	Location
150mm	Earthenware (EW)	LS 168762	Brunswick Street
225mm	Earthenware (EW)	LS 168760 LS 168744 LS 168759	Water Street
150mm	Property Connection	PC 307633	On line LS168744
150mm	Property Connection	PC 307683	At maintenance hole MH167229

5.2 Proposed Demand

In accordance with Council's Guidelines and the Sewerage Code of Australia, the expected loading from the proposed mixed use development is as follows:

Table 5.2: Estimated Sewerage Demands

Description	Design Flow/EP	Flow (L/s)
Average Dry Weather Flow (ADWF)	210L/EP/Day	3.96
Peak Dry Weather Flow (PDWF)	540L/EP/Day	10.18
Peak Wet Weather Flow (PWWF)	1050L/EP/Day	19.78

The above flows are calculated as follows:

$$\text{Design Flow} = \frac{\text{EP} \times \text{Flow L/EP/day}}{18 \times 3600}$$

5.3 Point of Connection

In the preliminary discussion with Queensland Urban Utilities (QUU), QUU have advised that the existing sewer main is required to be upgraded. However, ULDA has advised the sewer will only require to be upgraded on the phase two of the proposed development.

Liaison with QUU and the hydraulics consultant will be required in the future to determine the site's requirements and to discuss the staging of the project.

Further details will be provided at the operational works stage.

6.0 Stormwater Drainage

According to the Survey Plan produced by RPS and Brisbane City Council's eBimap information the following stormwater infrastructure is located in the vicinity of the site.

The existing stormwater system consists of the following:

- A stormwater gully pit (L15092246) located on the northern side of the Water Street adjacent to the site's south-west corner where it intersects with Brunswick Street. Stormwater gully pit L15092246 connects to stormwater gully pit (L15092629) to the south on the eastern side of the Brunswick Street at the same intersection via a 100mm diameter stormwater pipe. The stormwater gully pit L15092629 then connects to stormwater manhole (L15003719) close by. An unknown stormwater pipe connects the stormwater manhole L15003719 to the 1275 x 2150mm stone arch channel which runs along the middle of the intersection.
- From the intersection, the 1275 x 2150mm stone arch channel continues in an easterly direction along the centre of Water Street. A stormwater manhole (L15003723) is located over the stone arch channel at the centre of Water Street adjacent to Lot 11 on RP10552.
- A stormwater gully pit (L15145921) located on the southern side of Water Street adjacent to Lot 1 on RP42507. Stormwater gully pit L15145921 connects via a 750mm diameter stormwater pipe to a stormwater manhole (L15003724) to the north which is located over the 1275 x 2150mm stone arch channel.

- The 1275 x 2150mm stone arch channel discharges into a 1650 x 2075mm stone arch channel through stormwater manhole (L15000116). The 1650 x 2075mm stone arch then runs along centre of Water Street towards north-east direction. This stormwater manhole is located on the centre of the Water Street where Baxter Street intersects.
- 2 stormwater gully pits (L15092259 and L15092260) are located on the each side of Diggles Close adjacent to the site's north-east boundary. Stormwater gully pits L15092259 and L15092260 are connected to a stormwater manhole nearby via a 300mm diameter stormwater pipe and an unknown stormwater pipe respectively.
- From this manhole, a 525mm diameter stormwater pipe runs towards the south-east into Easement B on RP881617 along site's north-east boundary. 2 stormwater field inlets (L15011785 and L15011786) are located along this 525mm diameter pipe in Easement B on RP881617. This 525mm diameter pipe then connects to a stormwater manhole (L15011787) located on the driveway in Lot 2 on RP881617 (Easement No. 700829619). From manhole L15011787, the stormwater pipe continues to run in a south easterly direction via a 750mm stormwater pipe and connects to a stormwater manhole (L15011788) located next to the kerb and channel on the driveway crossover that connecting Water Street. Manhole L15011788 is connected to manhole L15000116 (as mentioned above) on Water Street via a 750mm stormwater pipe.
- A field inlet is located on the south-east corner of the existing carpark adjacent to the site's southern boundary. This field inlet is connected to a gully pit (L15092248) on the northern side of Water Street via a 110mm stormwater pipe. Gully pit L15092248 then connects to another gully pit (L15092249) on the direct opposite (Southern side of the Water Street) via a 300mm diameter stormwater pipe. From gully pit L15092249, a 300mm diameter stormwater pipe then runs to the east and discharges to the stormwater gully pit (L15092273) which located on the western side of the Baxter Street where intersects with Water Street.

It is proposed that the piped (minor) stormwater drainage system from the site will be connected to the existing stormwater infrastructure in Water Street.

Further details will be provided at the operational works stage

7.0 Electrical Supply

According to the available information, the site has the following electrical reticulation infrastructure located in its immediate vicinity:

- Underground electrical reticulation system runs along both sides of Water Street, along the eastern side of Brunswick Street and the southern side of Diggles Close.
- Overhead electrical reticulation system runs along the southern side of Water Street and the western side of Brunswick Street.

It is proposed that the electrical consultant will determine the extent of any upgrading works that may be required due to the proposed development.

8.0 Telecommunications

According to survey and DBYD information the following Telstra and Optus telecommunications infrastructure is located in the site's vicinity:

- Telecommunications cables are located in Water Street and Brunswick Street.

It is proposed that the service consultant will negotiate with the relevant carriers regarding the requirements of the proposed development telecommunications connection and the extent of any upgrading works to the system if necessary.

9.0 Gas

According to survey and DBYD information the following gas reticulation system is located in the site's vicinity:

- A gas main runs along Brunswick Street
- A gas main located in Diggles Close.
- A gas main located in Baxter Street terminating at the intersection with Water Street.

Any upgrading, extension or relocation works of the existing gas reticulation main would need to be undertaken by the services consultant in conjunction with the asset owner.

10.0 Conclusion

The site appears to be adequately serviced by public utilities. All information discussed in this report is inferred from detailed survey plans, Brisbane City Council's eBimap information, Dial-Before-You-Dig records, NearMap satellite imagery and site investigation.

There is existing council piped stormwater infrastructure located immediately adjacent to the site.

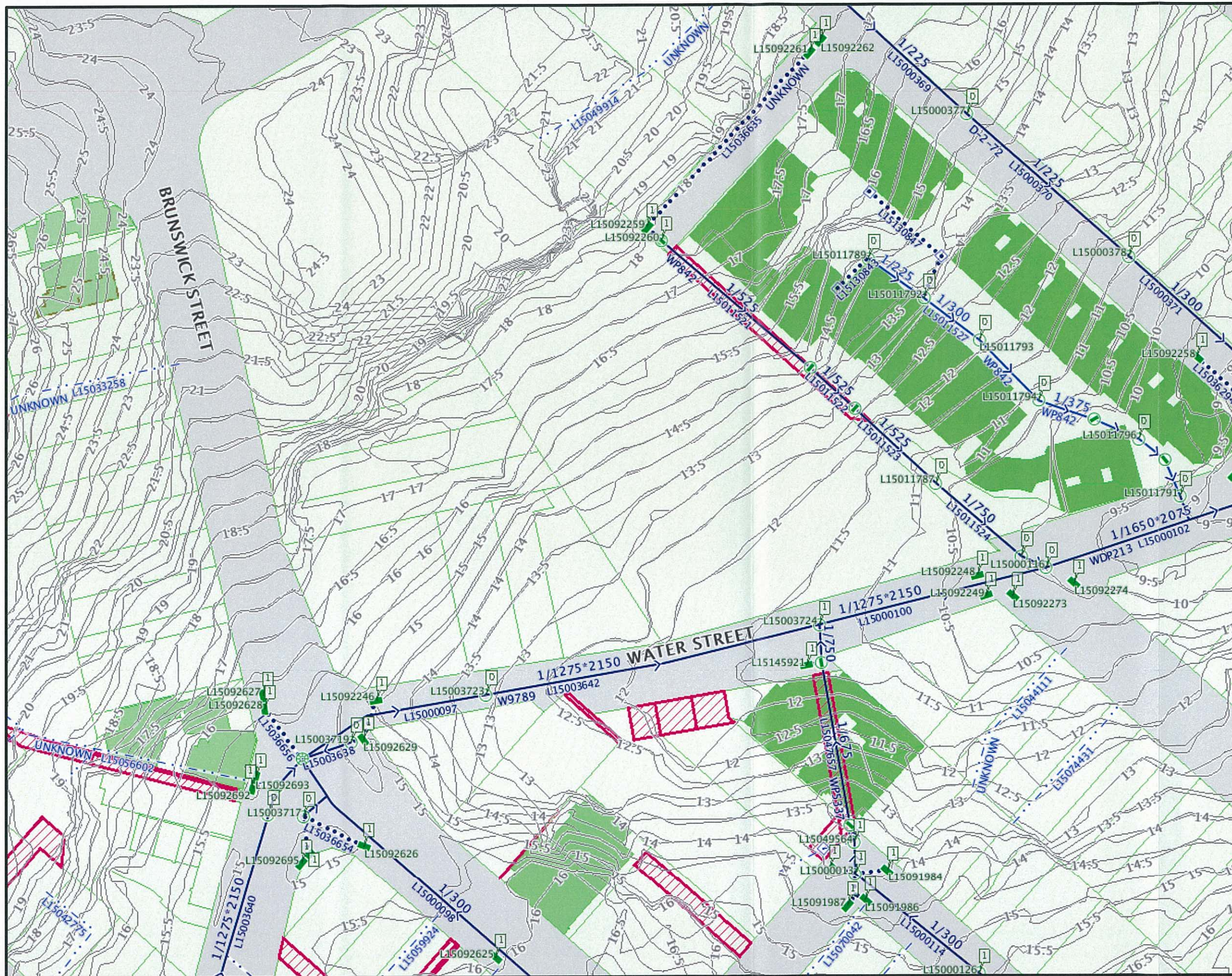
The site has electrical and telecommunication services located adjacent to the site. Some upgrading of the services may be expected due to the increased density by the development proposal.

There are existing gas mains located adjacent to the site and future work for connections to the gas reticulation main would need to be undertaken in consultation with the asset owner.

Existing water and sewer reticulation mains are located immediately adjacent to the site. The existing water services will have the capacity to cater for the proposed development. Nevertheless, as a result of the proposed increase in GFA of the site and the height of the buildings, upgrading to the sewer will be required on the phase two of the development and this will be addressed at the detail design stage of the project.

Appendix A

Brisbane City Council eBimap information



Cnr Brunswick & Water St

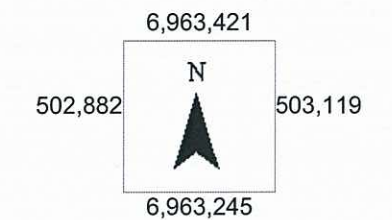
Stormwater 03

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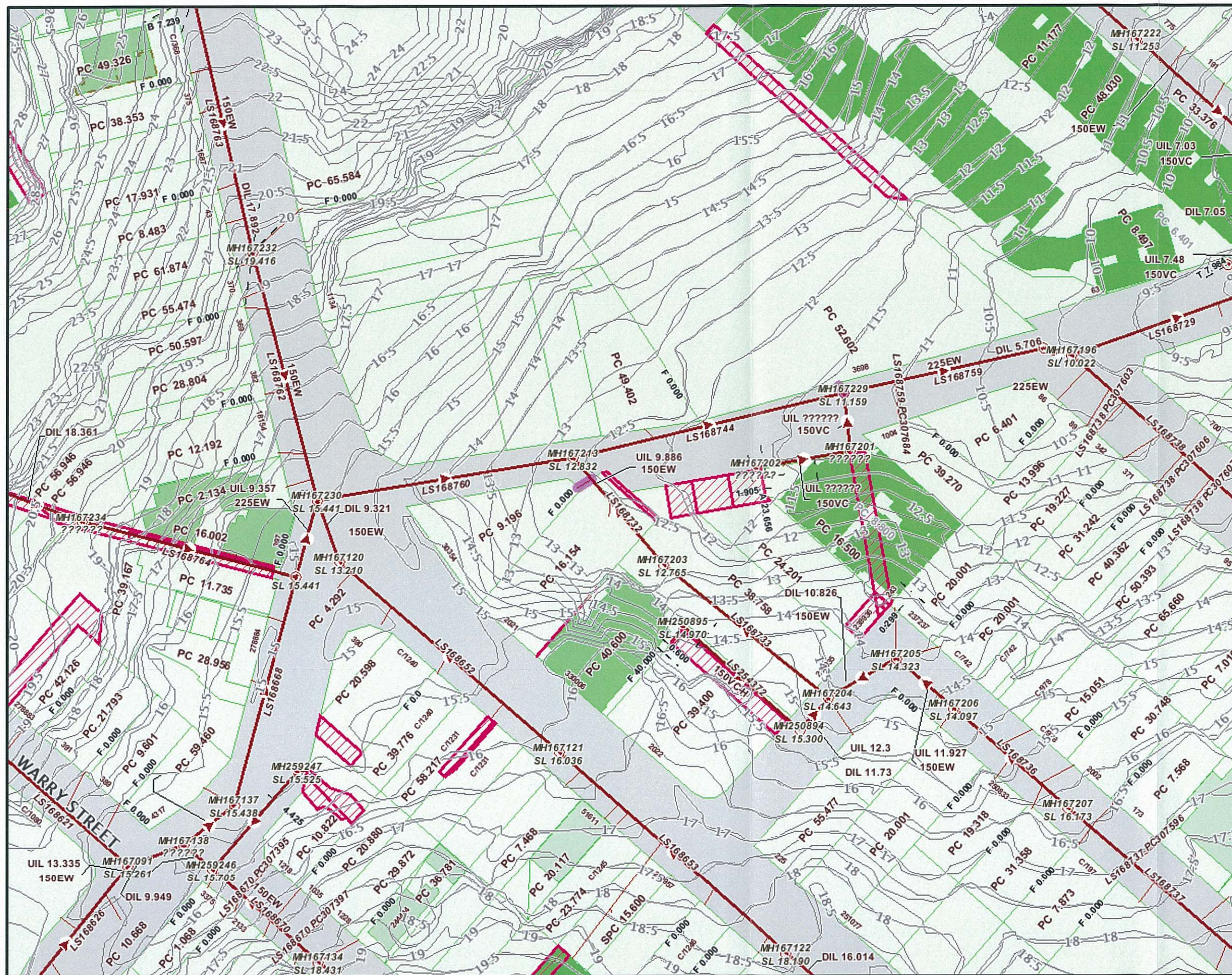
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Cnr Brunswick & Water St SEWER 02

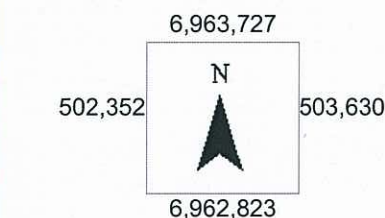
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Disclaimer :

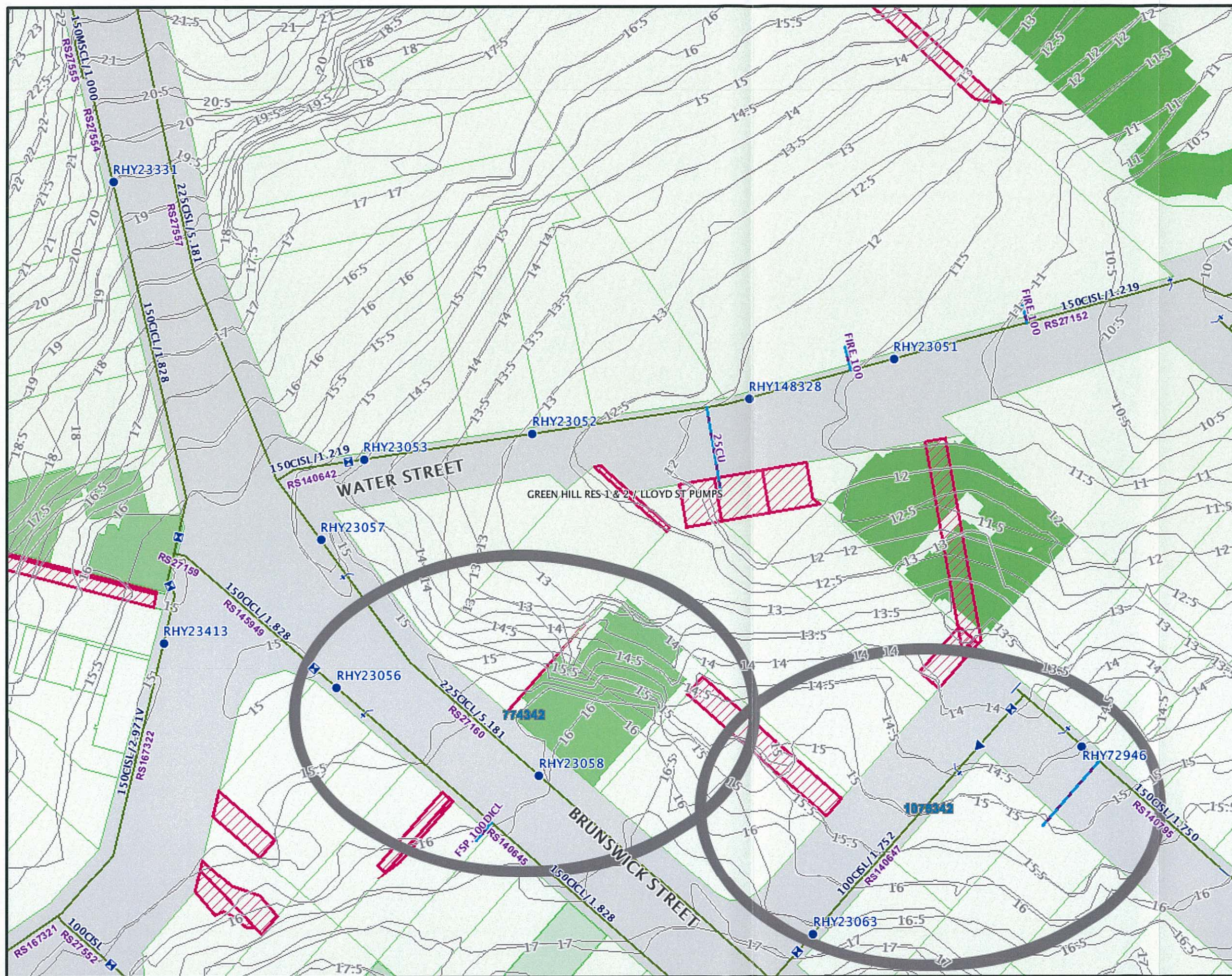
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Cnr Brunswick & Water St WATER 02

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6,963,727
502,352 N 503,630
6,962,823

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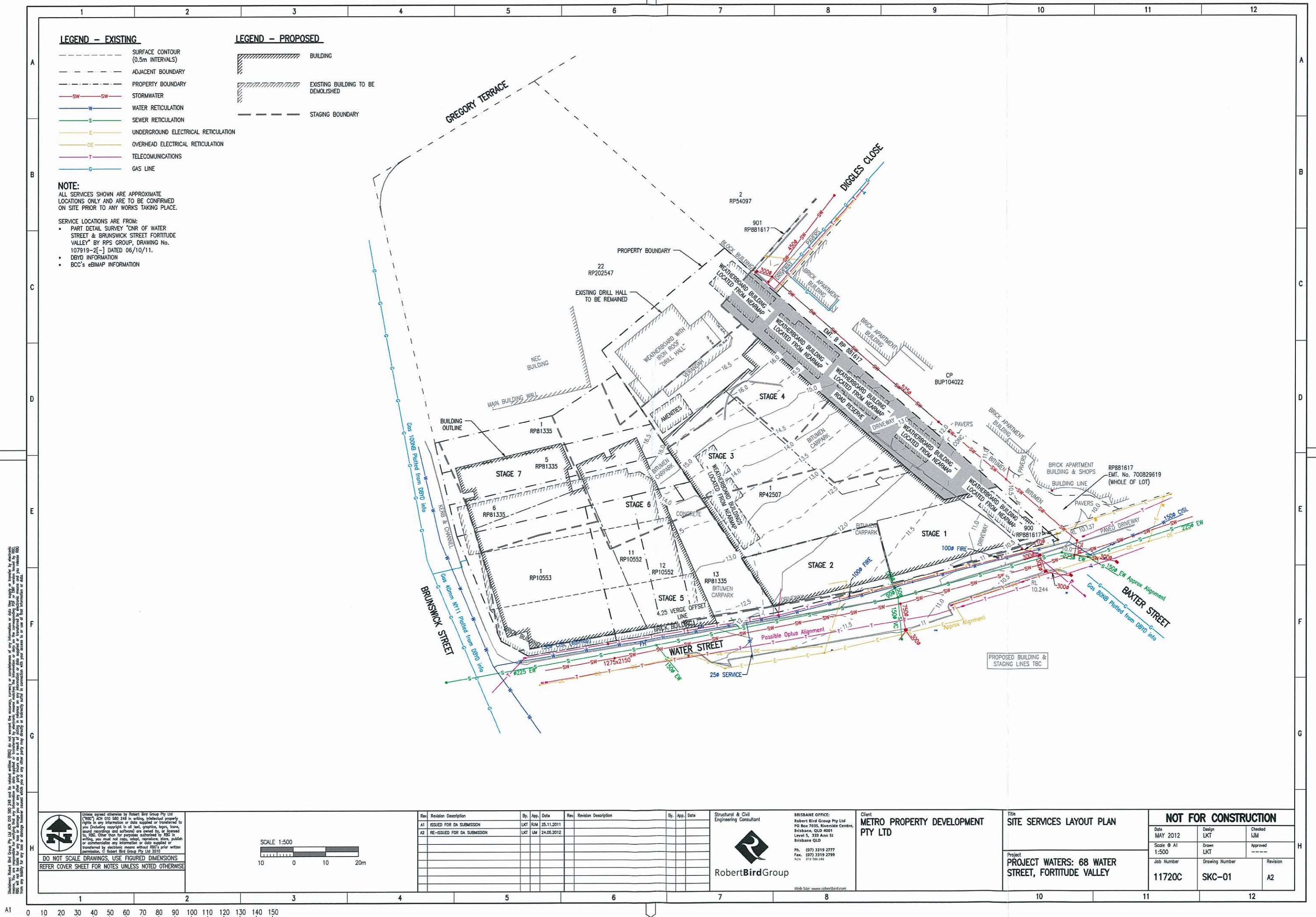
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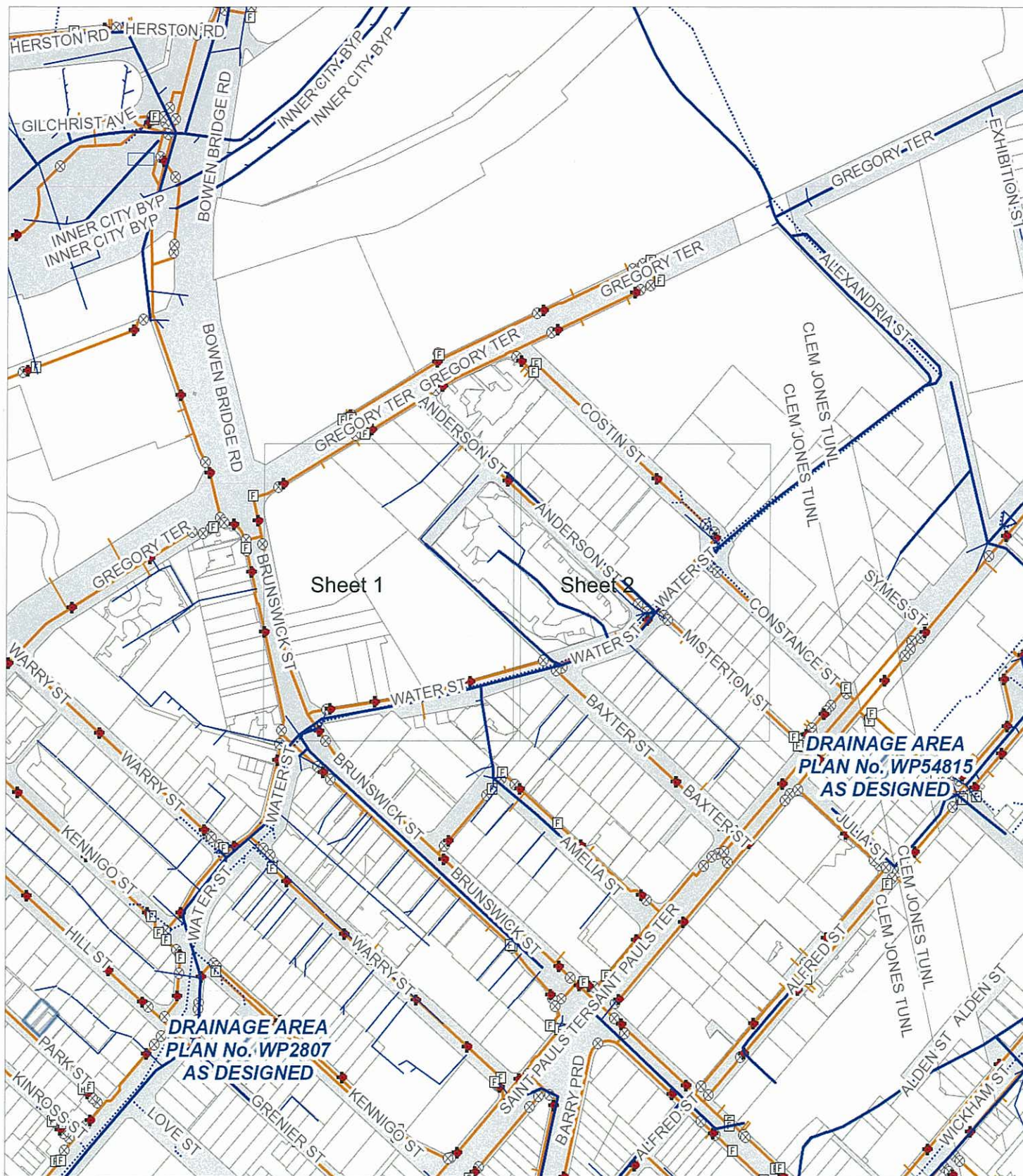
Appendix B

Site Services Plan by Robert Bird Group



Appendix C

Dial-Before-You-Dig Information



Map Sheet Overview

Water and Stormwater Network

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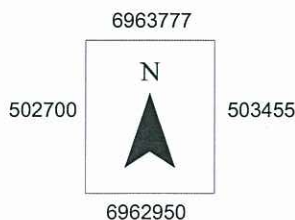
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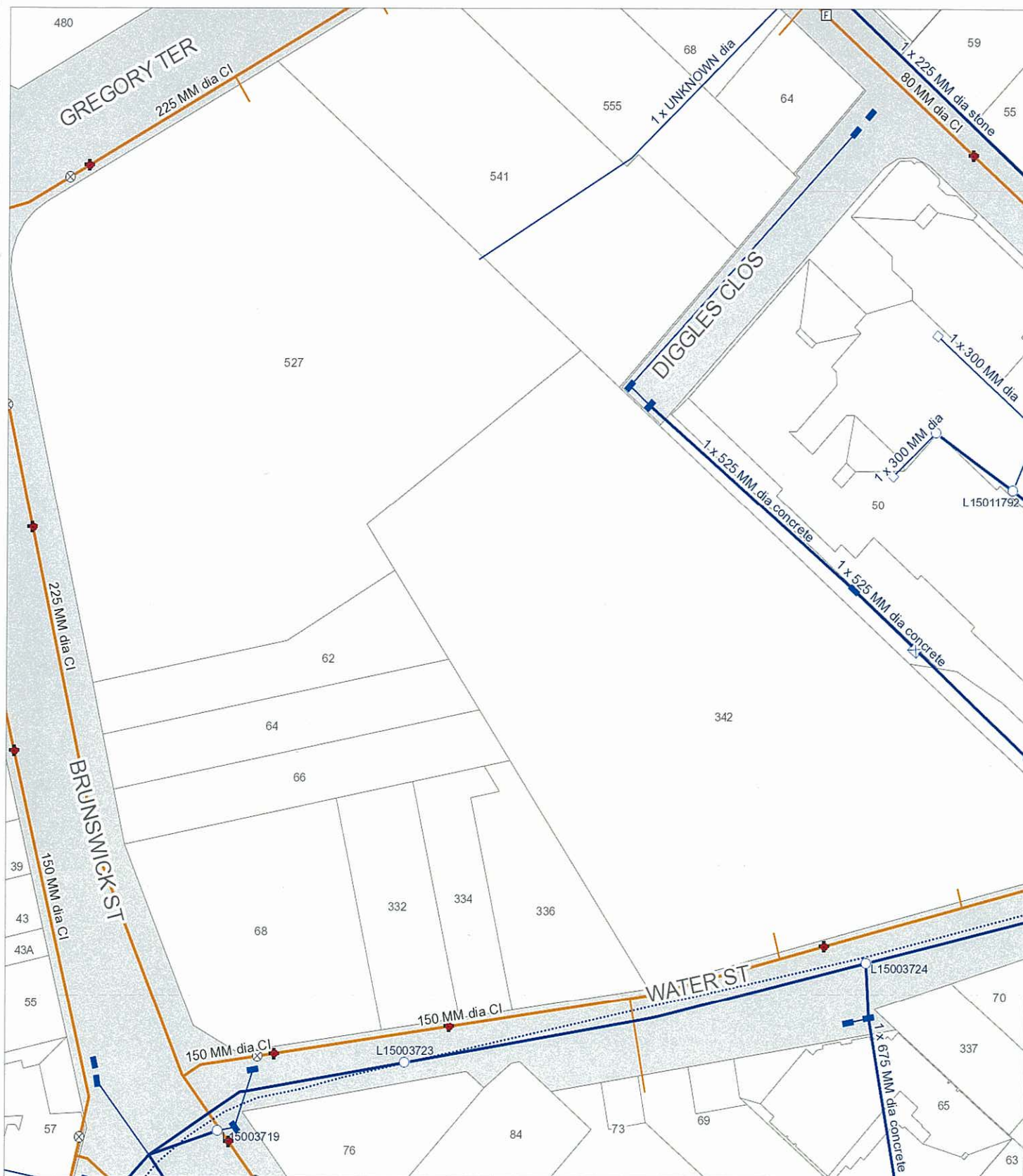
Sequence Number: 22379861

Notification Number: 4871876

Date: Aug 16, 2011



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503081
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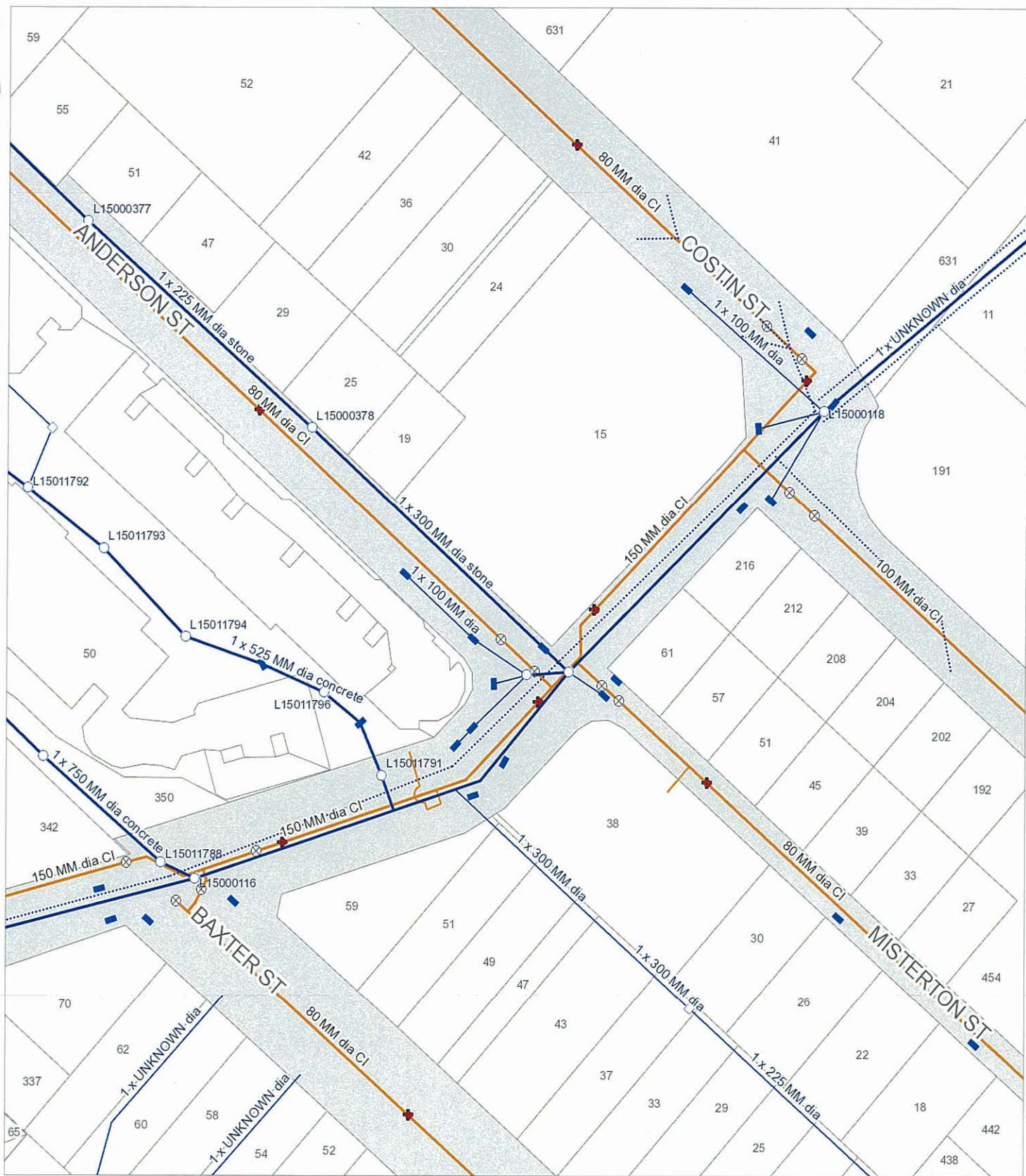
Notification Number: 4871876

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Sheet 1



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Notification Number: 4871876

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Scale = 1:1000



Location:

6963468



503074

503266

6963258

Sheet 2



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Legend

Stormwater Network

-  Stormwater Drain
-  Stormwater Gully / Roofwater Connection
-  Future Stormwater Drain
-  Stormwater Maintenance Hole
-  Stormwater Roofwater Pit
-  Stormwater Gully Pit

Water Supply Network

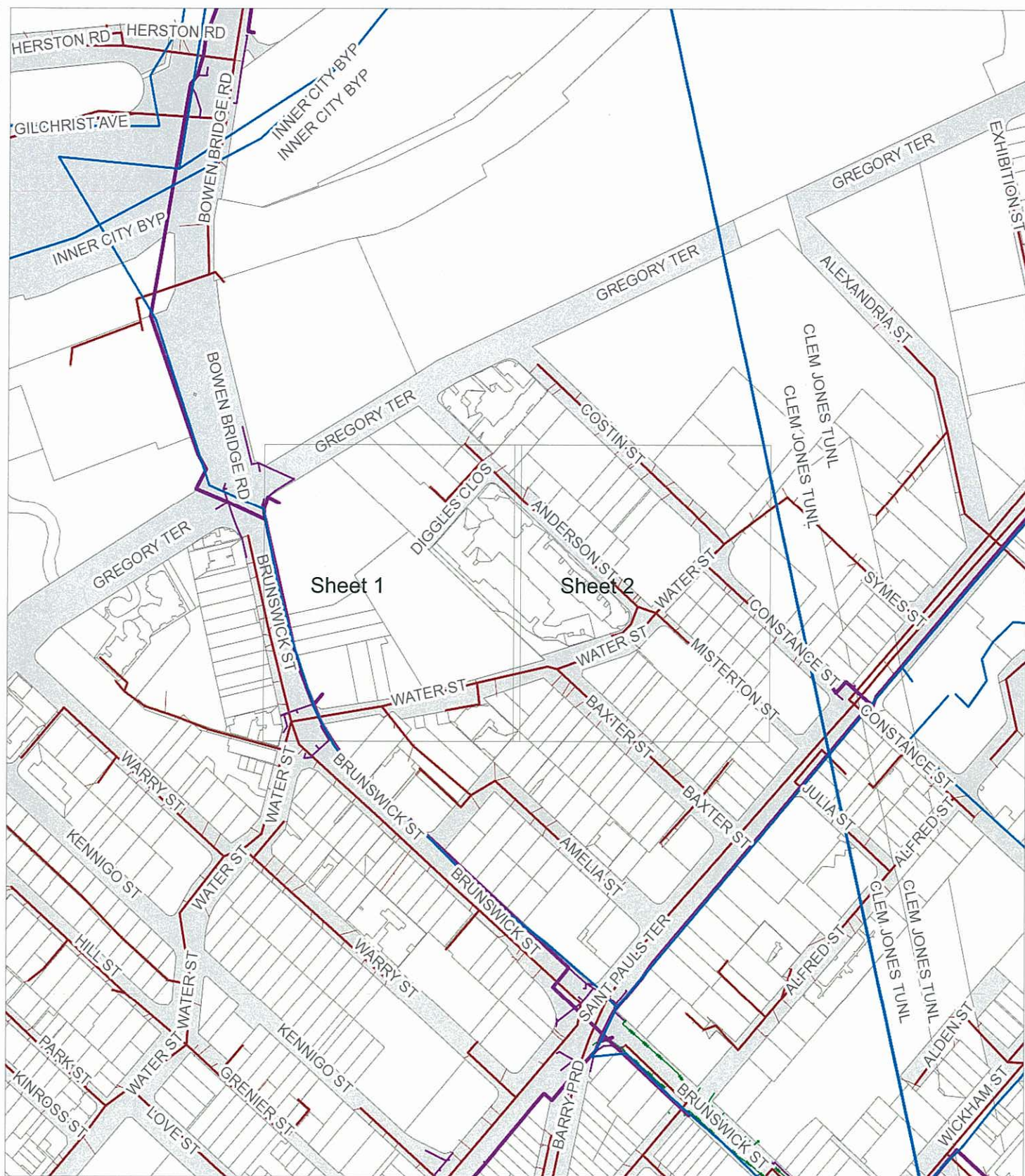
-  Water Trunk Main
-  Water Reticulation Main
-  Water Service
-  Water Fitting
-  Water Hydrant
-  Water Valve

Sewer Network

-  Sewer Main
-  Sewer Property Connection
-  Future Sewer Pipe
-  Sewer Maintenance Hole
-  Sewer Overflow / Outlet

BCC Cable Network

-  Traffic System Cable
-  Traffic Signal Ducting
-  Traffic Light Conduit
-  Fibre Optic Cable Location
-  Fibre Optic Pit Location



Map Sheet Overview

Sewer and BCC Cable Network

Sequence Number: 22379861

Notification Number: 4871876

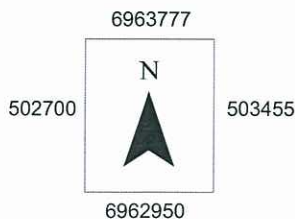
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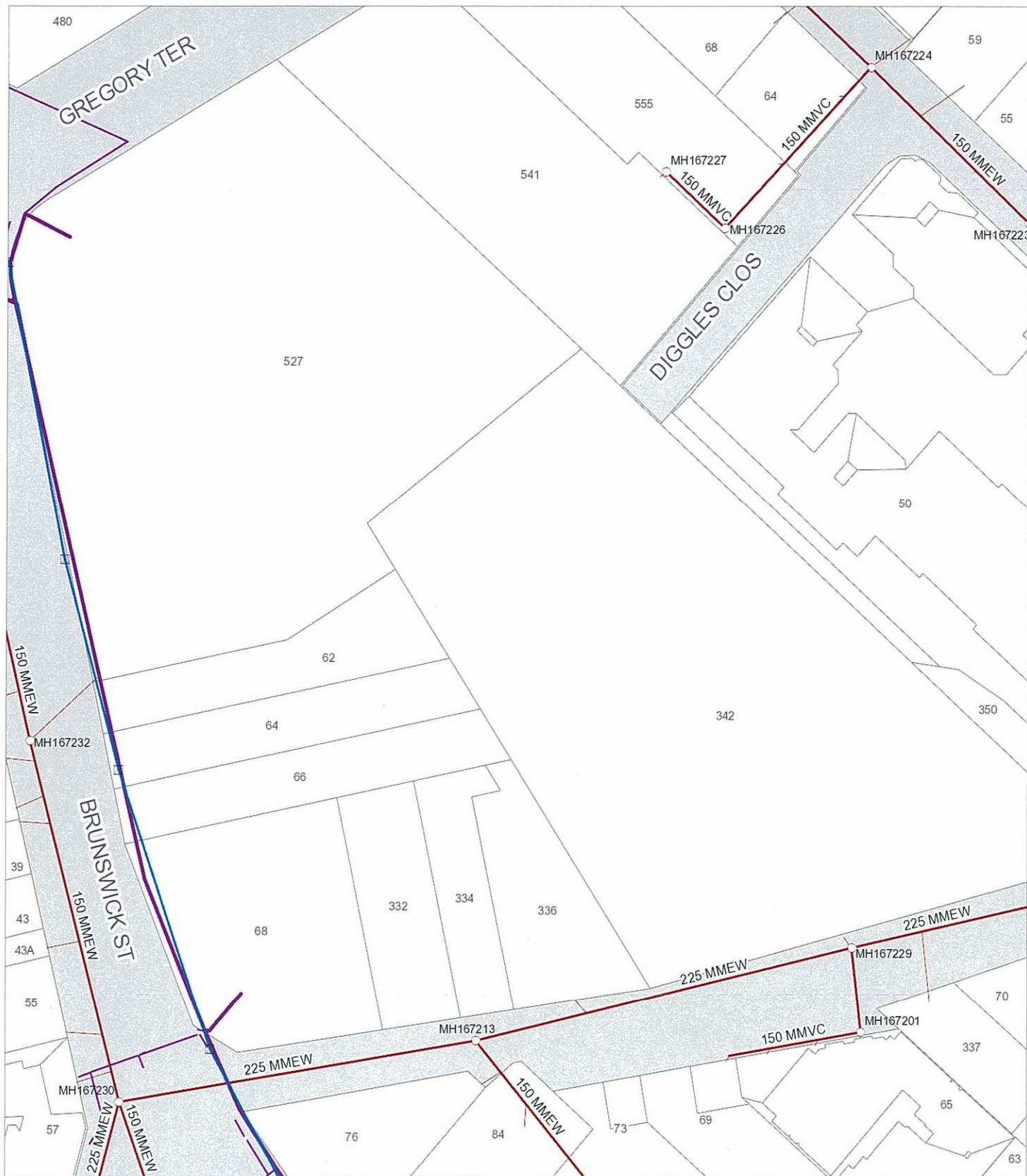
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Scale = 1:1000
 Metres 20 40

Location:

6963468
 502889
 N
 503081
 6963258

Sheet 1

Sequence Number: 22379861
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Legend

Stormwater Network

-  Stormwater Drain
-  Stormwater Gully / Roofwater Connection
-  Future Stormwater Drain
-  Stormwater Maintenance Hole
-  Stormwater Roofwater Pit
-  Stormwater Gully Pit

Water Supply Network

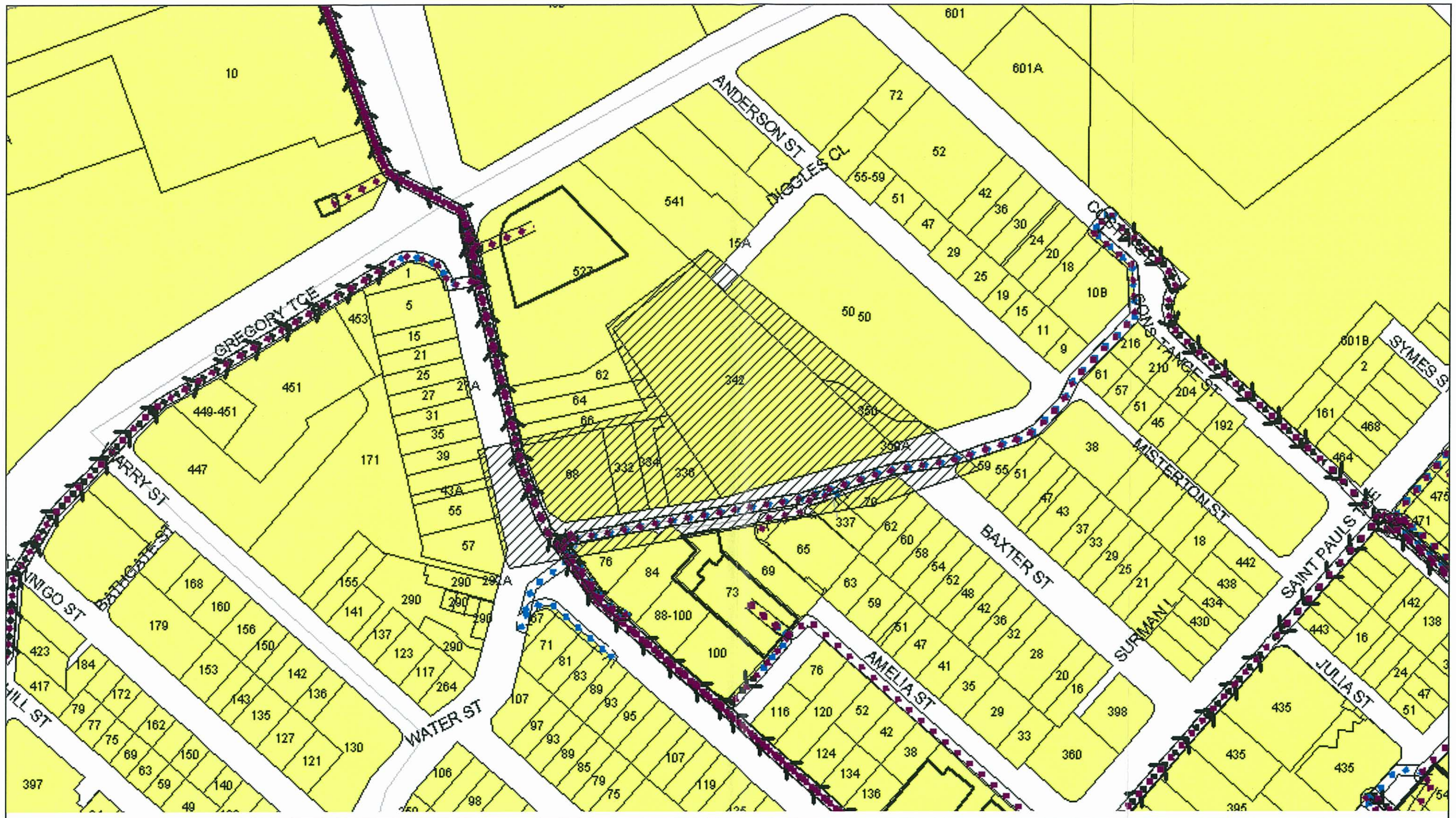
-  Water Trunk Main
-  Water Reticulation Main
-  Water Service
-  Water Fitting
-  Water Hydrant
-  Water Valve

Sewer Network

-  Sewer Main
-  Sewer Property Connection
-  Future Sewer Pipe
-  Sewer Maintenance Hole
-  Sewer Overflow / Outlet

BCC Cable Network

-  Traffic System Cable
-  Traffic Signal Ducting
-  Traffic Light Conduit
-  Fibre Optic Cable Location
-  Fibre Optic Pit Location

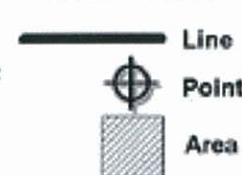


Optus
Cable Optus Underground OVERVIEW MAP
 Scale: 1 : 2500 Printed On: 17/08/2011

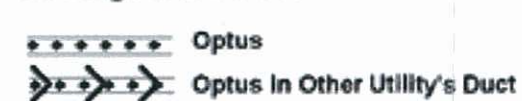
Sequence Number: 22379866
 Location: Water St



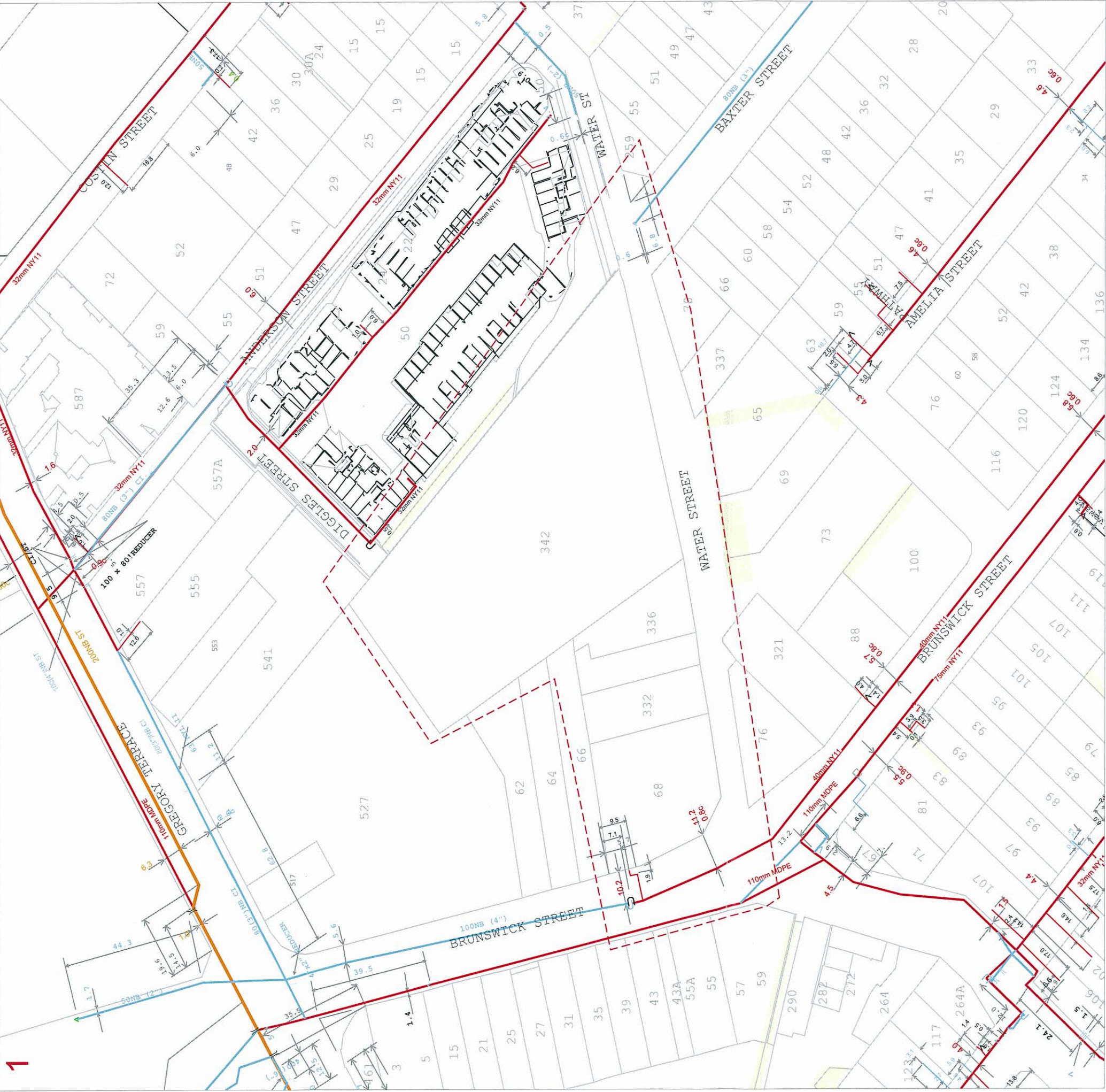
Job Location



Underground Asset



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22379867 Map Sheet: 1

Papersize: A3 Scale: 1: 1000



Map Key:

1

Legend

	Transmission Pressure Natural Gas		Sleeve		Sewer Manhole
	High Pressure Natural Gas		Valve		Power Pole
	Medium Pressure Natural Gas		Syphon		Telecom Pit
	Low Pressure Natural Gas		Endcap		Baghole
	LPG Reticulation		Regulator		Reducer
	Dormant Main		Pipe Connector		Purge Point
	Proposed Main		Insulated Connection		Warning Sign (Marker)
			Cathodic Test Point		

Point Request
Line / Polygon Request

Data Source

Pipeline Data Copyright APA Envestra Pty Ltd, Property Parcels Copyright QLD Government, UBD Imagery Copyright Sensis, DBYD Dig Location provided by DBYD.

This maps is created in colour and shall be printed in colour

[illegible]

LEGEND

	STATION NUMBER
	HV & LV POLE
	LV OR SL POLE
	POLE TRANSFORMER
	LV LINKS
	SL - MV OR MH
	LV UG TERMINATION
	EX. OH CONDUCTOR
	EX. UG CABLE
	PROPOSED CABLE IN CONDUIT
	EXISTING CABLE IN CONDUIT
	CONC. CABLE PIT
	LV PILLAR
	PADMOUNT TRANSFORMER
	GROUND TRANSFORMER
	EQUIPMENT EARTH
	PROP. OH CONDUCTOR
	PROP. UG CABLE

This record provides details on ENERGEX 240 volt, 11 000 volt, 33 000 volt, 110 000 volt underground cables.

Detail Works Plan C0151138/E01
Trench & Install Conduits
Install LV Cables, Replace LV
Poles & Associated Works
Water St, Fortitude Valley

All underground cables shall be treated as being energised. Where a cable is located that is not represented on the ENERGEX EnerGISE DBYD map, then ENERGEX shall be contacted immediately.

For Emergency Situations
Please call 13 19 62



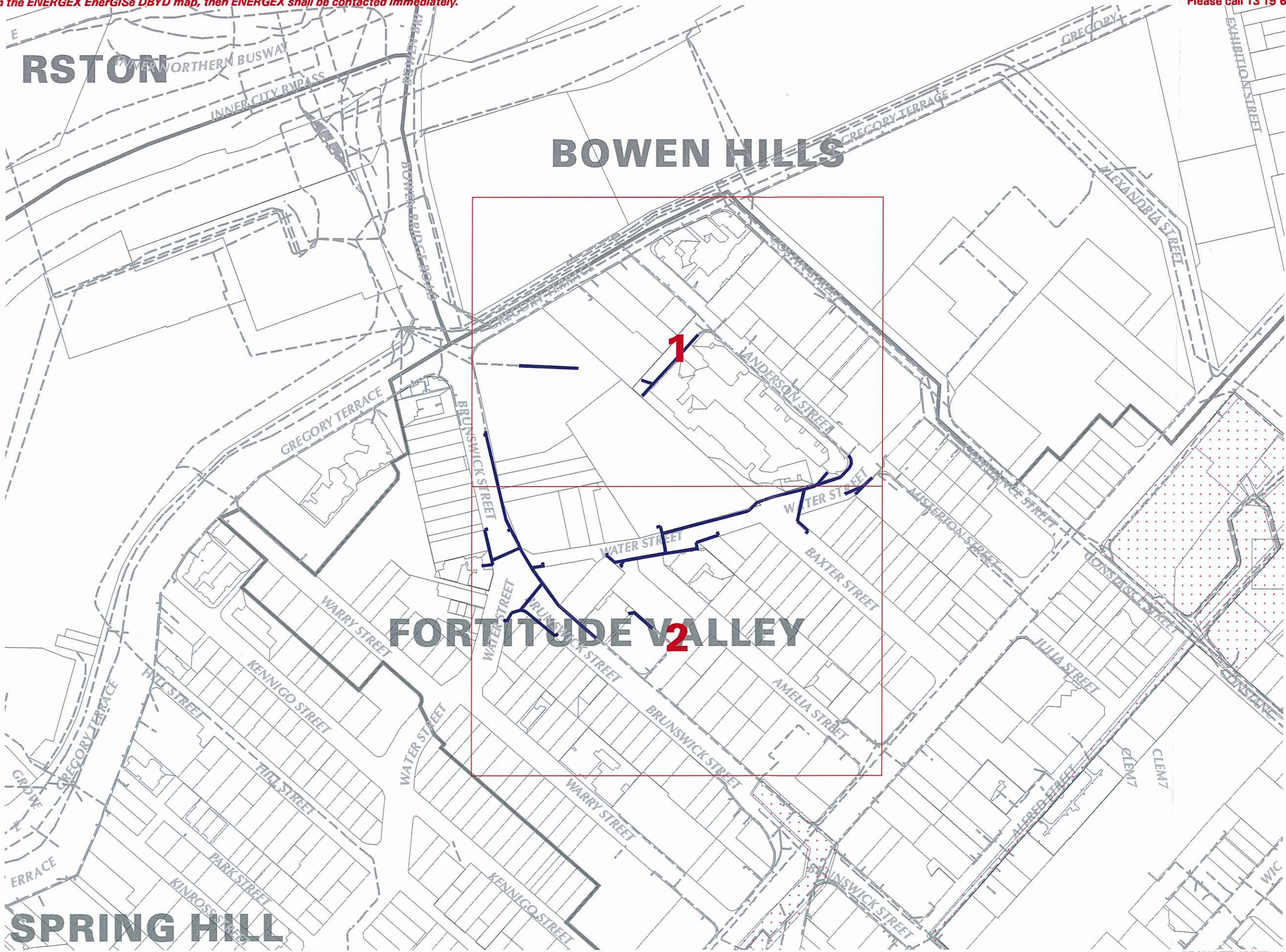
EnerGISE
DBYD

Date: 16 Aug 11 Time: 11.02.50
Requested By: DBYD

NOT TO SCALE

0 100m

Enquiry No: 22379863
KEY MAP



LOCALITY DIAGRAM



This output provides details of the ENERGEX electrical network. As variations may exist no responsibility is incurred by ENERGEX for the accuracy or completeness of the information provided. Exact positions of cables and electrical connectivity should be confirmed on site.

UNCONTROLLED COPY