WATERLOO METRO QUARTER OVER STATION DEVELOPMENT

Environmental Impact Statement
Appendix T – Services and Utilities Infrastructure Report

SSD-10438 Basement Car Park

Detailed State Significant Development
Development Application

Prepared for **Waterloo Developer Pty Ltd**

30 September 2020

Reference	Description
Applicable SSD Applications	SSD-10438 Basement
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1. Glossary and Abbreviations

Reference	Description
ACHAR	Aboriginal Cultural Heritage Assessment Report
ADG	Apartment Design Guide
AHD	Australian height datum
AfC	Application for Connection
AQIA	Air Quality Impact Assessment
ASP	Accredited Service Provider
BC Act	Biodiversity Conservation Act 2016
BCA	Building Code of Australia
BC Reg	Biodiversity Conservation Regulation 2017
BDAR	Biodiversity Development Assessment Report
CEEC	critically endangered ecological community
CIV	capital investment value
CMP	Construction Management Plan
Concept DA	A concept DA is a staged application often referred to as a 'Stage 1' DA. The subject application constitutes a detailed subsequent stage application to an approved concept DA (SSD 9393) lodged under section 4.22 of the EP&A Act.
Council	City of Sydney Council
CPTED	Crime Prevention Through Environmental Design
CSSI approval	critical State significant infrastructure approval
CTMP	Construction Traffic Management Plan
DA	development application
DPIE	NSW Department of Planning, Industry and Environment
DRP	Design Review Panel
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	NSW Environment Protection Authority
EPA Regulation	Environmental Planning and Assessment Regulation 2000

EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
ESD	ecologically sustainable design
GANSW	NSW Government Architect's Office
GFA	gross floor area
HIA	Heritage Impact Assessment
IAP	Interchange Access Plan
LGA	Local Government Area
NCC	National Construction Code
OSD	over station development
PDS	Proposed Design Scope
PIR	Preferred Infrastructure Report
POM	Plan of Management
PSI	Preliminary Site Investigation
RMS	Roads and Maritime Services
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SEPP 55	State Environmental Planning Policy No 55—Remediation of Land
SEPP 65	State Environmental Planning Policy No. 65 – Design Quality of Residential Apartment Development
SRD SEPP	State Environmental Planning Policy (State and Regional Development) 2009
SREP Sydney Harbour	State Regional Environmental Plan (Sydney Harbour Catchment) 2005
SSD	State significant development
SSD DA	State significant development application
SLEP	Sydney Local Environmental Plan 2012
Transport for NSW	Transport for New South Wales
TIA	Traffic Impact Assessment
The proposal	The proposed development which is the subject of the detailed SSD DA

The site	The site which is the subject of the detailed SSD DA
VIA	Visual Impact Assessment
WMQ	Waterloo Metro Quarter
WMP	Waste Management Plan
WSUD	water sensitive urban design

Table 1 Glossary and Abbreviations

2. Executive Summary

This planning report has been prepared by WSP and Waterloo Developer, with key input information from our design consultants WSP Pty Ltd, Aurecon Pty Ltd and Warren Smith and Partners Pty Ltd, to accompany a detailed State significant development (SSD) development application (DA) for the Basement over station development (OSD) at the Waterloo Metro Quarter site.

This report has been prepared to address the relevant conditions of the concept SSD DA (SSD 9393) and the Secretary's Environmental Assessment Requirements (SEARs) issued for the detailed SSD DA (SSD 10438).

This report concludes that the proposed Basement OSD which is a component of the Northern and Central precincts as it facilitates the incoming supply for the services and utilities to these buildings, And that it suitable and warrants approval subject to the implementation of the following mitigation measures.

- Disconnection and demolition of the existing utilities and services to allow the proposed Basement development construction
- Utility diversions, amplifications and modifications of existing authority mains for wastewater, potable water, stormwater and high voltage, is anticipated to commence upon direction and approval of the respective authority accredited designs prior to development approval.
- Proceed with Sydney Water Notice of Requirements application for Northern Precinct and Central Precincts, and associated conditions of consent for connection of Potable Water, Sewer and Stormwater services
- Proceed with Ausgrid contestable works approval process for Northern Precinct (includes Central precinct and Basement) and associated submission and approvals for connection of high voltage power and construction of chamber substation
- Proceed with City of Sydney and Sydney Water Tap In application for Northern Precinct and Central Precincts, and associated conditions of consent for connection of Stormwater services
- Proceed with Jemena connection application for Northern Precinct and Central Precincts, and associated conditions of consent for connection of Natural Gas services
- Proceed with Carrier and communication providers application for connection process for Northern Precinct and Central Precincts, and associated conditions of consent for connection of carrier communication services
- Proceed with NBN application for connection process for Northern Precinct and Central Precincts, and associated conditions of consent for connection of NBN communication services
- Coordinate new utility services to avoid landscape tree planting and structures.
- Coordinate new utility services to consider roads, footpaths and street reservations.
- Coordinate new utility services and metro station retail services requirements to ensure no services pass through the metro station boxes.

Following the implementation of the above mitigation measures, the remaining impacts are appropriate.

3. Introduction

This report has been prepared to accompany a detailed State significant development (SSD) development application (DA) for the Basement over station development (OSD) at the Waterloo Metro Quarter site. The detailed SSD DA is consistent with the concept approval (SSD 9393) granted for the maximum building envelope on the site, as proposed to be modified.

The Minister for Planning, or their delegate, is the consent authority for the SSD DA and this application is lodged with the NSW Department of Planning, Industry and Environment (DPIE) for assessment.

The detailed SSD DA seeks development consent for the design, construction and operation of:
Basement Car Park

- 2-storey shared basement car park and associated excavation
- Ground level structure
- Carparking for the commercial Building 1, residential Building 2, social housing Building 4, Waterloo Congregational Church and Sydney Metro
- Service vehicle spaces
- Commercial end-of-trip and bicycle storage facilities
- Retail end-of-trip and bicycle storage facilities
- Residential storage facilities
- Shared plant and services.
- In ground Onsite Detention tank for residential Building 2 and Cope Street Plaza, located in Church Square

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 9 April 2020 and issued for the detailed SSD DA. Specifically, this report has been prepared to respond to the SEARs requirements summarised below.

Item	Description of requirement	Section reference (this report)
14. Utilities	identify and address the existing capacity to service the development proposed and any augmentation requirements for utilities in consultation with relevant agencies.	Potable Water – Section 9.1.2 Wastewater – Section 9.3.2 Natural Gas – Section 9.4.2 Stormwater – Section 9.5.2 High Voltage Electrical – Section 9.6.2 Communications – Section 9.7.2 Appendix 1 – Waterloo Station Utility Design
14. Utilities	Identify any potential impacts of the proposed construction and operation on the existing utility infrastructure and service provider assets, and demonstrate how these will be protected, or impacts mitigated.	Potable Water – Section 9.1.4 Wastewater – Section 9.3.4 Natural Gas – Section 9.4.4 Stormwater – Section 9.5.4

Item	Description of requirement	Section reference (this report)
		High Voltage Electrical – Section 9.6.4 Communications – Section 10.7.4 Appendix 1 – Waterloo Station Utility Design

Table 2 SEARs requirements

This report has also been prepared in response to the following conditions of consent issued for the concept SSD DA (SSD 9393) for the OSD as summarised in the table below.

Item	Description of requirement	Section reference (this report)
B5	Refer to WMQ Design Amenity Guidelines 2020-03 Clause 13 Section 3D: Integrate New and relocated utilities underground within the street reservation, with services located underground and in a manner that facilities tree planting	Potable Water – Section 9.1.2 Wastewater – Section 9.3.2 Natural Gas – Section 9.4.2 Stormwater – Section 9.5.2 High Voltage Electrical – Section 9.6.2 Communications – Section 9.7.2 Appendix 1 – Waterloo Station Utility Design
B5	Refer to WMQ Design Amenity Guidelines 2020-03 Clause 3 Section 3Q: The utility services for the station must not pass through the OSD	14.2.3 – Station Precinct

Table 3 Conditions of Concept Approval

4. The Site

The site is located within the City of Sydney Local Government Area (LGA). The site is situated about 3.3 kilometres south of Sydney CBD and eight kilometres northeast of Sydney International Airport within the suburb of Waterloo.

The Waterloo Metro Quarter site comprises land to the west of Cope Street, east of Botany Road, south of Raglan Street and north of Wellington Street (refer to Figure 1). The heritage-listed Waterloo Congregational Church at 103–105 Botany Road is within this street block but does not form a part of the Waterloo Metro Quarter site boundaries.

The Waterloo Metro Quarter site is a rectangular shaped allotment with an overall site area of approximately 1.287 hectares.

The Waterloo Metro Quarter site comprises the following allotments and legal description at the date of this report. Following consolidation by Sydney Metro (the Principal) the land will be set out in deposited plan DP1257150.

- 1368 Raglan Street (Lot 4 DP 215751)
- 59 Botany Road (Lot 5 DP 215751)
- 65 Botany Road (Lot 1 DP 814205)
- 67 Botany Road (Lot 1 DP 228641)
- 124-128 Cope Street (Lot 2 DP 228641)
- 69-83 Botany Road (Lot 1, DP 1084919)
- 130-134 Cope Street (Lot 12 DP 399757)
- 136-144 Cope Street (Lots A-E DP 108312)
- 85 Botany Road (Lot 1 DP 27454)
- 87 Botany Road (Lot 2 DP 27454)
- 89-91 Botany Road (Lot 1 DP 996765)
- 93-101 Botany Road (Lot 1 DP 433969 and Lot 1 DP 738891)
- 119 Botany Road (Lot 1 DP 205942 and Lot 1 DP 436831)
- 156-160 Cope Street (Lot 31 DP 805384)
- 107-117A Botany Road (Lot 32 DP 805384 and Lot A DP 408116)
- 170-174 Cope Street (Lot 2 DP 205942).

The detailed SSD DA applies to the Basement (the site) of the Waterloo Metro Quarter site. The site has an area of approximately 5,700sqm. The subject site comprises the following allotments and legal description at the date of this report.

Basement Car Park DA

- 1368 Raglan Street (Lot 4 DP 215751) (Part)
- 59 Botany Road (Lot 5 DP 215751) (Part)
- 65 Botany Road (Lot 1 DP 814205) (Part)
- 67 Botany Road (Lot 1 DP 228641) (Part)
- 124–128 Cope Street (Lot 2 DP 228641) (Part)
- 69–83 Botany Road (Lot 1, DP 1084919)

- 130–134 Cope Street (Lot 12 DP 399757) (Part)
- 136–144 Cope Street (Lots A-E DP 108312) (Part)
- 85 Botany Road (Lot 1 DP 27454)
- 87 Botany Road (Lot 2 DP 27454)
- 89–91 Botany Road (Lot 1 DP 996765)
- 93–101 Botany Road (Lot 1 DP 433969 and Lot 1 DP 738891) (Part).

The boundaries of the overall site are identified at Figure 1, and the subject site of the detailed SSD DA is identified at Figures 2 and 3. The site is reasonably flat with a slight fall to the south.

The site previously included three to five storey commercial, light industrial and shop top housing buildings. All previous structures except for an office building at the corner of Botany Road and Wellington Street have been demolished to facilitate construction of the new Sydney Metro Waterloo station. As such the existing site is predominately vacant and being used as a construction site.
Construction of the Sydney metro is currently underway on site in accordance with critical State significant infrastructure approval (CSSI 7400).

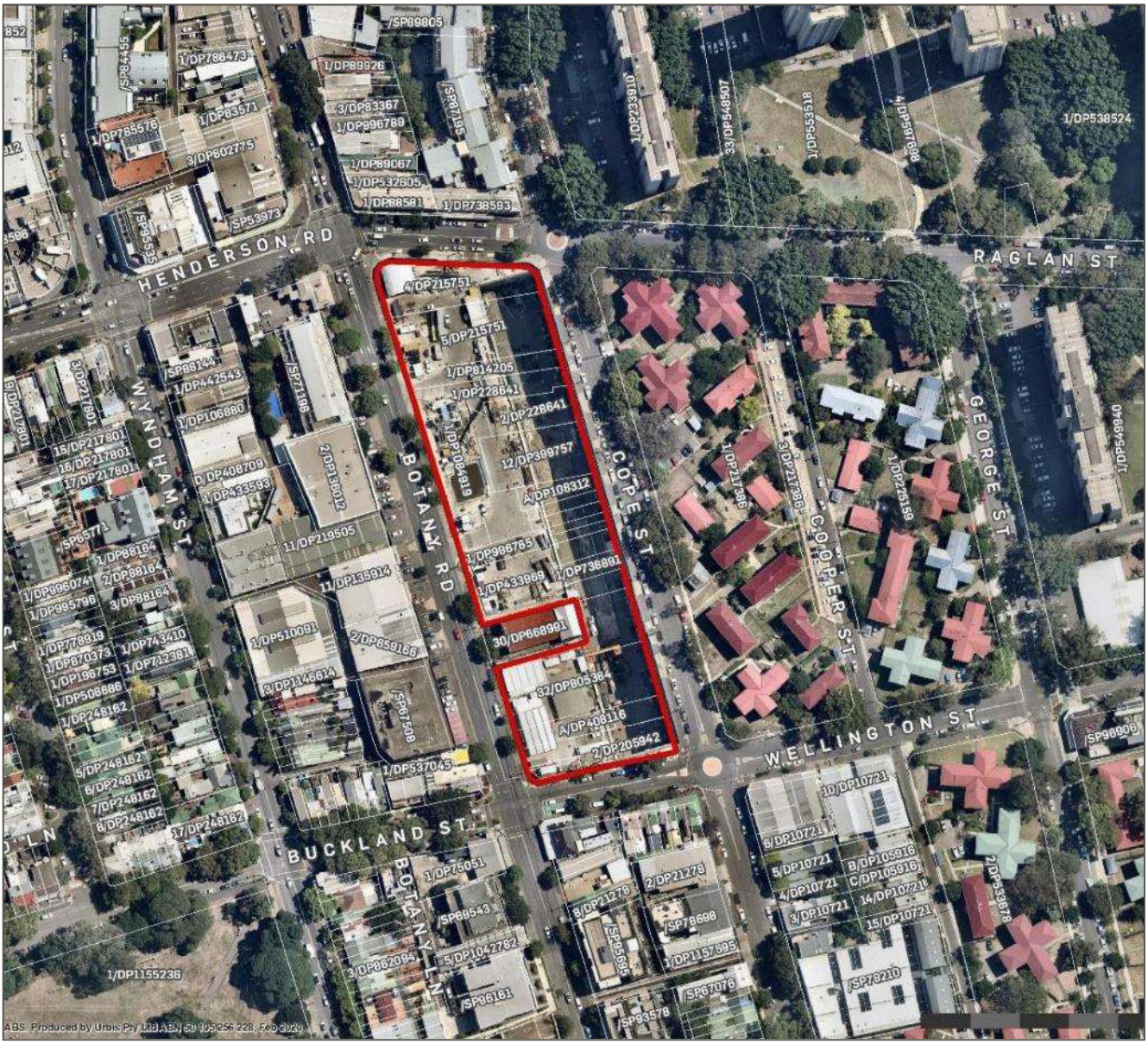


Figure 1 Aerial image of the site
Source: Urbis

The area surrounding the site consists of commercial premises to the north, light industrial and mixed-use development to the south, residential development to the east and predominantly commercial and light industry uses to the west.

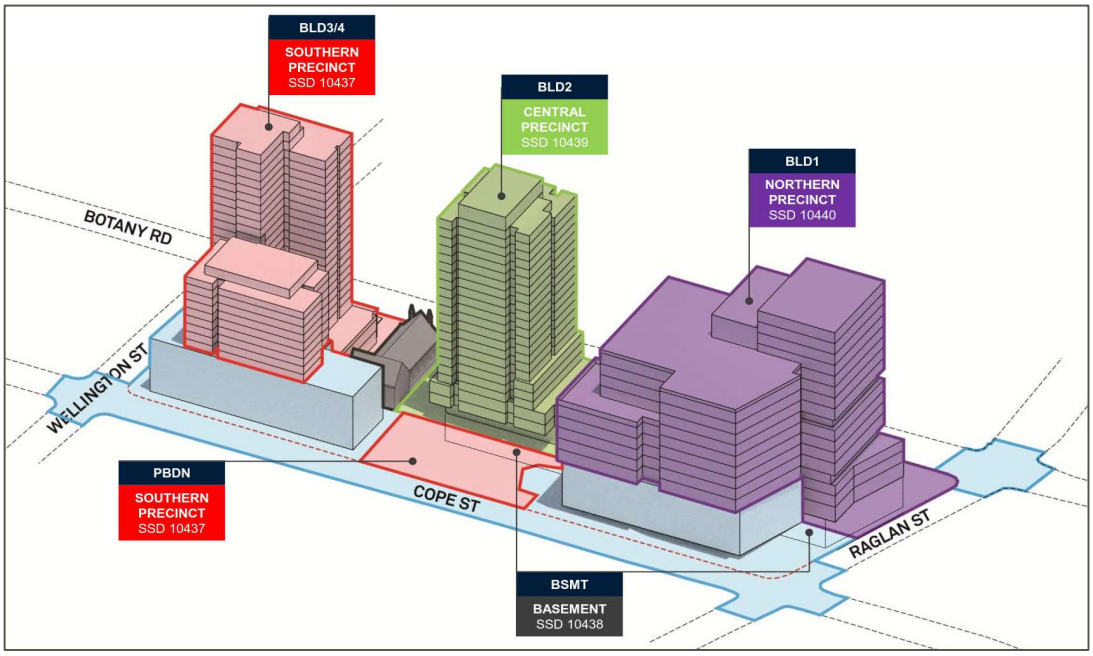


Figure 2 Waterloo Metro Quarter site, with sub-precinct buildings identified
Source: HASSELL

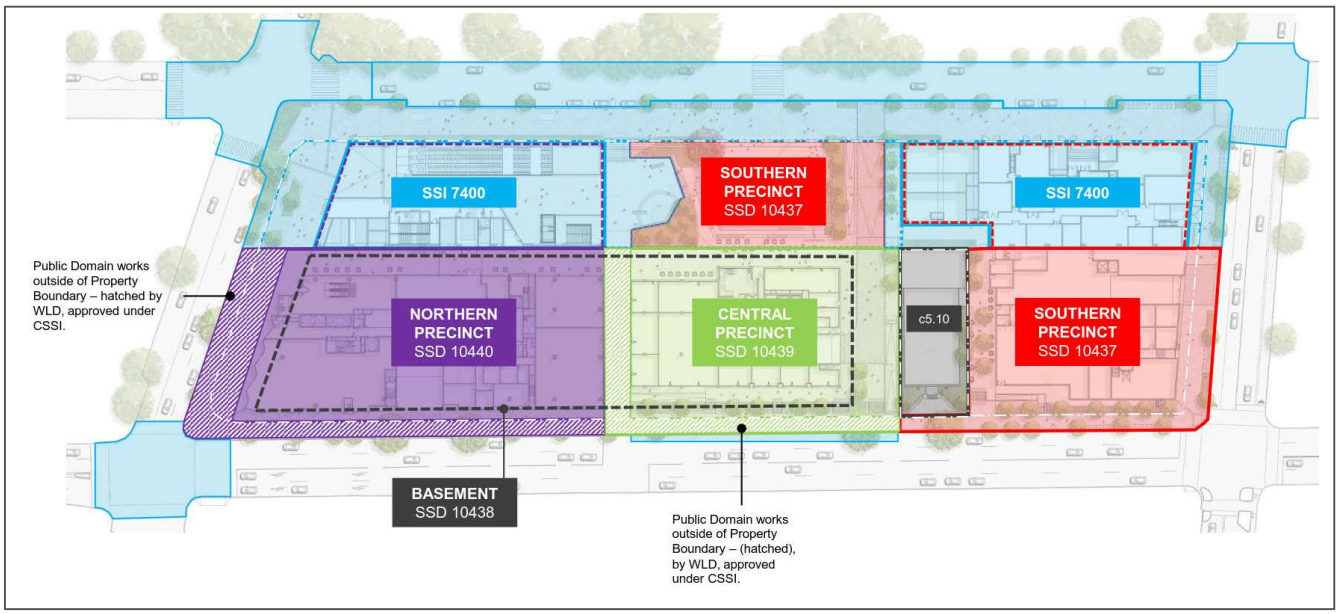


Figure 3 Waterloo Metro Quarter site, with sub-precincts identified
Source: Waterloo Developer Pty Ltd

5. Background

5.1 About Sydney Metro

Sydney Metro is Australia's biggest public transport project. Services started in May 2019 in the city's North West with a train every four minutes in the peak. A new standalone railway, this 21st century network will revolutionise the way Sydney travels.

There are four core components:

5.1.1 Sydney Metro North West

This project is now complete and passenger services commenced in May 2019 between Rouse Hill and Chatswood, with a metro train every four minutes in the peak. The project was delivered on time and $1 billion under budget.

5.1.2 Sydney Metro City & Southwest

Sydney Metro City & Southwest project includes a new 30km metro line extending metro rail from the end of Metro Northwest at Chatswood, under Sydney Harbour, through new CBD stations and southwest to Bankstown. It is due to open in 2024 with the ultimate capacity to run a metro train every two minutes each way through the centre of Sydney.

Sydney Metro City & Southwest will deliver new metro stations at Crows Nest, Victoria Cross, Barangaroo, Martin Place, Pitt Street, Waterloo and new underground metro platforms at Central Station. In addition, it will upgrade and convert all 11 stations between Sydenham and Bankstown to metro standards.

5.1.3 Sydney Metro West

Sydney Metro West is a new underground railway connecting Greater Parramatta and the Sydney CBD. This once-in-a-century infrastructure investment will transform Sydney for generations to come, doubling rail capacity between these two areas, linking new communities to rail services and supporting employment growth and housing supply between the two CBDs.

The locations of seven proposed metro stations have been confirmed at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock and The Bays.

The NSW Government is assessing an optional station at Pyrmont and further planning is underway to determine the location of a new metro station in the Sydney CBD.

5.1.4 Sydney Metro Greater West

Metro rail will also service Greater Western Sydney and the new Western Sydney International (Nancy Bird Walton) Airport. The new railway line will become the transport spine for the Western Parkland City's growth for generations to come, connecting communities and travellers with the rest of Sydney's public transport system with a fast, safe and easy metro service.

The Australian and NSW governments are equal partners in the delivery of this new railway.

The Sydney Metro project is illustrated below.

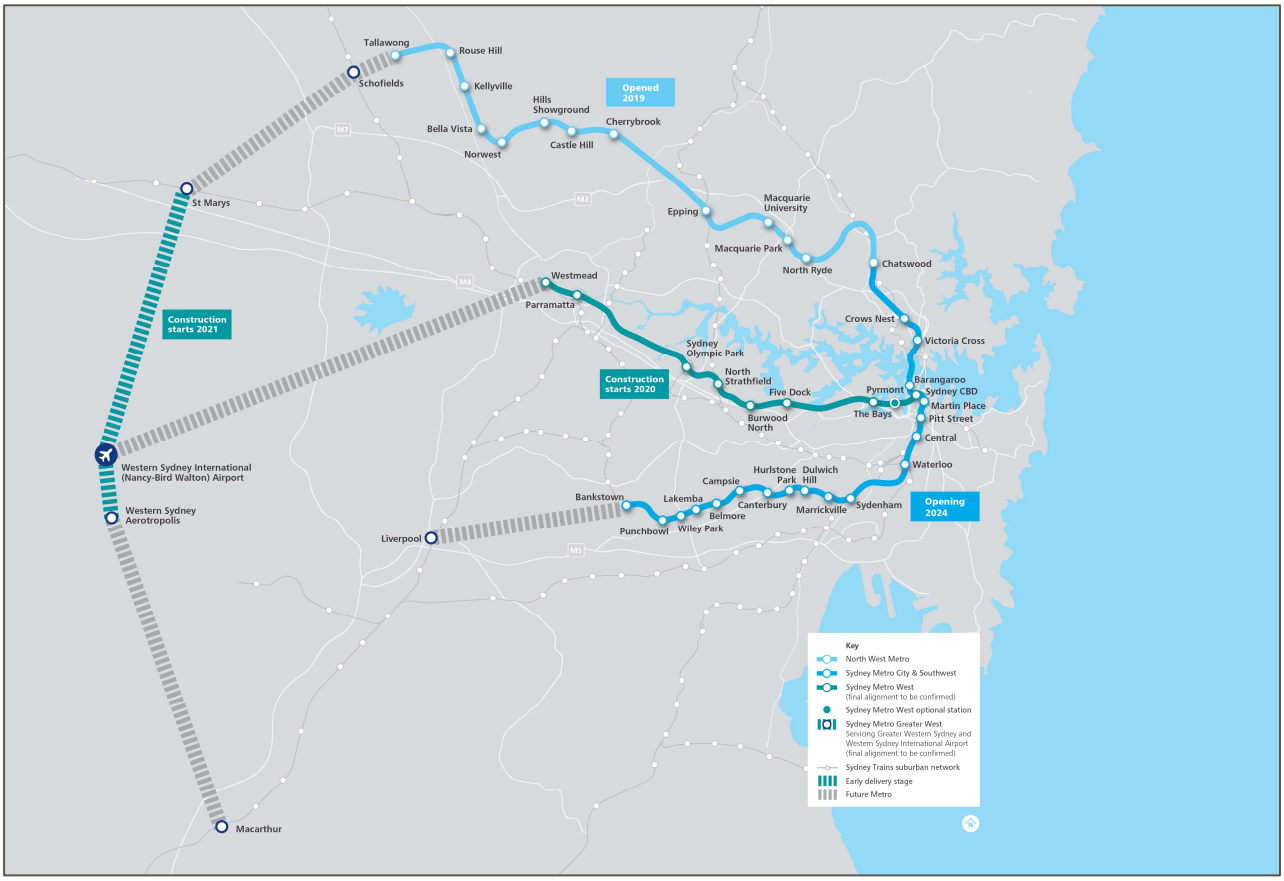


Figure 4 Sydney Metro alignment map
Source: Sydney Metro

5.2 Sydney Metro CSSI Approval (SSI 7400)

On 9 January 2017, the Minister for Planning approved the Sydney Metro City & Southwest - Chatswood to Sydenham project as a critical State significant infrastructure (CSSI) project (reference SSI 7400) (CSSI approval). The terms of the CSSI approval includes all works required to construct the Sydney Metro Waterloo Station. The CSSI approval also includes the construction of below and above ground works within the metro station structure for appropriate integration with the OSD.

With regards to CSSI related works, any changes to the 'metro station box' envelope and public domain will be pursued in satisfaction of the CSSI conditions of approval and do not form part of the scope of the concept SSD DA or detailed SSD DA for the OSD.

Except to the extent described in the EIS or Preferred Infrastructure Report (PIR) submitted with the CSSI application, any OSD buildings and uses do not form part of the CSSI approval and will be subject to the relevant assessment pathway prescribed by the EP&A Act.

The delineation between the approved Sydney Metro works, generally described as within the two 'metro station boxes' and surrounding public domain works, and the OSD elements are illustrated in Figure 5.

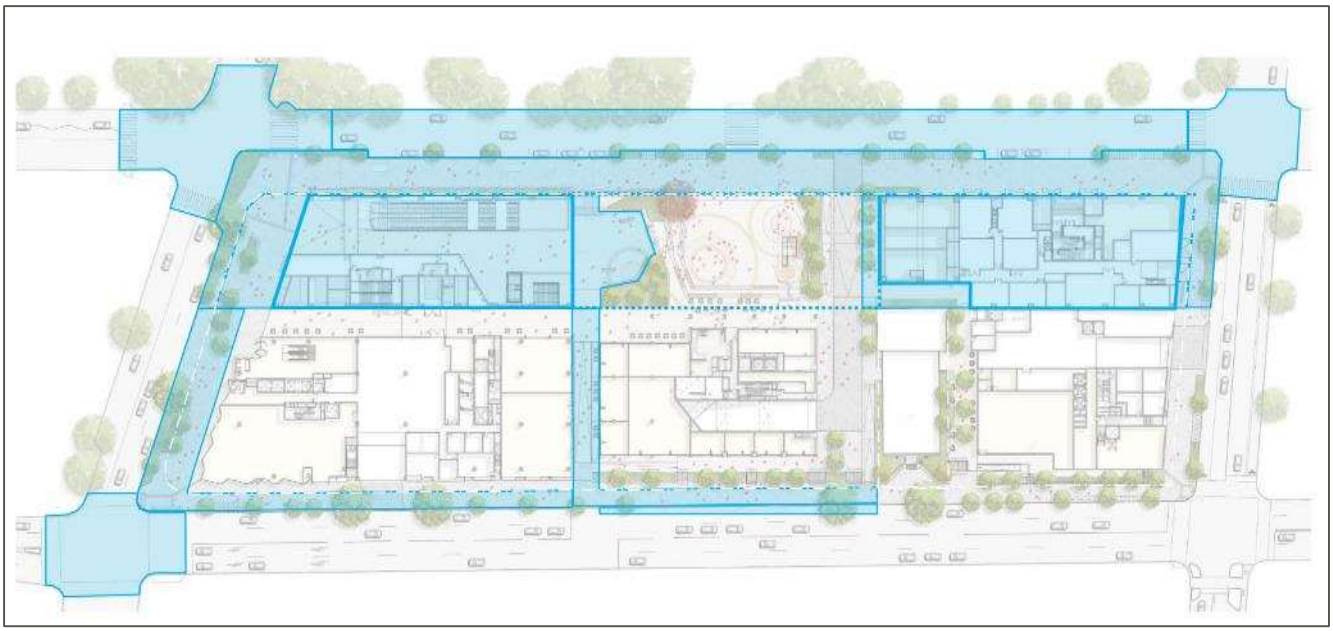


Figure 5 CSSI Approval scope of works
Source: WL Developer Pty Ltd

5.3 Concept Approval (SSD 9393)

As per the requirements of clause 7.20 of the *Sydney Local Environmental Plan 2012* (SLEP), as the OSD exceeds a height of 25 metres above ground level (among other triggers), development consent is first required to be issued in a concept DA (formerly known as Stage 1 DA).

Development consent was granted on 10 December 2019 for the concept SSD DA (SSD 9393) for the Waterloo Metro Quarter OSD including:

- a maximum building envelope for podium, mid-rise and tower buildings
- a maximum gross floor area of 68,750sqm, excluding station floor space
- conceptual land use for non-residential and residential floor space
- minimum 12,000sqm of non-residential gross floor area including a minimum of 2,000sqm of community facilities
- minimum 5% residential gross floor area as affordable housing dwellings
- 70 social housing dwellings
- basement car parking, motorcycle parking, bicycle parking, and service vehicle spaces.

The detailed SSD DA seeks development consent for the OSD located within the Basement of the site, consistent with the parameters of this concept approval. Separate SSD DAs have been prepared and will be submitted for the Northern Precinct, Central Precinct, and Southern Precinct which is inclusive of the Cope St Plaza proposed across the Waterloo Metro Quarter site.

A concurrent amending concept SSD DA has been prepared and submitted to the DPIE which proposed to make modifications to the approved building envelopes at the northern precinct and central building. This amending concept SSD DA does not impact the proposed development within the southern precinct.

6. Proposed development

6.1 Waterloo Metro Quarter Development

The Waterloo Metro Quarter OSD comprises four separate buildings, a basement carpark and public domain works adjacent to the Waterloo Metro station.

Separate SSD DAs will be submitted concurrently for the design, construction and operation of each building in the precinct;

- Southern precinct SSD-10437,
- Basement Car Park SSD-10438,
- Central precinct SSD-10439, and
- Northern precinct-SSD-10440.

An overview of the Development is included below for context. This detailed SSD DA seeks development consent for the design, construction and operation of the Basement Car Park:

6.1.1 Northern Precinct

The Northern Precinct comprises:

- 17-storey commercial building (Building 1) comprising Commercial floor space, with an approximate capacity of 4000 workers
- Ground level retail tenancies, loading dock facilities serving the northern and central precinct including Waterloo metro station
- Landscaping and private open space at podium and roof top levels to support the commercial tenants
- New public open space including the delivery of the Raglan Street Plaza, Raglan Walk and expanded footpaths on Raglan Street and Botany Road and public domain upgrades
- External licensed seating areas
- Signage zone locations
- Utilities and service provision
- Stratum subdivision (staged).

6.1.2 Central Precinct

The Central Precinct comprises:

- 24-storey residential building (Building 2) comprising approximately 126 market residential and 24 affordable housing apartments, to be delivered as a mixture of 1 bedroom, 2 bedroom and 3 bedroom apartments
- Ground level retail tenancies, community hub, precinct retail amenities and basement car park entry
- Level 1 and level 2 community facilities (as defined in the SLEP) intended to be operated as a childcare centre
- Landscaping and private and communal open space at roof top levels to support the residential accommodation
- New public open space including the delivery of the Church Square, including vehicle access to the basement via a shared way from Cope Street, expanded footpaths and public domain upgrades on Botany Road

- External licensed seating areas
- Signage zone locations
- Utilities and service provision
- Stratum subdivision (staged).

6.1.3 Southern Precinct

The Southern Precinct comprises:

- 25-storey residential building (Building 3) comprising student accommodation, to be delivered as a mixture of studio and twin apartments with approximate capacity of 474 students
- 9 storey residential building (Building 4) above the southern station box to accommodate 70 social housing dwellings
- Ground level retail tenancies including Makerspace and gymnasium lobby, and loading facilities
- Level 1 and level 2 gymnasium and student accommodation communal facilities
- Landscaping and private and communal open space at podium and roof top levels to support the residential accommodation
- New public open space including the delivery of the Cope Street Plaza, including vehicle access to the site via a shared way from Cope Street, expanded footpaths on Botany and Wellington Streets and public domain upgrades
- Signage zone locations
- Utilities and service provision
- Stratum subdivision (staged).

6.1.4 Basement Car Park (Subject DA)

The Basement Car Park comprises:

- 2-storey shared basement car park and associated excavation comprising
- Ground level structure
- Carparking for the Commercial Building 1, Residential Building 2, social housing Building 4, Waterloo Congregational Church and Sydney Metro
- Service vehicle bays
- Commercial end of trip and bicycle storage facilities
- Retail end of trip and bicycle storage facilities
- Residential storage facilities
- Shared plant and services.
- In ground Onsite Detention tank for residential Building 2 and Cope Street Plaza, located in Church Square

7. Methodology

7.1 Infrastructure

- Engage relevant agencies to identify and address existing capacity to service the proposed development
- Incorporate requirement for proposed utility design in consultation with relevant agencies
- Identify any potential impact of the proposed construction and operation on the existing utility
- Coordinate and manage to remove, relocate or protect existing utilities in accordance with the relevant agencies requirements if required

To establish connections to all the utility services required for the operation of over the Station development the Basement development, including:

- Portable and non-portable water connection to Sydney Water network
- Sewer connection to Sydney Water network
- Stormwater connection to local road drainage network
- Telstra/NBN (Communication) connection to main backbone network
- Gas connection to Jemena local distribution network
- High voltage electricity connection to local Ausgrid substation

A combined utilities model is developed through incorporating design inputs from other engineering design disciplines and utility provider engagement and design development including utility provider design certifications; and a clash register is developed to track any potential utility clashes identified during the design development, refer to Appendix 1 for detail.

7.2 Building Services

- Engage relevant designers to identify required demand and capacity to service the proposed development
- Coordinate, manage and Incorporate services requirements into development concept designs
- Ensure all services designs, are designed to an extent that they will not have an impact to the Sydney Metro Station.

8. Infrastructure Assessment and findings

8.1 Survey Input

A survey of the existing utilities within and around the site has been completed, and a 3D revit model has been compiled to document the existing utilities and proposed connections to the respective utilities. The method of surveying and data used to generate the 3D utility model varies according to the specific utility services and available information.

The below table clarifies the various data quality levels for each utility services surveyed in line with AS 5488-2019 Classification of Subsurface Utility Information (SUI).

The survey quality levels exist to define the relative special accuracy of the surveyed lines to the physical position of the utility. Due to interference from other utilities and structures, varying ground conditions and limitations in the technology, the spatial tolerances outlined in AS 5488 are defined.

In instances where survey anomalies or inconsistencies are identified due to the conditions outlined above, the utilities are interpolated from standards, DBYB, as-built information or the nearest utility services.

Survey Level	Description of requirement	Section reference (this report)
Level A	Potholing and surveying to give accurate horizontal and vertical position of the existing utility (includes measurement and survey of pit and maintenance structures)	- Utility owner identification - Utility type, status, material, size and configuration identification - Date of installation (if known) - Feature codes of surface features, including but not limited to pits, access chambers, poles, valves and hydrants Location of points surveyed on surface and subsurface features measured in terms of absolute spatial positioning with a maximum horizontal tolerance of +/- 50 mm
Level B	Geophysical locating and survey using cable location equipment or ground penetrating radar to generate an approximate horizontal and vertical position.	- Utility owner identification - Utility type identification - Date of installation (if known) Location of surface features measured in terms of relative spatial positioning with a maximum horizontal tolerance of +/- 300 mm Location of surface features measured in terms of relative spatial positioning with a maximum horizontal tolerance of +/- 300 mm and maximum vertical tolerance of +/- 500 mm

Survey Level	Description of requirement	Section reference (this report)
Level C	Undertake field ground survey of existing asset features as a surface feature correlation of approximate location	- Utility owner identification - Utility type identification - Date of installation (if known) - Interpolation of the location and direction of the subsurface utility surface features as a point of reference - Feature codes of surface features, including but not limited to pits, access chambers, poles, valves and hydrants Location of surface features measured in terms of relative spatial positioning with a maximum horizontal tolerance of +/- 300 mm
Level D	Use of 'dial before you dig' hotline and consult Utility Authorities GIS database location information.	- Existing records - Cursory site inspection - Anecdotal evidence

Table 4 Classification of Subsurface Utility

Document Reference	Description of requirement	Quality Level	Date of Survey	Format
PR132497-15-Botany RD Waterloo-001-A	Pothole survey	A	19/01/2019	
DBYD (various)	Dial Before You Dig responses for the investigation area	D	15/01/2020	
SMCSWSWL-JHG-SWL-SR-M3D-000001	First preliminary survey, used to create existing ground surface	N/A	21/02/2020	
SMCSWSWL-A28-SWL-DE-CSD-000219	Topographic Detail Survey - Waterloo Station	D	May 2016	

Table 5 Survey information

9. Infrastructure Services

Infrastructure services have been designed to a concept level of design.

9.1 Water Services (Potable Cold Water)

9.1.1 Demand Assessment

The WMQ Basement expected water use demand is covered within the northern precinct commercial building 1 (81kL / day) and central precinct residential building 2 (86kL / day), development applications.

9.1.2 On-Site Utility Infrastructure

The existing Sydney Water network in the project area consist of potable, wastewater and stormwater mains. Refer to Table 5 for Potable Water assets are present within the Waterloo ISD area:

Type	Size	Location
Water	450mm CICL	Cope St under northbound lanes
	100mm CICL	Cope St eastern verge
	100mm CICL	Raglan St under westbound lanes
	500mm CICL	Raglan St under westbound lanes
	300mm CICL	Raglan St northern verge
	100mm CICL	Wellington St northern verge
	100mm CICL	Botany Road western verge
	150mm CICL	Botany Road eastern verge

Table 6 Water Assets within the Waterloo ISD area

The location of these services has been documented in Appendix 1, based on surveys as outlined in section 9.1. Although the exact depths and positions of these existing mains will not be known until potholing investigation is conducted during the detail design (DD) phase to confirm the suitability and impacts of the proposed design on the existing network.

The following proposed connections points for the northern precinct and central precinct along Botany Road have been sent to Sydney Water for pressure and flow enquiry by WSP Water service coordinator (WSC):

Portable Water:

- Northern Precinct: 150CICL network on Botany Road, connection is proposed approximately ~36m along Botany Road to the south of Raglan Street (Refer to Appendix 1, for indicative location of connection)
- Central Precinct: 150CICL network on Botany Road, connection is proposed approximately ~118m along Botany Road to the south of Raglan Street (Refer to Appendix 1, for indicative location of connection)

Currently this connection route is designed to comply with Sydney Water requirements and achieves sufficient clearance to other existing utilities. The project Water Services Coordinator (WSC) will provide a detailed connection design after receiving Sydney Water response to the Section 73 Notice of Requirements (NoR) during detail design (DD) phase to be conducted post DA submission.

9.1.3 Connection

- Sydney Water has provided preliminary advice via Sydney Water Feasibility letter (as contained in Appendix 2), indicating that the connection to the 150CICL authority main is appropriate for the northern and central precinct developments.
- Direct connection to 150CICL Water Authority Main reticulated along Raglan Street, is proposed via a DN150 reticulated from building Water meter room.
- A reduced pressure zone device (RPZD) shall be installed for site containment on the downstream side of the cold water authority meter and all supply points of high cross contamination risks as required by Sydney Water and code requirements. Pressure boosting pumps where required shall be located within the site water meter room.
- It is noted that Sydney Water reserves the right to amend requirements in the section 73 Notice of Requirements (NoR). The NoR will provide certainty on the available capacity of the existing Sydney Water mains.

9.1.4 Amplifications and/or Diversions

- Requirements for amplifications and/or diversions will be confirmed as part of the Section 73 NoR from Sydney Water.
- Feasibility Notice of Requirements has been completed for the Waterloo Development and it indicates that modifications to increase the Botany Road water main from DN150 to DN200 should be investigated with the submission and acceptance of the Section 73 NoR, which will be completed post Central Precinct DA submission.
- It is noted that Sydney Water reserves the right to amend requirements in the section 73 NoR. The NoR will provide certainty on the available capacity of the existing Sydney Water mains, and indicate where amplifications and/or diversions are required to the Sydney Water network.

9.2 Water Services (Fire)

9.2.1 Demand Assessment

The WMQ northern precinct commercial building 1 expected water use demand for the sprinkler system has been sized to cater for the highest hazard within the developments plus allowance for the fire hydrants and a number of operational drenchers. As the northern precinct commercial building 1 demand is higher than central precinct residential building 2, it determines the worst-case fire scenario.

The system shall be fed from the fire pumps in the basement level.

- Water supply will be a dual-water supply as defined in AS 2118.6-2012.
- Town main water supply as the primary water supplies (basement level) supplying electric driven primary pumps (basement level).
- Fire tanks as the secondary water supplies (located within the basement level) supplying diesel driven stand-by pumps (basement level).

9.2.2 On-Site Utility Infrastructure

Refer to Water services section 9.1.2

9.2.3 Connection

- A new DN150mm diameter connection will be made to the respective commercial building 1 and residential building 2 water supplies from within each of the respective water meter rooms. The incoming supply will incorporate a double check detector assembly, Fire & Rescue NSW booster assembly and serve the new combined sprinkler and hydrant system. The fire protection services contractor shall extend from this point to service all fire system within the building. Top-up for evaporation purposes to the fire services tank shall be provided from the metered potable cold water supply, all other infills to tank shall be via the fire services system.
- It is noted that Sydney Water reserves the right to amend requirements in the section 73 NoR. The NoR will provide certainty on the available capacity of the existing Sydney Water mains.

9.2.4 Amplifications and/or Diversions

- Refer to Water services section 9.1.4

9.3 Wastewater Services

9.3.1 Demand Assessment

The WMQ Basement expected wastewater (sewer) use demand is covered within the northern precinct commercial building 1 (49kL / day) and central precinct residential building 2 (52kL / day), development applications.

9.3.2 On-Site Utility Infrastructure

The existing Sydney Water network in the project area consist of potable water, wastewater and stormwater mains. Refer to Table 6 for Sewer / Wastewater assets are present within the Waterloo ISD area:

Type	Size	Location
Wastewater / Sewer	400mm VC	Cope St under road pavement
	225mm VC	Raglan St under road pavement
	300mm VC	Wellington St under road pavement

Table 7 Sewer assets within the Waterloo ISD area

The location of these services has been documented in Appendix 1, based on surveys as outlined in section 9.1. Although the exact depths and positions of these existing mains will not be known until potholing investigation is conducted during the detail design (DD) phase to confirm the suitability and impacts of the proposed design on the existing network.

The following proposed connections points along Botany Street have been sent to Sydney Water for pressure and flow enquiry by WSP Water Service Coordinator (WSC):

Sewer:

- 225VC network on Botany Road, connection is proposed approximately 48m along Botany Road to the south of Raglan Street (Refer to Appendix 1, for indicative location of connection)
- 225VC network on Botany Road, connection is proposed approximately 126m along Botany Road to the south of Raglan Street (Refer to Appendix 1, for indicative location of connection)

Currently this connection route is designed to comply with Sydney Water requirement and achieved sufficient clearance to existing utilities. WSC will provide a detailed connection design after receiving Sydney Water response during detail design (DD) phase to be conducted post DA submission.

9.3.3 Connection

- Sydney Water has provided preliminary advice via Sydney Water Feasibility letter (as contained in Appendix 2), indicating that the connection to the 225VC authority main is appropriate for the northern and central precinct developments.
- Direct connection to DN225 Sewer Authority Main reticulated along Botany Road, is proposed via a DN225 reticulated from building 1 and DN225 from building 2 Sewer networks
- Provision will be made for a Sanitary drainage system complete with boundary trap, IPMF and overflow relief gully located on the ground level to provide a safe release from the connection point. Reflux valves shall be provided to drainage located below the overflow surcharge level.
- It is noted that Sydney Water reserves the right to amend requirements in the section 73 NoR. The NoR will provide certainty on the available capacity of the existing Sydney Water mains.

9.3.4 Amplifications and/or Diversions

- Requirements for amplifications and/or diversions will be confirmed as part of the Section 73 NoR from Sydney Water.
- Feasibility Notice of Requirements has been completed for the Waterloo Development and it indicates that modifications to the Botany Road Sewer main will not be required to service the central precinct development, and the proposed point of connection is provisionally accepted pending the submission and acceptance of the Section 73 NoR, which will be completed post Northern and Central Precinct DA submission.
- It is noted that Sydney Water reserves the right to amend requirements in the section 73 NoR. The NoR will provide certainty on the available capacity of the existing Sydney Water mains, and indicate where amplifications and/or diversions are required to the Sydney Water network.

9.4 Natural Gas Services

9.4.1 Demand Assessment

The WMQ Basement expected natural gas use demand is covered within the northern precinct commercial building 1 (3500mj/hr) and central precinct residential building 2 (6000mj/hr), development applications.

9.4.2 On-Site Utility Infrastructure

Within the Waterloo ISD work zone Jemena gas has underground assets within Cope St, Botany Rd, Wellington St and Raglan St. Refer to Table 7 for Natural assets are present within the Waterloo ISD area:

Type	Size	Location
Natural Gas	32mm NY 210kPa	Cope St under verge, east side of road
	32mm NY 210kPa	Cope St under verge, west side of road
	50mm NY 210kPa	Wellington St under verge, south side of road
	50mm NY 210kPa	Raglan St under verge, north side of road
	75mm NY 210kPa	Raglan St under verge, north side of road
	110mm NY 210kPa	Botany Road under verge, west side of road (this transitions to 50mm NY 210kPa heading south halfway between Wellington and Raglan)
	110mm NY 210kPa	Botany Road under verge, east side of road

Table 8 Natural Gas assets within the Waterloo ISD area

There are also 2 valves located at the North-West corner of Raglan St and Cope St, for isolation of the above services.

The location of these services has been documented in Appendix 1, based on surveys as outlined in section 9.1. Although the exact depths and positions of these existing mains will not be known until potholing investigation is conducted during the detail design (DD) phase to confirm the suitability and impacts of the proposed design on the existing network.

The following proposed connection point along Botany Street have been discussed with Jemena (Refer to Appendix 4):

Natural Gas:

- 7kPa network on Botany Road, connection is proposed for the WMQ commercial building 1 approximately ~43m along Botany Road to the south of Raglan Street (Refer to Appendix 1, for indicative location of connection)
- 7kPa network on Botany Road, connection is proposed for the WMQ residential building 2 approximately ~108m along Botany Road to the south of Raglan Street (Refer to Appendix 1, for indicative location of connection)

Currently this connection route is designed to comply with Jemena requirements and achieve sufficient clearance to existing utilities. A detailed connection design will be compiled and issued to Jemena during detail design (DD) phase to be conducted post DA submission.

9.4.3 Connection

- Jemena has provided preliminary advice via Connection email letter dated 18-June-20 (as contained in Appendix 4), indicating that the connection to the 110NY 210kPa authority main to Botany Road as indicated will provide 7kPa at point of connection for the WMQ northern precinct commercial building 1 and WMQ residential building 2.

- The natural gas meter rooms shall be located at ground level for building 1 and building 2 with direct street access and shall be in strict accordance with Jemena's requirements for gas meter rooms. The gas meter room shall be a shared room and will house the main volume meter/gas regulator for the site and the main authority meters for the retail tenants.
- The natural gas is intended to supplied directly from the authority mains to the respective Retail tenancy's.
- It is noted that Jemena reserves the right to amend the connection requirements when the application for connection is made and certainty on the available capacity of the existing Jemena mains is confirmed.

9.4.4 Amplifications and/or Diversions

- Requirements for amplifications and/or diversions will be confirmed as part of the application for connection response from Jemena.
- Advice provided from Jemena (as contained in Appendix 3) confirms that there is sufficient capacity in the mains surrounding the site and amplifications will not be required.
- It is noted that Jemena reserves the right to amend the connection requirements when the application for connection is made and certainty on the available capacity of the existing Jemena mains is confirmed.

9.5 Stormwater Services

9.5.1 Demand Assessment

The WMQ Basement expected stormwater point of discharge demand is covered within the northern precinct commercial building 1 and central precinct residential building 2, development applications. Refer to SSD-10440 Northern Precinct EIS Appendix O – Stormwater Management and Flooding Impact Assessment Report, and SSD-10439 Central Precinct EIS Appendix O – Stormwater Management and Flooding Impact Assessment Report, for details on stormwater demand assessments.

9.5.2 On-Site Utility Infrastructure

There is existing Sydney Water and City of Sydney network stormwater mains in the project area. Refer to Table 8 for Stormwater assets are present within the Waterloo ISD area:

Type	Size	Location
Stormwater Drainage	900 Pipe [City of Sydney]	Botany Road, western verge
Stormwater Drainage	900 Pipe [City of Sydney]	Botany Road, western verge
Stormwater Drainage	914 x 914Box Culvert [Sydney Water]	Cope Street, western verge
Stormwater Drainage	900 Pipe [City of Sydney]	Cope Street, western verge

Type	Size	Location
Stormwater Drainage	Pipe	Wellington Street – drainage pit connections at the intersection of Wellington an Cope Street, discharging to Cope Street drainage.
Stormwater Drainage	Pipe	Raglan Street – drainage pit connections at the intersection of Raglan and Cope Streets, discharging to Cope Street drainage.

Table 9 Stormwater assets within the Waterloo ISD area

The overall development site (of which the Northern and Centrals Precinct are parts) drains to four (4) frontages; Botany Road, Cope, Wellington and Raglan Street.

Botany Road frontage is serviced by a 900-diameter pipe with undersized and poorly maintained (based on recent visual inspection on-site) inlet pits.
Cope St is serviced by a Council stormwater main located under the kerb and gutter and a Sydney Water owned box culvert located under the western footpath. Raglan and Wellington Street is provided with surface drainage infrastructure. The site drains to Sheas Creek via Sydney Water trunk drainage and ultimately to Alexandra Canal and Botany Bay.

The location of these services has been documented in SSD-10440 Northern Precinct EIS Appendix O – Stormwater Management and Flooding Impact Assessment Report, and SSD-10439 Central Precinct EIS Appendix O – Stormwater Management and Flooding Impact Assessment Report, based on surveys as outlined in section 9.1. Although the exact depths and positions of these existing mains will not be known until potholing investigation is conducted during the detail design (DD) phase to confirm the suitability and impacts of the proposed design on the existing network.

9.5.3 Connection

- Stormwater drainage for the site is proposed to comply with the City of Sydney A4 Drainage Design Guidelines and City of Sydney – Interim Floodplain Management Policy.
- Direct connection to DN900 Authority Main, reticulating along Botany Road is proposed via a DN300 reticulated from building 1 Onsite Detention tank and DN300 reticulated from the building 2 Onsite Detention tank.
- The potential connection to the Sydney Water asset along Cope St will be further evaluated during the detail design phase post DA submission.
- It is noted that Sydney Water reserves the right to amend requirements in the application for connection. The Section 73 NoR will provide certainty on the available capacity of the existing Sydney Water mains.
- It is noted that City of Sydney reserves the right to amend requirements in the Tap In application for connection. The Tap In application for connection will provide certainty on the available capacity of the existing City of Sydney mains.

9.5.4 Amplifications and/or Diversions

- Requirements for amplifications and/or diversions to the City of Sydney and Sydney Water assets will be confirmed as part of the detailed design phase post DA submission. It is not currently anticipated that amplifications will be required to the existing Botany Road DN900 Pipe.

9.6 High Voltage Electrical

9.6.1 Demand Assessment

The WMQ Basement expected electrical use demand is covered within the northern precinct commercial building 1 (4,438 Amps per phase) and central precinct residential building 2 (1,460 Amps per phase), development applications.

9.6.2 On-Site Utility Infrastructure

The existing Ausgrid network comprises of low voltage and high voltage assets that utilises a combination of overhead and underground method of reticulation.

The current arrangement includes overhead LV cabling along south side of Raglan street, the east side of Botany Road and the south side of Wellington Street, along with LV auxiliary cabling and HV Cabling within conduits back around the perimeter of the site.

The LV overhead network is supplying street lights and properties within the ISD area supplied from existing Kiosk Substations.

9.6.3 Connection

A Proposed Design Scope (PDS) has been submitted to Ausgrid for the development following the initial Application for Connection (AfC) being submitted to Ausgrid and the assignment of a Contestable Project Coordinator by Ausgrid (refer to Appendix 4).

The PDS proposes the establishment of a 3x 1,500kVA transformer surface chamber substation within the Northern precinct, to support the Northern and Central Precinct, and Basement loads.

It is proposed that the chamber substation shall be looped in to the local HV network between the Zetland zone substation and substation No. 8412.

It is noted that the application for connection AN21264 is currently under determination with Ausgrid, in accordance with the Contestable works process.

9.6.4 Amplifications and/or Diversions

During Stage 2 of the Waterloo station package design development, Ultegra has been engaged to prepare a concept design to enable the relocation of existing assets to facilitate the undergrounding of the surround overhead aerial network and facilitate the reticulation of the HV underground routing to supply the development.

The current design has been modelled in 3d for utility design coordination and in accordance with the relevant Ausgrid design requirement. This design has been sent to Ausgrid for review and comment.

Any utility connection and protection requirements will be further detailed by the WSP ASP level 3 designer in the next design stage.

It is currently expected that a new trench and conduits will be required from the point of network at the intersection of Wellington Street, Botany Road and Buckland Street, to the Chamber Substation within the Northern Precinct.

Requirements for amplifications and/or diversions will be confirmed as part of the AN21264 Ausgrid response.

9.7 Communication and Data

9.7.1 Demand Assessment

The WMQ Basement expected electrical use demand is covered within the northern precinct commercial building 1 and central precinct residential building 2, development applications.

9.7.2 Existing Providers

The WMQ northern precinct building 1 site has access to following communication providers;

- NBN, NSW-Act
- Nextgen, NCC – NSW
- PIPE Networks, NSW
- Verizon Business (NSW)
- Vocus Fibre Pty Ltd (NSW)
- Telstra, NSW
- Optus, NSW

The Existing Telstra assets a mixture of copper and fibre optic cables in 100 mm and 50mm conduits, with trench arrangements ranging from single conduits to banks of 20.
Telstra assets such as pillars and exchanges are located outside the Waterloo ISD area on the corner of Botany-Wellington and Botany-Raglan. Any impact to these assets by Waterloo OSD buildings may results in alterations to existing assets within the ISD site.

NBN have assets located within the Telstra conduit network. Where Telstra conduits are being relocated, NBN will be notified as their services will also be transferred to the new routes.

The location of these services has been documented in Appendix 1, based on DYBD reports and initial site inspections. Although the exact depths and positions of these existing mains are unknown, and further investigation will be required during the detail design (DD) phase to confirm the suitability and impacts of the proposed design on the existing network.

9.7.3 Connection

The proposed design is currently requiring two separate connections lead-ins for Northern Precinct development on Botany Street;

- 4 x 100mm Conduits, Communication provider TBC, approximately ~52m along Botany Road to the south of Raglan Street, for WMQ commercial building 1
- 4 x 100mm conduits, Communications provider TBC, approximately ~80m along Botany Road to the south of Raglan Street (Shared Trench with Central Precinct residential building 2) for commercial building 1 and residential building 2

The requirements for communication connection is still under design development, the relevant service provider will be engaged to review the design during the detail design phase post DA submission.

9.7.4 Amplifications and/or Diversions

Requirements for amplifications and/or diversions will be confirmed as part of the engagement with NBN Co., Carriers and other communication and data providers.

9.8 Coordination with Other Services

Coordination of the proposed new infrastructure works within and around are the site will be based on the Streets Opening Conference standards.

9.8.1 Water Services Coordination

In addition, Section 5.12.5.2 of the Water Services Association of Australia codes (WSA 03-2011-3.1, Sydney Water Edition – 2012) states the clearance requirements for water mains, shall not be less than the minimum vertical and horizontal clearances as detailed.

9.8.2 Wastewater Services Coordination

In addition, Section 5.12.5.2 of the Water Services Association of Australia codes (WSA 02-2002-2.2, Sydney Water Edition – Version 3) states the clearance requirements for sewer mains, shall not be less than the minimum vertical and horizontal clearances as detailed below.

9.8.3 Electrical Services Coordination

In addition, Ausgrid network standards for design and reticulation of services will apply for all works, including but not limited to;

- NS114: Electrical Design and Construction Standards for Chamber Type Substations
- NS130: Specification for Laying Underground Cables up to and including 11kV

9.8.4 Data and Communication Services Coordination

In addition, clearances for NBN services from other utilities is given in Section 5.2.13 of “New Development: Deployment of the NBN Co Conduit and Pit Network – Guidelines for Developers”.

9.8.5 Landscape Coordination

In addition, clearances for the respective authority utility services the new utility services will be coordinated in manner to ensure the landscape tree planting and structures are avoided.

9.8.6 Civil Coordination

In addition, clearances for the respective authority utility services the new utility services will be coordinated in manner to ensure the roads, footpaths and street reservations are considered.

10. Mechanical Services

Mechanical services have been designed to a concept level of design.

10.1 General

The general approach and design criteria for the mechanical services for the basement are detailed in the following sections and comprise:

- Air conditioning systems to serve all normally occupied areas in the building;
- Mechanical ventilation to plant rooms, car parks, toilets, kitchens and other plant areas as necessary;
- Smoke hazard management systems including smoke exhaust and stair pressurisation systems;
- Associated electrical services;
- Building management systems to control and monitor the mechanical equipment;
- Details are included for the northern precinct commercial building, and southern precinct residential building

10.2 Design Conditions

10.2.1 External Conditions

The following design conditions have been used to size the air conditioning systems:

	Cooling	Heating
Outdoor	34.0°C Dry Bulb / 23°C Wet Bulb	7.0°C, saturated

Table 10 Mechanical Outdoor Design Conditions

Notes:

1. Outdoor design conditions are based on AIRAH DA09 with the design dry-bulb temperature being increased as a nominal allowance for 1.5oC temperature increase due to climate change.
2. Air cooled condensers for DX units and the like selected to operate up to an outdoor temperature of 45oC and noting that peak design capacity may not be delivered under this temperature

10.2.2 Internal Conditions

The internal conditions to spaces within the basement shall be in accordance with the commercial building 1 and residential building 2 requirements for their respective areas.

10.2.3 Outside Air

Outside air intake shall comply with AS1668 Part 2, BCA and the projects ESD requirements.

10.2.4 Exhaust Air

Exhaust air systems shall comply with AS1668 Part 2, and the projects ESD requirements. The commercial office spaces within the basement shall also comply with PCA A-Grade requirements.

10.2.5 Acoustics

Control of noise generated by the mechanical plant is required. Plant shall be designed to maintain noise levels in the building and not exceed noise levels or noise budgets as prescribed in AS2107 and the Waterloo OSD Integration Report.

10.3 Mechanical Services

10.3.1 Proposed Air Conditioning Systems

The space heating and cooling air conditioning systems to serve the commercial office and residential areas within the basement will be further reviewed as part of the design development phase. The initial proposal is to provide packaged air conditioning systems;

- A centralised condenser system, connecting to packaged air conditioning units
- Each room to include an in ceiling-mounted fan coil unit.
- Air cooled VRF systems, with carpark mounted outdoor units may be provided for select rooms

10.3.2 Mechanical Ventilation Systems

Mechanical ventilation systems will be provided to comply with statutory code requirements and in accordance with the requirements of AS1668.2, to the following areas;

- Back of House areas
- Amenities
- Loading Dock – Residential
- Carpark
- Plantrooms

10.3.3 Smoke Hazard Management

The smoke hazard management systems shall be further reviewed as part of the design development phase. The initial proposals for the smoke hazard management systems include the following:

- Stair pressurisation to each office tower stair (2off) and sized for two open doors on the office levels in addition to the exit door and to code requirements for discharge per door.
- Zoned smoke control system to serve the commercial office floors;
- Smoke exhaust shall be at the top of the Atrium;
- Air supply to all floors except the fire affected floors shall be via the central air handling plant;

10.3.4 Building Management Control System

The building is to be provided with an Integrated Building Platform (IBP) and an integrated HVAC control system which shall provide comprehensive building automation functionality available for use by the Facility Maintenance staff.

The system shall be based on the open industry protocol and network standards. Control and monitoring functions of the IBP and HVAC Controls shall be used to automatically control, monitor and provide alarms for all the building services.

11. Electrical and Communication Services

Electrical and Communication services have been designed to a concept level of design.

11.1 General

The general approach and design criteria for the electrical services for the northern precinct are detailed in the following sections and comprise:

- Power distribution and chamber substation;
- LV power distribution infrastructure;
- Metering;
- General and Emergency Lighting for Internal and External areas;
- Lighting Control System;
- Earthing and Lightning / surge protection systems;
- Communications and Data systems;
- Electronic Security System;

11.2 Power Supply and Distribution

11.2.1 Origin of Supply

The northern precinct will be supplied via a chamber substation located on ground floor next to the loading dock. It is understood that a 3 x 1500 kVA Chamber Substation will be provided, and this will supply both the northern, centre and basement precincts. It is assumed that the substation falls under option number 11 in the Ausgrid document NS109 Design Standards for Overhead Supply Developments and Distribution Centres.

The assumed 5500A firm rating is what has been used to assess the capacity of the substation against the maximum demand of the northern precinct.

11.2.2 Consumer's Mains and Main Switchboard

Consumer's mains dedicated to the northern precinct shall be provided from the Ausgrid substation to a main switch room located within the basement. Consumer's Mains shall have appropriate fire rating performance in accordance with AS3013 to satisfy AS3000.

The current location of the Main Switchrooms for building 1 is provided within the commercial back of house areas to the centre west area of the P1 basement, which is accessible via the basement ramp entry for maintenance and replacement of electrical plant and by the fire brigade should an emergency occur.

The current location of the Main Switchroom is provided within the residential back of house areas to the south east end of the P1 basement, which is accessible via the basement ramp entry for maintenance and replacement of electrical plant and by the fire brigade should an emergency occur.

The Main Switch Room shall be:

- 2-hour fire rated
- Designed and Constructed to minimise the effects of EMI on Surrounding areas
- Have two separate means of egress

11.2.3 Metering

An energy metering and monitoring system will be provided to each building to meet PCA A Grade, BCA, Greenstar and NABERS requirements.

Additionally all shared central plant will be metered with revenue grade (NMI) meters to allow accurate apportionment of cost between building tenants. A metering and monitoring headend system will be provided and collate all metering information to facilitate monitoring, reporting and trending required to achieve Greenstar and NABERS targets.

Supply Authority Revenue meters will be provided for house services and multiple removable links for the future installation of up to 4 Supply Authority Revenue meters will be provided to each tenanted level.

11.2.4 Lightning / Surge Protection

A complete Lightning Protection System (LPS) will be installed to the requirements of AS1768:2007. The LPS design for the tower will be developed in accordance with the E+B strategy for the station precinct.

The Lighting Protection Level (LPL) will be determined during detailed design.

Lightning protection includes:

- Surge protection on MSB
- Steel roof and structural frame to be electrically continuous and use air termination network
- Bonding of air termination network into perimeter structural reinforcement.
- Bonding of column and slab reinforcement to ensure continuity of down conductors
- Pad footings utilised as earth electrodes at base of building.

Further information is required from Power Earth on the requirements for utilising down conductors without effecting the Metro boxes earthing system

11.2.5 Power to Specialised Equipment

Power shall be provided to all equipment in accordance with the rated requirements of that equipment. It is anticipated that this shall comprise a combination of:

- Single phase outlets;
- 3 phase outlets rated to specific equipment requirements; and
- Permanent connections via local isolator switch.

All power to dedicated equipment shall be coordinated with the final equipment location. UPS and Standby Generator requirements shall be provided integral or dedicated to the specific equipment as required by PCA A-Grade.

11.2.6 General Power

House Distribution Boards will be provided on every level of the basement and will be served from the respective commercial or residential MSRs.

Essential distribution boards will be provided on every basement level and will serve fire and life safety services.

Dedicated Mechanical services switchboards (provided by the mechanical trade) will be provided for central mechanical plant.

11.2.7 COPE STREET PLAZA Power

Provision will be made for general power to the Cope Street Plaza for access and amenity. General power requirements shall be provided in accordance with the landscape design to the plaza areas managed and maintained by the Waterloo Developer.

General power system cable containment conduits will originate from Basement or Building 3 switch rooms and terminate at the outlet. Outlet types, final system configuration and source of supply will be designed during the detail design phase post DA submission.

11.2.8 Backup Power

A standby diesel generator will be provided to serve the commercial building back of house in accordance with PCA A-Grade requirements.

A containerised generator set will be located on the commercial plant room rooftop. The containerised approach eliminates the need for a generator room with standalone equipment and effectively bundles the generator, air intake, day tank, muffler, acoustic treatment, exhaust and the like into one unit. The noise, vibration and structural loading impacts of this location will need to be considered during detailed design.

The diesel fuel storage for this generator will be located within the basement.

11.2.9 Cable Reticulation

Electrical risers shall be split into tenant and house risers. Tenant risers will contain tenant metering panels and tenant cabling. On anchor tenant floors the two tenant distribution boards shall be located within the tenant riser as well as the tenant meter panel.

House risers will contain house distribution boards, essential distribution boards, house cabling and diesel pipework.

Reticulation to all distribution boards and metering panels from rising mains will be via circuit breaker protected tee off boxes.

Submains will be XLPE/PVC insulated and sheathed cables with copper conductors, will be sized for the full rating of the circuit protective device with adjustment for all derating factors. All submains and protective devices serving tenant distribution boards will be sized in accordance with PCA A Grade requirement.

Fire rated submains reticulated on fire rated cable ladders will be provided for all Fire and Life Safety Services.

All containment systems for power cabling will be sized to provide a minimum of 25% spare capacity.

11.3 Lighting

11.3.1 Interior Lighting

Lighting for the basement will be in accordance with the northern precinct commercial building requirements.

Interior lighting shall be designed to comply with NCC requirements for energy efficiency (Section J) as well as taking guidance from AS 1680 and other codes/standards as applicable. All lighting shall be coordinated with the architect, marketing drawings and inclusions lists, and shall be designed to suit each particular area.

11.3.2 Lighting Controls

An Intelligent Lighting Control System (ILCS) shall be provided for all electric lighting throughout the basement which allows for high level automation of the lighting functionality based on user requirements and environmental influences to maximise energy efficiency, reducing Greenhouse Gases and the facilities carbon footprint. The ILCS shall include diurnal and timer operation, occupancy sensing, daylight harvesting and maintenance harvesting as a minimum.

The ILCS shall consist of a network of luminaires, sensors and user override control devices which are integrated with the ICN to allow management to and modification of the system throughout the lifecycle of the facility, as well as providing flexibility to the varying tenant requirements.

11.3.3 COPE STREET PLAZA Lighting

Provision will be made for lighting to the Cope Street Plaza for access and amenity. Lighting poles shall be provided in accordance with the landscape design to the plaza areas managed and maintained by the Waterloo Developer.

Lighting system cable containment conduits will originate from Basement or Building 3 switch rooms and terminate within the base of each light pole. Lighting types, operation, control, final system configuration and source of supply will be designed during the detail design phase post DA submission.

11.3.4 Emergency Lighting

Emergency egress and signage lighting provided throughout the basement will be of a single-point battery back-up type and will be monitored via the predominant ILCS platform provided throughout the building. The luminaires will be of a DALI type Inverter / driver combination and integrate directly into the ILCS or through an interface device in the case of a PoE platform.

The emergency lighting design shall be carried out in accordance with AS/NZS 2293.1:2018: Emergency escape lighting and exit signs for buildings, Part 1: System design, installation and operation as well as National Construction Code (NCC) (Formerly Building Code of Australia(BCA)) 2019.

11.4 Data / Communications

11.4.1 General

The Data / Communication Services for the northern precinct commercial building generally include but are not limited to the following systems:

- House network infrastructure including:
  - Network headend cabinets
  - Structured cabling system
  - Field enclosures
  - Field equipment patching
- Carrier infrastructure including:
  - Incoming connections
  - Carrier cabinets
  - Structured cabling system
- Distributed Antenna System (DAS) infrastructure including:
  - Incoming connections
  - DAS cabinets
  - Structured cabling system
  - Remote units
  - Antennas
- Master Antenna Television System (MATV) infrastructure including:
  - Rooftop communications system
  - MATV headend
  - Structured cabling system
- Tennant infrastructure including:
  - Structured cabling system

11.4.2 NBN Co provisions

Fibre to the Premises (FTTP) by the national broadband network (NBN) is the preferred method of providing an internet connection to the tenants of building 2.

The NBN infrastructure for building 2 has four major components:

- Premise Distribution Hub (PDH)
- Fibre Distribution Terminal (FDT)
- Tenant NBN Terminal (TEN)
- Structured cabling system

These components will be supplied and installed as per NBN requirements.

The PDH will be a 600mm wide by 400mm deep wall mounted enclosure located within the telecommunications room on basement level P1.
The FDT will be a 300mm wide by 200mm deep wall mounted enclosure located within the ICT riser on each floor that has a tenant. The structured cabling system will be a star topology and will be comprised of optic fibre.

The NBN incomers will be reticulated from the property boundary.

11.4.3 House Services Communications

The house network provides communication services to the following systems:

- Publicly available WI-FI in public and plant spaces;
- Integrated Building Platform (IBP);
- All building automation systems;
- All essential and non-essential building communication systems;

11.4.4 Wireless Access

A wireless access point system will be provided to the northern precinct for coverage to the following areas;

- Public areas
- Main Lobby
- Back of House areas accessible by including, storage areas and loading docks
- Commercial Plantrooms

11.4.5 COPE STREET PLAZA Wireless Access

Provision will be made for a wireless access point system (or Wifi system) to the Cope Street Plaza for public use. Wifi coverage will be provided to the plaza areas managed and maintained by the Waterloo Developer. Wireless access points shall be designed and positioned on the selected light pole locations within Cope street plaza as part of public domain works.

Wifi system cable containment conduits will originate from Basement or building 3 shared communications rooms and terminate within the base of each light pole. Wireless access point locations, final system configuration and source of supply will be designed during the detail design phase post DA submission.

11.4.6 Distributed Antenna System

A distributed antenna system (DAS) will be deployed to provide full mobile phone coverage as per PCA A grade requirements to the commercial basement areas.

To achieve this the DAS will have space allocated to three key components within building 1:

- DAS headend cabinets
- Structured Cabling System
- DAS remote unit

Spatial allocation for the DAS headend racks will be made within the northern precinct commercial building 1 DAS room on basement level P1. The DAS structured cabling system backbone cabling will connect this room and the field enclosures via ICT riser 1.

Incoming carrier supply for the DAS will be from property boundary to basement level P1 DAS room.

11.4.7 Carrier Infrastructure

To comply with PCA A grade requirements spatial allocation for two main carriers will be provided.
The carrier infrastructure is comprised the following components:

- Diverse and physically separated carrier lead ins
- Carrier cabinets
- Structured cabling system
- Floor distribution panels

Incoming carrier connections shall be from building perimeter into northern precinct building 1 telecommunications room.

Space for four cable trays has been provided to allow a tenant who has an existing relationship with a carrier to install their own infrastructure without affecting the infrastructure of the other tenants or Developer. This space is can be reallocated at a future date to accommodate changes in tenant or carrier requirements.

Additional cabling will be required to traverse the length of the basement floors as some backbone reticulation pathways will become longer. However as previously stated both multimode and single mode optic fibre are more than capable of handling the additional distances.

11.4.8 MATV System

The master antenna television system encompasses the following components:

- Rooftop communications system (individual systems for Commercial and Residential areas within the basement)
- MATV headend
- Structured cabling system

Rooftop communications services require the ability to distribute Free-to-Air (FTA) and PayTV services throughout basement areas.

FTA services will be provided through a VHF/UHF antenna mounted on a vertical mast and will be positioned with a clear direct line of site of a DVB-T transmitting tower.

PayTV services will be provided a spatial allocation for a satellite dish on the roof. The dish will be aligned for Azimuth elevation setup and cross-polarisation.

Spatial allocation for the MATV headend racks will be made within the northern precinct commercial building 1 and central precinct building 2 telecommunications rooms on basement level P1. The MATV structured cabling system backbone cabling will be located within ICT risers.

11.5 Electronic Security Systems

11.5.1 General

The electronic security systems to be installed in northern precinct commercial building 1 of the Waterloo Integrated Station Development will consist of the following:

- Integrated Security Management System (ISMS);

- Closed Circuit Television (CCTV) System;
- Electronic Access Control System (EACS), inclusive of relevant alarm points; and
- Intercommunication System.

All electronic security systems will be connected to the Building's communication network, and all head-end equipment will be located in a secure rack within the Main Communications Room.

11.5.2 Access Control and Intruder Detection

The ISMS will be responsible for the coordination and information exchange between the different security systems, and it will present this information to the Operators through a single Graphic User Interface (GUI) software package.

All monitoring and control of the electronic security systems of northern precinct commercial building 1 will take place primarily in the Security Office located on Level 01. This will be the primary location where administration and operation of the security systems takes place. This location will be equipped with photo ID card production equipment.

A secondary control and monitoring location will be within the Dock Manager's Office on the Ground Floor.

11.5.3 Intercommunication System – Commercial Building

The intercommunication system is to be installed with an IP based system consisting of audio and video master and slave stations. The primary master intercom unit will be located in the Security Office, with the secondary master intercom unit being located in the Dock Manager's Office.
The slave intercom units will be located in the following areas, as a minimum:

- Staff entrances;
- Public entrances for after-hours entry; and
- Carpark entrances and exits.

11.5.4 Intercom and Remote Door Release System- Residential Building

An audio intercom system to each apartment shall be provided that interconnects to the street level panel. The system shall incorporate the following features:
Handset monitor stations in each apartment with the ability to remotely release the external doors required to access the apartment.
This shall also include remote access to the required lift services;

- The panel located at the front door shall have the ability to page any of the handsets within the apartments;
- Monitor stations within each apartment shall only be able to provide remote door release to the external doors and lifts required to access the apartment; and
- Upon providing access via remote door release from a monitor station the door of the apartments from which the request came from is to be released.

11.5.5 Closed Circuit TV (CCTV) System

A digital CCTV System as is to be provided for the development comprising:

- Video Management and Recording System;
- Equipment Rack Cabinet;
- IP Cameras;
- Signage; and
- Power Supplies.

The CCTV head end equipment is proposed to be located in a dedicated house services communications room and viewed through the security control room.

11.5.6 COPE STREET PLAZA Closed Circuit Television (CCTV) System

Provision will be made for a CCTV system to the Cope Street Plaza for security monitoring of areas managed and maintained by the Waterloo Developer. CCTV cameras shall be designed and positioned on the selected light pole locations within Cope street plaza as part of public domain works.

CCTV system cable containment conduits will originate from Basement or Building 3 shared communications room and terminate within the base of each light pole. CCTV point locations, final system configuration and source of supply will be designed during the detail design phase post DA submission.

12. Hydraulic

Hydraulic services have been designed to a concept level of design.

12.1 General

The general approach and design criteria for the hydraulic services for the northern precinct are detailed in the following sections and comprise:

- Potable cold-water services;
- Non-potable and recycled water systems;
- Potable Hot-water services;
- Natural Gas;
- Sanitary Plumbing and Drainage;
- Stormwater Drainage services;
- Acoustic insulation to all pipework, including bracketing, separation between structure and insulation;

12.1.1 Backflow Prevention

The northern precinct commercial building 1 shall have a back flow prevention device installed directly downstream of the Sydney Water master meter. Additional backflow prevention shall be provided for:

- Mechanical plant and equipment;
- Trade waste equipment e.g. car wash
- Recycled water system top-up; and
- Irrigation plant and equipment.

Furthermore, additional zone protection in accordance with the Sydney Water requirements shall be provided for irrigation system, swimming pool, water fountain, cooling towers.

12.1.2 Rainwater collection and drainage

Rainwater collected from plantroom, roof and surrounding controlled roof areas shall be via 'siphonic' pipework system and be directed to the rainwater harvesting system Rain water from areas other than those noted above shall be collected via a separate Gravity or alternate 'siphonic' system picking up the surface water and will be directed to the stormwater drainage system.

Rainwater collection, treatment and storage tanks suitable for the reuse profile addressed within the development. Uses shall include in order of precedence;

- Landscape irrigation
- Common amenities toilet flush (where capacity permits)

Design shall include pre-treatment devices to manage the first flush of contaminants. Rainwater harvesting water treatment plants are to consist of a minimum dual parallel arrangement of primary filtration, secondary bag filtration plus additional treatment required to meet the local authority's requirements for use of water.

12.1.3 Natural Gas

The natural gas system will be sized based on the methods described within AS 5601 to satisfy clause 5.2.4 of AS5601(2013), to supply the retail spaces only, there is no requirement for gas for commercial office heating or hot water.

Allowance has been made for pressure loss through bends and the like as the number of these will increase significantly during the coordination process. Additionally, it has been estimated that the negligible pressure loss through these bends and the like will be catered for in diversity and the spare system capacity as we have allowed for 100% duty with no diversity therefore could be seen to be very conservative.

12.2 Hydraulic Services – Commercial and Residential areas

12.2.1 Potable Cold Water System

The Potable cold water systems will be sized and designed for the respective commercial building 1 and residential building 2 areas within the basement.

12.2.2 Potable Hot Water System

The Potable hot water systems will be sized and designed for the respective commercial building 1 and residential building 2 areas within the basement.

12.2.3 Sanitary Plumbing

The sanitary drainage sizing calculations will be based on the fixture unit method, pipe sizes, and pipe grades described within AS 3500.2.

12.2.4 Trade Waste

The trade waste pre-treatment devices will be sized in accordance with the local Guidelines, good engineering practice. Trade waste drainage and sanitary plumbing will be sized based on the fixture units and methods described within AS 3500.2.

12.2.5 COPE STREET PLAZA Hydraulic Requirements

Provision will be made for irrigation, potable cold water and drainage to the Cope Street Plaza for access and amenity. Hydraulic requirements shall be provided in accordance with the landscape design to the plaza areas managed and maintained by the Waterloo Developer.

Irrigation and potable cold water supplies will originate from Basement or Building 3 hydraulic plantrooms and terminate at the outlet. Outlet types, final system configuration and source of supply will be designed during the detail design phase post DA submission.

13. Fire Services

Fire services have been designed to a concept level of design.

13.1 General

The building fire protection system is to be designed and installed in accordance with all relevant Australian Standards, codes and authority requirements;

- National Construction Code (NCC) 2019
- Fire hydrants and sprinklers shall form part of a combined sprinkler and hydrant system in accordance with AS2118.6-2012, with dual-water supply consisting of town main water supply and on-site water storage tanks,
- Automatic fire sprinkler system in accordance with AS 2118.1-2017,
- Fire hydrants installed in accordance with AS 2419.1-2017,
- Fire hose reels installed in accordance with and AS 2441-2005,
- Fire detection and alarm system in accordance with AS 1670.1-2018,
- Emergency Warning and Intercom System in accordance with AS 1670.4-2018,
- Smoke hazard management in accordance with AS 1668.1-2018,
- Portable fire extinguishers shall be provided in accordance with Table E1.6 of the NCC with selection and location to AS 2444.
- Fire Engineering Report (To be prepared by Fire Engineer during detail design phase)

13.1.1 Combined automatic fire sprinkler and hydrant system

A Combined Fire Sprinkler and Hydrant System shall be provided throughout the building in accordance with the referenced standards AS 2118.1-2017, AS 2118.6-2012, AS 2419.1-2005, BCA G3.8 and FEBQ requirements, providing appropriate means of wet fire suppression and fire-fighting provisions for the operation of Fire & Rescue NSW, The water supply shall consist of a dual-water supply with town main + electric pump, and water tank + diesel pump. In addition a relay pump (electric) will be provided to enable FRNSW system boosting capability to the high-level pressure zone.

FRNSW booster access will be available from Botany Road.

13.1.2 Fire Hose Reel System

Fire Hose Reels are to be provided throughout the building in accordance with NCC and located in accordance with AS 2441.

- Hose reels are provided on each floor level (excluding Class 2, 3 and 5 portions of the building) adjacent to the fire stairs using 36-meter hose reels.
- Hose reels shall be a separate system fed and pressurized from a stand-alone fire hose reel pump

13.1.3 Portable Fire Extinguishers

Portable fire extinguishers and fire blankets are to be provided throughout to comply with NCC table E1.6 and selected, located and distributed in accordance with sections 1 to 4 of AS 2444.

13.1.4 Fire Detection and Alarm Systems

An addressable fire detection & alarm system shall be provided in accordance with AS 1670.1 – 2018, E2.2a of the BCA.

A networked addressable analogue Fire Detection (FDCIE) shall be provided in the Fire Control Room of the Building – on ground level. Panels are to be of the non-proprietary type with open protocol.

The Fire Detection & Alarm System will provide interface between the sprinkler and hydrant systems, smoke detectors and shut-down / control of the mechanical smoke control systems, security, audio visual, and BMCS.

The FDCIE will incorporate Fire Fan Control Panel(s) (FFCP) that will automatically and manually control the ventilation and air distribution systems throughout the entire building, for operation of the fire fans by Fire & Rescue NSW, for fire and smoke control.

A network interface will be provided between Building 1 (FDCIE) and Building 2 (FDCIE).

13.1.5 Building Occupant Warning System

An EWIS (SSISEP) will be provided in accordance with AS 1670.4 – 2018, E4.9 and G3.8 of the BCA.
An Emergency Warning CIE (EWCIE) will be provided in the Fire Control Room adjacent to the FDCIE, FFCP.

The EWIS shall be activated by the automatic operation of an active fire system or manual operation from the Fire Control Room / Fire Detection CIE.

13.1.6 Fire Control Room

A Fire Control Room (FCR) shall be provided within the building which has direct access from Botany street level as required under NCC.

14. Assessment and Findings

14.1 Technical assessment.

The technical assessment of the utility requirements for WMQ Basement is contained within the northern precinct commercial building 1 and central precinct residential building 2. An assessment of the respective building requirements has determined that all connections to services will be made along Botany Road, as outlined in Appendix 1.

14.2 Cumulative impacts

The cumulative impacts of the proposed utility connections on the adjacent precincts has been summarised below;

14.2.1 Southern Precinct

The WMQ Southern precinct student accommodation building 3 and social housing building 4 has proposed connections to some of the same utility services along Botany Road, and other utility services along Wellington.

As a result of the northern, central and southern precinct proposed utility connections, amplifications and modifications will be required to some of the authority networks along Botany Road.

The proposed utility connections along Wellington are only proposed for the southern precinct. Based on investigations and engagements with the authorities it is not envisaged that any amplifications will be required to utilities along Wellington.

The exact details of the authority network utility amplifications and modifications will not be known until after formal applications are completed during the detail design phase post DA submission.

14.2.2 Station Precinct

The WMQ Station precinct has dedicated utility services connections along Cope St and through the Line Wide Tunnel network, for all station operations, with the exception of the station retail spaces.

As a result of these dedicated connections for the Station operations there is not intended to be any impact from the proposed northern precinct utility services connections. The northern precinct will supply the power and trade waste building services to the northern Station retail building services, this is further outlined in the OSD Integration Report, where the point of services connection is located within the WMQ areas outside the metro station boxes.

Through consultation and communication within the WMQ Developer team applications for the Northern, Central and Southern precinct authority utility connections will be coordinated to ensure all requirements are understood. And will be designed to ensure that no WMQ services or utilities pass through the metro station boxes.

All authorities that are currently aware of the differing WMQ precincts and their connection requirements, have been outlined in Appendices of this report.

15. Mitigation measures

To complete the required utility connections for the Basement, the following mitigation measures will need to be followed;

- Disconnection and demolition of the existing utilities and services to allow the proposed Basement development construction
- Utility diversions, amplifications and modifications of existing authority mains for wastewater, potable water, stormwater and high voltage, is anticipated to commence upon direction and approval of the respective authority accredited designs prior to development approval.
- Proceed with Sydney Water Notice of Requirements application for Northern Precinct and Central Precincts, and associated conditions of consent for connection of Potable Water, Sewer and Stormwater services
- Proceed with Ausgrid contestable works approval process for Northern Precinct (includes Central precinct and Basement), associated submissions and approvals for connection of high voltage power and construction of chamber substation
- Proceed with City of Sydney Tap In application for Northern Precinct and Central Precincts, and associated conditions of consent for connection of Stormwater services
- Proceed with Jemena connection application for Northern Precinct and Central Precincts, and associated conditions of consent for connection of Natural Gas services
- Proceed with Carrier and communication provider applications for connection process for Northern Precinct and Central Precincts, and associated conditions of consent for connection of carrier communication services
- Proceed with NBN application for connection process for Northern Precinct and Central Precincts, and associated conditions of consent for connection of NBN communication services
- Coordinate new utility services to avoid landscape tree planting and structures.
- Coordinate new utility services to consider roads, footpaths and street reservations.
- Coordinate new utility services and metro station retail services requirements to ensure no services pass through the metro station boxes.

The mitigation measures and application processes as outlined above have been provisionally commenced and are recognised as a condition of consent for the Basement development application and associated works.

16. Conclusion

16.1 Utility Provisions

All Utility Authorities that have assets within the area of works will be notified of the proposed adjustments to their assets. The Utility Authorities through their specific application processes will review the impacts to assets and proposed augmentations and provide their individual required conditions of consent for connection of the required utilities.

Based on the confirmation of conditions of consent for asset connection as understood through authority codes, requirements and practices, the proposed northern precinct will be able to achieve the required utilities and building services statutory requirements.

16.2 Assumptions and Constraints

The following assumption and constraints have been considered during the utility coordination and design:

- The locations used for adjusting around, and tying into, existing utilities are based on WSP supplied information. This information is a mix of DBYD data and survey located data to a quality level of A, B, C and D as defined in AS5488. Further detailed survey will be required as design develops
- For communication design, current assumption is to provide 4x100 conduit shared trench for northern and central precincts tap into existing Telstra/NBN backbone network. Telstra/NBN is current reviewing the comms design. Design and connection detail to be confirmed in the next design stage. All other communications connections will be made on a building specific basis.
- It is assumed that Jemena will provide a single 7kPa connection and can be protected if required. Design to be detailed during detail design (DD) phase to be conducted post DA submission.
- ASP 3 design is current under Ausgrid review and subject to change in the next stage. Currently assume design is correct for the HV connection and assumes the chamber substations for the precinct will supply all power to the Metro Quarter buildings and areas. The Waterloo Metro Station will obtain its own dedicated power supply.
- It is assumed that Sydney Water will confirm that connections to Botany Road potable water and sewer will require amplification from Raglan to Wellington to facilitate the new development. The details of this amplification will not be confirmed until the individual notice of requirements is submitted for each building.

16.3 Building Services Provisions

The building services for the Basement have been designed to a concept level of design, to suit the requirements of the northern commercial building 1 and the central residential building 2 in accordance with the relevant codes, standards and guidelines.

16.4 Design Considerations

The following design considerations have been incorporated into the building services to a concept level of design:

- Maintenance
- Reliability
- Environmental and industry best practice
- Safety in Design for Construction and Maintenance

- Alternative Systems considered and assessed
- Authority infrastructure size, age and capacity
- Incorporating spare capacity
- Redundancy and backup
- Systems monitoring
- Plant Location
- Staged CC
- Site access during construction

Based on the design considerations and completion of the utility service connection provisions for WMQ Basement, which are required for the northern commercial building 1 and central residential building 2, as outlined in this document. The new WMQ Basement will be able to be constructed and commissioned in accordance with the project and statutory requirements and supports the proposal for the Basement development application.

17. Appendices

Appendix 1 – Waterloo Station Utility Design

WATERLOO INTEGRATED STATION DEVELOPMENT

WATERLOO METRO QUARTER OSD

PROPOSED UTILITY SERVICES

LOCALITY PLAN
NOT TO SCALE

DRAWING INDEX

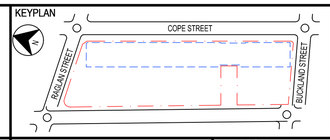
UTILITIES

FOR REVIEW

REV.	BY	DATE	DESCRIPTION	APPD.
A	C.Z.	03.07.20	ISSUED FOR DEVELOPMENT APPLICATION	J.P.

SCALES

KEYPLAN



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DESIGNED	J. CEREZO	03.07.20
DRG CHECK	C. BIDART	03.07.20
DESIGN CHECK	R. JIANG	03.07.20
APPROVED	J. PICKERING	03.07.20

WATERLOO ISD
WATERLOO METRO QUARTER OSD
PROPOSED UTILITY SERVICES
COVER SHEET AND DRAWING INDEX

STATUS: FOR REVIEW | SHEET 1 OF 1 | ©

DRG No. WMQ-SITE-WSP-UT-DWG-U8900 | REV. A

A1 Original | Co-ordinate System: MGA Zone 56 | Height Datum: A.H.D. | This sheet may be prepared using colour and may be incomplete if copied | NOTE: Do not scale from this drawing. | ALT. DRG No. [Alt. Drg. No.]

LEGEND

GENERAL

- EXISTING CADASTRAL BOUNDARY
- ROAD DESIGN

PROPOSED UTILITIES

- GAS
- SEWER
- WATER
- COMMUNICATION
- HV ELECTRICAL UNDERGROUND
- SERVICES TRENCH FOOTPRINT
- TO BE REMOVED

PROPOSED UTILITIES - WATERLOO STATION PACKAGE (DP22)

- GAS
- SEWER
- WATER
- COMMUNICATION
- ELECTRICAL UNDERGROUND
- SERVICES TRENCH FOOTPRINT
- TO BE REMOVED

EXISTING UTILITIES

- GAS MAIN - DIGITISED
- SEWER MAIN - DIGITISED
- WATER MAIN - DIGITISED
- ELECTRICAL - DIGITISED
- COMMS - DIGITISED
- DRAINAGE - DIGITISED
- EXISTING OVERHEAD STREET LIGHT
- EXISTING LOW VOLTAGE OVERHEAD
- TRANSMISSION LINE
- POLE
- STREET LIGHT
- EXISTING ELECTRICAL JUNCTION BOX
- OPTICAL FIBER PIT
- OPTICAL JUNCTION BOX
- JUNCTION MANHOLE
- MANHOLE COVER
- SEWER LAMPHOLE COVER

GENERAL NOTES

NOTES:

1. THE UTILITIES/SERVICES SHOWN IN THESE PLANS HAVE BEEN COMPILED FROM MULTIPLE SOURCES OF INFORMATION. IT IS RESPONSIBILITY OF THE CONTRACTOR TO UNDERTAKE THEIR OWN SITE INVESTIGATIONS (INCLUDING DBYD) PRIOR TO ANY CONSTRUCTION ACTIVITIES. THESE DRAWINGS ARE NEVER TO BE USED FOR THE PURPOSE OF LOCATING SERVICES. WSP SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE CAUSED USING THE UTILITIES/SERVICES INFORMATION SHOWN ON THIS DRAWINGS.
2. LOCATION AND LEVEL OF ALL EXISTING SERVICES CROSSING PROPOSED DRAINAGE MUST BE CONFIRMED PRIOR TO CONSTRUCTION.
3. UTILITY DRAWINGS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH THE UTILITY SERVICES STRATEGY REPORT.
4. ABANDONED UTILITIES DUE TO SERVICE RELOCATION ARE ASSUMED TO BE GROUT FILLED AND NOT COMPLETELY REMOVED BY THE UTILITY INSTALLATION CONTRACTOR.
5. EACH DRAWING IN THE UTILITY SET SHOULD NOT BE READ IN ISOLATION FROM THE OTHER SERVICE DRAWINGS IN THE SET.
6. UTILITIES ARE TO BE IN ACCORDANCE WITH ALLOCATIONS SPECIFIED BY THE NSW STREETS OPENING CONFERENCE. 'GUIDE TO CODES AND PRACTICES FOR STREET OPENING', UNLESS DETAILED OTHERWISE.

PITS

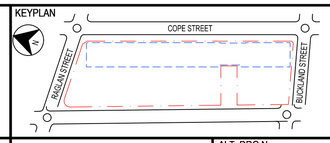
1. PITS WITHIN PAVED AREA TO BE INSTALLED WITH INFILLED LIDS AS PER LANDSCAPE ARCHITECT DETAILS.

FOR REVIEW

REV.	BY	DATE	DESCRIPTION	APPD.
A	C.Z.	03.07.20	ISSUED FOR DEVELOPMENT APPLICATION	J.P.

SCALES

KEYPLAN



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DRG CHECK	C. BIDART	03.07.20
DESIGN CHECK	R. JIANG	03.07.20
APPROVED	J. PICKERING	03.07.20

WATERLOO ISD

WATERLOO METRO QUARTER OSD
PROPOSED UTILITY SERVICES
GENERAL NOTES AND LEGEND

STATUS: FOR REVIEW | SHEET 1 OF 1 | ©

DRG No WMQ-SITE-WSP-UT-DWG-U8901 | REV. A

A1 Original | Co-ordinate System: MGA Zone 56 | Height Datum: A.H.D. | This sheet may be prepared using colour and may be incomplete if copied | NOTE: Do not scale from this drawing. | ALT. DRG No [Alt. Drg. No.]

NOT PART OF THIS SUBMISSION
REFER TO WATERLOO STATION PACKAGE

SOUTHERN PRECINCT (PUB | SOUTHERN | PRECINCT (PU

NORTHERN PRECINCT (BUILDING 1 AND BASEMENT BELOW)

CENTRAL PRECINCT (BUILDING 2 AND BASEME | CENTRAL PRECINCT (BU

RAGLAN STREET

PROPOSED POTABLE WATER Ø150mm CICIL CONNECTION SUPPLY BLDG 1 AND BASEMENT (REFER TO BUILDING SERVICE PACKAGE) TO BE CONNECTED TO EXISTING POTABLE WATER LINE

PROPOSED GAS LINE COMING FROM BLDG 1 GAS METER ROOM. 7kPa SUPPLY BLD1 AND BASEMENT (REFER TO BUILDING SERVICE PACKAGE) TO BE CONNECTED TO JEMENA GAS LINE. GAS PIPE SIZE TO BE DESIGN BY JEMENA

PROPOSED HV FEEDER SUPPLY BUILDING 1 AND 2 CONNECT TO 1x CHAMBER SUBSTATION

PROPOSED SEWER CONNECTION FOR BLDG 1 AND BASEMENT (REFER TO BUILDING SERVICE PACKAGE) TO BE CONNECTED TO EXISTING SEWER LINE

PROPOSED 4 x Ø100mm COMMUNICATION LINE COMING SUPPLY BLDG 1 AND BASEMENT. (REFER TO BUILDING SERVICE PACKAGE) SERVICE PROVIDER TBC

PROPOSED 2 x Ø100mm COMMUNICATION LINE COMING SUPPLY BLDG 2 AND BASEMENT (REFER TO BUILDING SERVICE PACKAGE) TO BE CONNECTED TO EXISTING NBN LINE

PROPOSED GAS LINE COMING FROM BLDG 2 GAS METER ROOM. 7kPa SUPPLY BLD1 AND BASEMENT(REFER TO BUILDING SERVICE PACKAGE) TO BE CONNECTED TO JEMENA GAS LINE. GAS PIPE SIZE TO BE DESIGN BY JEMENA

PROPOSED POTABLE WATER Ø150mm. CICIL CONNECTION SUPPLY BLDG 2 AND BASEMENT (REFER TO BUILDING SERVICE PACKAGE) TO BE CONNECTED TO EXISTING POTABLE WATER LINE

ADJOINS SHEET - UT-U8972

EXISTING JEMENA GAS 110mm NYLON

EXISTING SYDNEY WATER SEWER DN225 VC

EXISTING SYDNEY POTABLE WATER DN150 CICL

CONNECT TO EXISTING SEWER LINE

PROPOSED 4 x Ø100mm COMMUNICATION LINE SUPPLY BLDG 1 AND BASEMENT. (REFER TO BUILDING SERVICE PACKAGE) SERVICE PROVIDER TBC

PROPOSED 11kv HV 300CU1 CABLE IN 2 x 150mm CONDUITS WITH 2 x 150mm SPARE CONDUITS. REFER TO APS3 DESIGN FOR DETAIL

NEW HV TRENCH

CONNECT TO EXISTING SEWER

PROPOSED SEWER CONNECTION FOR BLDG 2 AND BASEMENT (REFER TO BUILDING SERVICE PACKAGE) TO BE CONNECTED TO EXISTING SEWER LINE

HENDERSON ROAD

BOTANY ROAD

RAGLAN ST MAIN CONTROL - CL400

NOTES:

1. ALL DIMENSIONS ARE SHOWN IN METRES UNO.
2. FOR GENERAL NOTES AND FULL UTILITY LEGEND REFER TO WMQ-SITE-WSP-UT-DWG-U8901.

THE UTILITIES/SERVICES SHOWN IN THESE PLANS HAVE BEEN COMPILED FROM MULTIPLE SOURCES OF INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO UNDERTAKE THEIR OWN SITE INVESTIGATIONS (INCLUDING DBYD) PRIOR TO ANY CONSTRUCTION ACTIVITIES. THESE DRAWINGS ARE NEVER TO BE USED FOR THE PURPOSE OF LOCATING SERVICES. WSP SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE CAUSED USING THE UTILITIES/SERVICES INFORMATION SHOWN ON THESE DRAWINGS.

FOR REVIEW

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B	C.Z	27.07.20	ISSUED FOR DEVELOPMENT APPLICATION	J.P.
A	C.Z.	03.07.20	ISSUED FOR DEVELOPMENT APPLICATION	J.P.

WORK IN PROGRESS

SCALES
0 2 4 8 12
Full Size 1:200 ; Half Reduction 1:400
SCALE (m)

KEYPLAN
COPE STREET
RAGLAN STREET
BUCKLAND STREET

PRINCIPAL AEO
JOHN HOLLAND

CLIENT
mirvac

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APPROVED	J. PICKERING	27.07.20

WATERLOO ISD

WATERLOO METRO QUARTER OSD
PROPOSED UTILITY SERVICES
GENERAL ARRANGEMENT PLAN

STATUS: FOR REVIEW | SHEET 1 OF 2 | ©

DRG No. WMQ-SITE-WSP-UT-DWG-U8971 | REV. B

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SOUTHERN PRECINCT (PUBLIC DOMAIN)

NOT PART OF THIS SUBMISSION
REFER TO WATERLOO STATION PACKAGE

CENTRAL PRECINCT (BUILDING 2 AND BASEMENT BELOW)

SOUTHERN PRECINCT (BUILDING 3)

WELLINGTON STREET

BOTANY ROAD

ADJOINS SHEET - UT-U8971

PROPOSED GAS LINE COMING FROM BLDG 3 AND 4 GAS METER ROOM. 7kPa SUPPLY BLD3 AND BLD4 (REFER TO BUILDING SERVICE PACKAGE) TO BE CONNECTED TO JEMENA GAS LINE. GAS PIPE SIZE TO BE DESIGN BY JEMENA

PROPOSED SEWER CONNECTION COMING FOR BLDG 3 (REFER TO BUILDING SERVICE PACKAGE) TO BE CONNECTED TO EXISTING SEWER LINE. OPTIONS UNDER REVIEW TO BE CONFIRMED WITH AUTHORITY

PROPOSED 4 x Ø100mm COMMUNICATION LINE SUPPLY BLDG 3 AND 4 (REFER TO BUILDING SERVICE PACKAGE) TO BE CONNECTED TO EXISTING NBN LINE

PROPOSED HV FEEDER SUPPLY BUILDING 3 AND 4 CONNECT TO 2 x CHAMBER SUBSTATION. REFER TO ASP3 DESIGN FOR DETAIL

PROPOSED POTABLE WATER Ø150mm. CICIL CONNECTION SUPPLY BLDG 3 (REFER TO BUILDING SERVICE PACKAGE) TO BE CONNECTED TO EXISTING POTABLE WATER LINE. OPTIONS UNDER REVIEW TO BE CONFIRMED WITH AUTHORITY

PROPOSED POTABLE WATER Ø150mm. CICIL CONNECTION SUPPLY BLDG 4 (REFER TO BUILDING SERVICE PACKAGE) TO BE CONNECTED TO EXISTING POTABLE WATER LINE. OPTIONS UNDER REVIEW TO BE CONFIRMED WITH AUTHORITY

PROPOSED SEWER CONNECTION COMING FOR BLDG 4 (REFER TO BUILDING SERVICE PACKAGE) TO BE CONNECTED TO EXISTING SEWER LINE. OPTIONS UNDER REVIEW TO BE CONFIRMED WITH AUTHORITY

HV JOINT CONNECT TO EXISTING HV NETWORK REFER TO ASP3 DESIGN FOR DETAIL

POSSIBLE AMPLIFICATION OF THE SEWER AND WATER MAIN TO COPE STREET. OPTIONS UNDER REVIEW TO BE CONFIRMED WITH AUTHORITY

POSSIBLE ALTERNATIVE PROPOSED POTABLE WATER AND SEWER CONNECTION SUPPLY BLDG 3 AND 4 OPTIONS UNDER REVIEW TO BE CONFIRMED WITH AUTHORITY

HV JOINT CONNECT TO EXISTING HV NETWORK REFER TO ASP3 DESIGN FOR DETAIL

EXISTING JEMENA GAS 110mm NYLON

CONNECT TO EXISTING SEWER LINE

PROPOSED 11kv HV 300CU1 CABLE IN 2 x 150mm CONDUITS WITH 2 x 150mm SPARE CONDUITS. REFER TO APS3 DESIGN FOR DETAIL

CONNECT TO EXISTING SEWER LINE

POSSIBLE AMPLIFICATION OF THE SEWER AND WATER MAIN ALONG BOTANY ROAD. OPTIONS UNDER REVIEW TO BE CONFIRMED WITH AUTHORITY

WARNING UNDERGROUND TRANSMISSION CABLES PRESENT

FOR WORK NEAR TRANSMISSION CABLES IT IS COMPULSORY TO ARRANGE FOR AN AUSGRID REPRESENTATIVE TO ATTEND THE WORKSITE. CONTRACT WITH AUSGRID MUST BE MADE AT LEAST TWO WEEKS BEFORE WORK COMMENCES ON THE SITE. PHONE THE AUSGRID TRANSMISSION ENQUIRIES ON (02) 4951 9200 TO ARRANGE FOR AN AUSGRID REPRESENTATIVE IN YOUR REGION.
THIS TO ENSURE THE WORK IS UNDERTAKEN SAFETY AND SO AS NOT TO ENDANGER THE CABLES OR WORKERS. THE RELEVANT DETAILS SHOULD BE PROVIDED AND THE REPRESENTATIVE'S ATTENDANCE ARRANGED. A REGULATED CHARGE WILL BE MADE FOR THIS SERVICE

NOTES:

1. ALL DIMENSIONS ARE SHOWN IN METRES UNO.
2. FOR GENERAL NOTES AND FULL UTILITY LEGEND REFER TO WMQ-SITE-WSP-UT-DWG-U8901.

THE UTILITIES/SERVICES SHOWN IN THESE PLANS HAVE BEEN COMPILED FROM MULTIPLE SOURCES OF INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO UNDERTAKE THEIR OWN SITE INVESTIGATIONS (INCLUDING DBYD) PRIOR TO ANY CONSTRUCTION ACTIVITIES. THESE DRAWINGS ARE NEVER TO BE USED FOR THE PURPOSE OF LOCATING SERVICES. WSP SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE CAUSED USING THE UTILITIES/SERVICES INFORMATION SHOWN ON THESE DRAWINGS.

FOR REVIEW

REV.	BY	DATE	DESCRIPTION	APPD.
B	C.Z.	27.07.20	ISSUED FOR DEVELOPMENT APPLICATION	J.P.
A	C.Z.	03.07.20	ISSUED FOR DEVELOPMENT APPLICATION	J.P.

WORKS IN PROGRESS

SCALES
0 2 4 8 12
Full Size 1:200 ; Half Reduction 1:400
SCALE (m)

KEYPLAN
COPE STREET
BARLOW STREET
BUCKLAND STREET

PRINCIPAL AEO: JOHN HOLLAND

CLIENT: mirvac

SERVICE PROVIDERS
wsp
Level 27, 680 George Street, Sydney
GPO Box 5394, NSW 2001, Australia
Tel: +61 2 9272 5100 Fax: +61 2 9272 5101
wsp.com

DRAWN	C. ZHANG	27.07.20
DESIGNED	J. CEREZO	27.07.20
DRG CHECK	C. BIDART	27.07.20
DESIGN CHECK	R. JIANG	27.07.20
APPROVED	J. PICKERING	27.07.20

WATERLOO ISD

WATERLOO METRO QUARTER OSD
PROPOSED UTILITY SERVICES
GENERAL ARRANGEMENT PLAN

STATUS: FOR REVIEW | SHEET 2 OF 2 | ©

DRG No WMQ-SITE-WSP-UT-DWG-U8972 | REV. B

A1 Original | Co-ordinate System: MGA Zone 56 | Height Datum: A.H.D. | This sheet may be prepared using colour and may be incomplete if copied | NOTE: Do not scale from this drawing. | ALT. DRG No. [Alt. Drg. No.]

Appendix 2 – Sydney Water Feasibility Notice of Requirements

Case Number: 185224

30 July 2020

PATRICK GARLAND
WL DEVELOPER PTY LTD
c/- WSP AUSTRALIA PTY LTD

FEASIBILITY LETTER

Developer:	**WL DEVELOPER PTY LTD**
Your reference:	**PS119449**
Development:	**Lot 2 DP228641** **126 COPE ST, Waterloo**
Development Description:	**This development comprises of four multilevel buildings comprising of a total of 788 units.**
Your application date:	**3 June 2020**

Note: **Level 1 water restrictions are now in place**, which limits how and when water can be used outdoors. This can impact you and your contractors in the activities they need to undertake for this proposal.

Using water to suppress dust is not restricted, but this does mean that you/your contractors will need to apply for an exemption permit to use water for most outdoor uses including:

- Cleaning equipment and the exterior of new buildings
- Drilling and boring, and
- Batching concrete on-site

Fines for deliberate breaches of restriction rules apply from 1 September 2019.
For more information on the restrictions and for applying for an exemption, visit our web site at http://www.sydneywater.com.au/SW/water-the-environment/what-we-re-doing/water-restrictions/index.htm
The more water everyone saves, the longer we can stave off the progression to stricter restrictions or emergency measures.
Please provide this information to your contractors and delivery partners to inform them of their obligations.

Dear Patrick,

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

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

Sydney Water will then send you either a:

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

These documents will be the definitive statement of Sydney Water's requirements.

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

- if you change your proposed development, e.g. the development description or the plan/ site layout, after today, the requirements in this Letter could change when you submit your new application; and

- if you decide to do your development in stages then you must submit a new application (and pay another application fee) for each stage.

What You Must Do To Get A Section 73 Certificate

To get a Section 73 Certificate you must do the following things. You can also find out about this process by visiting www.sydneywater.com.au > Plumbing, building & developing > Developing > Land development.

1. **Obtain Development Consent from the consent authority for your development proposal.**

2. **Engage a Water Servicing Coordinator (Coordinator).**

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

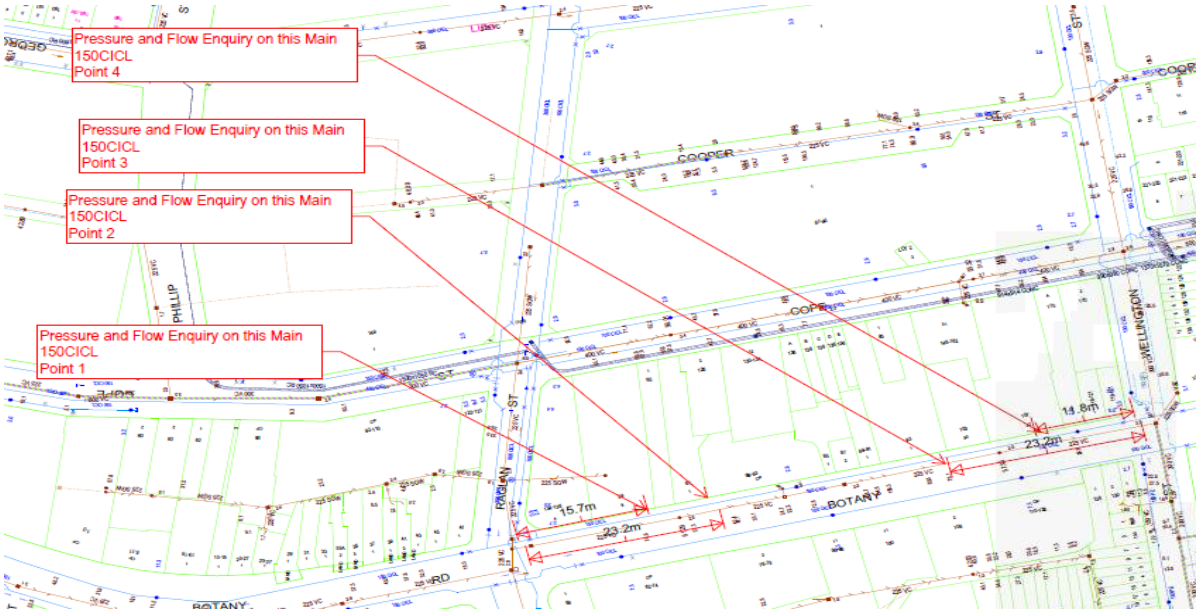
   For a list of authorised Coordinators, either visit www.sydneywater.com.au > Plumbing, building & developing > Developing > Providers > Lists or call **13 20 92.**

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

3. **Developer Works Deed**

   Your feasibility application is served from existing mains and does not require any works to be constructed at this time. Sydney Water will confirm this with you after you have received Development Approval from Council and your Coordinator has submitted a new Development application and Sydney Water has issued you with a formal Notice of Requirements.

4. Water, Recycled Water and Sewer Works



4.1 Water

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

Sydney Water has assessed your application and found the existing DN150 main in Botany Street has sufficient capacity. However, if this main is impacted (e.g. resurfacing driveways) as part of the development then this main will need to be upsized to a DN200 as per the WSA Code guidelines for buildings more than 8 storeys given the scale of this development.

4.2 Recycled Water

While there is no existing Sydney Water recycled water supply to this area, Sydney Water is open to working in partnership with developers to consider potential decentralised recycled water servicing solutions that may offset potable water demands for irrigation, toilet flushing and domestic washing machines, as well as air cooling towers. Consideration can also be given for rainwater capture and stormwater runoff reduction.

Please contact your Sydney Water Account Manager to investigate the potential for a commercial arrangement to supply recycled water to your development.

4.3 Sewer

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

Sydney Water has assessed your application and found that:

- Although there is capacity in the existing DN225 sewer main in Botany Rd, from an operational standpoint due to the discharge flows it is recommended that your development connects to the DN400 in Cope St. We advise that this will minimise the risk of an overflow. Figure 2 below (DN400 highlighted in red).
- The connection to the DN400 is an external connection into a maintenance structure; either an existing maintenance hole (MH) or new MH with a sideline to the property boundary.
- If the development is below 16m RL it may be exposed to a risk of internal surcharge under extreme weather conditions. To mitigate this, you will need to consider design alternatives, e.g. Reflux valve on Customer Sanitary Drain

Figure 2

5. Ancillary Matters

5.1 Asset adjustments

After Sydney Water issues, this letter (and more detailed designs are available), Sydney Water may require that the water main/sewer main/stormwater located in the footway/your property needs to be adjusted/deviated. If this happens, the work must meet the conditions of this letter and you will need to complete it **before we can issue the Certificate**. Sydney Water will need to see the completed designs for the work and we will require you to lodge a security. The security will be refunded once the work is completed.

5.2 Entry onto neighbouring property

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

6. Approval of your Building Plans

You must have your building plans approved **before the Certificate can be issued. Building construction work MUST NOT commence until Sydney Water has granted approval.** Approval is needed because construction/building works may affect Sydney Water's assets (e.g. water and sewer mains).

Your Coordinator can tell you about the approval process including:

- Your provision, if required, of a "Services Protection Report" (also known as a "pegout"). This is needed to check whether the building and engineering plans show accurately where Sydney Water's assets are located in relation to your proposed building work. Your Coordinator will then either approve the plans or make requirements to protect those assets before approving the plans;
- Possible requirements;
- Costs; and
- Timeframes.

You can also find information about this process (including technical specifications) if you either:

- visit www.sydneywater.com.au > Plumbing, building & developing > Building > Building over or next to assets. Here you can find Sydney Water's *Technical guidelines - Building over and adjacent to pipe assets*; or
- call 13 20 92.

Notes:

- **The Certificate will not be issued until the plans have been approved and, if required, Sydney Water's assets are altered or deviated;**
- **You can only remove, deviate or replace any of Sydney Water's pipes using temporary pipework if you have written approval from Sydney Water's Urban Growth Business. You must engage your Coordinator to arrange this approval; and**
- **You must obtain our written approval before you do any work on Sydney Water's systems. Sydney Water will take action to have work stopped on the site if you do not have that approval. We will apply Section 44 of the *Sydney Water Act 1994*.**

7. **Special Requirements**

OTHER THINGS YOU MAY NEED TO DO
Shown below are other things you need to do that are NOT a requirement for the Certificate. They may well be a requirement of Sydney Water in the future because of the impact of your development on our assets. You must read them before you go any further.

Disused Sewerage Service Sealing

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

Soffit Requirements

Please be aware that floor levels must be able to meet Sydney Water's soffit requirements for property connection and drainage.

Requirements for Business Customers for Commercial and Industrial Property Developments

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

Trade Wastewater Requirements

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

The permit application should be emailed to Sydney Water's Business Customer Services at

businesscustomers@sydneywater.com.au

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

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

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

Backflow Prevention Requirements

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

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

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

Before you install a backflow prevention device:

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

For installation, you will need to engage a licensed plumber with backflow accreditation who can be found on the Sydney Water website:
http://www.sydneywater.com.au/Plumbing/BackflowPrevention/

Water Efficiency Recommendations

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

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

- Install water efficiency fixtures to help increase your water efficiency, refer to WELS (Water Efficiency Labelling and Standards (WELS) Scheme, http:// www.waterrating.gov.au/
- Consider installing rainwater tanks to capture rainwater runoff, and reusing it, where cost

effective. Refer to http://www.sydneywater.com.au/Water4Life/InYourBusiness/RWTCalculator.cfm

- Install water-monitoring devices on your meter to identify water usage patterns and leaks.
- Develop a water efficiency plan for your business.

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

Contingency Plan Recommendations

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

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

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

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

For further information please visit the Sydney Water website at: http://www.sydneywater.com.au/OurSystemsandOperations/TradeWaste/ or contact Business Customer Services on **1300 985 227** or businesscustomers@sydneywater.com.au

Fire Fighting

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

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

Large Water Service Connection

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

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

- A plan of the hydraulic layout;
- A list of all the fixtures/fittings within the property;
- A copy of the fireflow pressure inquiry issued by Sydney Water;
- A pump application form (if a pump is required);
- All pump details (if a pump is required).

You will have to pay an application fee.

Sydney Water does not consider whether a water main is adequate for firefighting purposes for your development. We cannot guarantee that this water supply will meet your Council's firefighting requirements. The Council and your hydraulic consultant can help.

Disused Water Service Sealing

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

Other fees and requirements

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

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

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

END

Appendix 3 – Jemena Correspondence and Proposed connections

Patrick Garland

From: Zachary Kennett <Zachary.Kennett@jemena.com.au>
Sent: Wednesday, 1 July 2020 11:56 AM
To: Jiang, Ray
Cc: Pickering, John; Ramajoo, Jonathan; Patrick Garland; Fennelly, Geraldine
Subject: RE: Waterloo Over Station Development - Jemena Gas Connection

Hi Ray,

I have completed a preliminary investigation and confirmed with our capacity planners that we currently have sufficient network capacity to connect the below sites based on these loads. The next steps will be to submit formal application requests to Jemena either via the Jemena portal or through the end use customers preferred retailer.

The applications will need to be split up depending on the configuration of each building and metering required within those buildings, when submitting the applications you are unclear on what type of application you require please email me the buildings site plan, building use and meter room designs.

Please note Jemena does not reserve capacity on the network until a formal application is submitted and assessed.

Regards,
Zachary Kennett
Network Development Specialist – I&C
Jemena
99 Walker Street, North Sydney NSW 2060
PO Box 1220, North Sydney NSW 2059
Tel: 02 9867 7182 | 0409 608 399
www.jemena.com.au

From: Jiang, Ray <Ray.Jiang@wsp.com>
Sent: Tuesday, 30 June 2020 3:22 PM
To: Zachary Kennett <Zachary.Kennett@jemena.com.au>
Cc: Pickering, John <john.pickering@wsp.com>; Ramajoo, Jonathan <Jonathan.Ramajoo@wsp.com>; patrick.garland@mirvac.com; Fennelly, Geraldine <Geraldine.Fennelly@wsp.com>
Subject: RE: Waterloo Over Station Development - Jemena Gas Connection

Hi Zachary,

As requested, based on current design the estimated loads at each connection point are as of follows:

Connection 1

- Building 1: 6 off (inclusive of the Community Tenancies for future, and the 1 tenancy from the Metro Box) = 3000mj/hr

Connection 2

- Building 2: 12 off (inclusive of the Community Tenancies for future) = 6000mj/hr

Connection 3

- Building 3 HW plant 3000 Mj/hr
- Building 4 HW plant 900 MJ/h
- Retail allowances 2 x 750Mj/hr for building retail and 3rd 500Mj/hr for station retail, that's 750 x 2 + 500 = 2000Mj/hr

Please let me know if you need more information from us.

Regards,

Ray Jiang
Senior Engineer

M: 0437 397 314
Ray.Jiang@wsp.com

WSP Australia Pty Limited
Level 27, 680 George Street
Sydney, NSW
2000 Australia

wsp.com

From: Zachary Kennett [mailto:Zachary.Kennett@jemena.com.au]
Sent: Thursday, 18 June 2020 11:42 AM
To: Jiang, Ray <Ray.Jiang@wsp.com>
Cc: Pickering, John <john.pickering@wsp.com>; Ramajoo, Jonathan <Jonathan.Ramajoo@wsp.com>; patrick.garland@mirvac.com
Subject: RE: Waterloo Over Station Development - Jemena Gas Connection

Hi Ray,

Ill be looking after the Waterloo over station development applications and process on behalf of Jemena as I'm currently looking after a number of other metro stations within the city.

The preliminary serving review completed in 2018 indicated that their was enough gas supply for these buildings with supply coming from the 210 kPa network and a load of 30,000 mj/h across the whole site with multiple connection points.

Can you please provide the estimated loads required at each of the point?

I also note that you are indicating 7kPa connection points off a 210kPa network which is not possible, the incoming connections will be at 210kPa and reduce down at either boundary regulators or meter sets within the lots.

Regards,
Zachary Kennett
Network Development Specialist – I&C
Jemena
99 Walker Street, North Sydney NSW 2060
PO Box 1220, North Sydney NSW 2059
Tel: 02 9867 7182 | 0409 608 399
www.jemena.com.au

From: Jiang, Ray <Ray.Jiang@wsp.com>
Sent: Wednesday, 17 June 2020 2:23 PM
To: Neale Hilton <Neale.Hilton@jemena.com.au>
Cc: Pickering, John <john.pickering@wsp.com>; Ramajoo, Jonathan <Jonathan.Ramajoo@wsp.com>;

patrick.garland@mirvac.com; Stephen Angel <Stephen.Angel@jemena.com.au>; Zachary Kennett <Zachary.Kennett@jemena.com.au>; Andrew Haigh <Andrew.Haigh@jemena.com.au>
Subject: RE: Waterloo Over Station Development - Jemena Gas Connection

Hi Neale,

Refer to the email below from Andrew. Could you please provide information on the existing Jemena gas network in relation to the attached proposed gas connection requirement for this project?

Please let me know if you need more information from us.

Regards,

Ray Jiang
Senior Engineer

M: 0437 397 314
Ray.Jiang@wsp.com

WSP Australia Pty Limited
Level 27, 680 George Street
Sydney, NSW
2000 Australia

wsp.com

From: Andrew Haigh [mailto:Andrew.Haigh@jemena.com.au]
Sent: Wednesday, 17 June 2020 2:05 PM
To: Jiang, Ray <Ray.Jiang@wsp.com>
Cc: Pickering, John <john.pickering@wsp.com>; Ramajoo, Jonathan <Jonathan.Ramajoo@wsp.com>; patrick.garland@mirvac.com; Neale Hilton <Neale.Hilton@jemena.com.au>; Stephen Angel <Stephen.Angel@jemena.com.au>; Zachary Kennett <Zachary.Kennett@jemena.com.au>
Subject: RE: Waterloo Over Station Development - Jemena Gas Connection

Hi Ray,

As discussed, please contact Neale Hilton (cc'd). Cheers.

Regards,

Andrew Haigh
Commercial Manager – External Works
Mobile: 0427413252
Telephone : 02 9867 8573
Jemena
Level 12, 99 Walker Street, North Sydney, NSW 2060
andrew.haigh@jemena.com.au | www.jemena.com.au
www.gonaturalgas.com.au

From: Jiang, Ray <Ray.Jiang@wsp.com>
Sent: Wednesday, 17 June 2020 1:55 PM
To: Andrew Haigh <Andrew.Haigh@jemena.com.au>
Cc: Pickering, John <john.pickering@wsp.com>; Ramajoo, Jonathan <Jonathan.Ramajoo@wsp.com>; patrick.garland@mirvac.com
Subject: Waterloo Over Station Development - Jemena Gas Connection

Hi Andrew,

As discussed, please find attached gas connection design requirement for this project. We are currently working on towards detailed SSD DA application submission.

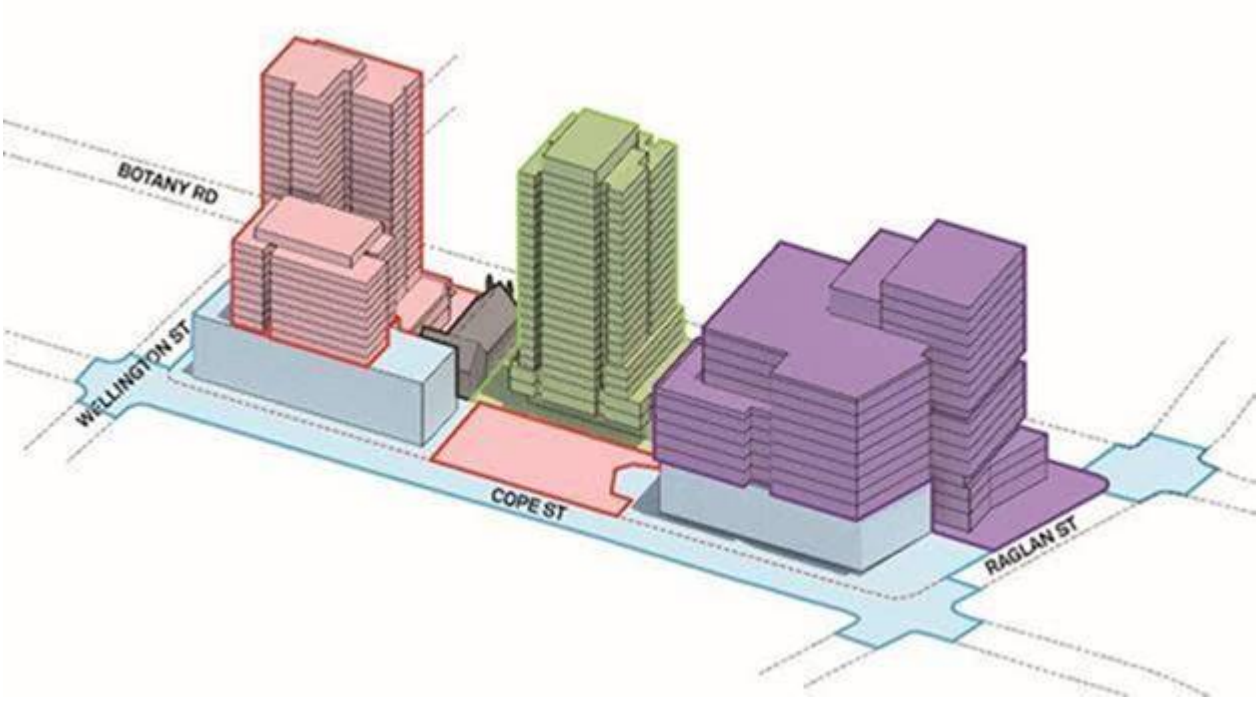
In particular, as part of the design process, we need to understand:

- What is the existing capacity of your current network in the precinct area.
- Does Jemena have any plans to upgrade its existing network in the precinct area.

Can you please refer me to an appropriate person if required.

Also, here is a bit of general overview of the Waterloo Metro Quarter project:

- podium, mid-rise and tower buildings
- excluding station floor space
- land use for non-residential and residential floor space
- social housing dwellings
- basement car parking, motorcycle parking, bicycle parking, and service vehicle spaces.



Please let me know if you need more information.

Regards,

Ray Jiang
Senior Engineer

M: 0437 397 314
Ray.Jiang@wsp.com

WSP Australia Pty Limited
Level 27, 680 George Street
Sydney, NSW
2000 Australia

wsp.com

-LAEmHhHzdJzBITWfa4Hgs7pbKl

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****

Appendix 4 – Ausgrid Application for Connection AN21264

Ausgrid

New Connection Above 100 AMP

Reference Code : 0109479

New Connection

LOCATION

Land Title Type
Strata
Lot Number
7
Nearest Cross Street
Raglan St
Location Address
Botany Road, Waterloo, 2017
Land Zoning
Urban
Location Diagram

File name	Ausgrid filename reference	Size
Project Location.pdf	LocationAttachmentFilePath_1	0.982 MB

APPLICANT

Applicant Type
Other On Behalf Of A Retail Customer Or Real Estate Developer
Full Name
Mr Patrick Garland
Email Address
patrick.garland@mirvac.com
ABN/ACN
44637792888
Company Name
Wl Developer Pty Ltd
Street Number/RMB
54
Applicant Address
Park Street Sydney 2000
Phone Number
0409510034

CUSTOMER

Customer Type
Real Estate Developer
Full Name
Mr Tim Manning
Email Address
tim.manning@mirvac.com
Phone Number
0408273358

ABN/ACN
44637792888
Company Name
Wl Developer Pty Ltd

LOAD DETAILS

Proposed Point Of Common Coupling
Substation
Proposed Asset Identifier
Unknown
Proposed Connection Point
Main Switchboard
Proposed Service Length
20
Proposed Service Type
Underground
Service Voltage
Low Voltage 230/400v
Service Size
Other (5461 A)

Proposed Maximum Demand	Number Of Phases:	Phase A:	Phase B:	Phase C:
	3	5461	5461	5461

Proposed Maximum Demand Calculation

File name	Ausgrid filename reference	Size
200506 Bld 1 & 2 Max Demand.pdf	WFAMaxDemandCalc_1	2.921 MB

Are You Intending To Connect Controlled Load At This Premises?
No

ADDITIONAL DEVELOPMENT DETAILS

HOUSE SERVICES

Number Of House Service Premises:	1
Proposed Maximum Demand Number Of Phases:	3
Phase A:	5461
Phase B:	5461
Phase C:	5461
Total Number Of Premises:	1

I Will Be Installing Equipment At The Premises That May Result In Non Linear / Fluctuating Loads
No

Construction Of The Premises Connection Assets Will Commence
16-Aug-2021
When Do You Wish To Electrify The Premises?
14-Sep-2021
Ausgrid Has Provided A Certified Design Number(Cdn) For A Network Augmentation Project Associated With The Premises
No
Asp 1 Has Been Appointed
No
Do You Have Development Consent (Da) For Your Proposal?
No
Do You Wish To Underground / Relocate Electricity Assets In Conjunction With This Connection Application?
Yes

Underground / Relocation Details

Install 3x 1500kva Standard Surface Chamber Distribution Substation. Redirect Existing Underground 11kv Feeder In The Street.

Comments

Building 1 Is Commercial Retail And Building 2 Is Market Residential Affordable Housing Community. We Propose A Surface Chamber Substation Of 3 X 1500 Kva Tx'S. (Please See Our Proposed Layout).

Please attach any documents that are relevant to your connection for example Proposed Design, sketch of the building, Photos etc

File name	Ausgrid filename reference	Size
200409_BLD1 Floor Plans.pdf	AdditionalAttachment_1	6.025 MB
Bld 1 & 2.pdf	AdditionalAttachment_2	0.228 MB
CHAMBER SUBSTATION LAYOUT OPTIONS_20200427.pdf	AdditionalAttachment_3	0.267 MB

EXPEDITED CONNECTION

Do you want to expedite your connection offer for all premises? (●) Yes ( ) No

- [ ] Basic connection services - 100 Amps connections (Download here)
- [x] * Basic connection services - over 100 Amps connections (Download here)
- [ ] Basic connection services - Micro EG connections (Download here)
- [ ] Standard connection services - Ausgrid augmentation (substation upgrade) (Download here)
- [ ] Standard connection services - offsite Ausgrid augmentation works (Download here)
- [ ] Standard connection services - contestable ASP1 connections (Download here)
- [ ] I do not know which one of these offers is relevant

DECLARATION

Applicant Name

Mr Patrick Garland

Application Date

25-May-2020

Price Description

Above 100 Amps Connection Offer - Technical Assessment required 1 x 452.80

Price Including GST

AUD $452.80

Total Price

AUD $452.80

Terms and Conditions:

In submitting this application you are engaging Ausgrid to provide you with a connection offer. Once submitted the fee charged is consumed. Ausgrid will aim to provide you with a written response within 10 business days. If additional work and/or fees are required, we will contact you to advise prior to providing the response.

Where this application requests an expedited connection, I declare that I have read and understood the terms and conditions of the connection offer and agree that if the connection is expedited that a contract based on that offer will be formed with Ausgrid on the date that Ausgrid receives the application. Where this application is being made on behalf of a retail customer or real estate developer, I declare that I have obtained the authority of that person to make this application of their behalf, including where applicable, making a request for expedition of the connection application.

*I acknowledge the terms & conditions.

PROPOSED DESIGN SCOPE

DATE: 02/07/2020

To: Ausgrid - Contestable Connections
contestability@ausgrid.com.au

Ausgrid reference:

From: ASP Company: WSP Australia Pty Ltd
ASP Representative: Richard Saliba
Authorisation Number: 5045
Phone: 0404 898 456
Email: richard.saliba@wsp.cor

Project Description:	Establishment of 1 x 3 transformer surface chamber substations
Project Address:	Corner of Botany Road & Raglan Street, Waterloo, 2017

Connection Details	☐ HV Supply (i.e. HVC) ☒ LV Supply			Include description of existing and proposed load fields below	
Existing Load:	Phases		Amps	UNKNOWN	
Proposed Load:	3 Phases	5461	Amps		
Total:		5461	Amps	Proposed connection Date:	01.05.2021

HV Proposal	
Proposed Distribution Centre: include substation type, size, LV panel layout (e.g. L type kiosk, 1000kVA, 1600/400 panels)	3X1500 Oil type 11kV/415V Tx's, E-Type LV board
Proposed Zone/Feeder:	Zetland/ ZN188PA34
HV Network Proposal: describe the HV connection proposal (e.g. loop in new new substation between HS01234 and HS09876)	Loop in new substation between Zetland zone substation & Sub 8412
HV Relocation Proposal:	NA

LV and/or SL Proposal, including comms	
LV and/or SL Network Proposal:	Connect 2 630mm distributors to building 1 & 500mm distributor to building 2.
LV/SL Relocation Proposal:	NA

Does this proposal involve modification of Ausgrid's transmission, ADSS or pilot cable system(s)? If YES, please include on sketch	☐ YES ☒ NO
Do you require fault level information that is not on WebGIS:?	☐ YES ☒ NO

Attachments:
Items marked with X are mandatory
Items with * asterisk are mandatory if applicable to the project type/application

- ☒ Sketch - proposed method of connection*
- ☒ Sketch – System Diagram (for HV works)*
- ☒ Connection Application
  - ☐ includes large/disturbing loads*
- ☒ Design Contract Acceptance
- ☐ Master plan (if multi stage subdivision)*
- ☐ Photographs
- ☐ Development Site Plans
- ☐ Other

Ausgrid Use Only	Date Offer Accepted:	Load Cycle:
	Ausgrid Project Number:	CPC:

Planning: Response / Comments / Recommendations: (use additional pages if necessary)

PRELIMINARY MAXIMUM DEMAND SUMMARY PAGE

Project	Waterloo Integrated Station Development (MQD Works)
Aurecon Reference	509191
Client	Mirvac
Revision	3
Date	Wednesday, 6 May 2020

Building 1 Summary

Building 1 GFA (m2)	40060
Basement GBA (m2)	9530
Building Load (kVA)	3075
Building Load (A)	4438

Substation Size (kVA)	3 x 1500	
Substation Capacity (A)	5500	Assumed firm rating

Building 2 Summary

Building 2 GFA (m2)	17447
Building Load (kVA)	1012
Building Load (A)	1460

Site Summary

Site Load (kVA)	4087	
Diveristy Factor	0.7	Diversity factor applied to Building 2 Load
Diversified Maximum Demand (kVA)	3783	
Diversified Maximum Demand (A)	5461	

Spare Capacity	0.7%

BUILDING 1 MAXIMUM DEMAND

Project	Waterloo Integrated Station Development (MQD Works)
Aurecon Reference	509191
Client	Mirvac
Revision	3
Date	Wednesday, 6 May 2020

Notes

1 - All VA/m2 rates include lighting and small power only unless noted otherwise

2 - GFAs are based upon the Woods Baggot architectural set issued on 09.04.2020 (Aconex ref: WB-MEMO-000046)

3 - Mechanical loads are based upon the systems described in the *'Building 1 Mechanical Scheme Concept Design report rev 0'* (Aconex ref: Aurecon-CADV-000010) and includes the additional tenant future cooling towers and associated pumps

4 - Hydraulic loads are based upon the Building 1 Hydraulic services spatial planning register [05] (Aconex ref: WSAP-MEMO-000013)

Level	Area	GFA (m2)	VA/m2	Total (kVA)	Comments
P2	Basement	4765	10	47.65	GBA not GFA, GFA TBC
P1	Basement	4765	10	47.65	GBA not GFA, GFA TBC
GF	Retail (Bld 1)	653	60	39.18	Lighting and small power only
GF	Retail (Metro)	439	60	26.34	GFA pending latest set of metro floor plans
GF	Community	250	60	15.00	Allowance as per retail allowance for future conversion to retail if needed
GF	Lobby	255	25	6.38	Small power and lighting in lobby with allowance for feature lighting
GF	BOH	956	15	14.34	General lighting, loading dock power, managers office, compactor
GF	Amenities	39	15	0.59	General lighting and hand dryers etc
Mezz	BOH	146	10	1.46	
1	Commercial	892	40	35.68	
1	Fire Stairs	57.5	5	0.29	
1	Lobby	74	12	0.89	
1	Communal work area	577	30	17.31	Lower density then typical commercial floor
1	Management	50	40	2.00	
1	Amenities	126	15	1.89	
2	Commercial	1565	40	62.60	
2	Fire Stairs	53	5	0.27	
2	Lobby	144	15	2.16	
2	Amenities	80	15	1.20	
3	Commercial	1483	40	59.32	
3	Fire Stairs	53	5	0.27	
3	Lobby	79	15	1.19	
3	Amenities	80	15	1.20	
4	Commercial	3181	40	127.24	PCA A Grade Requirement for lighting and small power
4	Fire Stairs	53	5	0.27	Lighting within fire stairs
4	Lobby	79	15	1.19	Lighting in lobby with allowance for feature lighting
4	Amenities	103	15	1.55	General lighting and hand dryers etc
5	Commercial	3181	40	127.24	
5	Fire Stairs	53	5	0.27	
5	Lobby	79	15	1.19	
5	Amenities	103	15	1.55	
6	Commercial	3181	40	127.24	
6	Fire Stairs	53	5	0.27	
6	Lobby	79	15	1.19	
6	Amenities	103	15	1.55	
7	Commercial	3181	40	127.24	
7	Fire Stairs	53	5	0.27	
7	Lobby	79	15	1.19	
7	Amenities	103	15	1.55	
8	Commercial	3081	40	123.24	
8	Fire Stairs	53	5	0.27	
8	Lobby	79	15	1.19	
8	Amenities	103	15	1.55	
9	Commercial	2475	40	99.00	
9	Fire Stairs	53	5	0.27	
9	Lobby	79	15	1.19	
9	Amenities	103	15	1.55	
9	Terrace	552	2	1.10	Minimal outdoor lighting only
10	Commercial	2528	40	101.12	
10	Fire Stairs	52	5	0.26	

10	Lobby	79	15	1.19	
10	Amenities	103	15	1.55	
11	Commercial	2528	40	101.12	
11	Fire Stairs	52	5	0.26	
11	Lobby	79	15	1.19	
11	Amenities	103	15	1.55	
12	Commercial	2528	40	101.12	
12	Fire Stairs	52	5	0.26	
12	Lobby	79	15	1.19	
12	Amenities	103	15	1.55	
13	Commercial	693	40	27.72	
13	Fire Stairs	52	5	0.26	
13	Lobby	136	15	2.04	
13	Amenities	103	15	1.55	
13	Terrace	1665	2	3.33	Minimal outdoor lighting only
14	Plant	750	5	3.75	Plant lighting
14	Commercial	250	40	10.00	Allowance for extra commercial space
15	Plant	270	5	1.35	Plant lighting
	Lifts			130.00	Assumed on 20kW per lift, 11 lifts. Final load to be confimed by WSP
P1	EV Chargers			57.50	5% (9) of total car parks. Assumed 7.5kW chargers
	Total Building 1 GFA	40060	m2		Excludes Metro and Basement
		Total Mech		1,250.80	kVA
		Total Hyd		139.33	kVA

Total Commercial MD	3,075	kVA
	4,438	Amps

BUILDING 2 MAXIMUM DEMAND

Project	Waterloo Integrated Station Development (MQD Works)
Aurecon Reference	509192
Client	Mirvac
Revision	3
Date	Wednesday, 6 May 2020

Notes

1 - All VA/m2 rates include lighting and small power only unless noted otherwise

2 - All VA/apt loads include lighting and power only unless noted otherwise

3 - GFAs and apartment numbers are based upon Hassel architectural set issued on 27.04.2020 (Aconex ref: HSL-RESP-000020)

4 - Mechanical loads are based upon the systems described in the *'Building 2 Mechanical Scheme Concept Design report rev 0'* (Aconex ref: Aurecon-CADV-000009) and includes increased retail K/E provisions

5 - Hydraulic loads are based upon the Building 2 Hydraulic services spatial planning register [03] (Aconex ref: WSAP-MEMO-000013)

6 - Apartment loads include the use of induction cooktops

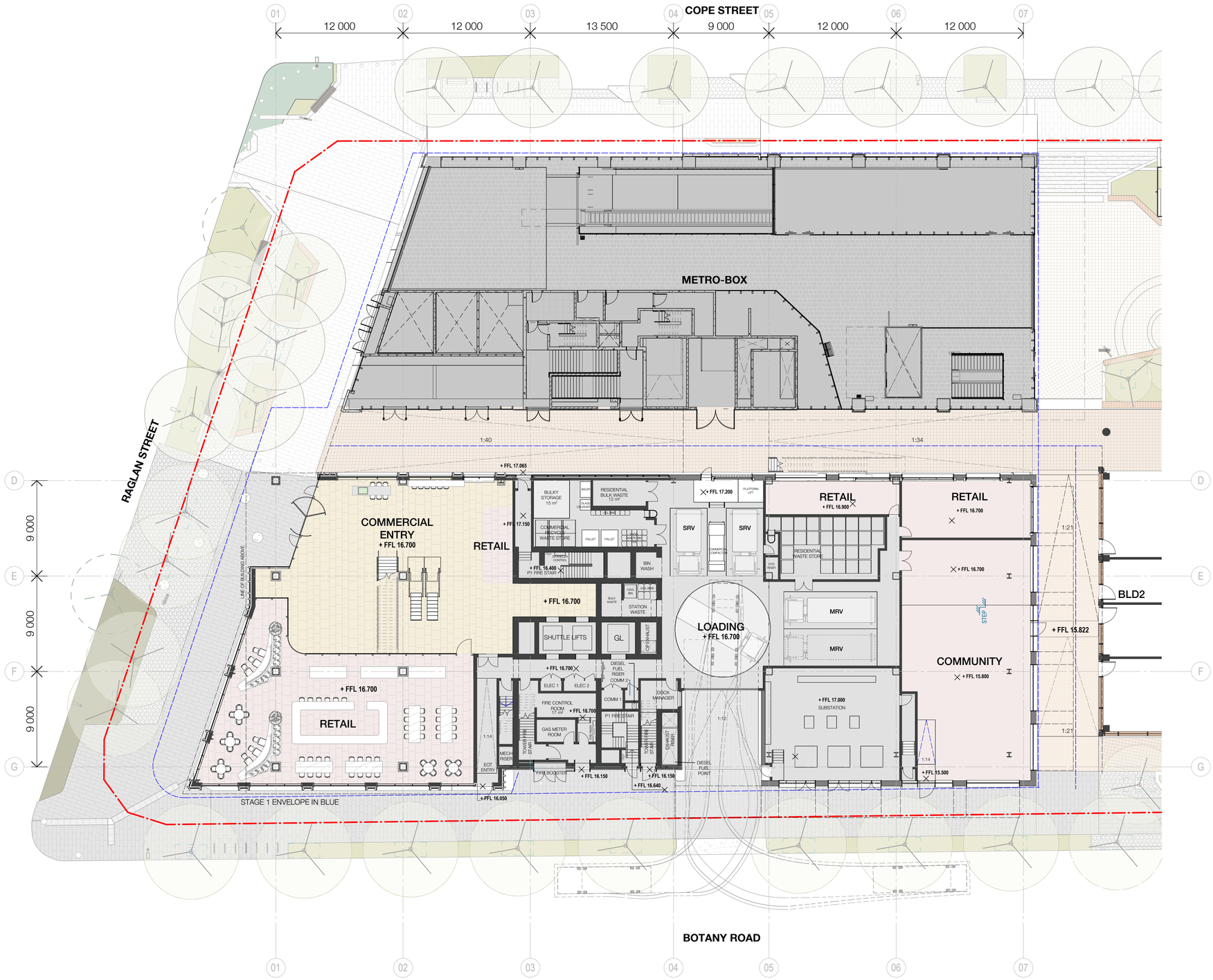
Level	Space	GFA (m2)	VA/m2	kVA	Notes
GF	Retail	554	60	33.2	Lighting and small power only
GF	Community	97	20	1.9	Lighting and small power to community space
GF	Lobby	68	25	1.7	Small power and lighting in lobby with allowance for feature lighting
GF	Stair case and meter room	65.5	5	0.3	Lighting within stairs and meter room
GF	Fire Control Room	13	40	0.5	Lighting and small power for workstation
GF	Amenities	47	15	0.7	General lighting and hand dryers etc
1	Childcare	555	40	22.2	
1	Lobby	81.5	15	1.2	
1	Childcare Terrace	615	5	3.1	
1	Stair Case	35	5	0.2	
2	Childcare	519	40	20.8	
2	Lobby	81.5	15	1.2	
2	Childcare Terrace	583	5	2.9	
2	Stair Case	35	5	0.2	
22	Shared Amenity	51	20	1.0	Lighting and small power to shared space
23	Plant	469	5	2.3	Plant lighting
	Apt Lobby Lighting	1080	5	5.4	
	Apt Stair Case	320	5	1.6	
	Lifts			55.8	Assumed 20kW per lift, 3 lifts. Final load to be confimed by WSP
	Total GFA	17447	m2		
		No. of Apts	**VA/apt**		
3	Affordable Apartments	9	1400	12.6	
4	Affordable Apartments	9	1400	12.6	
5	Affordable Apartments	9	1400	12.6	
6	Apartments	8	1400	11.2	
7	Apartments	8	1400	11.2	
8	Apartments	8	1400	11.2	
9	Apartments	8	1400	11.2	
10	Apartments	8	1400	11.2	
11	Apartments	8	1400	11.2	
12	Apartments	8	1400	11.2	
13	Apartments	8	1400	11.2	
14	Apartments	8	1400	11.2	
15	Apartments	8	1400	11.2	
16	Apartments	8	1400	11.2	
17	Apartments	8	1400	11.2	
18	Apartments	8	1400	11.2	
19	Apartments	8	1400	11.2	
20	Apartments	6	1400	8.4	
21	Apartments	6	1400	8.4	
22	Apartments	2	2100	4.2	Based on apartments being 1.5x the size of typical level apartment
	Total Apartments	153			
		Total Mech		550.7	kVA
		Total Hyd		89.2	kVA

Total Residential MD	**1011.8**	kVA
	1460.4	A

Per apartment maximum demand calculations as per AS/NZS 3000 Table C1

Apartments	155
Worst Loaded phase	52

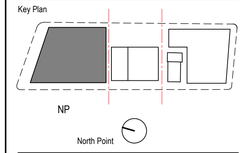
Load Group	Load	Column	Load (A)	Total A	
A i	Lighting	5	0.5 per unit	26	
B i	Socket Outlets =<10A	5	50 + 1.9per unit	148.8	
C	Cooking appliances and outlets >10A	5	2.8 per unit	145.6	
				320.4	A/ph
				222.0	kVA
				1.4	kVA/apartment



Recent revision history

#	Status	Description	Date
A		FOR INFORMATION	30.03.20
B		FOR INFORMATION	05.05.20
C		FOR INFORMATION	12.05.20
D		FOR INFORMATION	02.06.20
E		FOR INFORMATION	17.06.20

Key Plan



Client

Waterloo Integrated Station Development
A Joint Venture Project
JOHN HOLLAND
mirvac

NSW GOVERNMENT
sydney METRO

Consultant

WOODS BAGOT

Project

WATERLOO METRO QUARTER DEVELOPMENT

Project number	Size check
121234	25mm

Checked	Approved	Sheet size	Scale
DH	PM	A1	1 : 200

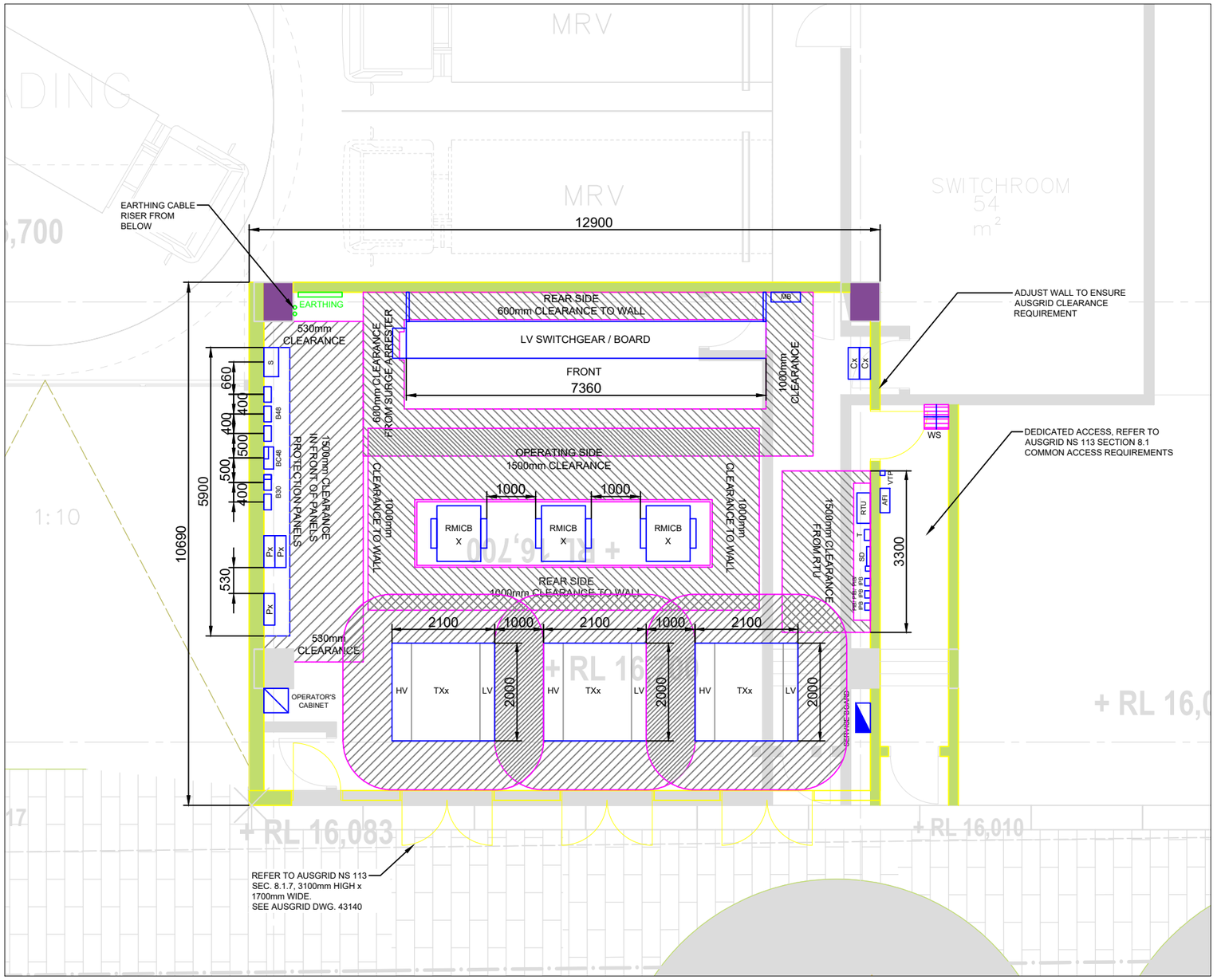
Sheet title

BUILDING 1 - GROUND LEVEL

Status

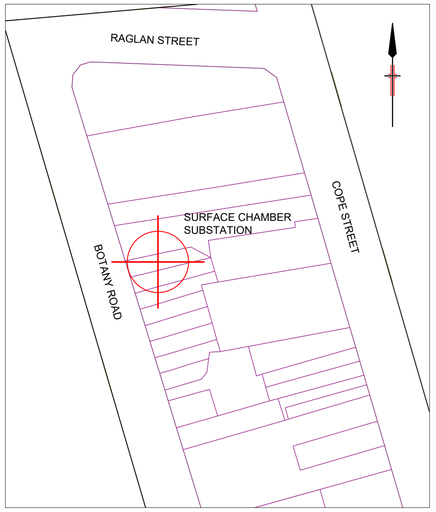
FOR INFORMATION

Sheet number	Revision
WMQ-BLD1-WBG-AR-DRG-A1000	E



BC30	BATTERY CHARGER A
B30	30V DC 'A' BATTERY
BC48	BATTERY CHARGER B
B48	48V DC 'B' BATTERY
Px	PROTECTION PANEL
Cx	CUSTOMER OVERCURRENT No. x PROTECTION PANEL
AFI	ARC FAULT INDICATOR
VTP	VOLTMETER / TEST POINT FOR 30V DC 'A' BATTERY
MB	MARSHALLING BOX
WS	WATER SERVICE
SD	SIGNALLING DISCONNECTION BOX
S	SCADA PANEL
PIB	PILOT ISOLATION BOX
IPB	INTERCONNECTOR PILOT BOX
RTU	C50 REMOTE TERMINAL UNIT
T	TELEPHONE
HV	HIGH VOLTAGE
LV	LOW VOLTAGE
TXx	TRANSFORMER
RMICB	RING MAIN ISOLATOR CIRCUIT BREAKER
WS	WATER SERVICE

SUBSTATION LAYOUT
OPTION 1



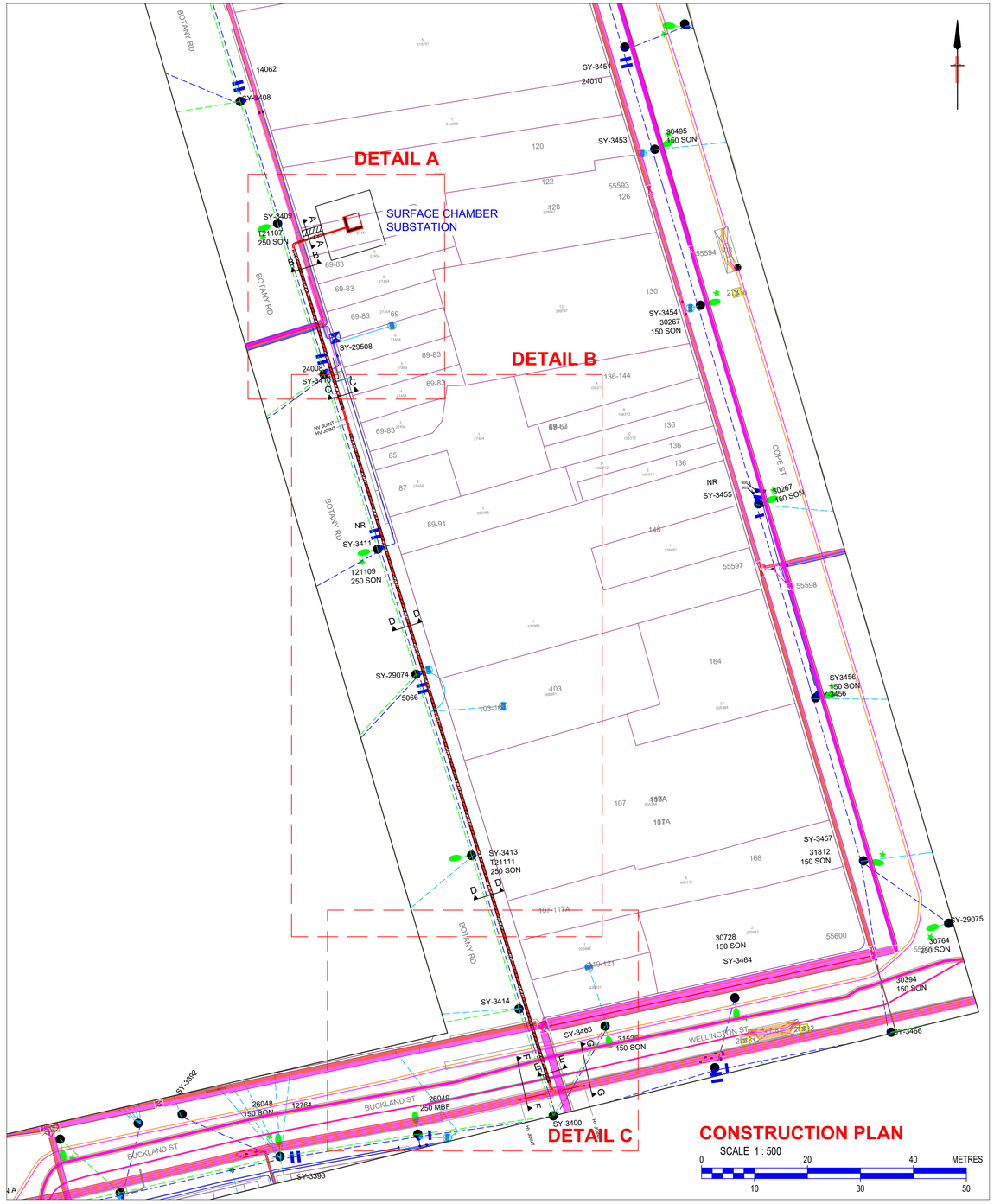
PROJECT LOCATION:
WATERLOO, UBD MAP 297 F10
NTS

LEGEND

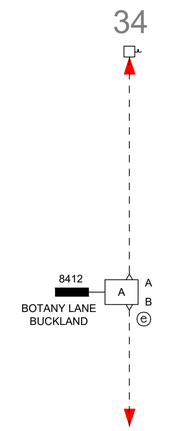
	PROPOSED	EXISTING
Pole	○	●
SL Standard	◎	◉
SL Column Remove		◉
LV Pillar	□	■
LV Link Pillar	⊠	⊠
Streetlight		
Streetlight-PEC		
Streetlight-replacement		
Streetlight-remove		
UGOH or Riser	○	●
Pot End	◁	◀
Joint	⬭	⬬
HV cable	○	●
HV Triplex	⁂	⁂
LV cable	○	●
SL cable	○	●

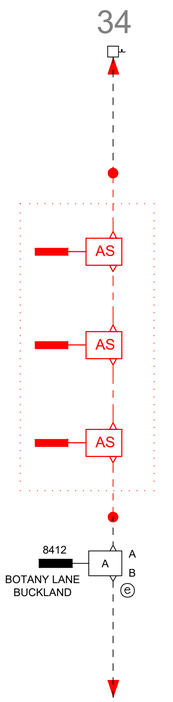
	PROPOSED	EXISTING
Item to be Removed	x	
Pole-to be removed		✱
Pillar-to be removed		■
USL	▯▯	▮▮
ABS	◁	◀
IDT	▯	▮
Kiosk Sub	▭	■
Chamber Sub	▭	■
Sealed End	◁	◀
Cable Termination	◁	◀
Service cable	○	●
Auxiliary cable	○	●
Cable to be removed		✖
Open Point	0	0
PEC	☆	★
4-WAY LINK BOX	▭	

	PROPOSED	EXISTING	REMOVE
Conduit	▨	▭	
OH Lines	HV	HV	HV
	LV	LV	LV
	SL	SL	SL
	SV	SV	SV
	TR132	TR132	TR132
	TR33	TR33	TR33
	AUX	AUX	AUX
UG Cables	HV	HV	
	LV	LV	
	SL	SL	
	SV	SV	
	TR132	TR132	
	TR33	TR33	
	AUX	AUX	



ZETLAND ZONE SUBSTATION





HV SCHEMATIC - EXISTING ZETLAND ZONE

HV SCHEMATIC - PROPOSED ZETLAND ZONE

CHECK FOR OTHER SERVICES BEFORE BORING OR EXCAVATING

CAD DRAWING DO NOT AMEND

AMENDMENTS

ASSOCIATED DRAWINGS

ASP # 5045
Lvl 27, 680 George St, Sydney, NSW, 2000
PO Box 5394, Sydney, NSW 2001, Australia
Tel: +61 2 9272 5100 Fax: +61 2 9272 5101
www.wspgroup.com/asia-pacific

DESIGNED BY	
AUTH NO.	
SUBMIT DATE	SUBMITTED __/__/__
LGA	WATERLOO
MAP REF.	297 F10
AUSGRID REF.	SY43
PRJTRAK No.	
ASP REF.	PS119449

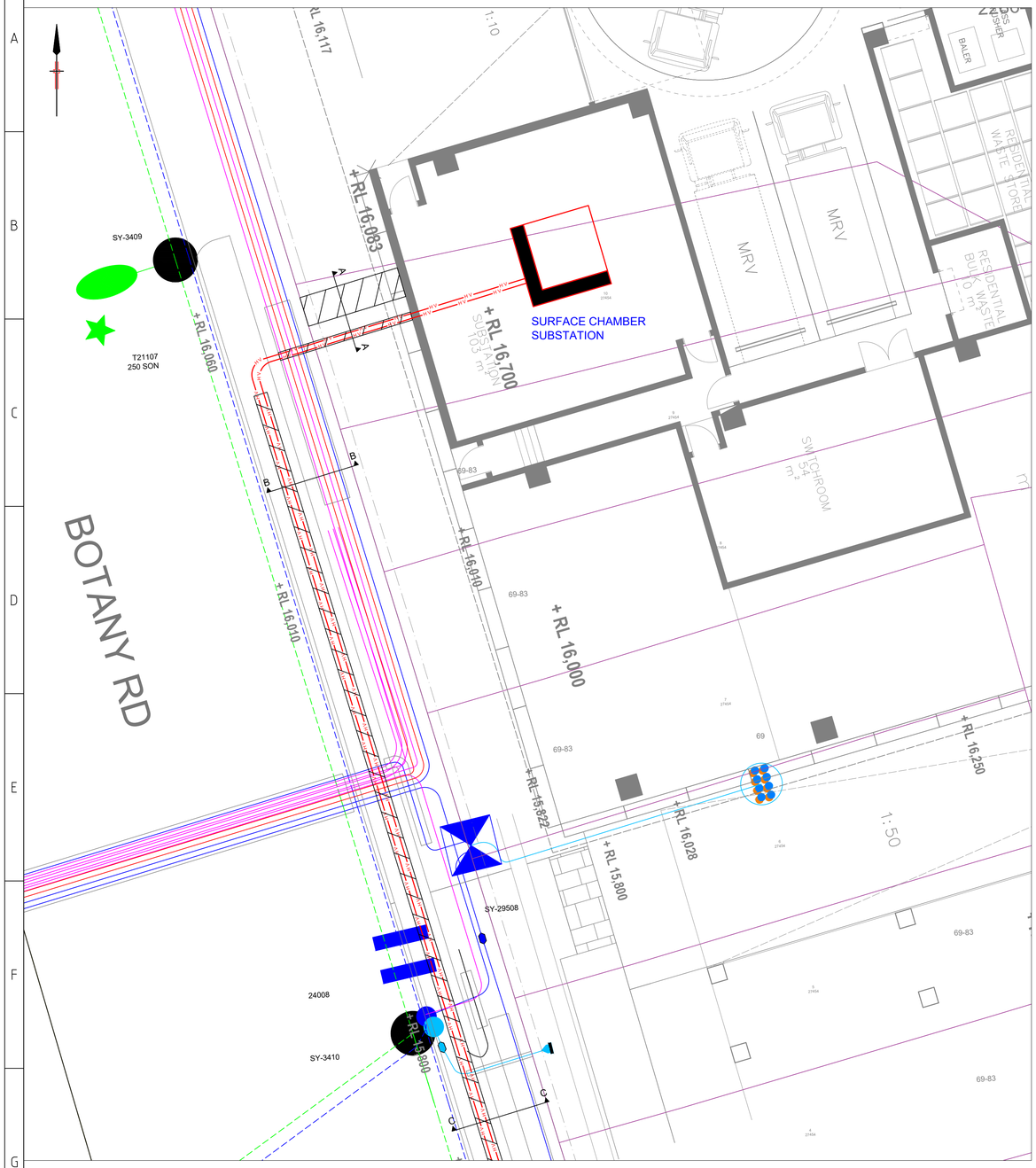
CERTIFICATION NUMBER ##/##

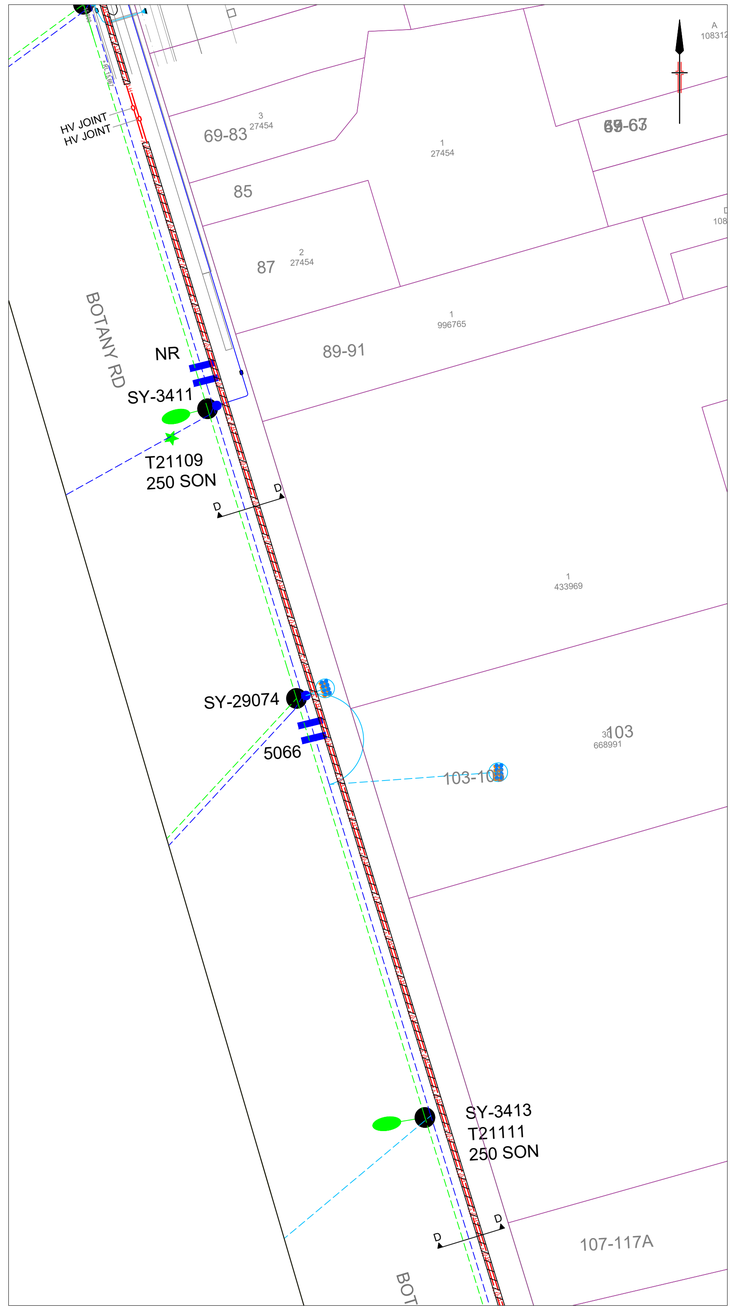
ESTABLISH SURFACE CHAMBER SUBSTATION BOTANY ROAD, WATERLOO

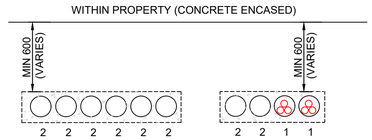
SIZE A1 | AUSGRID PROJECT No. | SHEETS 1 of 3 | AMD. 0

20160817

CONTINUATION SHEET 2 : CONSTRUCTION PLAN - DETAIL A



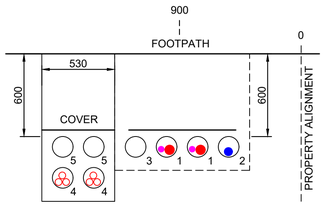




SECTION A-A

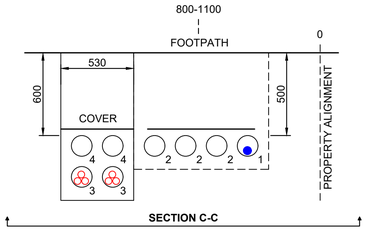
(ALL CONDUITS 125mm CONCRETE ENCASED)

1 - NEW 11kV 300CU1 CABLE IN NEW 125mm CONDUIT
2 - NEW 125mm CONDUIT - SPARE



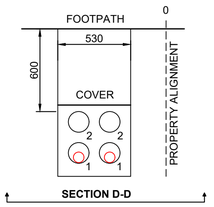
SECTION B-B

1 - EXISTING 11kV 323 AL3 XQ H FE Z CABLE (#346) & EXISTING 2.1 CU4 Q Q Z NY CABLE (#801)IN EXISTING 140mm CONDUIT
2 - EXISTING 415V 300 AL3 P AL(N) Z / SAC CABLE (#2131) IN EXISTING 140mm CONDUIT
3 - EXISTING 140mm CONDUIT - SPARE
4 - NEW 11kV 300CU1 CABLE IN NEW 150mm CONDUIT
5 - NEW 150mm CONDUIT - SPARE



SECTION C-C

1 - EXISTING 415V 300 AL3 P AL(N) Z / SAC CABLE (#2131) IN EXISTING 125mm CONDUIT
2 - EXISTING 125mm CONDUIT - SPARE
4 - NEW 11kV 300CU1 CABLE IN NEW 150mm CONDUIT
5 - NEW 150mm CONDUIT - SPARE



SECTION D-D

1 - NEW 11kV 400AL3 CABLE IN NEW 150mm CONDUIT
2 - NEW 150mm CONDUIT - SPARE

CONTINUATION SHEET 2 : CONSTRUCTION PLAN - DETAIL B

CONTINUATION SHEET 3 : CONSTRUCTION PLAN - DETAIL C

CONSTRUCTION PLAN - DETAIL A

SCALE 1 : 100

0 2 4 6 8 10 METRES

CONSTRUCTION PLAN - DETAIL B

SCALE 1 : 250

0 5 10 15 20 METRES 25

CHECK FOR OTHER SERVICES BEFORE BORING OR EXCAVATING

CAD DRAWING
DO NOT SCALE
AMENDMENTS

ASSOCIATED DRAWINGS

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ASP # 5045
Lvl 27, 680 George St, Sydney, NSW, 2000
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www.wspgroup.com/asia-pacific

ASP REF.	PS119449
CERTIFICATION NUMBER	## / ##

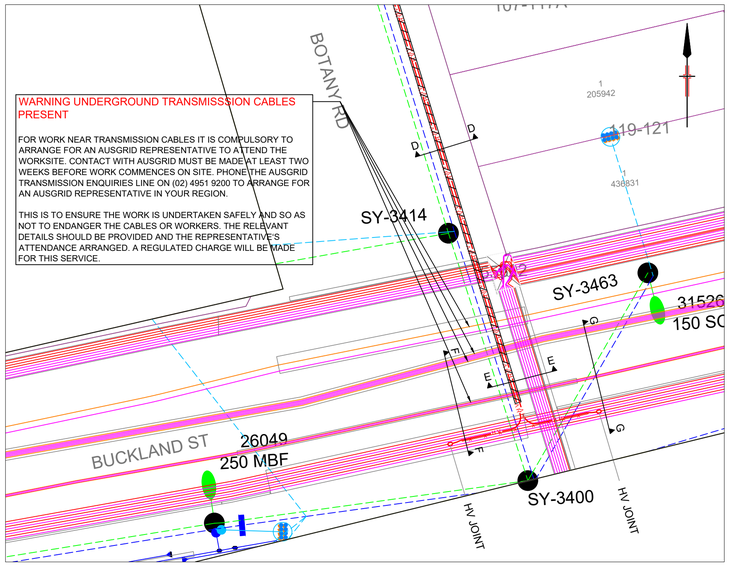
DESIGNED BY	
AUTH NO.	
SUBMIT DATE	SUBMITTED __/__/__
LGA	WATERLOO
MAP REF.	297 F10
AUSGRID REF.	SY43
PRJTRAK No.	

ESTABLISH SURFACE CHAMBER SUBSTATION BOTANY ROAD, WATERLOO

SIZE A1 | AUSGRID PROJECT No. | SHEETS 2 of 3 | AMD. 0

20160817

CONTINUATION SHEET 2 : CONSTRUCTION PLAN - DETAIL B

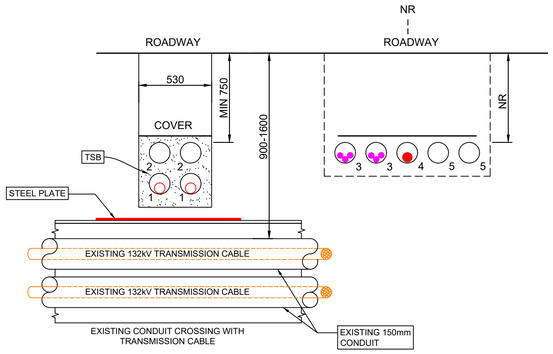


CONSTRUCTION PLAN - DETAIL C

SCALE 1 : 250

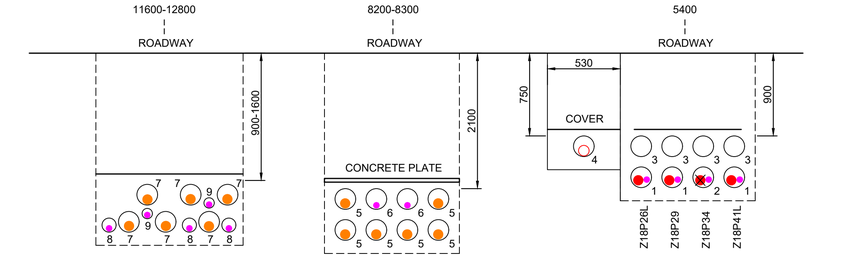
0 5 15 METRES 25

10 20



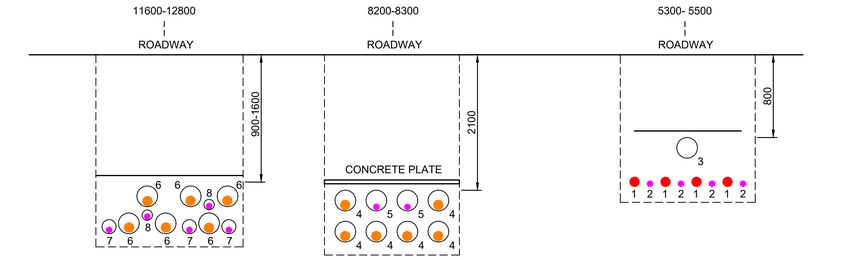
SECTION E-E

1 - NEW 11kV 400AL3 IN NEW 150mm CONDUIT
2 - NEW 150mm CONDUIT - SPARE
3 - EXISTING 3x4.6 CU3 P H + .82 CU3PR P L CABLE (#820) IN EXISTING 100mm CONDUIT
4 - EXISTING 11kV 194 CU3 P L CABLE (#255) IN EXISTING 100mm CONDUIT
5 - EXISTING 100mm CONDUIT



SECTION F-F

1 - EXISTING 11kV 500 AL3 P H L SW J CABLE (#351) & EXISTING 1.5 CU4 Q Q Z NY (#802) IN EXISTING 125mm CONDUIT
2 - EXISTING 11KV 500 AL3 P H L SW J CABLE (#351) TO BE CUT AND REMOVED & EXISTING 1.5 CU4 Q Q Z NY (#802) IN EXISTING 125MM CONDUIT
3 - EXISTING 125mm CONDUIT - SPARE
4 - NEW 11kV 400AL3 CABLE IN NEW 150mm CONDUIT
5 - EXISTING 132kV 1200 CU1 H P H AL Z CABLE (#1537) IN EXISTING 140mm CONDUIT
6 - EXISTING 1.27 CU100PR Q Q H YQ CABLE (#1798) IN EXISTING 140mm CONDUIT
7 - EXISTING 132kV 1600 CU1 XQ SAS 40KA YQ CABLE (#1246) IN EXISTING 150mm CONDUIT
8 - EXISTING 9 SM60 NYT F MT Q S Q / OPTIC CABLE (#461) IN EXISTING 63mm CONDUIT
9 - EXISTING 9.9 SM4 + 62.5 GI4 Z MB MQ NY YQ CABLE (#47) IN EXISTING 32mm CONDUIT



SECTION G-G

1 - EXISTING 11kV 500 AL3 P H L SW J CABLE (#351) DIRECT BURIED
2 - EXISTING 1.5 CU4 Q Q Z NY (#802) IN DIRECT BURIED
3 - EXISTING 125mm CONDUIT - SPARE
4 - EXISTING 132kV 1200 CU1 H P H AL Z CABLE (#1537) IN EXISTING 140mm CONDUIT
5 - EXISTING 1.27 CU100PR Q Q H YQ CABLE (#1798) IN EXISTING 140mm CONDUIT
6 - EXISTING 132kV 1600 CU1 XQ SAS 40KA YQ CABLE (#1246) IN EXISTING 150mm CONDUIT
7 - EXISTING 9 SM60 NYT F MT Q S Q / OPTIC CABLE (#461) IN EXISTING 63mm CONDUIT
8 - EXISTING 9.9 SM4 + 62.5 GI4 Z MB MQ NY YQ CABLE (#47) IN EXISTING 32mm CONDUIT

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CAD DRAWING DO NOT AMEND

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MAP REF.	297 F10
AUSGRID REF.	SY43
PRJTRAK No.	

ESTABLISH SURFACE CHAMBER SUBSTATION BOTANY ROAD, WATERLOO

SIZE A1 | AUSGRID PROJECT No. | SHEETS 3 of 3 | AMD 0

20160817

Appendix 5 – Utilities Survey

IMPORTANT NOTES:

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ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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ABN 53 615 735 727

CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

WATER

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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DATE OF SURVEY:	24/06/2020	DATE OF PLAN:	03/06/2020
HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	37 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

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W: www.veris.com.au
ABN 53 615 735 727

CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

WATER

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10

SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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ORIGINAL SIZE :	A3	SHEET:	38 OF 75

JOB NUMBER

202254

DRAWING NUMBER / ISSUE

202254-UTILS-001A

ADJOINS SHEET 38

ADJOINS SHEET 41

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COPE STREET

WELLINGTON STREET

WATER MAIN Ø450 CICL (QL-B)
0.6 to 1.2m TOP OF PIPE

WATER MAIN Ø100 CICL (QL-B)
0.4 to 0.9m TOP OF PIPE

WATER MAIN Ø100 CICL (QL-B)
0.4 to 0.7m TOP OF PIPE

WATER MAIN Ø100 CICL (QL-B)
0.4 to 0.9m TOP OF PIPE

WATER MAIN Ø100 CICL (QL-B)
0.6 to 1.01m TOP OF PIPE

WATER MAIN Ø100 CICL (QL-B)
0.4 to 0.7m TOP OF PIPE

WATER MAIN (QL-B)
1.3 to 1.5m TOP OF PIPE

WATER MAIN (QL-B)
1.3 to 1.5m TOP OF PIPE

WATER MAIN (QL-D)
REDUNDANT (GPR)

WATER MAIN Ø100 CICL (QL-B)
0.9m TOP OF PIPE

WATER MAIN Ø450 CICL (QL-B)
0.6 to 1.2m TOP OF PIPE

WATER MAIN Ø100 CICL (QL-B)
0.6 to 1.01m TOP OF PIPE

ADJOINS SHEET 40

ISSUE	DATE	AMMENDMENT	BY
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W: www.veris.com.au
ABN 53 615 735 727

CLIENT: JOHN HOLLAND

PROJECT TITLE: WATERLOO STATION
WATER

DRAWING TITLE: SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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JOB NUMBER: 202254

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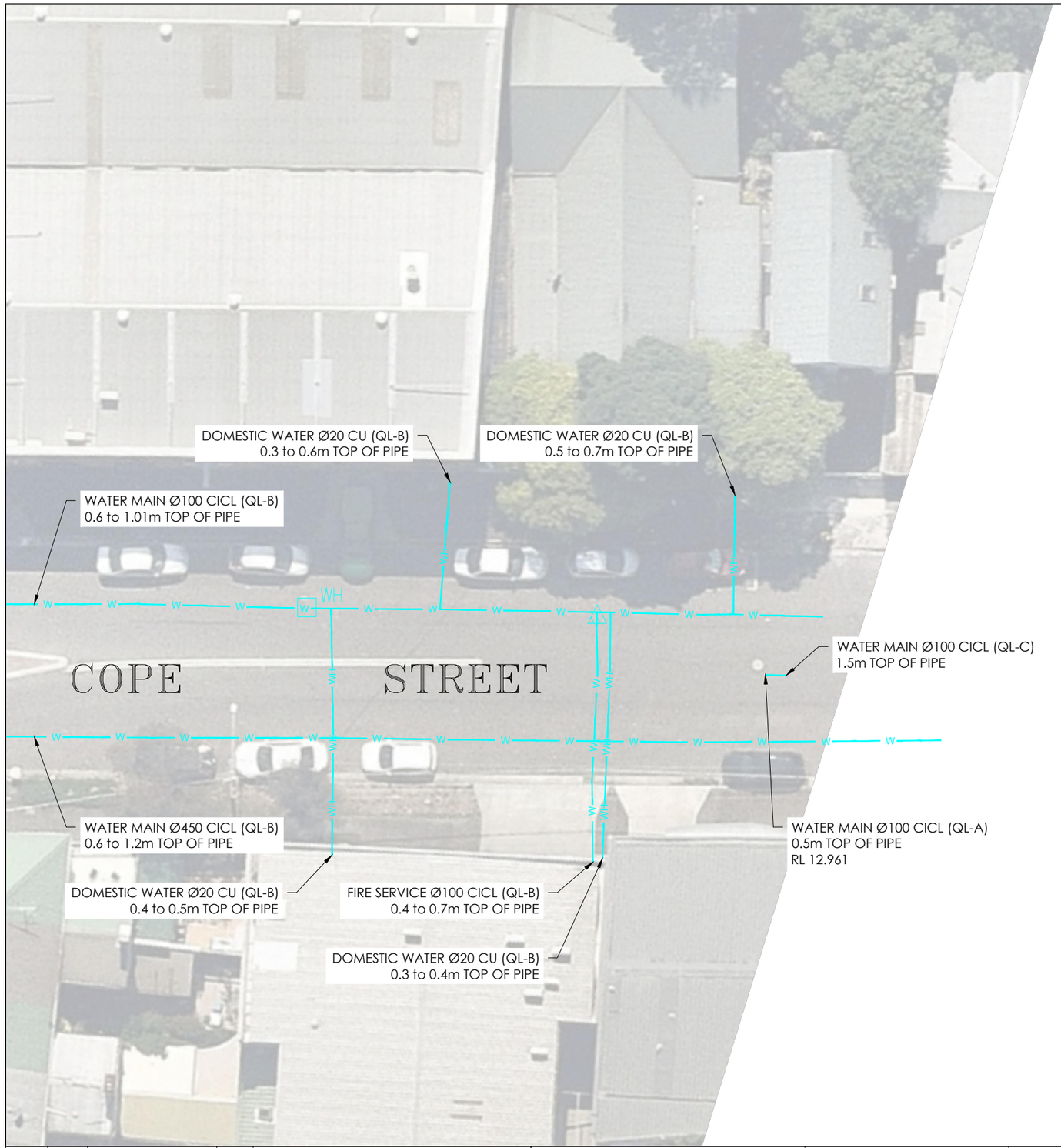

N
M.G.A

ADJOINS SHEET 39

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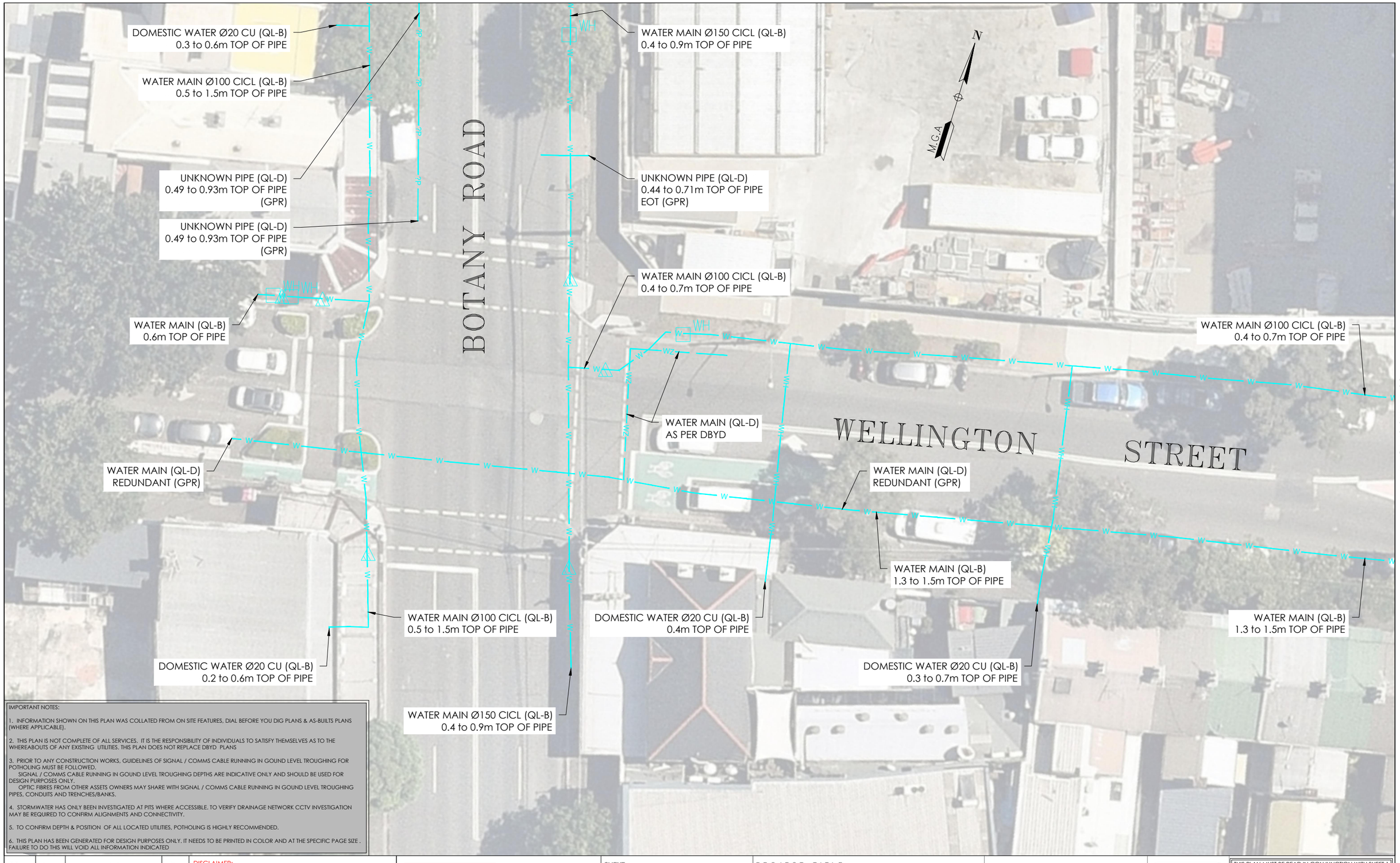
ADJOINS SHEET 42



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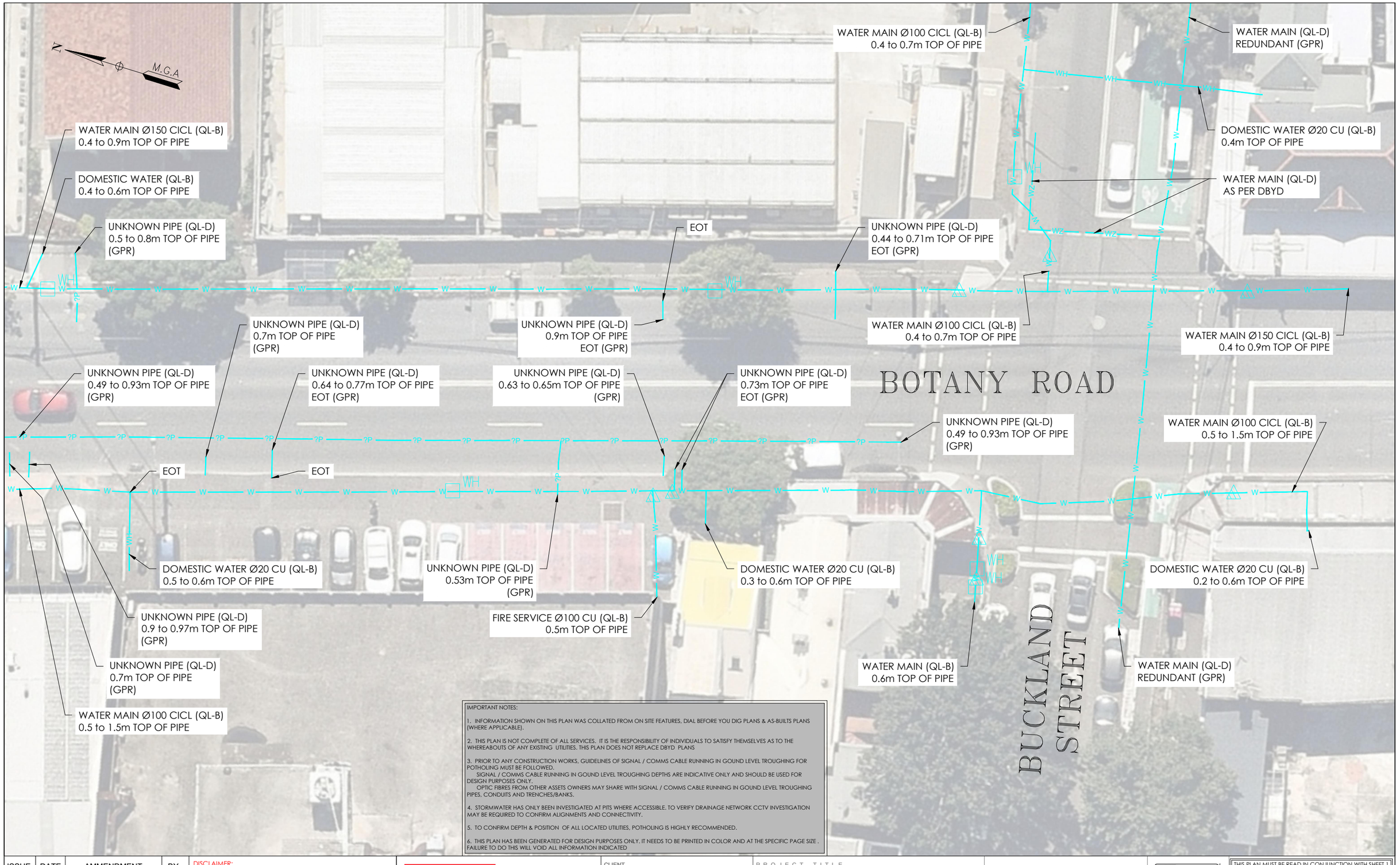
ORIGINAL SIZE :	A3	SHEET:	41 OF 75

DRAWING NUMBER / ISSUE 202254-UTILS-001A

ADJOINS SHEET 41

ADJOINS SHEET 43



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ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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W: www.veris.com.au
ABN 53 615 735 727

CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

WATER

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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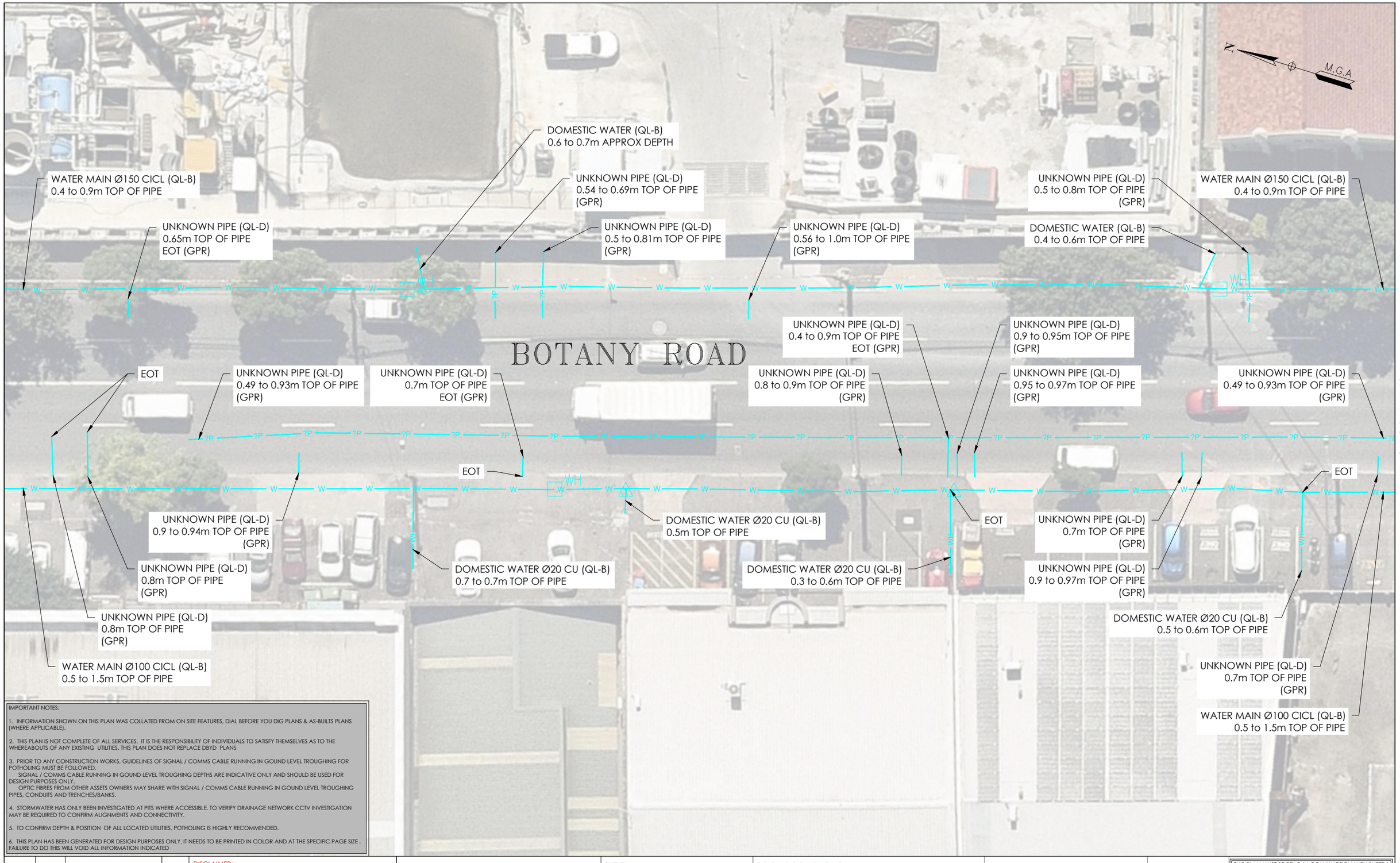
THIS PLAN MUST BE READ IN CONJUNCTION WITH SHEET 1 FOR ADDITIONAL NOTES, WARNINGS & LEGEND

DATE OF SURVEY: 24/06/2020	DATE OF PLAN: 03/06/2020
HEIGHT DATUM: AHD71	CO-ORD: MGA94
DBYD JOB# : 19449303/22/34	DBYD DATE: 30/04/2020
ORIGINAL SIZE : A3	SHEET: 42 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A



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ISSUE	DATE	AMMENDMENT	BY
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CLIENT: JOHN HOLLAND

PROJECT TITLE: WATERLOO STATION

WATER

DRAWING TITLE: SUB-SURFACE UTILITY PLAN

SCALE IN METERS 1: 250 (0 2 4 6 8 10)

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	43 OF 75

JOB NUMBER: 202254

DRAWING NUMBER / ISSUE: 202254-UTILS-001A

ADJOINS SHEET 46

ADJOINS SHEET 45

ADJOINS SHEET 43

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WATER MAIN Ø100 CICL (QL-B)
0.4 to 0.9m TOP OF PIPE

WATER MAIN Ø500 CICL (QL-C)
1.01 to 1.8m TOP OF PIPE

UNKNOWN PIPE (QL-D)
0.4 to 0.8m TOP OF PIPE
EOT (GPR)

WATER MAIN (QL-B)
0.5 to 1.0m TOP OF PIPE
REDUNDANT EOT

WATER MAIN Ø100 CICL (QL-B)
0.4 to 0.9m TOP OF PIPE

WATER MAIN (QL-B)
0.6 to 0.7m TOP OF PIPE

UNKNOWN PIPE (QL-D)
0.7m TOP OF PIPE
EOT (GPR)

UNKNOWN PIPE (QL-D)
0.6m TOP OF PIPE
EOT (GPR)

WATER MAIN Ø150 CICL (QL-B)
0.4 to 0.9m TOP OF PIPE

UNKNOWN PIPE (QL-D)
0.65m TOP OF PIPE
EOT (GPR)

BOTANY ROAD

WATER MAIN Ø150 CICL (QL-B)
0.4 to 0.9m TOP OF PIPE

WATER MAIN Ø100 CICL (QL-B)
0.5 to 1.5m TOP OF PIPE

UNKNOWN PIPE (QL-D)
0.6m TOP OF PIPE
EOT (GPR)

UNKNOWN PIPE (QL-D)
0.49 to 0.93m TOP OF PIPE
(GPR)

EOT

UNKNOWN PIPE (QL-D)
0.78m TOP OF PIPE
(GPR)

UNKNOWN PIPE (QL-D)
0.8m TOP OF PIPE
(GPR)

UNKNOWN PIPE (QL-D)
0.8m TOP OF PIPE
(GPR)

WATER MAIN Ø100 CICL (QL-B)
0.5 to 1.5m TOP OF PIPE

HENDERSON ROAD

WATER MAIN Ø500 CICL (QL-C)
1.01 to 1.8m TOP OF PIPE

WATER MAIN Ø100 CICL (QL-B)
1.01 to 1.2m TOP OF PIPE

DOMESTIC WATER Ø20 CU (QL-B)
0.5 to 0.8m TOP OF PIPE

DOMESTIC WATER Ø20 CU (QL-B)
0.5m TOP OF PIPE

UNKNOWN PIPE (QL-B)
0.7 to 1.01m TOP OF PIPE
EOT

WATER MAIN Ø100 CICL (QL-B)
1.01 to 1.2m TOP OF PIPE

WATER MAIN Ø500 CICL (QL-B)
0.8 to 1.01m TOP OF PIPE

WATER MAIN Ø100 CICL (QL-C)
0.8m TOP OF PIPE

WATER MAIN Ø500 CICL (QL-B)
0.8 to 1.01m TOP OF PIPE

M.G.A

ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

WATER

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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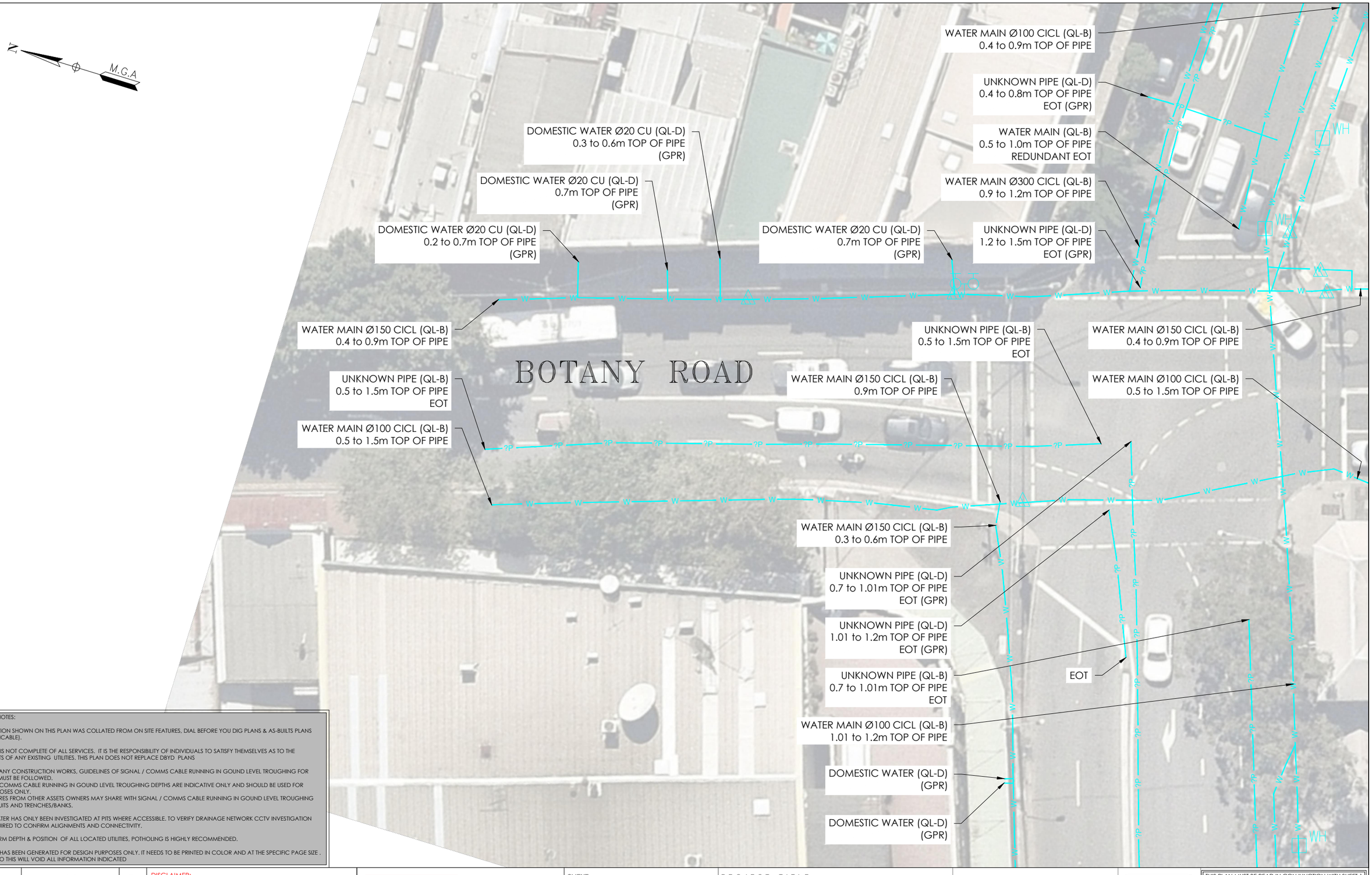
DATE OF SURVEY:	24/06/2020	DATE OF PLAN:	03/06/2020
HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	44 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A



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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

WATER

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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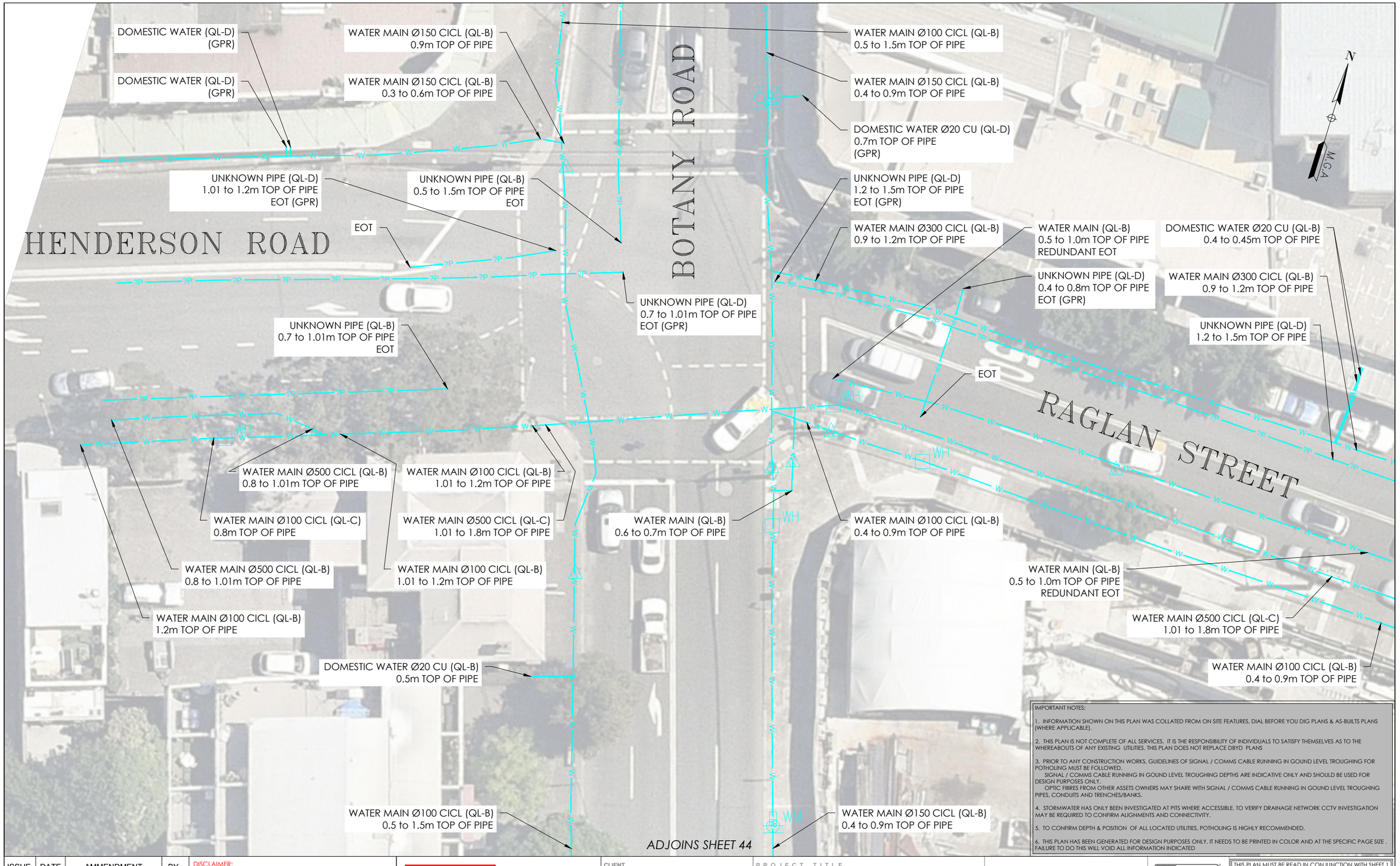
DATE OF SURVEY:	24/06/2020	DATE OF PLAN:	03/06/2020
HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	45 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 45



ADJOINS SHEET 44

ADJOINS SHEET 47

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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

WATER

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	46 OF 75

JOB NUMBER 202254

DRAWING NUMBER / ISSUE 202254-UTILS-001A

ADJOINS SHEET 36

ADJOINS SHEET 46

UNKNOWN PIPE (QL-D)
1.2 to 1.5m TOP OF PIPE

DOMESTIC WATER Ø20 CU (QL-B)
0.4 to 0.45m TOP OF PIPE

WATER MAIN Ø300 CICL (QL-B)
0.9 to 1.2m TOP OF PIPE

WATER MAIN Ø300 CICL (QL-D)
0.8 to 1.8m TOP OF PIPE
(GPR)

WATER MAIN (QL-D)
0.4 to 0.8m TOP OF PIPE
(GPR)

EOT

WATER MAIN Ø300 CICL (QL-D)
1.8m TOP OF PIPE
(GPR)

WATER MAIN Ø500 CICL (QL-B)
1.01 to 1.5m TOP OF PIPE

WATER MAIN (QL-B)
0.5 to 1.0m TOP OF PIPE
EOT (REDUNDANT)

WATER MAIN Ø500 CICL (QL-C)
1.01 to 1.8m TOP OF PIPE

WATER MAIN Ø100 CICL (QL-B)
0.4 to 0.9m TOP OF PIPE

WATER MAIN Ø100 CICL (QL-B)
0.4 to 0.9m TOP OF PIPE

WATER MAIN (QL-B)
0.5 to 1.0m TOP OF PIPE
EOT (REDUNDANT)

WATER MAIN Ø500 CICL (QL-B)
1.01 to 1.5m TOP OF PIPE

WATER MAIN Ø450 CICL (QL-B)
1.2 to 1.7m TOP OF PIPE

WATER MAIN Ø150 CICL (QL-B)
0.5 to 0.7m TOP OF PIPE

WATER MAIN Ø450 CICL (QL-B)
0.8 to 1.2m TOP OF PIPE

WATER MAIN (QL-D)
1.2 to 1.5m TOP OF PIPE
EOT (GPR)

WATER MAIN (QL-D)
AS PER DBYD

UNKNOWN PIPE Ø450 CICL (QL-D)
0.6 to 0.7m TOP OF PIPE
EOT (GPR)

WATER MAIN Ø150 CICL (QL-B)
0.8 to 1.2m TOP OF PIPE
SCOUR VALVE OUTLET

UNKNOWN PIPE (QL-B)
0.6m TOP OF PIPE
EOT

UNKNOWN PIPE (QL-D)
0.43 to 0.9m TOP OF PIPE
EOT (GPR)

UNKNOWN PIPE (QL-D)
1.15 to 1.43m TOP OF PIPE
EOT (GPR)

UNKNOWN PIPE (QL-D)
0.6 to 0.75m TOP OF PIPE
EOT (GPR)

WATER MAIN Ø300 CICL (QL-D)
0.8 to 1.8m TOP OF PIPE
(GPR)

UNKNOWN PIPE (QL-D)
0.86m TOP OF PIPE
EOT (GPR)

EOT

WATER MAIN (QL-B)
0.43 to 0.9m TOP OF PIPE
EOT (REDUNDANT)

WATER MAIN Ø100 CICL (QL-B)
0.4 to 0.9m TOP OF PIPE

DOMESTIC WATER Ø20 CU (QL-B)
0.5m TOP OF PIPE

WATER MAIN Ø450 CICL (QL-B)
0.6 to 1.2m TOP OF PIPE

WATER MAIN Ø100 CICL (QL-B)
0.4 to 0.9m TOP OF PIPE

COPE STREET

RAGLAN STREET

N

W.G.A

ADJOINS SHEET 37

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ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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W: www.veris.com.au
ABN 53 615 735 727

CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

WATER

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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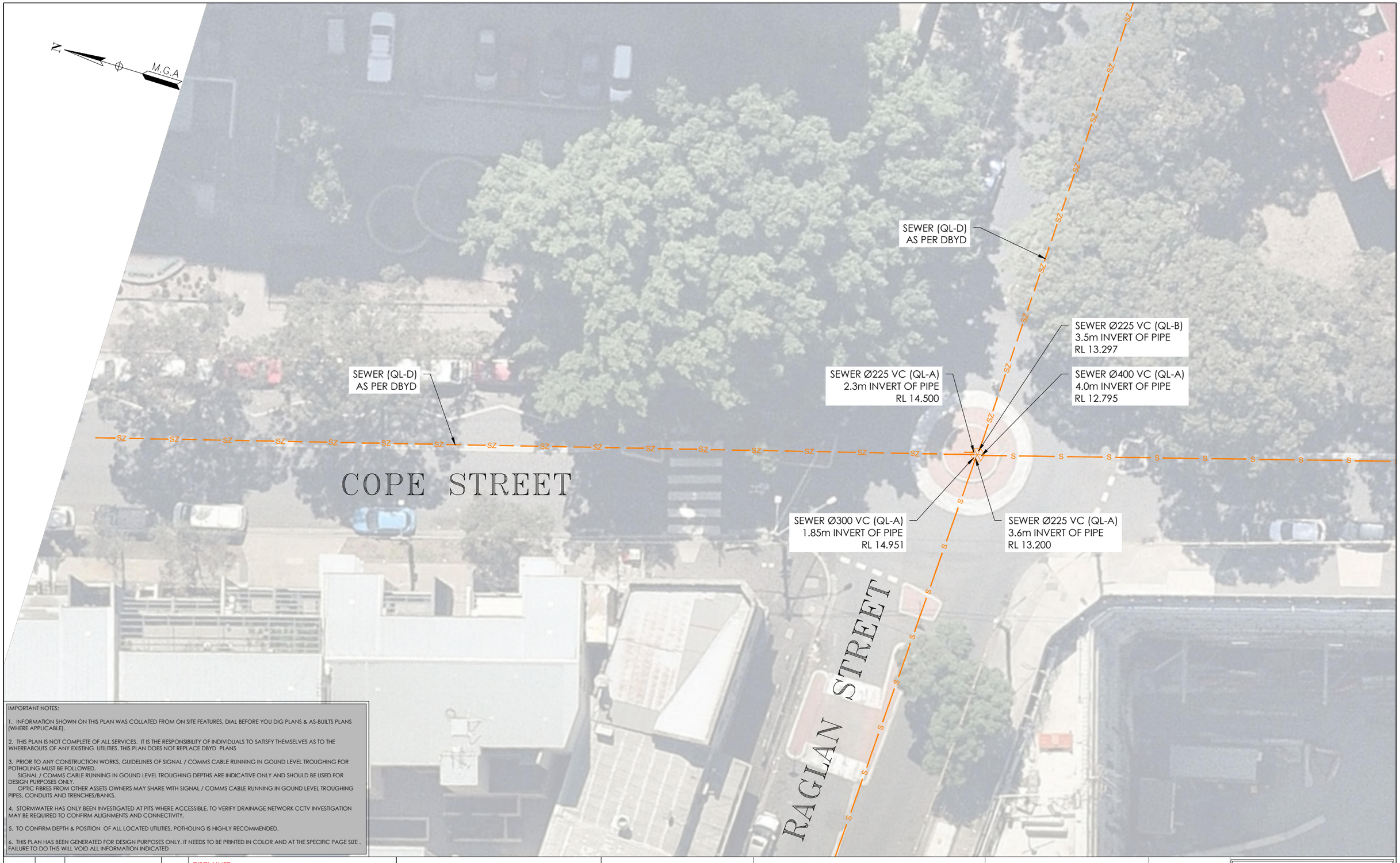
THIS PLAN MUST BE READ IN CONJUNCTION WITH SHEET 1 FOR ADDITIONAL NOTES, WARNINGS & LEGEND

DATE OF SURVEY:	24/06/2020	DATE OF PLAN:	03/06/2020
HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	47 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A



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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

SEWAGE

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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JOB NUMBER 202254

DRAWING NUMBER / ISSUE 202254-UTILS-001A

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DATE OF SURVEY:	24/06/2020	DATE OF PLAN:	03/06/2020
HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	48 OF 75

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N
M.G.A

ADJOINS SHEET 48

SEWER Ø400 VC (QL-D)
3.4m TOP OF PIPE
(GPR)

SLH

SLH

SEWER Ø400 VC (QL-D)
3.3m TOP OF PIPE
(GPR)

ADJOINS SHEET 50

COPE STREET

ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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SEWAGE

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

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DRAFTED BY:	J.V.
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ORIGINAL SIZE :	A3	SHEET:	49 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 49

ADJOINS SHEET 51

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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

SEWAGE

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10

SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	50 OF 75

JOB NUMBER

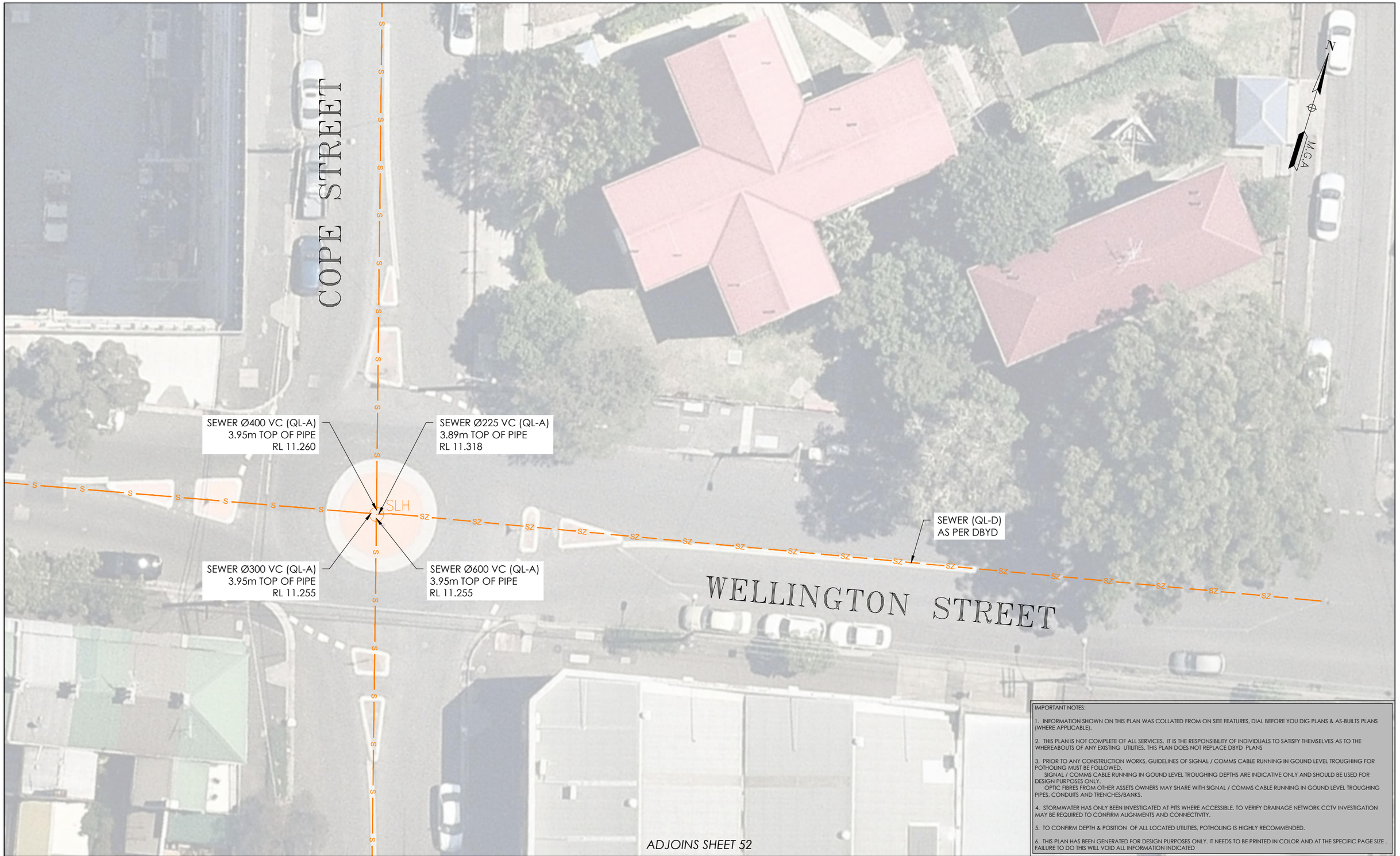
202254

DRAWING NUMBER / ISSUE

202254-UTILS-001A

ADJOINS SHEET 50

ADJOINS SHEET 53



ADJOINS SHEET 52

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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

SEWAGE

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
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ORIGINAL SIZE :	A3	SHEET:	51 OF 75

JOB NUMBER
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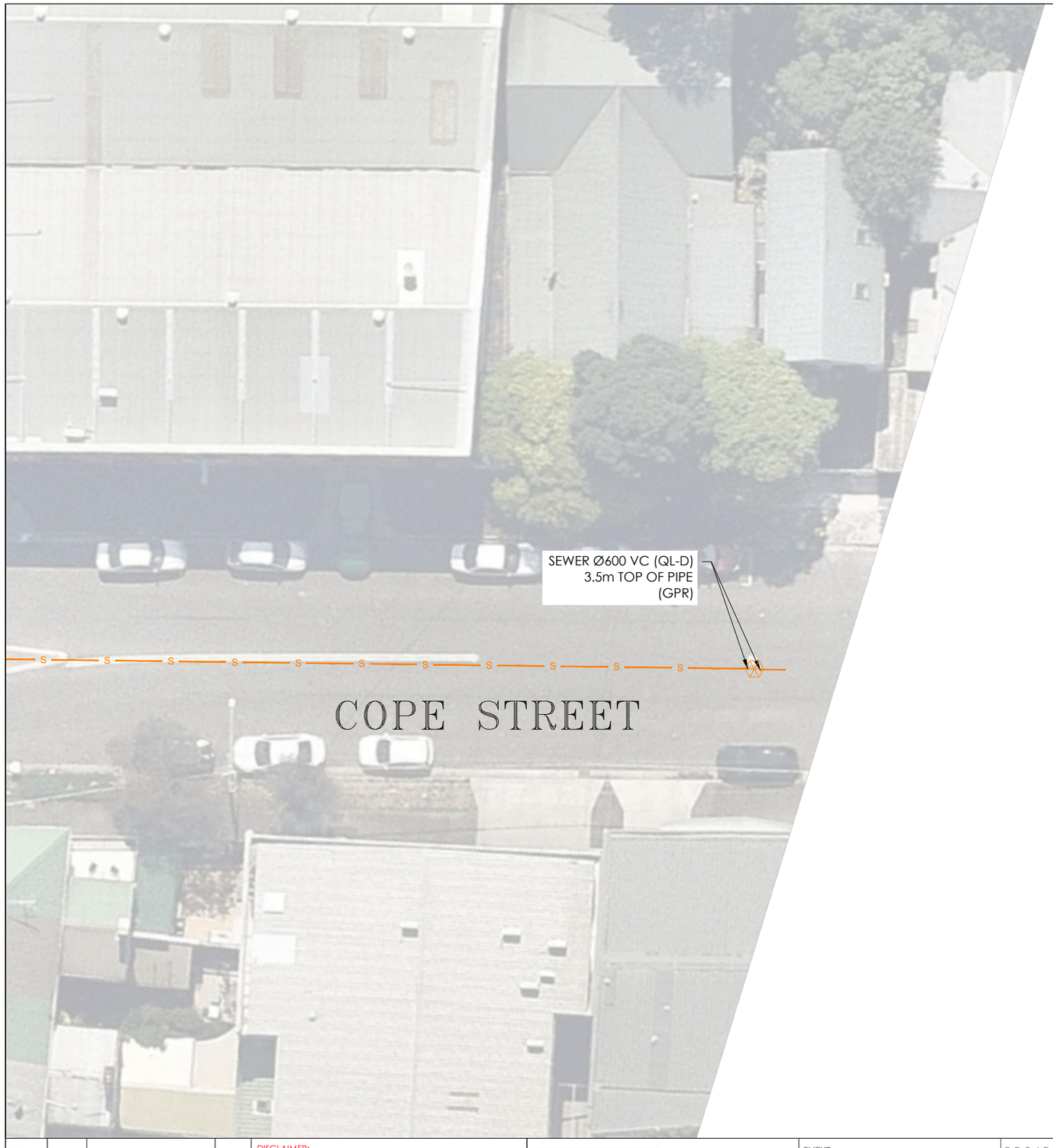
ADJOINS SHEET 51



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M.G.A

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PROJECT TITLE

WATERLOO STATION

SEWAGE

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SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
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HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	52 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 54

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N

M.G.A

SEWER Ø225 VC (QL-A)
3.47m INVERT OF PIPE
RL 11.719

SEWER Ø300 VC (QL-A)
3.48m INVERT OF PIPE
RL 11.711

SEWER Ø300 VC (QL-A)
3.48m INVERT OF PIPE
RL 11.719

SEWER (QL-D)
AS PER DBYD

SEWER Ø225 VC (QL-A)
3.4m INVERT OF PIPE
RL 11.791

SEWER Ø225 VC (QL-A)
1.62m INVERT OF PIPE
RL 13.579

SEWER Ø225 VC (QL-C)

SLH

WELLINGTON STREET

BOTANY ROAD

ADJOINS SHEET 51

ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

SEWAGE

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
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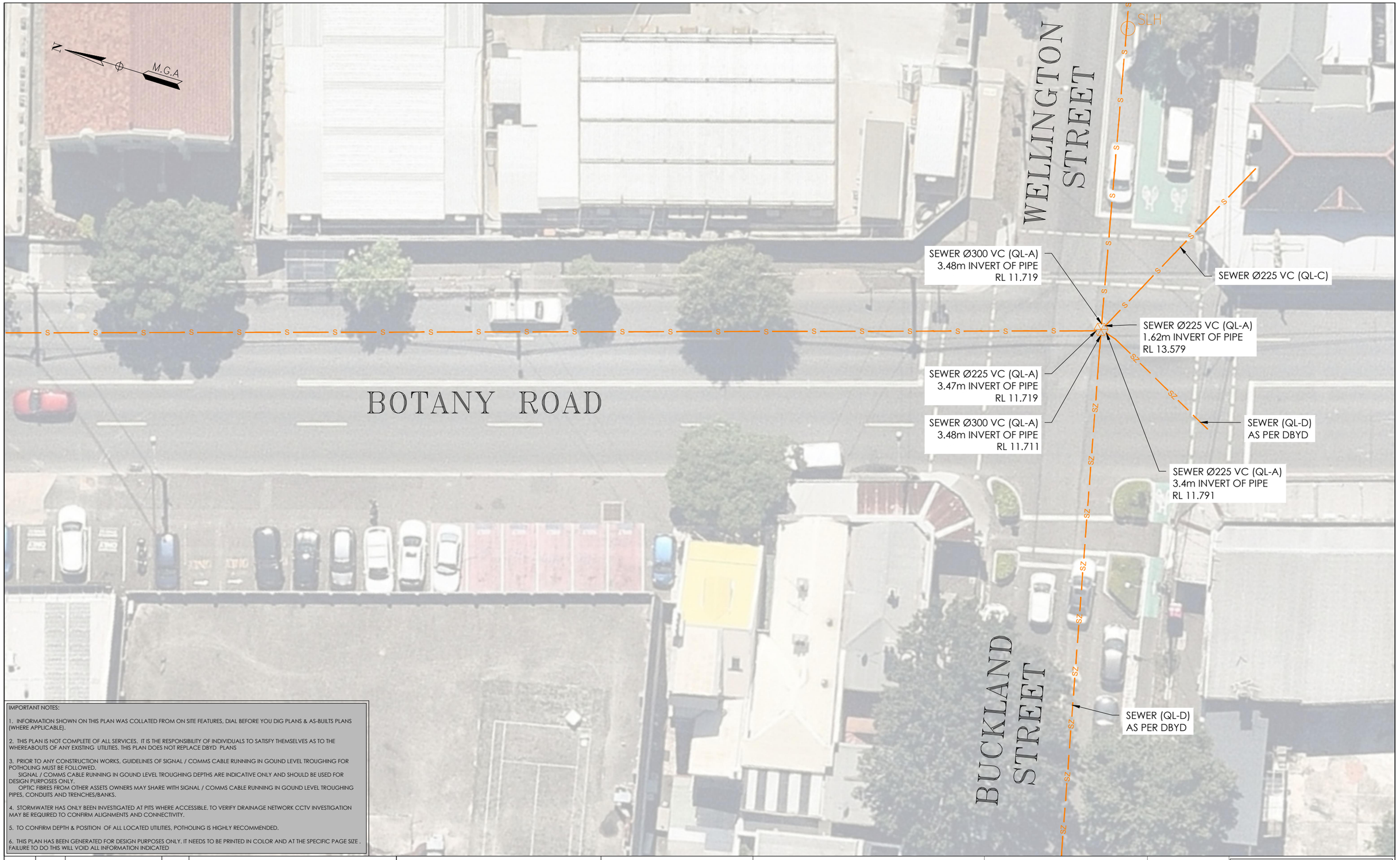
ORIGINAL SIZE :	A3	SHEET:	53 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 53

ADJOINS SHEET 55



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ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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W: www.veris.com.au
ABN 53 615 735 727

CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

SEWAGE

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

DIAL BEFORE YOU DIG www.1100.com.au

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DATE OF SURVEY: 24/06/2020	DATE OF PLAN: 03/06/2020
HEIGHT DATUM: AHD71	CO-ORD: MGA94
DBYD JOB# : 19449303/22/34	DBYD DATE: 30/04/2020
ORIGINAL SIZE : A3	SHEET: 54 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

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ABN 53 615 735 727

CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

SEWAGE

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	55 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 58

ADJOINS SHEET 57

ADJOINS SHEET 55

RAGLAN STREET

BOTANY ROAD

HENDERSON ROAD

SEWER (QL-D)
AS PER DBYD

SEWER Ø225 VC (QL-A)
1.5m INVERT OF PIPE
RL 14.982

SEWER Ø225 VC (QL-A)
2.9m INVERT OF PIPE
RL 13.569

SLH

SEWER (QL-D)
AS PER DBYD

SEWER (QL-D)
2.6m INVERT OF PIPE
(GPR)

SEWER (QL-D)
2.6m INVERT OF PIPE
(GPR)

SEWER (QL-D)
AS PER DBYD

M.G.A

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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

SEWAGE

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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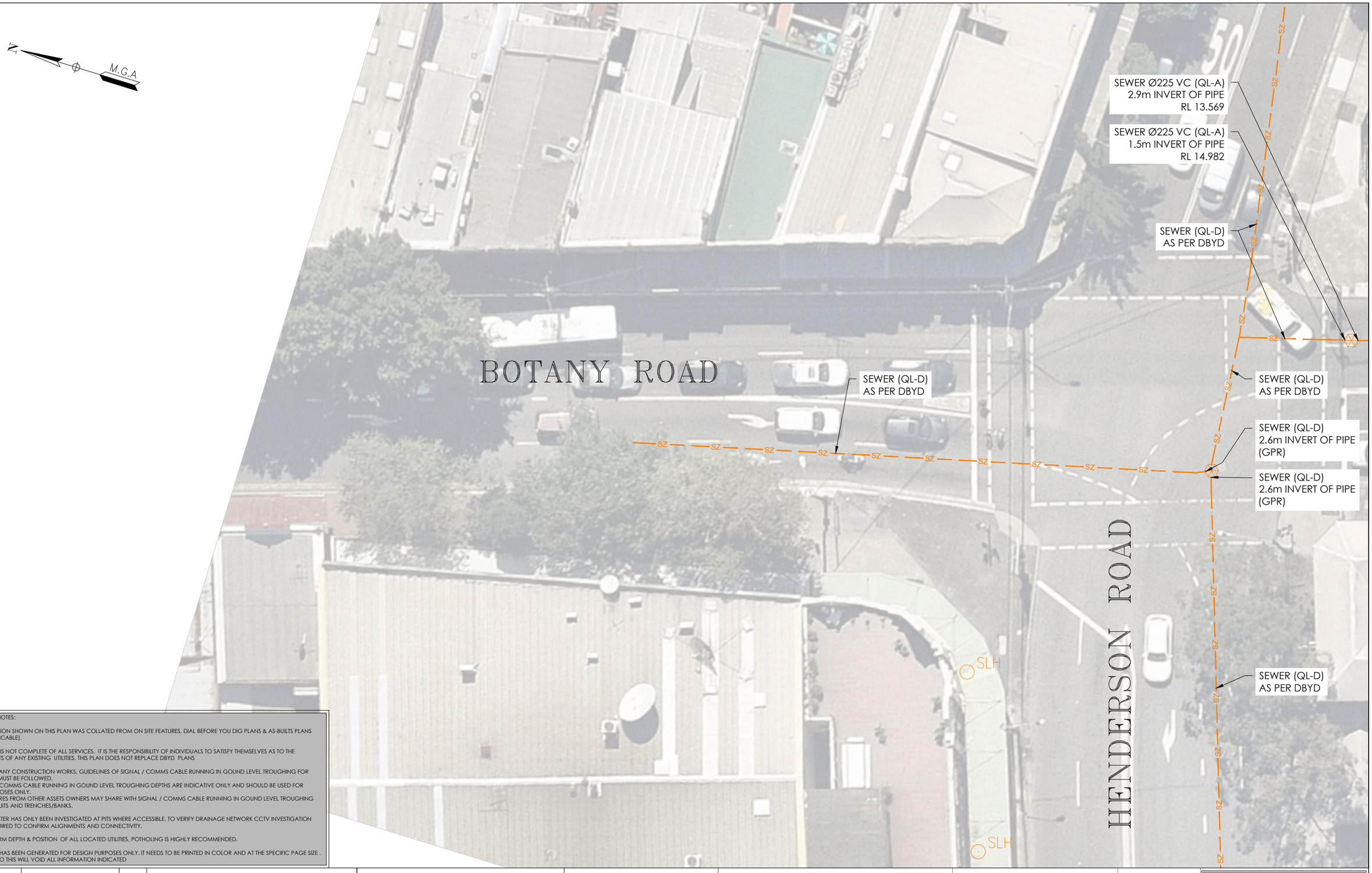
HEIGHT DATUM: AHD71	CO-ORD: MGA94
DBYD JOB# : 19449303/22/34	DBYD DATE: 30/04/2020
ORIGINAL SIZE : A3	SHEET: 56 OF 75

JOB NUMBER

202254

DRAWING NUMBER / ISSUE

202254-UTILS-001A



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PROJECT TITLE

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SEWAGE

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
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DBYD JOB# : 19449303/22/34	DBYD DATE: 30/04/2020
ORIGINAL SIZE : A3	SHEET: 57 OF 75

ADJOINS SHEET 57

HENDERSON ROAD

RAGLAN STREET

BOTANY ROAD

SLH

SLH

SEWER (QL-D)
AS PER DBYD

SEWER (QL-D)
2.6m INVERT OF PIPE
(GPR)

SEWER (QL-D)
2.6m INVERT OF PIPE
(GPR)

SEWER (QL-D)
AS PER DBYD

SEWER (QL-D)
AS PER DBYD

SEWER (QL-D)
AS PER DBYD

SEWER Ø225 VC (QL-A)
3.0m INVERT OF PIPE
RL 13.809

SEWER Ø225 VC (QL-A)
1.5m INVERT OF PIPE
RL 14.982

SEWER Ø225 VC (QL-A)
2.9m INVERT OF PIPE
RL 13.569

SEWER Ø225 VC (QL-A)
3.0m INVERT OF PIPE
RL 13.793

SEWER Ø225 VC (QL-A)
3.05m INVERT OF PIPE
RL 13.756

N

M.G.A

ADJOINS SHEET 56

ADJOINS SHEET 59

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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

SEWAGE

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10

SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	58 OF 75

JOB NUMBER

202254

DRAWING NUMBER / ISSUE

202254-UTILS-001A

ADJOINS SHEET 48

ADJOINS SHEET 58

SEWER (QL-D)
AS PER DBYD

SEWER Ø300 VC (QL-A)
1.85m INVERT OF PIPE
RL 14.951

SEWER Ø225 VC (QL-A)
2.3m INVERT OF PIPE
RL 14.500

SEWER Ø225 VC (QL-A)
3.6m INVERT OF PIPE
RL 13.200

SEWER (QL-D)
AS PER DBYD

SEWER Ø225 VC (QL-B)
3.5m INVERT OF PIPE
RL 13.297

SEWER Ø400 VC (QL-A)
4.0m INVERT OF PIPE
RL 12.795

COPE STREET

RAGLAN STREET

N

M.G.A

ADJOINS SHEET 49

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PROJECT TITLE

WATERLOO STATION

SEWAGE

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
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ORIGINAL SIZE : A3	SHEET: 59 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

N
M.G.A

COPE STREET

RAGLAN STREET

GAS Ø75 4NB 210KPa (QL-D)
0.45 to 0.5m TOP OF PIPE
(GPR)

GAS Ø32 6NB (QL-D)
0.5 to 0.9m TOP OF PIPE
(GPR)

GAS Ø75 4NB 210KPa (QL-D)
0.45 to 0.5m TOP OF PIPE
(GPR)

GAS Ø32 6NB (QL-D)
0.5 to 0.9m TOP OF PIPE
(GPR)

GAS Ø50 4NB 210KPa (QL-D)
0.4 to 0.56m TOP OF PIPE
(GPR)

GAS Ø50 4NB 210KPa (QL-D)
0.6 to 0.9m TOP OF PIPE
(GPR)

GAS Ø50 4NB 210KPa (QL-D)
0.8 to 1.2m TOP OF PIPE
(GPR)

GAS Ø75 4NB 120KPa (QL-D)
0.5 to 0.8m TOP OF PIPE
(GPR)

GAS Ø32 3NB (QL-D)
0.8 to 1.01m TOP OF PIPE
(GPR)

DOMESTIC GAS (QL-D)
0.6m TOP OF PIPE
(GPR)

DOMESTIC GAS (QL-D)
0.3 to 0.7m TOP OF PIPE
(GPR)

GAS Ø75 4NB 120KPa (QL-D)
0.5 to 0.8m TOP OF PIPE
(GPR)

GAS Ø110 12NB 210KPa (QL-D)
0.8m TOP OF PIPE
(GPR)

GAS Ø50 4NB 210KPa (QL-D)
0.6 to 0.9m TOP OF PIPE
(GPR)

ADJOINS SHEET 61

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ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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ABN 53 615 735 727

CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

GAS

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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THIS PLAN DOES NOT REPLACE DBYD PLANS

THIS PLAN MUST BE READ IN CONJUNCTION WITH SHEET 1 FOR ADDITIONAL NOTES, WARNINGS & LEGEND

DATE OF SURVEY:	24/06/2020	DATE OF PLAN:	03/06/2020
HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	60 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

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N
M.G.A

GAS Ø32 6NB (QL-D)
0.5 to 0.9m TOP OF PIPE
(GPR)

DOMESTIC GAS
(QL-D)
(GPR)

GAS Ø32 6NB (QL-D)
0.5 to 0.9m TOP OF PIPE
(GPR)

GAS Ø50 4NB 210KPa (QL-D)
0.4 to 0.56m TOP OF PIPE
(GPR)

COPE STREET

GAS Ø32 3NB (QL-D)
0.8 to 1.01m TOP OF PIPE
(GPR)

GAS Ø32 3NB (QL-D)
0.8 to 1.01m TOP OF PIPE
(GPR)

ADJOINS SHEET 60

ADJOINS SHEET 62

ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

GAS

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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JOB NUMBER
202254

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HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	61 OF 75

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 61

ADJOINS SHEET 63

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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

GAS

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	62 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 62

ADJOINS SHEET 65

GAS Ø32 3NB (QL-D)
0.8 to 1.01m TOP OF PIPE
(GPR)

GAS Ø32 6NB (QL-D)
0.5 to 0.9m TOP OF PIPE
(GPR)

COPE STREET

GAS Ø32 6NB (QL-D)
0.5 to 0.9m TOP OF PIPE
(GPR)

GAS Ø50 (QL-D)
0.6 to 0.7m TOP OF PIPE
(GPR)

GAS Ø50 (QL-D)
0.6 to 0.7m TOP OF PIPE
(GPR)

GAS Ø32 3NB (QL-D)
0.8 to 1.01m TOP OF PIPE
(GPR)

WELLINGTON STREET

DOMESTIC GAS (QL-D)
0.3m TOP OF PIPE
(GPR)

GAS Ø50 9NB 210KPa (QL-D)
0.4 to 0.8m TOP OF PIPE
(GPR)

DOMESTIC GAS (QL-D)
0.4m TOP OF PIPE
(GPR)

GAS Ø50 9NB 210KPa (QL-D)
0.4 to 0.8m TOP OF PIPE
(GPR)

N

MGA

ADJOINS SHEET 64

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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

GAS

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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JOB NUMBER
202254

DRAWING NUMBER / ISSUE
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DATE OF SURVEY:	24/06/2020	DATE OF PLAN:	03/06/2020
HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	63 OF 75

N
M.G.A

ADJOINS SHEET 63

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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

GAS

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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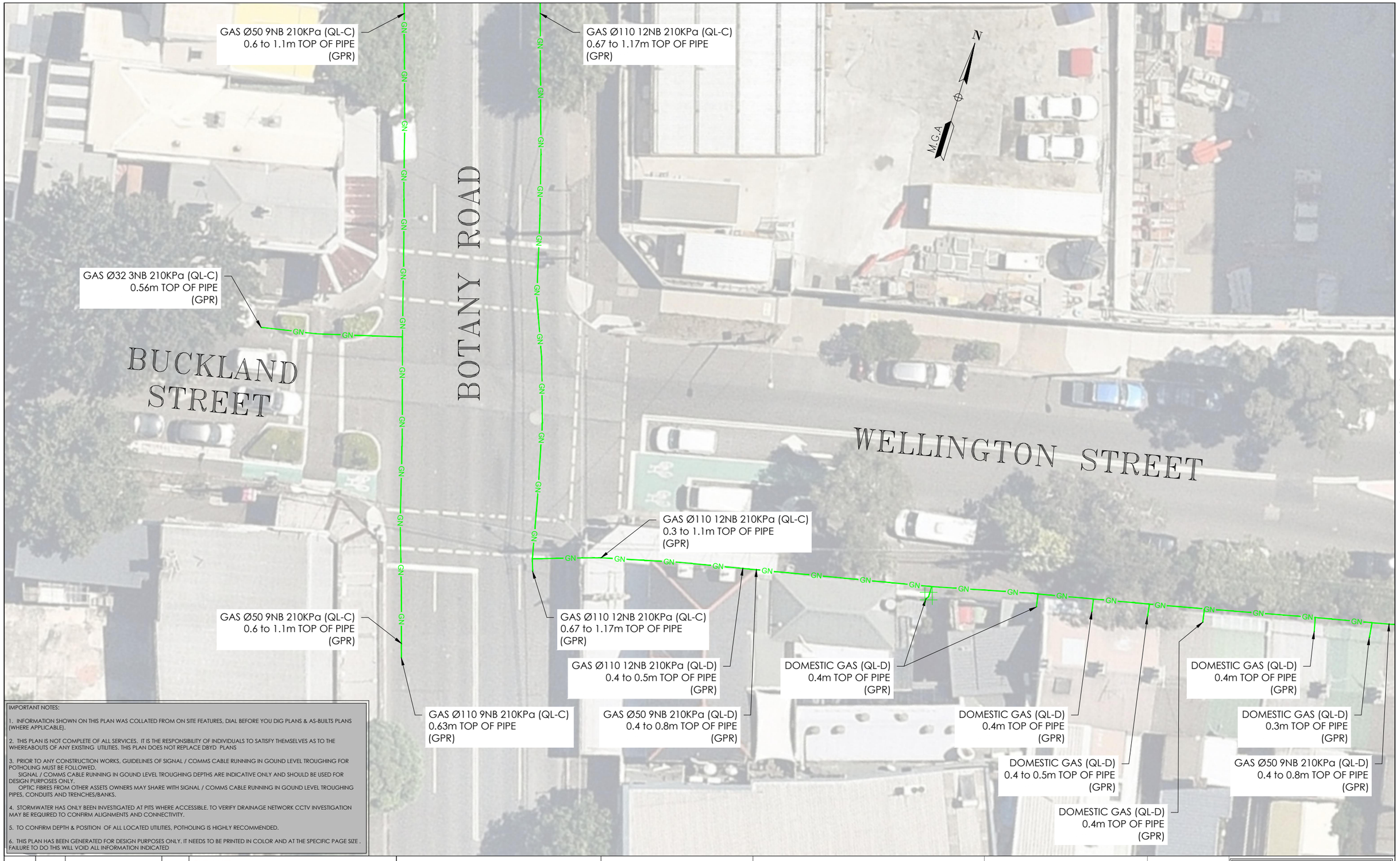
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	64 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 66



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JOB NUMBER
202254

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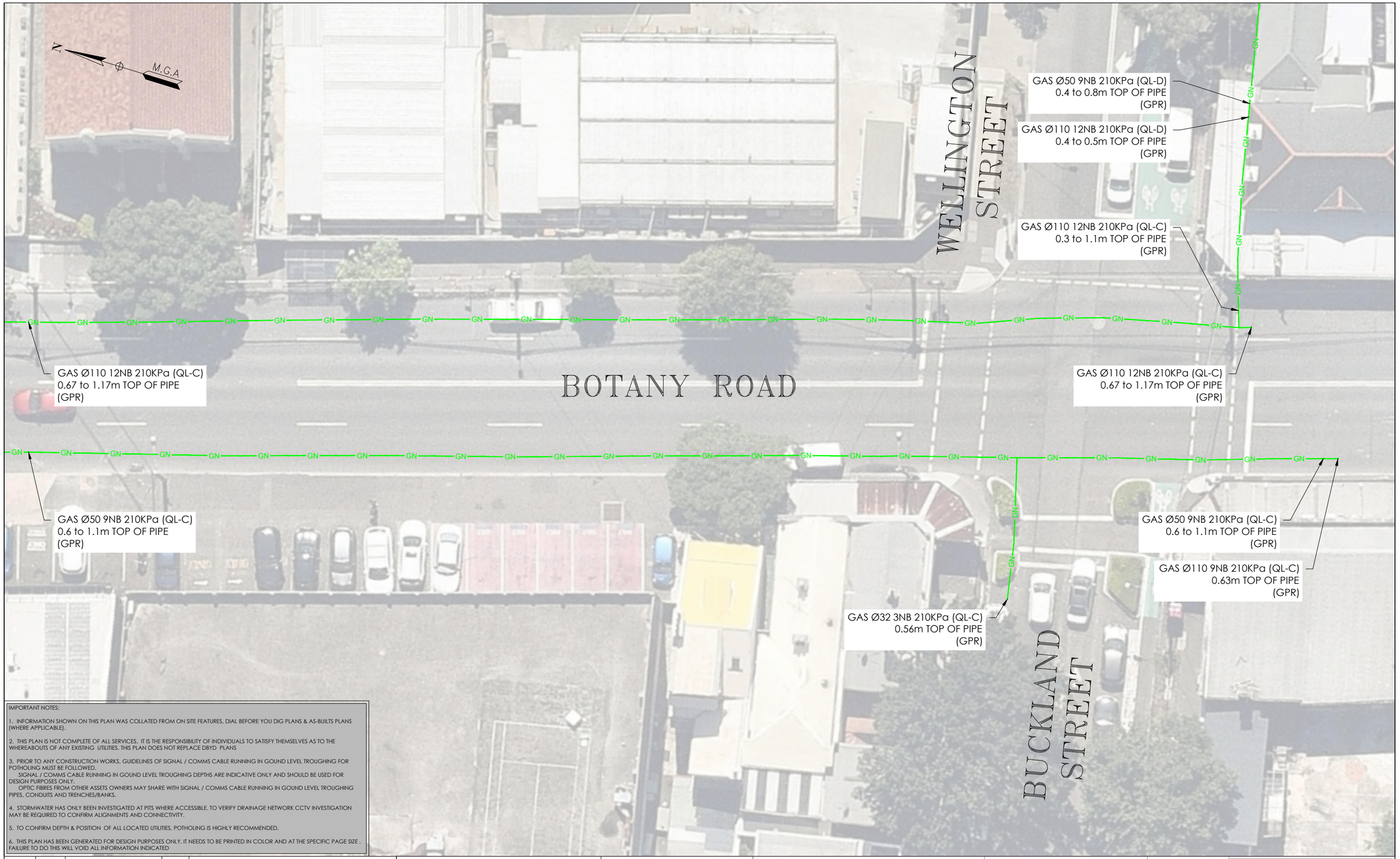
202254-UTILS-001A

ADJOINS SHEET 65

ADJOINS SHEET 67



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DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
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JOB NUMBER 202254

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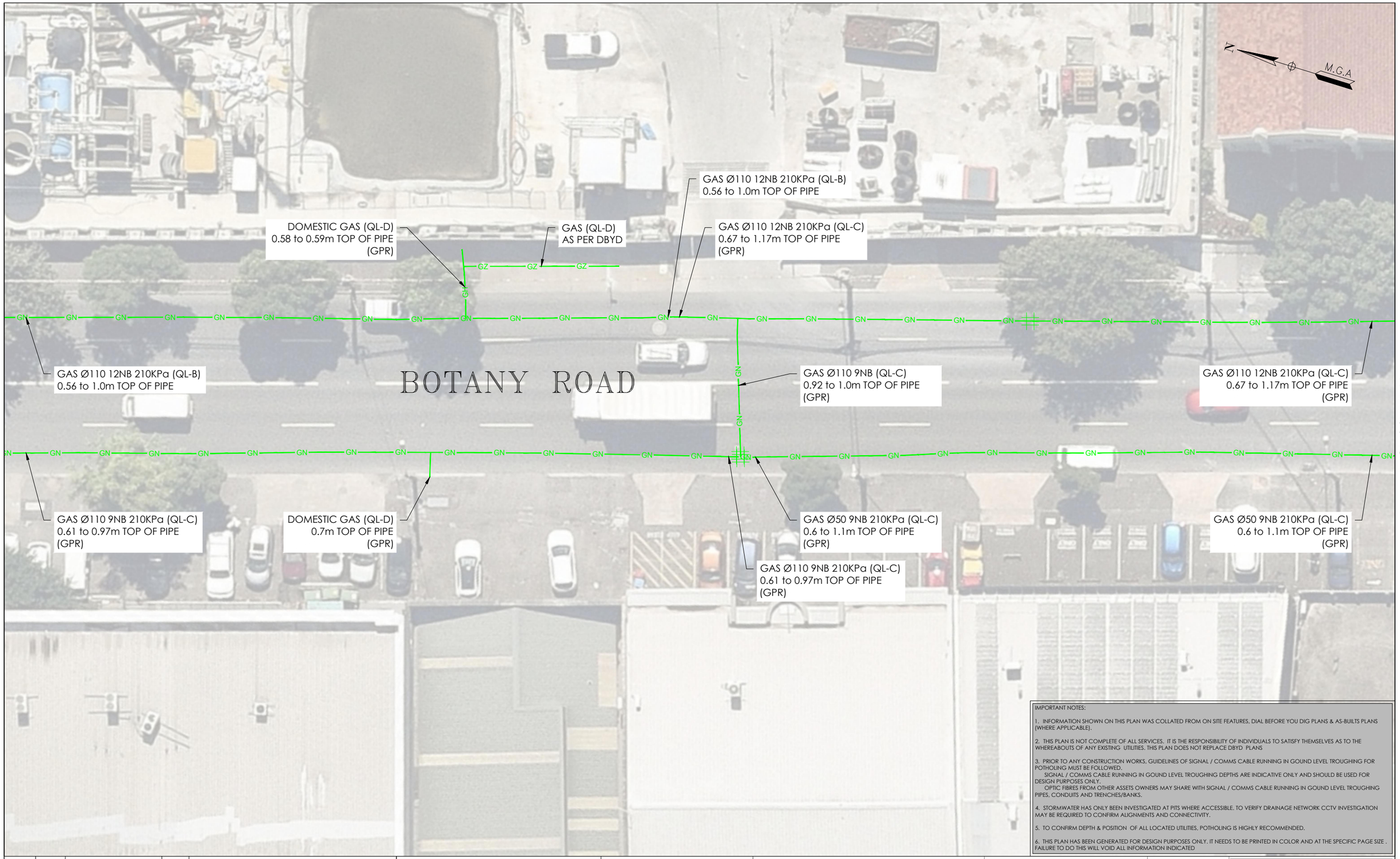
DATE OF SURVEY:	24/06/2020	DATE OF PLAN:	03/06/2020
HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	66 OF 75



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ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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ABN 53 615 735 727

CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

GAS

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	67 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 70

ADJOINS SHEET 69

ADJOINS SHEET 67

RAGLAN STREET

BOTANY ROAD

HENDERSON ROAD

GAS Ø110 12NB 210KPa (QL-D)
0.8m TOP OF PIPE
(GPR)

GAS Ø110 12NB 210KPa (QL-D)
0.8m TOP OF PIPE
(GPR)

GAS Ø110 12NB 210KPa (QL-C)
0.69m TOP OF PIPE
(GPR)

GAS Ø110 12NB 210KPa (QL-C)
0.69m TOP OF PIPE
(GPR)

GAS Ø110 12NB 210KPa (QL-B)
0.56 to 1.0m TOP OF PIPE

GAS Ø110 12NB 210KPa (QL-B)
0.56 to 1.0m TOP OF PIPE

GAS Ø110 9NB 210KPa (QL-C)
0.61 to 0.97m TOP OF PIPE
(GPR)

GAS Ø110 12NB 210KPa (QL-D)
(GPR)

DOMESTIC GAS (QL-D)
0.43m TOP OF PIPE
(GPR)

GAS Ø110 9NB 210KPa (QL-C)
0.61 to 0.97m TOP OF PIPE
(GPR)

GAS Ø110 12NB 210KPa (QL-D)
(GPR)

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M.G.A

ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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ABN 53 615 735 727

CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

GAS

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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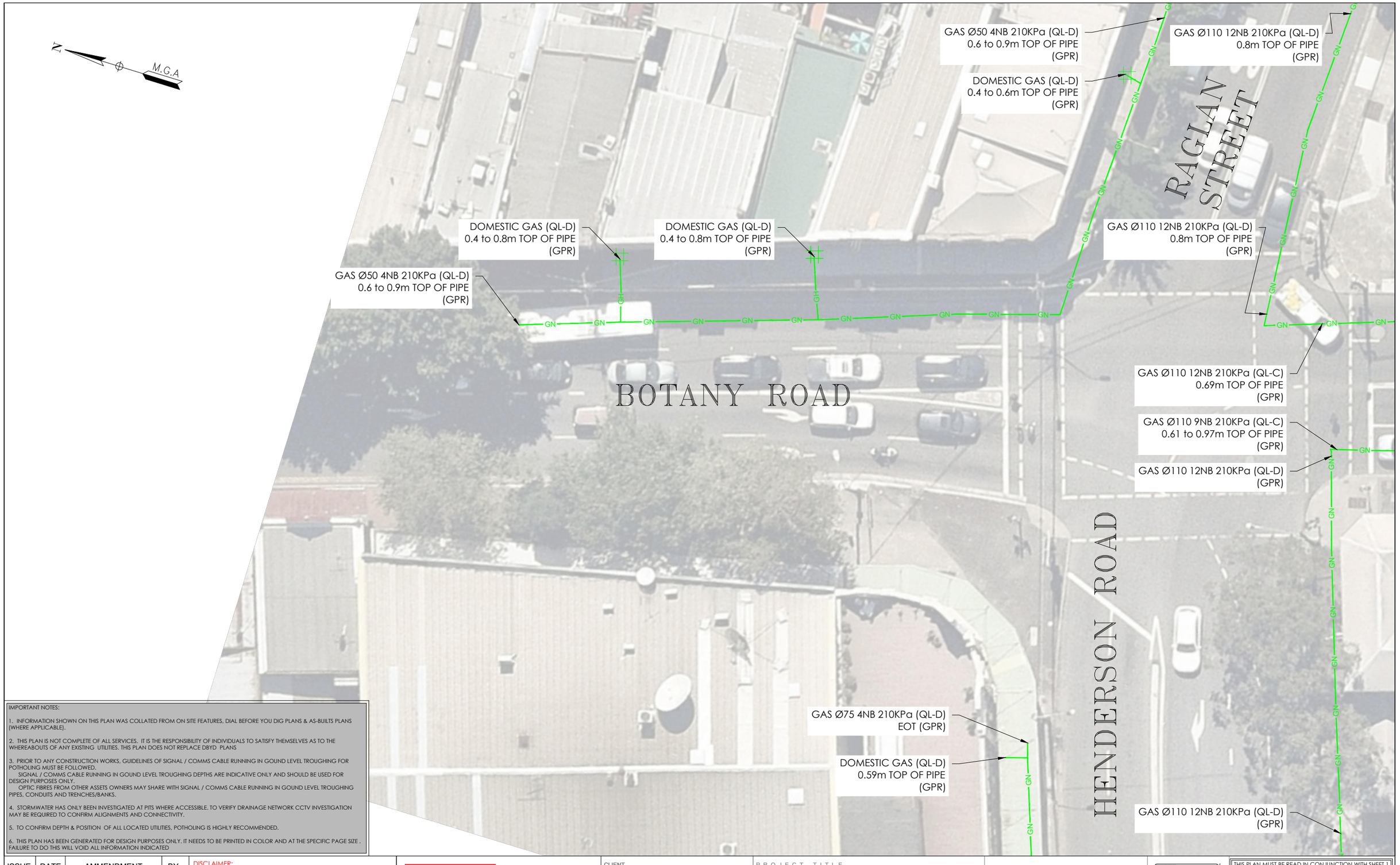
DATE OF SURVEY:	24/06/2020	DATE OF PLAN:	03/06/2020
HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	68 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A



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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

GAS

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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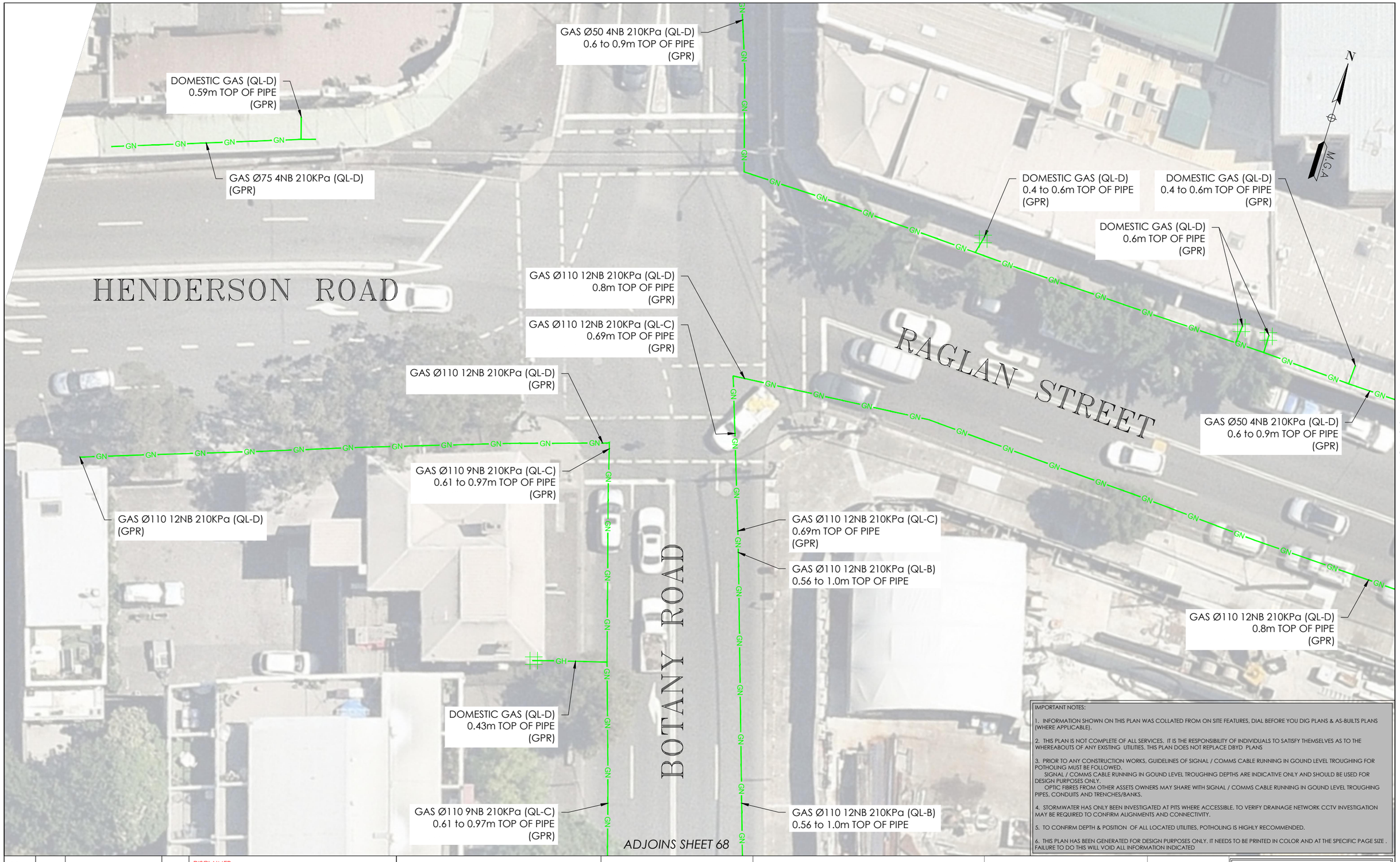
ORIGINAL SIZE :	A3	SHEET:	69 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 69



ADJOINS SHEET 68

ADJOINS SHEET 71

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ABN 53 615 735 727

CLIENT: JOHN HOLLAND

PROJECT TITLE: WATERLOO STATION

GAS

DRAWING TITLE: SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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JOB NUMBER: 202254

DRAWING NUMBER / ISSUE: 202254-UTILS-001A

THIS PLAN MUST BE READ IN CONJUNCTION WITH SHEET 1 FOR ADDITIONAL NOTES, WARNINGS & LEGEND

DATE OF SURVEY: 24/06/2020	DATE OF PLAN: 03/06/2020
HEIGHT DATUM: AHD71	CO-ORD: MGA94
DBYD JOB# : 19449303/22/34	DBYD DATE: 30/04/2020
ORIGINAL SIZE : A3	SHEET: 70 OF 75

ADJOINS SHEET 60

ADJOINS SHEET 70

DOMESTIC GAS (QL-D)
0.4 to 0.6m TOP OF PIPE
(GPR)

DOMESTIC GAS (QL-D)
0.3 to 0.7m TOP OF PIPE
(GPR)

DOMESTIC GAS (QL-D)
0.6m TOP OF PIPE
(GPR)

GAS Ø50 4NB 210KPa (QL-D)
0.6 to 0.9m TOP OF PIPE
(GPR)

GAS Ø50 4NB 210KPa (QL-D)
0.6 to 0.9m TOP OF PIPE
(GPR)

GAS Ø50 4NB 210KPa (QL-D)
0.8 to 1.2m TOP OF PIPE
(GPR)

GAS Ø110 12NB 210KPa (QL-D)
0.8m TOP OF PIPE
(GPR)

GAS Ø110 12NB 210KPa (QL-D)
0.8m TOP OF PIPE
(GPR)

GAS Ø75 4NB 120KPa (QL-D)
0.5 to 0.8m TOP OF PIPE
(GPR)

GAS Ø75 4NB 210KPa (QL-D)
0.45 to 0.5m TOP OF PIPE
(GPR)

GAS Ø75 4NB 210KPa (QL-D)
0.45 to 0.5m TOP OF PIPE
(GPR)

GAS Ø32 6NB (QL-D)
0.5 to 0.9m TOP OF PIPE
(GPR)

GAS Ø50 4NB 210KPa (QL-D)
0.4 to 0.56m TOP OF PIPE
(GPR)

GAS Ø75 4NB 120KPa (QL-D)
0.5 to 0.8m TOP OF PIPE
(GPR)

GAS Ø32 3NB (QL-D)
0.8 to 1.01m TOP OF PIPE
(GPR)

GAS Ø32 6NB (QL-D)
0.5 to 0.9m TOP OF PIPE
(GPR)

COPE STREET

RAGLAN STREET

N

W.G.A

ADJOINS SHEET 61

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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

GAS

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	71 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 73

IMPORTANT NOTES:

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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

TRAM TRACKS

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

DIAL BEFORE YOU DIG www.1100.com.au

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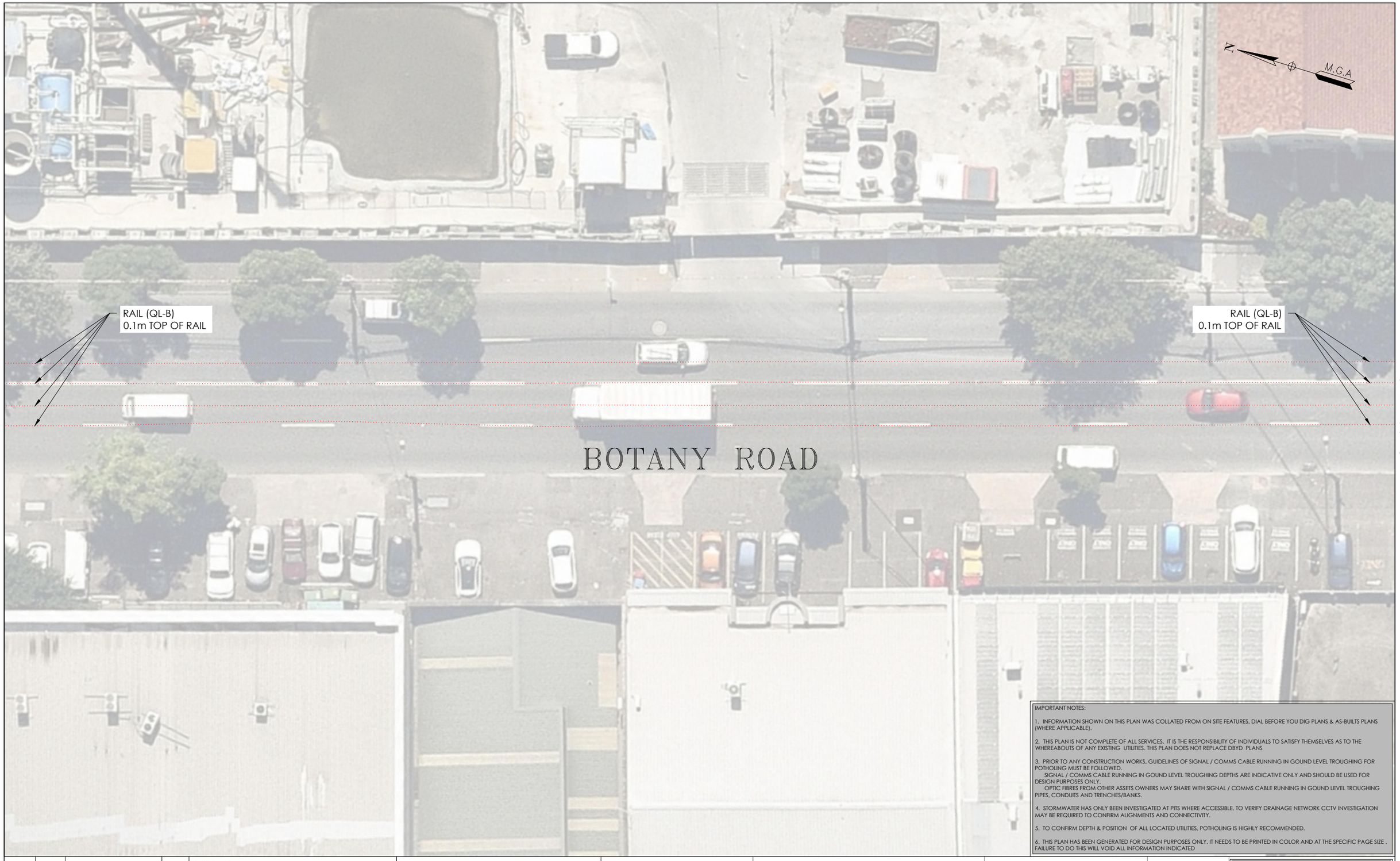
HEIGHT DATUM: AHD71	CO-ORD: MGA94
DBYD JOB# : 19449303/22/34	DBYD DATE: 30/04/2020
ORIGINAL SIZE : A3	SHEET: 72 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A



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3. PRIOR TO ANY CONSTRUCTION WORKS, GUIDELINES OF SIGNAL / COMMS CABLE RUNNING IN GOUND LEVEL TROUGHING FOR POTHOLING MUST BE FOLLOWED.
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ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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ABN 53 615 735 727

CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

TRAM TRACKS

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

DIAL BEFORE YOU DIG www.1100.com.au

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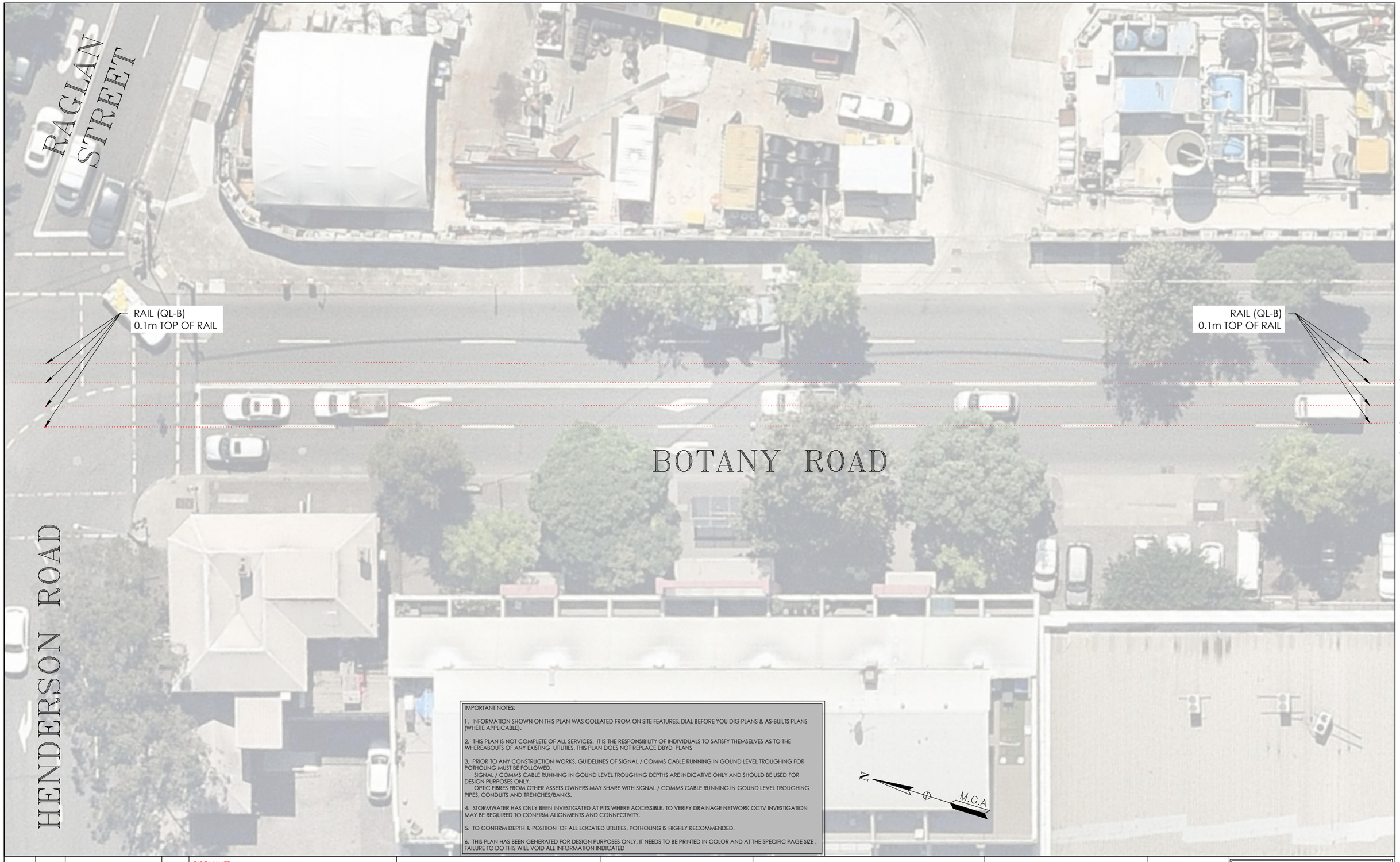
THIS PLAN MUST BE READ IN CONJUNCTION WITH SHEET 1 FOR ADDITIONAL NOTES, WARNINGS & LEGEND

DATE OF SURVEY:	24/06/2020	DATE OF PLAN:	03/06/2020
HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	73 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A



ADJOINS SHEET 75

ADJOINS SHEET 73

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SUB-SURFACE UTILITY PLAN

SCALE IN METERS 1: 250

0 2 4 6 8 10

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ORIGINAL SIZE :	A3	SHEET:	74 OF 75

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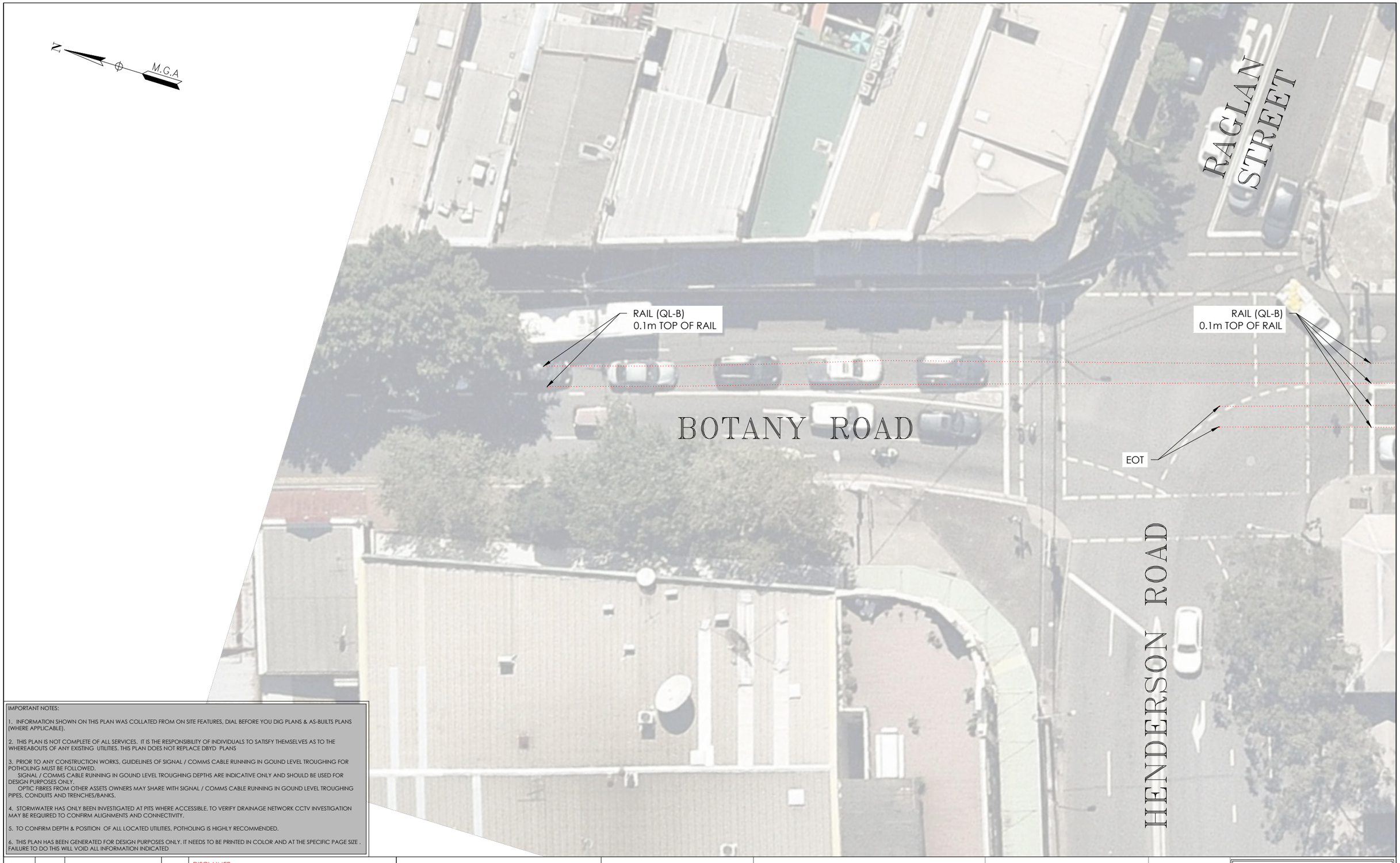

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TRAM TRACKS

DRAWING TITLE

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SCALE IN METERS 1: 250

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SURVEYED BY:	Y.M./A.D.
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AUSTRALIAN STANDARD AS5488-2019 CLASSIFICATION OF SUBSURFACE UTILITY INFORMATION (SUI)

THIS STANDARD (AS5488-2013) PROVIDES A FRAMEWORK FOR THE CLASSIFICATION OF SUBSURFACE UTILITY LOCATION AND ATTRIBUTE INFORMATION IN TERMS OF SPECIFIED QUALITY LEVELS. THE OBJECTIVE OF THIS STANDARD IS TO PROVIDE UTILITY OWNERS, OPERATORS AND LOCATORS WITH A FRAMEWORK FOR THE CONSISTENT CLASSIFICATION OF INFORMATION CONCERNING SUBSURFACE UTILITIES. THIS AIMS TO ASSIST WITH THE MANAGEMENT OF PROJECT RISK RELATED TO UNDERGROUND UTILITIES.
A QUALITY LEVEL DESCRIBES THE ACCURACY OF INFORMATION THAT IS COLLECTED OR HELD ON A SUBSURFACE UTILITY. THERE ARE FOUR QUALITY LEVELS - A,B,C AND D. QUALITY LEVEL A IS CONSIDERED TO BE THE HIGHEST QUALITY LEVEL AND QUALITY LEVEL D TO BE THE LOWEST. THE HIGHER THE QUALITY LEVEL, THE MORE INFORMATION IS KNOWN ABOUT THE SUBSURFACE UTILITY. THE QUALITY LEVEL OF A SUBSURFACE UTILITY MAY VARY ALONG ITS LENGTH DEPENDING ON THE ASSOCIATED ATTRIBUTE INFORMATION AND METADATA AVAILABLE.

QUALITY LEVEL D (QL-D) IS THE LOWEST OF THE FOUR QUALITY LEVELS. THE ATTRIBUTE INFORMATION CAN BE COMPILED FROM ANY, OR A COMBINATION OF THE FOLLOWING:
(1) EXISTING RECORDS (DBYD PLANS)
(2) CURSORY SITE INSPECTION
(3) ANECDOTAL EVIDENCE

QUALITY LEVEL C (QL-C) IS DESCRIBED AS A SURFACE FEATURE CORRELATION OR AN INTERPRETATION OF THE APPROXIMATE LOCATION AND ATTRIBUTES OF A SUBSURFACE UTILITY ASSET USING A COMBINATION OF EXISTING RECORDS (AND/OR ANECDOTAL EVIDENCE) AND A SITE SURVEY OF VISIBLE EVIDENCE. THE MINIMUM REQUIREMENT FOR A QUALITY LEVEL C IS A RELATIVE HORIZONTAL SPATIAL POSITION WITH A MAXIMUM TOLERANCE OF +/- 300MM.

QUALITY LEVEL B (QL-B) DESCRIBES ASSETS LOCATED USING ELECTROMAGNETIC PIPE AND CABLE LOCATORS AND LOCATING TECHNIQUES. THE INFORMATION REQUIRED TO ATTAIN QL-B MAY BE SOURCED THROUGH THE FOLLOWING METHODS:
(1) SURVEY
(2) TRACE
THE MINIMUM REQUIREMENT FOR A QUALITY LEVEL B IS A RELATIVE HORIZONTAL SPATIAL POSITION WITH A MAXIMUM TOLERANCE OF +/- 300MM AND A MAXIMUM VERTICAL TOLERANCE OF +/- 500MM. IF QUALITY LEVEL B INFORMATION IS COMPILED USING ELECTRONIC DETECTION, IT IS ONLY AN INDICATION OF THE EXISTENCE OF SUBSURFACE UTILITIES AND DOES NOT VALIDATE THE UTILITY LOCATION OR ATTRIBUTES.

QUALITY LEVEL A (QL-A) IS THE HIGHEST QUALITY LEVEL AND CONSISTS OF THE PHYSICAL IDENTIFICATION OF THE ATTRIBUTE AND LOCATION OF A SUBSURFACE UTILITY AT A POINT TO AN ABSOLUTE SPATIAL POSITION IN THREE DIMENSIONS. THE MAXIMUM TOLERANCE FOR BOTH HORIZONTAL AND VERTICAL POSITION IS +/- 50MM. IT IS THE ONLY QUALITY LEVEL THAT DEFINES A SUBSURFACE UTILITY AS 'VALIDATED'. IF THE WHOLE LINE SEGMENT CANNOT BE VERIFIED BY LINE OF SIGHT, QUALITY LEVEL A SHALL NOT BE ATTRIBUTED TO THE LINE SEGMENT BETWEEN VALIDATED POINTS. THE VERTICAL INFORMATION FOR THIS LOCATING METHOD IS TO THE TOP OR SHALLOWEST PART OF THE LOCATED SERVICE. IN THE CASE OF SEWER AND STORMWATER ASSETS THE INFORMATION COLLECTED FOR THESE ASSETS IS RECORDED TO THE INVERT LEVEL, WHERE AVAILABLE, AT THE RESPECTIVE ACCESS POINTS.

IT REMAINS THE RESPONSIBILITY OF THE COMPANY AND INDIVIDUAL CONDUCTING PHYSICAL WORKS TO ENSURE UP TO DATE DIAL BEFORE YOU DIG (DBYD) PLANS ARE CONSULTED AND AVAILABLE ON HAND DURING ANY WORKS.

NULCA AUSTRALIA INC National Utility Locating Contractors Association

DIAL BEFORE YOU DIG® CERTIFIED LOCATOR

ACCREDITED PLANT LOCATOR

OPTUS

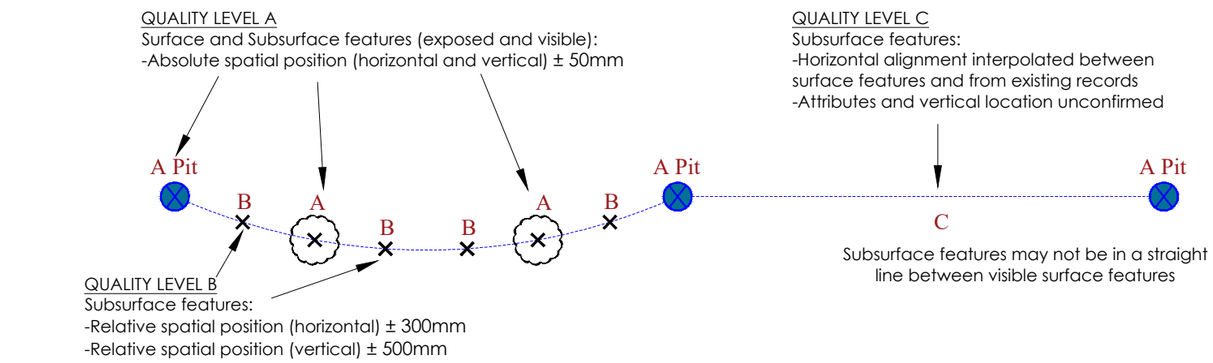
OHS Management - AS/NZS 4801 Global-Mark.com.au®

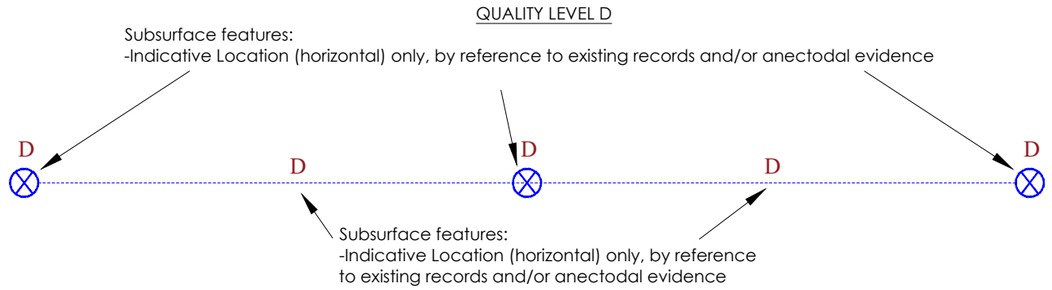
Environmental Management - ISO14001 Global-Mark.com.au®

Quality Management - ISO 9001 Global-Mark.com.au®

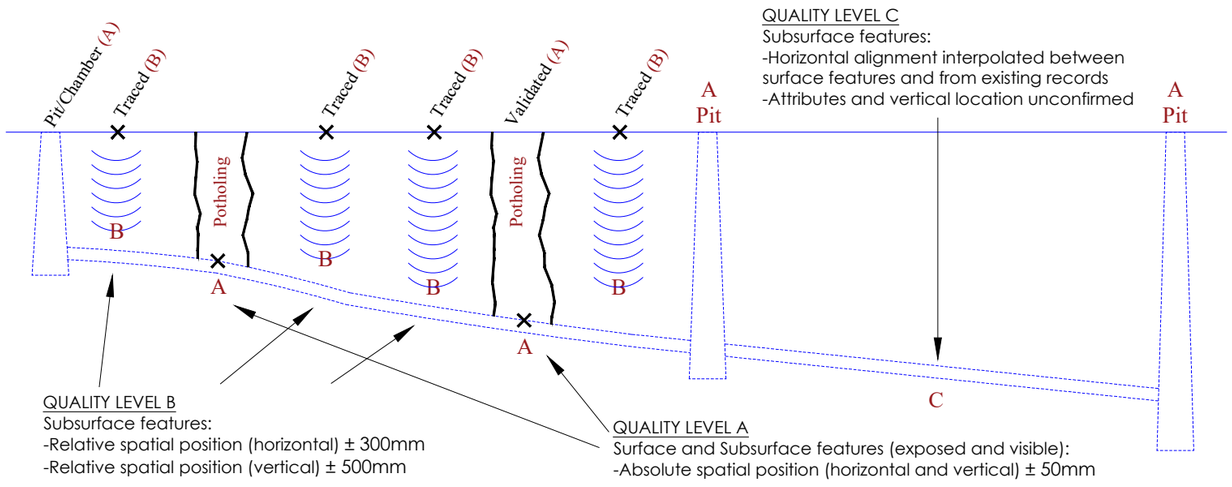
VARYING QUALITY LEVELS

(Taken from AS 5488-2019)





PLAN VIEW



LONGITUDINAL SECTION

VERIS LEGEND

WATER MAIN (WM)	W
WATER HOUSE CONNECTION (WY)	WH
WATER MAIN - RECYCLED (WR)	WR
WATER MAIN - DIGITISED (WZ)	WZ
UNIDENTIFIED PIPELINE (?P)	?P
GAS MAIN - QENOS HIGH PRESSURE PIPELINE (HG)	HG
GAS MAIN - QENOS LOW PRESSURE (LG)	LG
GAS HOUSE CONNECTION (DG)	GH
GAS MAIN - QENOS DIGITISED (GZ)	GZ
ELECTRIC LINE - MINOR TRANSMISSION (E)	E
ELECTRIC LINE - UNDERGROUND (EU)	EU
ELECTRIC HOUSE CONNECTION (EY)	EH
ELECTRIC LINE - DIGITISED (EZ)	EZ
SEWER MAIN (SM)	S
SEWER HOUSE CONNECTION (SY)	SH
SEWER MAIN - DIGITISED (SZ)	SZ
DRAINAGE PIPE - (Ø225)	Ø225
DRAINAGE PIPE - (Ø300)	Ø300
DRAINAGE PIPE - (Ø375)	Ø375
DRAINAGE PIPE - (Ø450)	Ø450
DRAINAGE PIPE - (Ø525)	Ø525
DRAINAGE PIPE - (Ø600)	Ø600
DRAINAGE PIPE - (Ø750)	Ø750
DRAINAGE PIPE - (Ø900)	Ø900
DRAINAGE PIPE - (Ø1200)	Ø1200
DRAINAGE PIPE - UNSPECIFIED DIAMETER (Ø?)	Ø?
DRAINAGE PIPE - DIGITISED (DZ)	DZ
COMMUNICATION LINE (C)	C
TELEPHONE LINE (TN)	T
TELEPHONE HOUSE CONNECTION (TY)	TH
TELEPHONE LINE - DIGITISED (TZ)	TZ
OPTICAL FIBRE - UNDERGROUND (OU)	OU
OPTICAL FIBRE - DIGITISED (OZ)	OZ
WATER HYDRANT (PWHY)	WH
WATER STOP VALVE (PWSV)	
WATER FIRE HYDRANT (PWFB)	
WATER METER (PWMR)	
METER (PGMR)	
PIPELINE MARKER (PGPM)	GP
GAS MANHOLE COVER (PGHL)	GMH
TELSTRA SINGLE CONC. PIT (PTSP)	
TELSTRA TWIN CONC. PIT (PTTP)	
TELSTRA DISTRIBUTION PILLAR	TDP
OPTICAL FIBRE PIT (POFP)	OFP
ELECTRIC CABLE MANHOLE (PEMH)	EMH
POLE - LIGHT (PLPL)	
POLE - POWER & LIGHT (PPLP)	
ELECTRIC CABLE JUNCTION BOX (PEJB)	EJB
TRAFFIC SIGNAL CONTROLLER (PSCL)	TSC
POWER SERVICE PILLAR - UNDERGROUND (PEUP)	
GULLY PIT POINT (PGUL)	
DRAINAGE PIT (DP)	
DRAINAGE JUNCTION MANHOLE (PDJM)	
SEWER MANHOLE COVER (PSMH)	
POTHOLE INDICATOR	PHOLE /
END OF TRACE	EOT
UNABLE TO LOCATE	UTL
UNABLE TO TRACE	UTT
UNABLE TO OPEN	UTO
DENOTES INVESTIGATION AREA	

ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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CLIENT

PROJECT TITLE
WATERLOO STATION
GENERAL NOTES AND LEGEND

DRAWING TITLE
SUB-SURFACE UTILITY PLAN

LOCATED BY: L.B.
SURVEYED BY: Y.M./A.D.
DRAFTED BY: J.V.
CHECKED BY: K.S./B.M./J.A.
APPROVED BY: D.M.

DIAL BEFORE YOU DIG www.1100.com.au
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DATE OF SURVEY: 24/06/2020	DATE OF PLAN: 03/06/2020
HEIGHT DATUM: AHD71	CO-ORD: MGA94
DBYD JOB# : 19449303/22/34	DBYD DATE: 30/04/2020
ORIGINAL SIZE : A3	SHEET: 1 OF 75

JOB NUMBER 202254

DRAWING NUMBER / ISSUE 202254-UTILS-001A

OVERVIEW

ISSUE	DATE	AMMENDMENT	BY
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CLIENT

PROJECT TITLE

WATERLOO STATION

KEY PLAN

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	2 OF 75

JOB NUMBER 202254

DRAWING NUMBER / ISSUE 202254-UTILS-001A

N
M.G.A

RAGLAN STREET

COPE STREET

PRIMUS Ø100 PVC (QL-A)
0.55m TOP OF PIPE
RL 15.555

PRIMUS Ø100 PVC (QL-A)
0.50m TOP OF PIPE
RL 15.640

PRIMUS Ø100 PVC (QL-C)
SIGNAL LOST

PRIMUS Ø100 PVC (QL-B)
2.0 to 2.1m TOP OF PIPE

PRIMUS Ø100 PVC (QL-D)
1.4 to 1.6m TOP OF PIPE
EOT (TRACE ROD OBSTRUCTED)

PRIMUS Ø100 PVC (QL-B)
0.55 to 0.8m TOP OF PIPE

OFP

TELSTRA Ø20 PVC (QL-A)
0.14m TOP OF PIPE
RL 16.227
EOT (EMPTY CONDUIT,
TRACE ROD UNABLE TO
NAVIGATE BEND)

TELSTRA Ø50 PVC (QL-B)
0.4 to 0.5m TOP OF PIPE

TELSTRA Ø20 PVC (QL-B)
0.15 to 0.45m TOP OF PIPE

TELSTRA Ø50 PVC (QL-A)
0.45m TOP OF PIPE
RL 16.254

TELSTRA Ø100 (QL-B)
0.4 to 0.5m TOP OF PIPE
UNABLE TO ACCESS PIT

TELSTRA (QL-B)
0.4 to 0.5m TOP OF PIPE
UNABLE TO ACCESS PIT

TELSTRA Ø100 PVC (QL-B)
0.4 to 0.5m TOP OF PIPE

TELSTRA Ø20 PVC (QL-A)
0.25m TOP OF PIPE
RL 16.131

TELSTRA Ø20 PVC (QL-A)
0.16m TOP OF PIPE
RL 16.550

TELSTRA Ø50 PVC (QL-A)
0.42m TOP OF PIPE
RL 16.173

TELSTRA Ø50 PVC (QL-A)
0.17m TOP OF PIPE
RL 16.533

TELSTRA Ø100 PVC (QL-A)
0.4m TOP OF PIPE
RL 16.216

TELSTRA Ø50 PVC (QL-A)
0.15m TOP OF PIPE
RL 16.502

TELSTRA Ø100 PVC (QL-B)
1.01 to 1.1m TOP OF PIPE

TELSTRA Ø20 PVC (QL-B)
0.4 to 0.5m TOP OF PIPE

TELSTRA Ø50 PVC (QL-A)
0.17m TOP OF PIPE
RL 16.487

TELSTRA Ø100 (QL-B)
0.4 to 0.5m TOP OF PIPE

TELSTRA Ø50 PVC (QL-B)
0.2m TOP OF PIPE

ADJOINS SHEET 13

ADJOINS SHEET 4

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ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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ABN 53 615 735 727

CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

TELEPHONY AND COMMS

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

DIAL BEFORE YOU DIG www.1100.com.au

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THIS PLAN MUST BE READ IN CONJUNCTION WITH SHEET 1 FOR ADDITIONAL NOTES, WARNINGS & LEGEND

DATE OF SURVEY:	24/06/2020	DATE OF PLAN:	03/06/2020
HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	3 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

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N

M.G.A

ADJOINS SHEET 3

ADJOINS SHEET 5

COPE STREET

PRIMUS Ø100 PVC (QL-A)
0.50m TOP OF PIPE
RL 15.640

PRIMUS Ø100 PVC (QL-A)
0.55m TOP OF PIPE
RL 15.555

OPTIC FIBRE Ø100 PVC (QL-A)
0.44m TOP OF PIPE
RL 15.384

TELSTRA Ø50 PVC (QL-A)
0.34m TOP OF PIPE
RL 15.484

TELSTRA Ø50 PVC (QL-A)
0.32m TOP OF PIPE
RL 15.546

TELSTRA Ø50 PVC (QL-A)
0.10m TOP OF PIPE
RL 15.689

TELSTRA Ø50 PVC (QL-A)
0.15m TOP OF PIPE
RL 15.635

TELSTRA Ø50 PVC (QL-A)
0.14m TOP OF PIPE
RL 15.551

TELSTRA Ø50 PVC (QL-A)
0.47m TOP OF PIPE
RL 15.439

TELSTRA Ø50 PVC (QL-B)
0.2 to 0.5m TOP OF PIPE

TELSTRA Ø50 PVC (QL-A)
0.34m TOP OF PIPE
RL 15.473

NBN Ø100 PVC (QL-A)
0.44m TOP OF PIPE
RL 15.373

PRIMUS Ø100 PVC (QL-B)
0.55 to 1.0m TOP OF PIPE

TELSTRA Ø50 PVC (QL-B)
0.1 to 0.5m TOP OF PIPE

NBN Ø100 PVC (QL-B)
0.3 to 0.4m TOP OF PIPE

PRIMUS Ø100 PVC (QL-D)
AS PER DBYD

TELSTRA Ø100 PVC (QL-A)
0.47m TOP OF PIPE
RL 15.562

TELSTRA Ø50 PVC (QL-B)
0.1 to 0.3m TOP OF PIPE

TELSTRA Ø50 PVC (QL-A)
0.47m TOP OF PIPE
RL 15.209

TELSTRA Ø50 PVC (QL-A)
0.25m TOP OF PIPE
RL 15.790

TELSTRA Ø100 (QL-A)
0.45m TOP OF PIPE
RL 15.509

NBN Ø100 PVC (QL-A)
0.44m TOP OF PIPE
RL 15.470

TELSTRA Ø100 PVC (QL-A)
0.4m TOP OF PIPE
RL 15.644

TELSTRA Ø100 PVC (QL-B)
0.5m TOP OF PIPE

TELSTRA Ø50 PVC (QL-B)
0.1 to 0.4m TOP OF PIPE

TELSTRA Ø50 PVC (QL-B)
0.1 to 0.2m TOP OF PIPE

TELSTRA Ø100 PVC (QL-B)
0.4 to 0.5m TOP OF PIPE

TELSTRA Ø100 PVC (QL-A)
0.44m TOP OF PIPE
RL 15.475

TELSTRA Ø50 PVC (QL-B)
0.1 to 0.3m TOP OF PIPE

TELSTRA Ø50 PVC (QL-B)
0.1 to 0.5m TOP OF PIPE

TELSTRA Ø50 PVC (QL-A)
0.22m TOP OF PIPE
RL 15.429

TELSTRA Ø50 PVC (QL-A)
0.32m TOP OF PIPE
RL 15.600

TELSTRA Ø50 PVC (QL-A)
0.22m TOP OF PIPE
RL 15.420

TELSTRA Ø50 PVC (QL-A)
0.13m TOP OF PIPE
RL 15.507

TELSTRA Ø50 PVC (QL-B)
0.1 to 0.2m TOP OF PIPE

ISSUE	DATE	AMMENDMENT	BY
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JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

TELEPHONY AND COMMS

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	4 OF 75

JOB NUMBER
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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

TELEPHONY AND COMMS

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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ORIGINAL SIZE :	A3	SHEET:	5 OF 75

JOB NUMBER
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ADJOINS SHEET 5

ADJOINS SHEET 8

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N

MGA94

COPE STREET

WELLINGTON STREET

OPTIC FIBRE Ø50 PVC (QL-A)
0.5m TOP OF PIPE
RL 14.348

OPTIC FIBRE Ø50 PVC (QL-A)
0.25m TOP OF PIPE
RL 14.601

OPTIC FIBRE Ø50 PVC (QL-A)
0.5m TOP OF PIPE
RL 14.358

OPTIC FIBRE Ø50 PVC (QL-A)
0.42m TOP OF PIPE
RL 14.402

OPTIC FIBRE Ø50 PVC (QL-A)
0.22m TOP OF PIPE
RL 14.629

OPTIC FIBRE Ø50 PVC (QL-A)
0.25m TOP OF PIPE
RL 14.661

TELSTRA Ø50 PVC (QL-A)
0.2m TOP OF PIPE
RL 14.727

TELSTRA Ø50 PVC (QL-B)
0.2 to 0.25m TOP OF PIPE

TELSTRA 20X Ø100 AC (QL-B)
0.7 to 1.01m TOP OF PIPE
UTL QL-A (CONFINED SPACE)

OPTIC FIBRE Ø20 PVC (QL-A)
0.2m TOP OF PIPE
RL 14.724

OPTIC FIBRE Ø20 PVC (QL-A)
0.15m TOP OF PIPE
RL 14.756

TPG 4X5 Ø100 AC (QL-B)
0.7 to 1.3m TOP OF PIPE

TELSTRA Ø50 PVC (QL-A)
0.12m TOP OF PIPE
RL 14.761

TELSTRA Ø50 PVC (QL-A)
0.12m TOP OF PIPE
RL 14.764

TELSTRA Ø20 PVC (QL-A)
0.2m TOP OF PIPE
RL 14.683

TELSTRA Ø50 PVC (QL-B)
0.29m TOP OF PIPE

TELSTRA Ø50 PVC (QL-A)
0.18m TOP OF PIPE

TELSTRA 2X Ø50 PVC (QL-A)
0.2m TOP OF PIPE

TELSTRA Ø20 PVC (QL-B)
0.2 to 0.4m TOP OF PIPE

TPG Ø100 AC (QL-A)
0.55m TOP OF PIPE
RL 14.219

PRIMUS Ø100 PVC (QL-D)
AS PER DBYD

TPG 4X5 Ø100 AC (QL-B)
0.7 to 1.3m TOP OF PIPE
UTL QL-A (CONFINED SPACE)

TELSTRA Ø100 PVC (QL-A)
0.47m TOP OF PIPE
RL 14.353

TELSTRA Ø50 PVC (QL-A)
0.38m TOP OF PIPE
RL 14.495

TELSTRA Ø20 CI (QL-B)
0.2 to 0.3m TOP OF PIPE

TELSTRA Ø50 PVC (QL-B)
0.2m TOP OF PIPE

PRIMUS Ø100 PVC (QL-D)
AS PER DBYD

PRIMUS Ø100 PVC (QL-D)
AS PER DBYD

TELSTRA Ø40 RC (QL-A)
0.12m TOP OF PIPE
RL 14.811

TELSTRA Ø40 RC (QL-A)
0.13m TOP OF PIPE
RL 14.803

TELSTRA 20X Ø100 AC (QL-B)
0.6 to 1.01m TOP OF PIPE
UTL QL-A (CONFINED SPACE)

TPG Ø100 AC (QL-A)
0.5m TOP OF PIPE
RL 14.257

TPG Ø50 PVC (QL-A)
0.17m TOP OF PIPE
RL 14.591

TPG Ø100 PVC (QL-A)
0.38m TOP OF PIPE
RL 14.434

TELSTRA Ø100 PVC (QL-A)
0.5m TOP OF PIPE
RL 14.319

TELSTRA Ø100 PVC (QL-A)
0.37m TOP OF PIPE
RL 14.494

TELSTRA Ø20 CI (QL-A)
0.28m TOP OF PIPE
RL 14.595

TELSTRA Ø50 PVC (QL-A)
0.4m TOP OF PIPE
RL 14.544

TELSTRA Ø50 PVC (QL-A)
0.55m TOP OF PIPE
RL 14.419

TPG Ø50 PVC (QL-A)
0.5m TOP OF PIPE
RL 14.476

TPG Ø50 PVC (QL-A)
0.5m TOP OF PIPE
RL 14.476

TELSTRA Ø50 PVC (QL-A)
0.46m TOP OF PIPE
RL 14.453

TELSTRA Ø50 PVC (QL-A)
0.38m TOP OF PIPE
RL 14.523

TPG Ø100 PVC (QL-A)
0.38m TOP OF PIPE
RL 14.475

TPG Ø50 PVC (QL-A)
0.22m TOP OF PIPE
RL 14.637

TELSTRA Ø50 PVC (QL-B)
0.1m TOP OF PIPE

TPG Ø50 PVC (QL-B)
0.5m TOP OF PIPE
EOT (TRACE ROD OBSTRUCTED)

TPG Ø50 PVC (QL-D)
AS PER DBYD

TELSTRA Ø50 PVC (QL-A)
0.1m TOP OF PIPE
RL 15.082

TELSTRA Ø50 PVC (QL-A)
0.45m TOP OF PIPE
RL 14.734

TELSTRA Ø50 PVC (QL-A)
0.2m TOP OF PIPE
RL 14.984

TELSTRA Ø50 PVC (QL-B)
0.34m TOP OF PIPE

TELSTRA 20X Ø100 AC (QL-B)
0.6 to 1.01m TOP OF PIPE

TELSTRA Ø50 PVC (QL-A)
0.45m TOP OF PIPE
RL 14.739

TELSTRA Ø50 PVC (QL-A)
0.4m TOP OF PIPE
RL 14.781

TELSTRA Ø100 PVC (QL-B)
0.5 to 0.6m TOP OF PIPE

TSP

OFP

ADJOINS SHEET 7

ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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PROJECT TITLE

WATERLOO STATION

TELEPHONY AND COMMS

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SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	6 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
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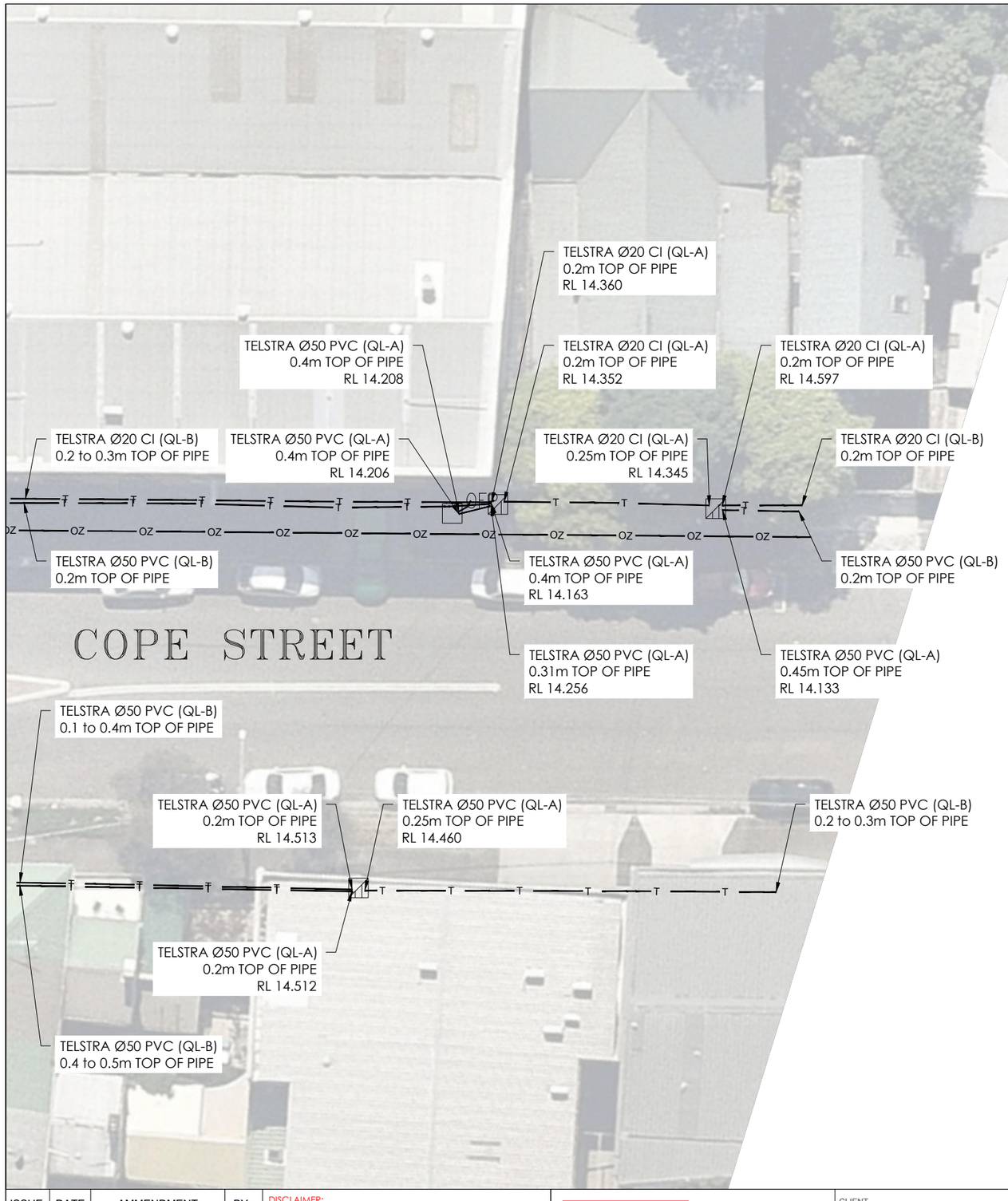

ADJOINS SHEET 7

N

M.G.A

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N

M.G.A

TELSTRA Ø50 PVC (QL-B)
0.14 to 0.4m TOP OF PIPE

NBN Ø100 PVC (QL-A)
0.36m TOP OF PIPE
RL 14.848

NBN Ø50 PVC (QL-B)
0.45m TOP OF PIPE
RL 14.704

TELSTRA Ø50 PVC (QL-A)
0.22m TOP OF PIPE
RL 15.037

NBN Ø100 PVC (QL-A)
0.48m TOP OF PIPE
RL 14.745

TELSTRA Ø100 PVC (QL-B)
0.47 to 0.6m TOP OF PIPE

NBN Ø50 PVC (QL-A)
0.46m TOP OF PIPE
RL 14.772

TELSTRA 2X Ø100 PVC (QL-A)
0.47m TOP OF PIPE

NBN Ø100 PVC (QL-A)
0.36m TOP OF PIPE
RL 14.884

TELSTRA Ø50 PVC (QL-A)
0.15m TOP OF PIPE
RL 15.140

NBN Ø100 PVC (QL-A)
0.37m TOP OF PIPE
RL 14.887

TELSTRA Ø50 PVC (QL-B)
0.26 to 0.45m TOP OF PIPE

TELSTRA (QL-B)
0.5 to 0.55m TOP OF PIPE

TELSTRA Ø32 PVC (QL-B)
0.4 to 0.46m TOP OF PIPE

CONFINED SPACE

TELSTRA Ø32 PVC (QL-A)
0.25m TOP OF PIPE
RL 14.939

TELSTRA 3X Ø100 E (QL-B)
0.6 to 0.8m TOP OF PIPE

NBN Ø100 PVC (QL-B)
0.38 to 0.6m TOP OF PIPE

TELSTRA Ø32 PVC (QL-A)
0.3m TOP OF PIPE
RL 14.890

TELSTRA 4X3 Ø100 PVC (QL-B)
1.2 to 1.4m TOP OF PIPE

TELSTRA Ø50 PVC (QL-A)
0.48m TOP OF PIPE
RL 14.714

TELSTRA Ø32 CICL (QL-A)
0.3m TOP OF PIPE
RL 14.878

NBN Ø100 PVC (QL-A)
0.45m TOP OF PIPE
RL 14.850

TELSTRA 4X3 Ø100 PVC (QL-B)
1.2 to 1.4m TOP OF PIPE

TELSTRA Ø20 PVC (QL-B)
0.1m TOP OF PIPE

TELSTRA Ø100 PVC (QL-A)
0.5m TOP OF PIPE
RL 14.808

NBN Ø100 PVC (QL-C)
0.5m TOP OF PIPE

CONFINED SPACE

TELSTRA 4X4 Ø100 AC (QL-B)
1.4 to 1.6m TOP OF PIPE
UTL QL-A (CONFINED SPACE)

TELSTRA Ø150 PVC (QL-B)
0.3m TOP OF PIPE

TELSTRA Ø32 PVC (QL-B)
0.2 to 0.3m TOP OF PIPE
RL 15.105

TELSTRA Ø20 PVC (QL-B)
0.2m TOP OF PIPE

TELSTRA Ø20 PVC (QL-A)
0.18m TOP OF PIPE
RL 15.156

TELSTRA Ø50 PVC (QL-A)
0.33m TOP OF PIPE
RL 15.008

TELSTRA Ø50 PVC (QL-A)
0.2m TOP OF PIPE
RL 15.141

TELSTRA Ø50 PVC (QL-A)
0.3m TOP OF PIPE
RL 15.115

TELSTRA Ø50 PVC (QL-A)
0.22m TOP OF PIPE
RL 15.192

TELSTRA 3X Ø90 E (QL-B)
0.5 to 0.62m TOP OF PIPE

NBN Ø100 PVC (QL-A)
0.5m TOP OF PIPE
RL 14.837

NBN Ø50 PVC (QL-A)
0.5m TOP OF PIPE
RL 14.872

TELSTRA 3X Ø90 E (QL-B)
0.5 to 0.62m TOP OF PIPE

TELSTRA Ø100 PVC (QL-B)
0.5m TOP OF PIPE

TELSTRA Ø100 PVC (QL-A)
0.49m TOP OF PIPE
RL 14.685

TELSTRA Ø50 PVC (QL-A)
0.41m TOP OF PIPE
RL 14.804

TELSTRA Ø50 PVC (QL-A)
0.41m TOP OF PIPE
RL 14.783

TELSTRA Ø100 PVC (QL-A)
0.48m TOP OF PIPE
RL 14.723

TELSTRA Ø100 PVC (QL-A)
0.4m TOP OF PIPE
RL 14.920

TELSTRA 2X Ø100 PVC (QL-A)
0.2m TOP OF PIPE
RL 15.117

CONFINED SPACE

TELSTRA 2X Ø100 PVC (QL-B)
0.4m TOP OF PIPE

TELSTRA Ø100 AC (QL-A)
0.59m TOP OF PIPE
RL 14.844

TELSTRA Ø100 AC (QL-A)
0.59m TOP OF PIPE
RL 14.853

TELSTRA 2X Ø100 PVC (QL-A)
0.5m TOP OF PIPE
RL 14.854

TELSTRA Ø100 PVC (QL-A)
0.5m TOP OF PIPE
RL 14.887

TELSTRA 3X Ø100 AC (QL-A)
1.2m TOP OF PIPE
RL 14.218

TELSTRA Ø100 PVC (QL-A)
0.35m TOP OF PIPE
RL 15.091

TELSTRA Ø20 PVC (QL-A)
0.47m TOP OF PIPE
RL 14.999

TELSTRA Ø20 PVC (QL-A)
0.35m TOP OF PIPE
RL 15.153

TELSTRA Ø20 PVC (QL-A)
0.25m TOP OF PIPE
RL 15.220

TELSTRA Ø20 PVC (QL-A)
0.3m TOP OF PIPE
RL 15.239

TELSTRA Ø50 PVC (QL-A)
0.2m TOP OF PIPE
RL 15.319

TELSTRA Ø100 AC (QL-A)
0.2m TOP OF PIPE
RL 15.297

TELSTRA Ø100 AC (QL-B)
0.2m TOP OF PIPE

TELSTRA Ø50 PVC (QL-A)
0.2m TOP OF PIPE
RL 15.311

TELSTRA Ø40 PVC (QL-A)
0.38m TOP OF PIPE
RL 14.940

TELSTRA Ø50 PVC (QL-A)
0.36m TOP OF PIPE
RL 14.993

TELSTRA Ø100 AC (QL-B)
0.55 to 0.6m TOP OF PIPE
UTL QL-A (CONFINED SPACE)

TELSTRA Ø50 PVC (QL-A)
0.2m TOP OF PIPE
RL 15.266

TELSTRA Ø50 PVC (QL-B)
0.18 to 0.33m TOP OF PIPE

TELSTRA Ø50 PVC (QL-A)
0.2m TOP OF PIPE
RL 14.962

TELSTRA (QL-A)
0.25m TOP OF PIPE
RL 14.900

TELSTRA Ø50 PVC (QL-B)
0.2 to 0.25m TOP OF PIPE

TELSTRA Ø50 PVC (QL-A)
0.3m TOP OF PIPE
RL 15.128

TELSTRA 2X Ø50 PVC (QL-C)

TELSTRA Ø20 PVC (QL-C)

TELSTRA Ø50 PVC (QL-C)

TELSTRA 2X Ø50 PVC (QL-A)
0.1m TOP OF PIPE
RL 15.231

TELSTRA Ø50 PVC (QL-A)
0.14m TOP OF PIPE
RL 15.185

TELSTRA Ø50 PVC (QL-A)
0.18m TOP OF PIPE
RL 15.027

TELSTRA Ø50 PVC (QL-A)
0.2m TOP OF PIPE
RL 15.063

TSP TDP TB OFP OU

BOTANY ROAD

WELLINGTON STREET

ADJOINS SHEET 6

ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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W: www.veris.com.au
ABN 53 615 735 727

CLIENT: JOHN HOLLAND

PROJECT TITLE: WATERLOO STATION
TELEPHONY AND COMMS

DRAWING TITLE: SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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THIS PLAN MUST BE READ IN CONJUNCTION WITH SHEET 1 FOR ADDITIONAL NOTES, WARNINGS & LEGEND

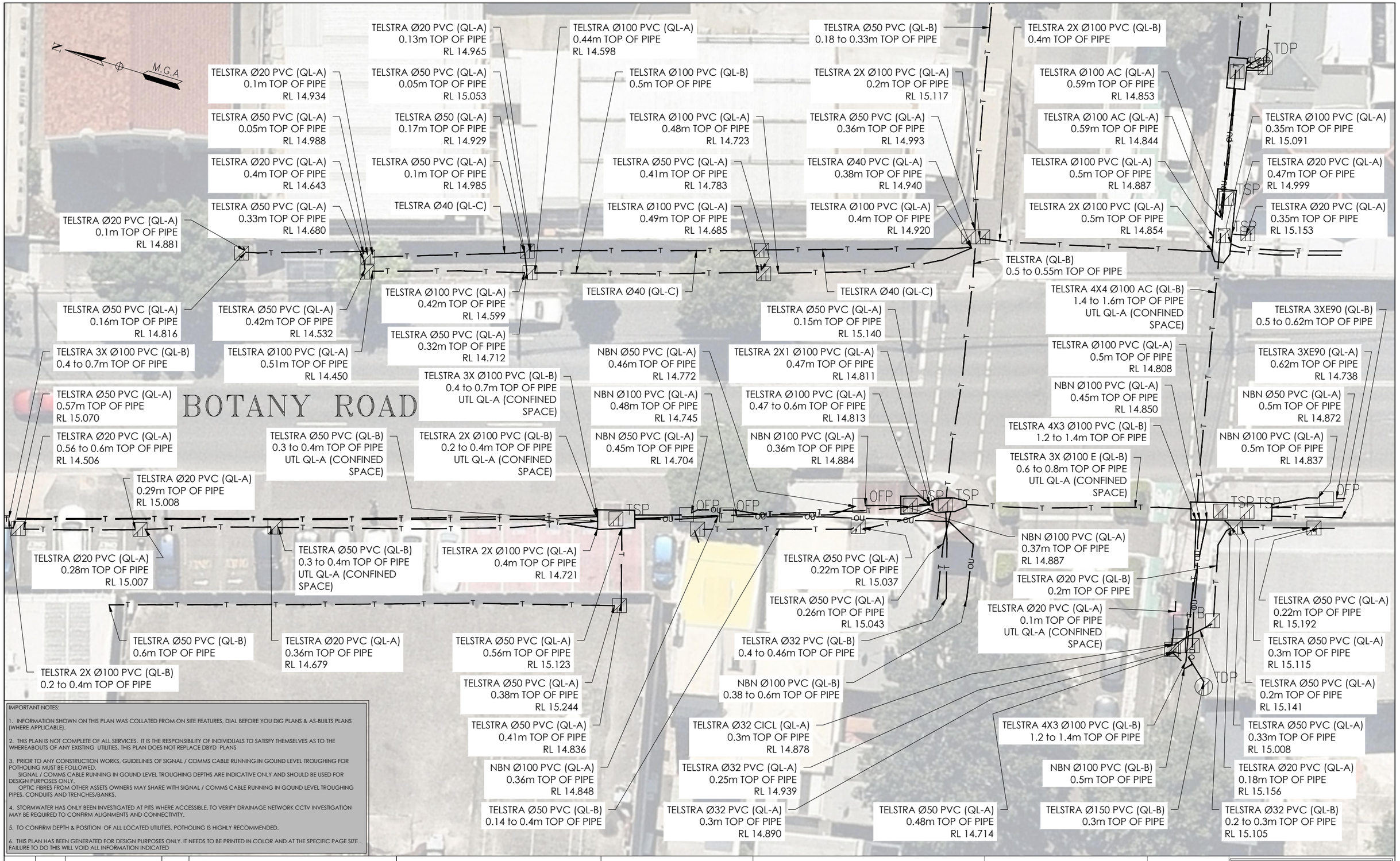
DATE OF SURVEY:	24/06/2020	DATE OF PLAN:	03/06/2020
HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	8 OF 75

JOB NUMBER: 202254

DRAWING NUMBER / ISSUE: 202254-UTILS-001A

ADJOINS SHEET 8

ADJOINS SHEET 10



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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

TELEPHONY AND COMMS

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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JOB NUMBER 202254

DRAWING NUMBER / ISSUE 202254-UTILS-001A

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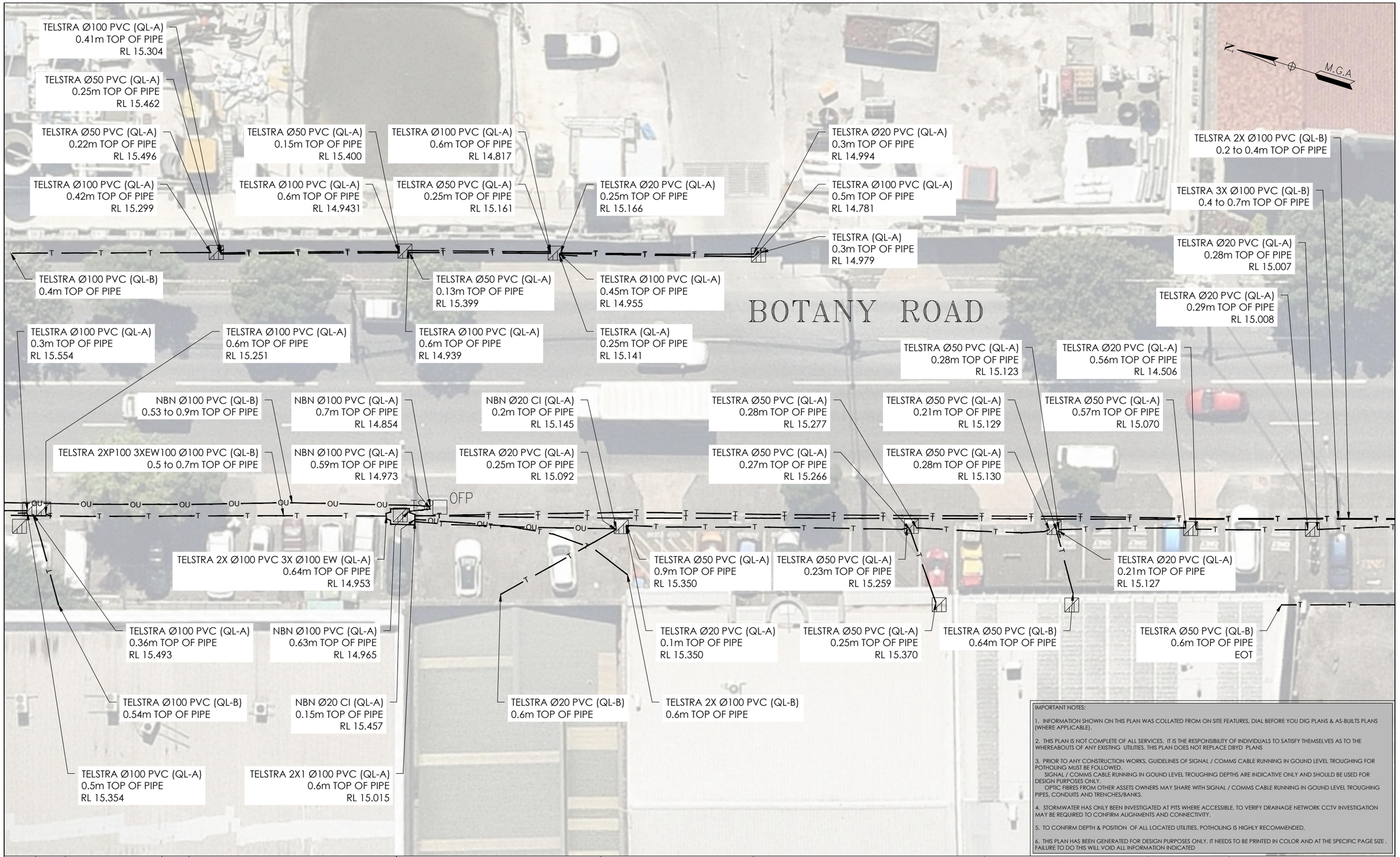
HEIGHT DATUM: AHD71	CO-ORD: MGA94
DBYD JOB# : 19449303/22/34	DBYD DATE: 30/04/2020
ORIGINAL SIZE : A3	SHEET: 9 OF 75



ADJOINS SHEET 11

ADJOINS SHEET 9

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PROJECT TITLE

WATERLOO STATION

TELEPHONY AND COMMS

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
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ORIGINAL SIZE :	A3	SHEET:	10 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 9

ADJOINS SHEET 12

ADJOINS SHEET 10

TELSTRA Ø100 (QL-B)
0.5m TOP OF PIPE
UTL QL-A
(CONFINED SPACE)

TELSTRA Ø50 (QL-B)
0.3m TOP OF PIPE
UTL QL-A (CONFINED
SPACE)

TELSTRA 2x2 Ø100 (QL-B)
0.5m TOP OF PIPE
UTL QL-A (CONFINED
SPACE)

TELSTRA Ø80 PVC (QL-A)
0.7m TOP OF PIPE
RL 16.014

TDP

TELSTRA Ø50 PVC (QL-A)
0.25m TOP OF PIPE
RL 16.425

TELSTRA 2X2 Ø100 PVC (QL-A)
0.53m TOP OF PIPE
RL 16.037

TELSTRA Ø100 PVC (QL-A)
0.29m TOP OF PIPE
RL 16.388

TELSTRA Ø100 PVC (QL-A)
0.6m TOP OF PIPE
RL 16.010

TELSTRA 2X2 Ø100 PVC (QL-A)
0.46m TOP OF PIPE
RL 16.137

TELSTRA Ø100 PVC (QL-A)
0.4m TOP OF PIPE
RL 16.212

TELSTRA Ø100 PVC (QL-A)
0.5m TOP OF PIPE
RL 16.171

TELSTRA Ø100 PVC (QL-D)
(GPR)

TELSTRA Ø100 PVC (QL-D)
(GPR)

TELSTRA 3X2 (QL-A)
1.5m TOP OF PIPE
RL 15.196

TELSTRA Ø100 PVC (QL-A)
0.57m TOP OF PIPE
RL 16.189

TELSTRA 3X2 Ø100 AC (QL-A)
1.4m TOP OF PIPE
RL 15.395

TELSTRA Ø20 PVC (QL-A)
0.3m TOP OF PIPE
RL 16.493

TELSTRA Ø50 PVC (QL-A)
0.27m TOP OF PIPE
RL 16.560

NBN Ø50 PVC (QL-A)
0.3m TOP OF PIPE
RL 16.538

TELSTRA Ø100 PVC (QL-A)
0.25m TOP OF PIPE
RL 16.095

TELSTRA Ø50 PVC (QL-A)
0.2m TOP OF PIPE
RL 16.128

TELSTRA 4X Ø100 PVC (QL-A)
1.01m TOP OF PIPE
RL 15.376

TELSTRA Ø100 PVC (QL-A)
0.5m TOP OF PIPE
RL 16.053

TELSTRA 3X Ø90 (QL-A)
0.6m TOP OF PIPE
RL 15.797

TELSTRA Ø100 PVC (QL-A)
0.4m TOP OF PIPE
RL 15.998

TELSTRA Ø32 PVC (QL-A)
0.3m TOP OF PIPE
RL 16.539

TELSTRA 2X1 Ø100 PVC (QL-A)
0.8m TOP OF PIPE
RL 16.038

TELSTRA Ø50 PVC (QL-A)
0.3m TOP OF PIPE
RL 16.531

TELSTRA Ø50 AC (QL-A)
0.3m TOP OF PIPE
RL 16.030

TELSTRA Ø50 AC (QL-A)
0.15m TOP OF PIPE
RL 15.976

TELSTRA Ø50 AC (QL-A)
0.15m TOP OF PIPE
RL 15.990

TELSTRA Ø100 PVC (QL-A)
0.3m TOP OF PIPE
RL 15.936

TELSTRA 4X Ø100 PVC (QL-A)
0.43m TOP OF PIPE
RL 15.809

TELSTRA Ø50 PVC (QL-A)
0.24m TOP OF PIPE
RL 16.033

TELSTRA Ø100 PVC (QL-A)
0.31m TOP OF PIPE
RL 15.969

NEXTGEN Ø100 PVC (QL-B)
0.6 to 1.1m TOP OF PIPE

TELSTRA Ø100 PVC (QL-A)
0.42m TOP OF PIPE
RL 15.746

TELSTRA Ø100 PVC (QL-A)
0.4m TOP OF PIPE
RL 15.998

TELSTRA 2X Ø100 PVC 3X Ø100 EW (QL-B)
0.6m TOP OF PIPE

TELSTRA Ø100 PVC (QL-B)
0.3 to 0.6m TOP OF PIPE

NBN Ø100 PVC (QL-A)
0.5m TOP OF PIPE
RL 15.876
(BLOCKED)

TELSTRA PVC (QL-A)
0.1m TOP OF PIPE
RL 15.915

TELSTRA Ø50 PVC (QL-A)
0.29m TOP OF PIPE
RL 15.713

TELSTRA Ø50 AC (QL-A)
0.1m TOP OF PIPE
RL 15.915

TELSTRA PVC (QL-A)
0.1m TOP OF PIPE
RL 15.915

TELSTRA Ø50 PVC (QL-A)
0.29m TOP OF PIPE
RL 15.713

TELSTRA Ø50 AC (QL-A)
0.1m TOP OF PIPE
RL 15.915

TELSTRA Ø100 PVC (QL-A)
0.26m TOP OF PIPE
RL 15.873

TELSTRA Ø100 PVC (QL-A)
0.42m TOP OF PIPE
RL 15.707

TELSTRA Ø50 PVC (QL-A)
0.3m TOP OF PIPE
RL 15.616

TELSTRA Ø50 PVC (QL-A)
0.15m TOP OF PIPE
RL 15.804

TELSTRA Ø50 PVC (QL-A)
0.2m TOP OF PIPE
RL 15.752

TELSTRA Ø100 PVC (QL-A)
0.4m TOP OF PIPE
RL 15.546

TELSTRA Ø100 PVC (QL-A)
0.37m TOP OF PIPE
RL 15.481

TELSTRA Ø50 PVC (QL-A)
0.3m TOP OF PIPE
RL 15.540

TELSTRA Ø100 PVC (QL-A)
0.5m TOP OF PIPE
RL 15.544

TELSTRA Ø100 PVC (QL-A)
0.6m TOP OF PIPE
RL 15.444

TELSTRA Ø100 PVC (QL-A)
0.5m TOP OF PIPE
RL 15.355

TELSTRA Ø100 PVC (QL-A)
0.49m TOP OF PIPE
RL 15.350

TELSTRA Ø100 PVC (QL-A)
0.42m TOP OF PIPE
RL 15.299

TELSTRA Ø100 PVC (QL-B)
0.4m TOP OF PIPE

TELSTRA Ø100 PVC (QL-A)
0.3m TOP OF PIPE
RL 15.554

TELSTRA Ø100 PVC (QL-A)
0.36m TOP OF PIPE
RL 15.493

TELSTRA Ø100 PVC (QL-A)
0.6m TOP OF PIPE
RL 15.251

TELSTRA Ø100 PVC (QL-A)
0.54m TOP OF PIPE
RL 15.314

TELSTRA Ø100 PVC (QL-A)
0.5m TOP OF PIPE
RL 15.354

NEXTGEN Ø100 PVC (QL-B)
0.53 to 0.9m TOP OF PIPE

TELSTRA 2X Ø100 PVC 3X Ø100 EW (QL-B)
0.5 to 0.7m TOP OF PIPE

BOTANY ROAD

M.G.A

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5. TO CONFIRM DEPTH & POSITION OF ALL LOCATED UTILITIES, POTHOLING IS HIGHLY RECOMMENDED.

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ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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W: www.veris.com.au
ABN 53 615 735 727

CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

TELEPHONY AND COMMS

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

DIAL BEFORE YOU DIG www.1100.com.au

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THIS PLAN MUST BE READ IN CONJUNCTION WITH SHEET 1 FOR ADDITIONAL NOTES, WARNINGS & LEGEND

DATE OF SURVEY: 24/06/2020	DATE OF PLAN: 03/06/2020
HEIGHT DATUM: AHD71	CO-ORD: MGA94
DBYD JOB# : 19449303/22/34	DBYD DATE: 30/04/2020
ORIGINAL SIZE : A3	SHEET: 11 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 13

N
M.G.A

TELSTRA Ø32 PVC (QL-A)
0.2m TOP OF PIPE
RL 17.420

TELSTRA Ø32 PVC (QL-A)
0.2m TOP OF PIPE
RL 17.114

TELSTRA Ø80 PVC (QL-A)
0.42m TOP OF PIPE
RL 16.547

TELSTRA (QL-A)
0.65m TOP OF PIPE
RL 16.089

TELSTRA Ø50 PVC (QL-A)
0.45m TOP OF PIPE
RL 17.167

TELSTRA Ø50 PVC (QL-A)
0.5m TOP OF PIPE
RL 16.814

TELSTRA Ø100 PVC (QL-A)
0.22m TOP OF PIPE
RL 16.783

TELSTRA Ø150 PVC (QL-A)
0.35m TOP OF PIPE
RL 16.406

TELSTRA Ø20 PVC (QL-A)
0.15m TOP OF PIPE
RL 17.458

TELSTRA Ø32 PVC (QL-A)
0.16m TOP OF PIPE
RL 17.159

TELSTRA Ø100 PVC (QL-A)
0.3m TOP OF PIPE
RL 16.738

TELSTRA Ø80 PVC (QL-A)
0.7m TOP OF PIPE
RL 16.014

TDP

TELSTRA Ø50 PVC (QL-A)
0.4m TOP OF PIPE
RL 17.206

TELSTRA Ø20 PVC (QL-A)
0.16m TOP OF PIPE
RL 17.157

TELSTRA Ø32 PVC (QL-A)
0.15m TOP OF PIPE
RL 16.891

TELSTRA Ø20 PVC (QL-A)
0.32m TOP OF PIPE
RL 17.464

TELSTRA Ø50 PVC (QL-A)
0.5m TOP OF PIPE
RL 16.814

TELSTRA Ø50 PVC (QL-B)
0.2 to 0.3m TOP OF PIPE

TELSTRA Ø50 PVC (QL-A)
0.25m TOP OF PIPE
RL 16.425

TELSTRA Ø50 PVC (QL-A)
0.22m TOP OF PIPE
RL 17.583

TELSTRA Ø100 PVC (QL-A)
0.29m TOP OF PIPE
RL 16.388

TELSTRA Ø100 PVC (QL-B)
0.5 to 0.6m TOP OF PIPE

TELSTRA Ø50 PVC (QL-A)
0.3m TOP OF PIPE
RL 17.300

TELSTRA Ø50 PVC (QL-A)
0.4m TOP OF PIPE
RL 17.142

TELSTRA Ø32 PVC (QL-A)
0.2m TOP OF PIPE
RL 16.962

TELSTRA Ø100 CI (QL-A)
0.4m TOP OF PIPE
RL 16.632

TELSTRA Ø100 PVC (QL-D)
(GPR)

TELSTRA Ø50 PVC (QL-A)
0.4m TOP OF PIPE
RL 17.381

TELSTRA Ø50 PVC (QL-A)
0.15m TOP OF PIPE
RL 17.322

TELSTRA Ø32 PVC (QL-A)
0.12m TOP OF PIPE
RL 17.425

TELSTRA Ø50 PVC (QL-A)
0.4m TOP OF PIPE
RL 16.760

TELSTRA Ø100 (QL-A)
0.7m TOP OF PIPE
RL 16.337

TELSTRA 6X (QL-A)
1.5m TOP OF PIPE
RL 15.196
UTL

BOTANY ROAD

TELSTRA Ø100 PVC (QL-A)
0.47m TOP OF PIPE
RL 16.996

TELSTRA Ø50 PVC (QL-A)
0.45m TOP OF PIPE
RL 17.071

TELSTRA Ø100 PVC (QL-A)
0.3 to 0.5m TOP OF PIPE
RL 16.779

TELSTRA 3X Ø90 PVC 3X Ø100 PVC (QL-A)
0.9m TOP OF PIPE
RL 15.811

TELSTRA 6X Ø90 PVC 1X Ø100 PVC (QL-B)
0.4 to 0.5m TOP OF PIPE

TELSTRA Ø100 PVC (QL-A)
0.49m TOP OF PIPE
RL 16.971

TELSTRA Ø32 PVC (QL-A)
0.25m TOP OF PIPE
RL 17.273

TELSTRA Ø32 PVC (QL-A)
0.3m TOP OF PIPE
RL 16.867

TELSTRA Ø100 AC (QL-A)
0.45m TOP OF PIPE
RL 16.270

RAGLAN STREET

TB

TELSTRA Ø100 PVC (QL-A)
0.45m TOP OF PIPE
RL 17.596

TELSTRA Ø32 PVC (QL-A)
0.2m TOP OF PIPE
RL 16.854

TELSTRA Ø100 PVC (QL-A)
0.6m TOP OF PIPE
RL 16.177

TELSTRA 6X Ø90 PVC 1X Ø100 PVC (QL-A)
1.4m TOP OF PIPE
RL 16.053

TELSTRA Ø100 PVC (QL-A)
0.5m TOP OF PIPE
RL 16.992

TELSTRA Ø100 AC (QL-A)
1.05m TOP OF PIPE
RL 15.772

TELSTRA Ø32 PVC (QL-B)
0.25 to 0.3m TOP OF PIPE

TELSTRA Ø100 PVC (QL-A)
0.57m TOP OF PIPE
RL 16.887

TELSTRA
4X Ø85 PVC (QL-B)
0.35m TOP OF PIPE

TELSTRA
3 XØ90 PVC
3X Ø100 PVC (QL-A)
1.05m TOP OF PIPE
RL 15.777

TELSTRA Ø100 PVC (QL-A)
0.65m TOP OF PIPE
RL 16.793

NBN Ø100 PVC (QL-A)
0.6m TOP OF PIPE
RL 16.244

NBN Ø100 PVC (QL-A)
0.55m TOP OF PIPE
RL 16.281

TELSTRA 3X2 Ø100 (QL-A)
1.05m TOP OF PIPE
RL 16.331

NBN Ø150 PVC (QL-A)
0.5m TOP OF PIPE
RL 16.338

TELSTRA 4X Ø85 PVC (QL-B)
0.35m TOP OF PIPE

TELSTRA Ø50 PVC (QL-A)
0.36m TOP OF PIPE
RL 16.470

TELSTRA 3X2 Ø100 AC (QL-B)
0.74 to 1.8m TOP OF PIPE

TELSTRA Ø100 PVC (QL-B)
0.3 to 0.4m TOP OF PIPE

TELSTRA Ø100 PVC (QL-A)
0.8m TOP OF PIPE
RL 15.979

NBN Ø50 PVC (QL-B)
0.45 to 0.5m TOP OF PIPE

TELSTRA 3X2 Ø100 (QL-A)
0.72m TOP OF PIPE
RL 16.385

TELSTRA 5X Ø100 PVC
1X Ø20 PVC (QL-B)
0.3 to 0.75m TOP OF PIPE

NBN Ø100 PVC (QL-A)
0.42m TOP OF PIPE
RL 16.373

NBN Ø50 PVC (QL-D)
(GPR)

ADJOINS SHEET 11

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ISSUE	DATE	AMMENDMENT	BY
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CLIENT
JOHN HOLLAND

PROJECT TITLE
WATERLOO STATION
TELEPHONY AND COMMS

DRAWING TITLE
SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

DIAL BEFORE YOU DIG www.1100.com.au
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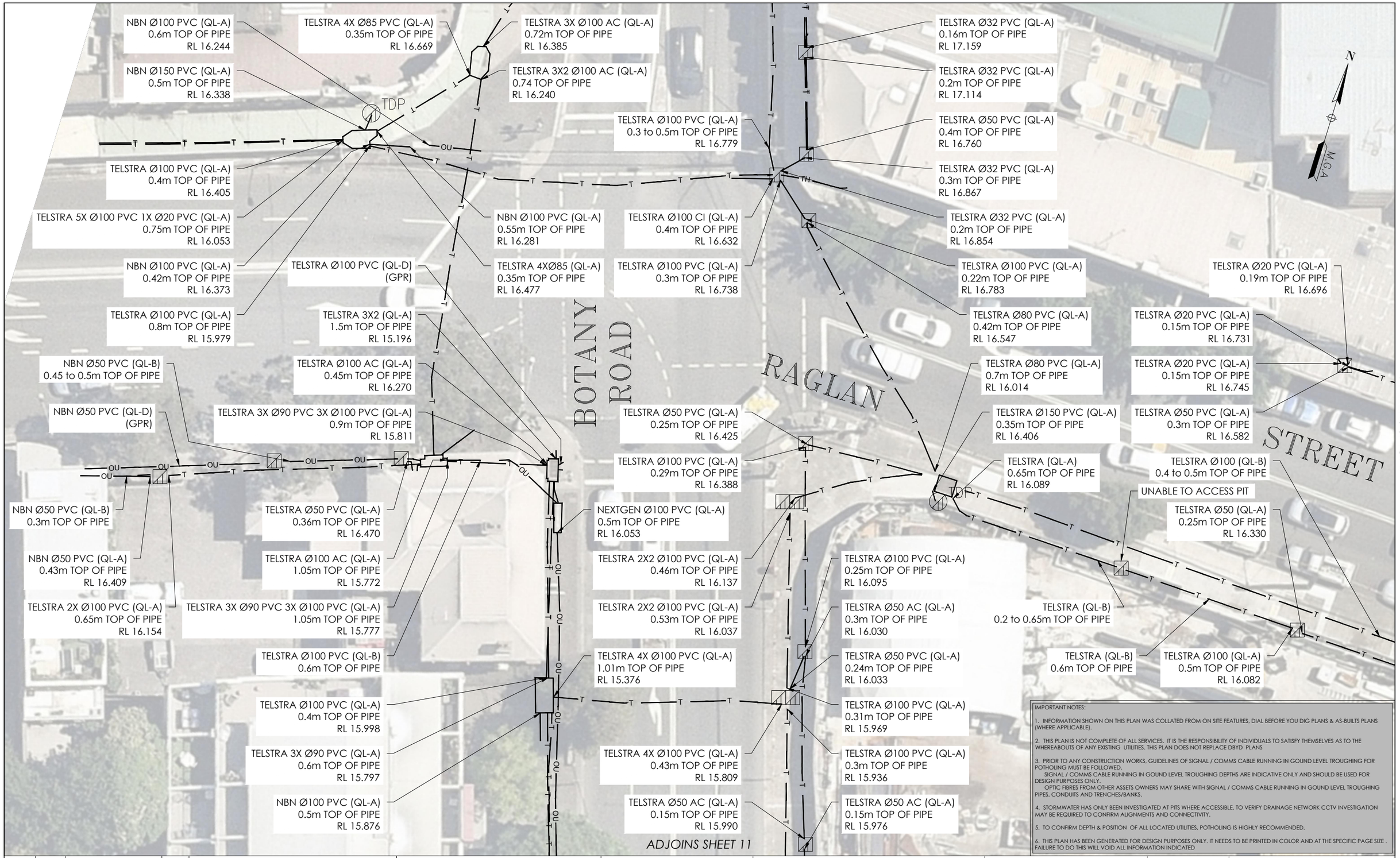
DATE OF SURVEY:	24/06/2020	DATE OF PLAN:	03/06/2020
HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	12 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 12



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CLIENT
JOHN HOLLAND

PROJECT TITLE
WATERLOO STATION
TELEPHONY AND COMMS

DRAWING TITLE
SUB-SURFACE UTILITY PLAN

SCALE IN METERS 1: 250 (0 2 4 6 8 10)

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

DIAL BEFORE YOU DIG www.1100.com.au

THIS PLAN DOES NOT REPLACE DBYD PLANS

JOB NUMBER
202254

THIS PLAN MUST BE READ IN CONJUNCTION WITH SHEET 1 FOR ADDITIONAL NOTES, WARNINGS & LEGEND

DATE OF SURVEY: 24/06/2020	DATE OF PLAN: 03/06/2020
HEIGHT DATUM: AHD71	CO-ORD: MGA94
DBYD JOB# : 19449303/22/34	DBYD DATE: 30/04/2020
ORIGINAL SIZE : A3	SHEET: 13 OF 75

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 3

ADJOINS SHEET 13

TELSTRA Ø50 PVC (QL-A)
0.24m TOP OF PIPE
RL 16.594

TELSTRA Ø20 PVC (QL-A)
0.16m TOP OF PIPE
RL 16.550

TELSTRA Ø50 PVC (QL-A)
0.45m TOP OF PIPE
RL 16.254

TELSTRA Ø50 PVC (QL-B)
0.2m TOP OF PIPE

TELSTRA Ø50 PVC (QL-A)
0.17m TOP OF PIPE
RL 16.533

TELSTRA Ø50 PVC (QL-A)
0.24m TOP OF PIPE
RL 16.580

TELSTRA Ø50 PVC (QL-A)
0.17m TOP OF PIPE
RL 16.487

TELSTRA Ø100 PVC (QL-B)
1.01 to 1.1m TOP OF PIPE

TELSTRA Ø50 PVC (QL-A)
0.15m TOP OF PIPE
RL 16.502

OFP

TELSTRA Ø100 (QL-A)
0.5m TOP OF PIPE
RL 16.082

TELSTRA Ø100 PVC (QL-A)
0.4m TOP OF PIPE
RL 16.216

TELSTRA Ø50 (QL-A)
0.25m TOP OF PIPE
RL 16.330

TELSTRA Ø50 PVC (QL-A)
0.42m TOP OF PIPE
RL 16.173

TELSTRA Ø100 (QL-B)
0.4 to 0.5m TOP OF PIPE

PRIMUS Ø100 PVC (QL-C)
SIGNAL LOST

TELSTRA Ø50 PVC (QL-A)
0.4m TOP OF PIPE
RL 16.123

TELSTRA (QL-B)
0.4 to 0.5m TOP OF PIPE
UNABLE TO ACCESS PIT

TELSTRA Ø20 PVC (QL-B)
0.4 to 0.5m TOP OF PIPE
EOT

TELSTRA Ø100 (QL-B)
0.4 to 0.5m TOP OF PIPE

TELSTRA Ø20 PVC (QL-A)
0.25m TOP OF PIPE
RL 16.131

TELSTRA Ø20 PVC (QL-A)
0.14m TOP OF PIPE
RL 16.227
EOT (EMPTY CONDUIT,
TRACE ROD UNABLE TO
NAVIGATE BEND)

COPE STREET

RAGLAN STREET

PRIMUS Ø100 PVC (QL-B)
2.0 to 2.1m TOP OF PIPE

OFP

NBN Ø100 PVC (QL-A)
0.4m TOP OF PIPE
RL 16.120

NBN Ø50 PVC (QL-A)
0.3m TOP OF PIPE
RL 16.480

NBN Ø100 PVC (QL-A)
0.3m TOP OF PIPE
RL 16.486

OFP

PRIMUS Ø100 PVC (QL-A)
0.50m TOP OF PIPE
RL 15.640

PRIMUS Ø100 PVC (QL-A)
0.55m TOP OF PIPE
RL 15.555

PRIMUS Ø100 PVC (QL-B)
0.55 to 0.8m TOP OF PIPE

TELSTRA Ø100 PVC (QL-B)
0.4 to 0.5m TOP OF PIPE

ADJOINS SHEET 4

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N

M.G.A

ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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CLIENT
JOHN HOLLAND

PROJECT TITLE
WATERLOO STATION
TELEPHONY AND COMMS

DRAWING TITLE
SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY: L.B.
SURVEYED BY: Y.M./A.D.
DRAFTED BY: J.V.
CHECKED BY: K.S./B.M./J.A.
APPROVED BY: D.M.

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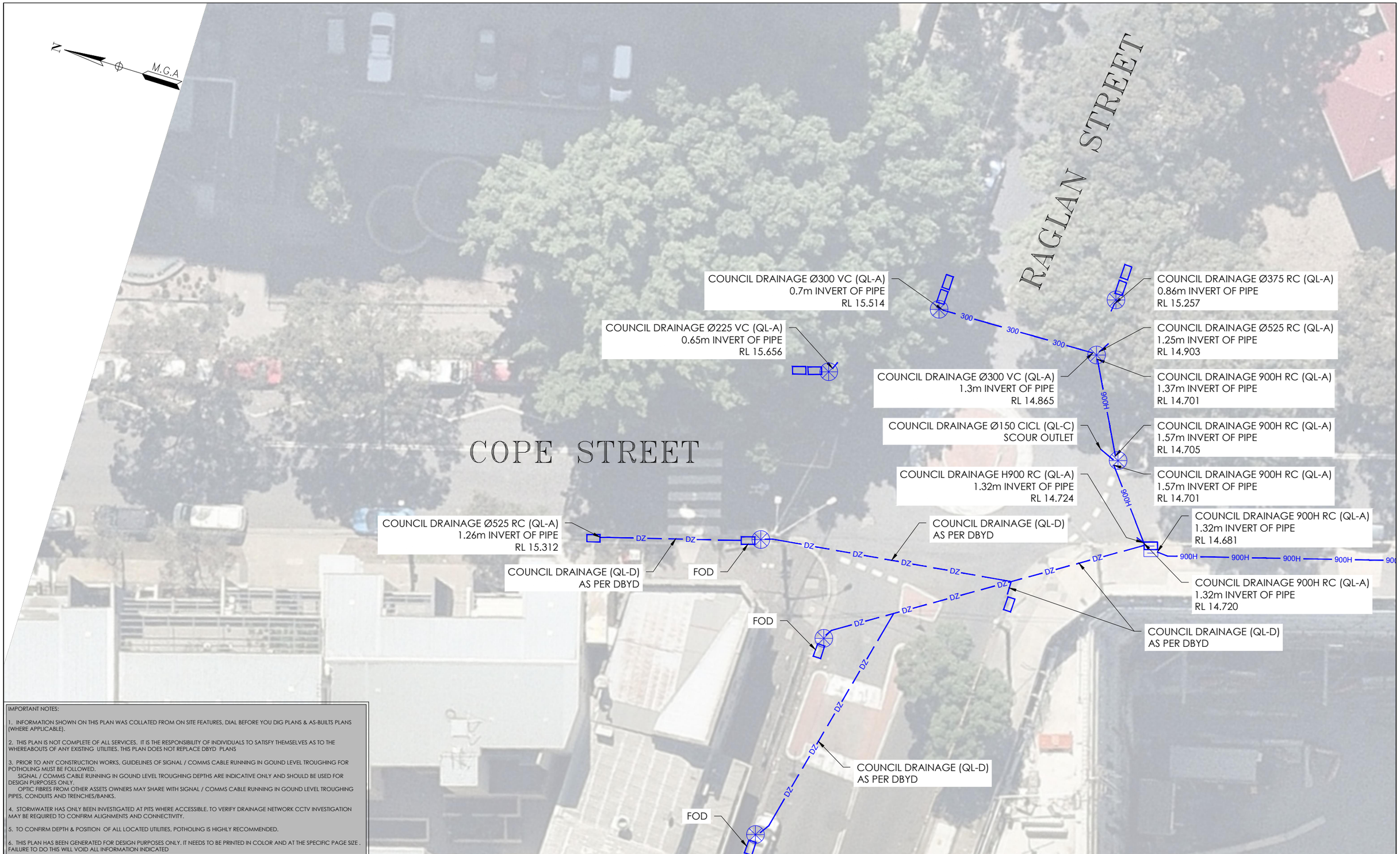
DATE OF SURVEY: 24/06/2020	DATE OF PLAN: 03/06/2020
HEIGHT DATUM: AHD71	CO-ORD: MGA94
DBYD JOB# : 19449303/22/34	DBYD DATE: 30/04/2020
ORIGINAL SIZE : A3	SHEET: 14 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A



ADJOINS SHEET 16

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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

DRAINAGE

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

DIAL BEFORE YOU DIG www.1100.com.au

THIS PLAN DOES NOT REPLACE DBYD PLANS

THIS PLAN MUST BE READ IN CONJUNCTION WITH SHEET 1 FOR ADDITIONAL NOTES, WARNINGS & LEGEND

DATE OF SURVEY:	24/06/2020	DATE OF PLAN:	03/06/2020
HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	15 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

IMPORTANT NOTES:

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ADJOINS SHEET 15

ADJOINS SHEET 17

ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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ABN 53 615 735 727

CLIENT
JOHN HOLLAND

PROJECT TITLE
WATERLOO STATION
DRAINAGE

DRAWING TITLE
SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY: L.B.
SURVEYED BY: Y.M./A.D.
DRAFTED BY: J.V.
CHECKED BY: K.S./B.M./J.A.
APPROVED BY: D.M.

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DATE OF SURVEY: 24/06/2020	DATE OF PLAN: 03/06/2020
HEIGHT DATUM: AHD71	CO-ORD: MGA94
DBYD JOB# : 19449303/22/34	DBYD DATE: 30/04/2020
ORIGINAL SIZE : A3	SHEET: 16 OF 75

JOB NUMBER 202254
DRAWING NUMBER / ISSUE 202254-UTILS-001A

ADJOINS SHEET 16

ADJOINS SHEET 18

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PROJECT TITLE

WATERLOO STATION

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DRAWING TITLE

SUB-SURFACE UTILITY PLAN

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SCALE IN METERS 1: 250

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SURVEYED BY:	Y.M./A.D.
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ORIGINAL SIZE :	A3	SHEET:	17 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
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ADJOINS SHEET 17

ADJOINS SHEET 20

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N

MGA

COPE STREET

WELLINGTON STREET

1.05H

COUNCIL DRAINAGE (QL-D)
AS PER DBYD

COUNCIL DRAINAGE (QL-D)
AS PER DBYD

COUNCIL DRAINAGE (QL-D)
AS PER DBYD

COUNCIL DRAINAGE (QL-D)
AS PER DBYD

COUNCIL DRAINAGE Ø600 RC (QL-A)
0.9m INVERT OF PIPE
RL 13.754

COUNCIL DRAINAGE Ø600 RC (QL-A)
0.95m INVERT OF PIPE
RL 13.735

COUNCIL DRAINAGE Ø600 RC (QL-A)
0.77m INVERT OF PIPE
RL 13.893

FOD

FOD

600

COUNCIL DRAINAGE 2X Ø150 PVC (QL-A)
0.25m INVERT OF PIPE
RL 14.430

COUNCIL DRAINAGE RC (QL-A)
0.47m INVERT OF PIPE
RL 14.288

COUNCIL DRAINAGE (QL-D)
AS PER DBYD

COUNCIL DRAINAGE Ø225 AC (QL-A)
0.67m INVERT OF PIPE
RL 13.865

COUNCIL DRAINAGE 900H RC (QL-A)
1.14m TOP OF PIPE
RL 13.461

COUNCIL DRAINAGE Ø150 PVC (QL-A)
0.0m INVERT OF PIPE
RL 14.709

COUNCIL DRAINAGE Ø150 PVC (QL-C)
0.15m INVERT OF PIPE

COUNCIL DRAINAGE 1.05H RC (QL-A)
1.5m TOP OF PIPE
RL 13.288

COUNCIL DRAINAGE 900H RC (QL-A)
1.14m TOP OF PIPE
RL 13.570

COUNCIL DRAINAGE 1.05H RC (QL-A)
1.5m TOP OF PIPE
RL 13.273

H006

CONFINED
SPACE

900

COUNCIL DRAINAGE Ø900 RC (QL-A)
1.28m TOP OF PIPE
RL 13.545

COUNCIL DRAINAGE Ø900 RC (QL-A)
1.3m TOP OF PIPE
RL 13.522

COUNCIL DRAINAGE 900H RC (QL-C)
1.36m TOP OF PIPE
UTL QL-A (CONFINED SPACE)

COUNCIL DRAINAGE Ø900 RC (QL-C)
1.35m TOP OF PIPE
UTL QL-A (CONFINED SPACE)

COUNCIL DRAINAGE Ø100 PVC (QL-A)
0.0m INVERT OF PIPE
RL 14.838

COUNCIL DRAINAGE Ø100 PVC (QL-C)

ADJOINS SHEET 19

ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

DRAINAGE

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	18 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 18

N
M.G.A

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PROJECT TITLE

WATERLOO STATION

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DRAFTED BY:	J.V.
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JOB NUMBER
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DRAWING NUMBER / ISSUE
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ADJOINS SHEET 21

ADJOINS SHEET 18

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JOB NUMBER
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ADJOINS SHEET 22

ADJOINS SHEET 20

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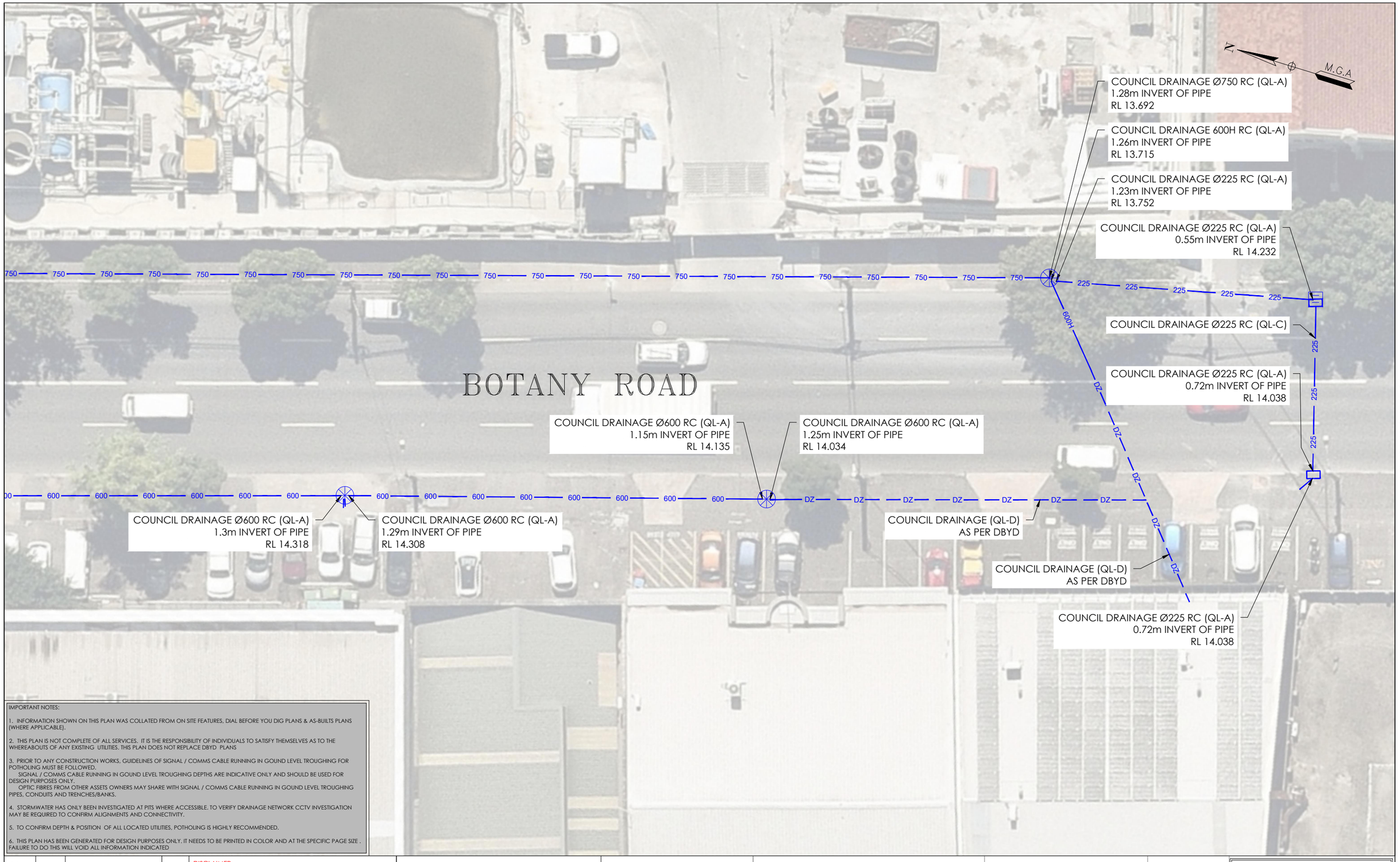

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ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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ABN 53 615 735 727

CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

DRAINAGE

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

DIAL BEFORE YOU DIG www.1100.com.au

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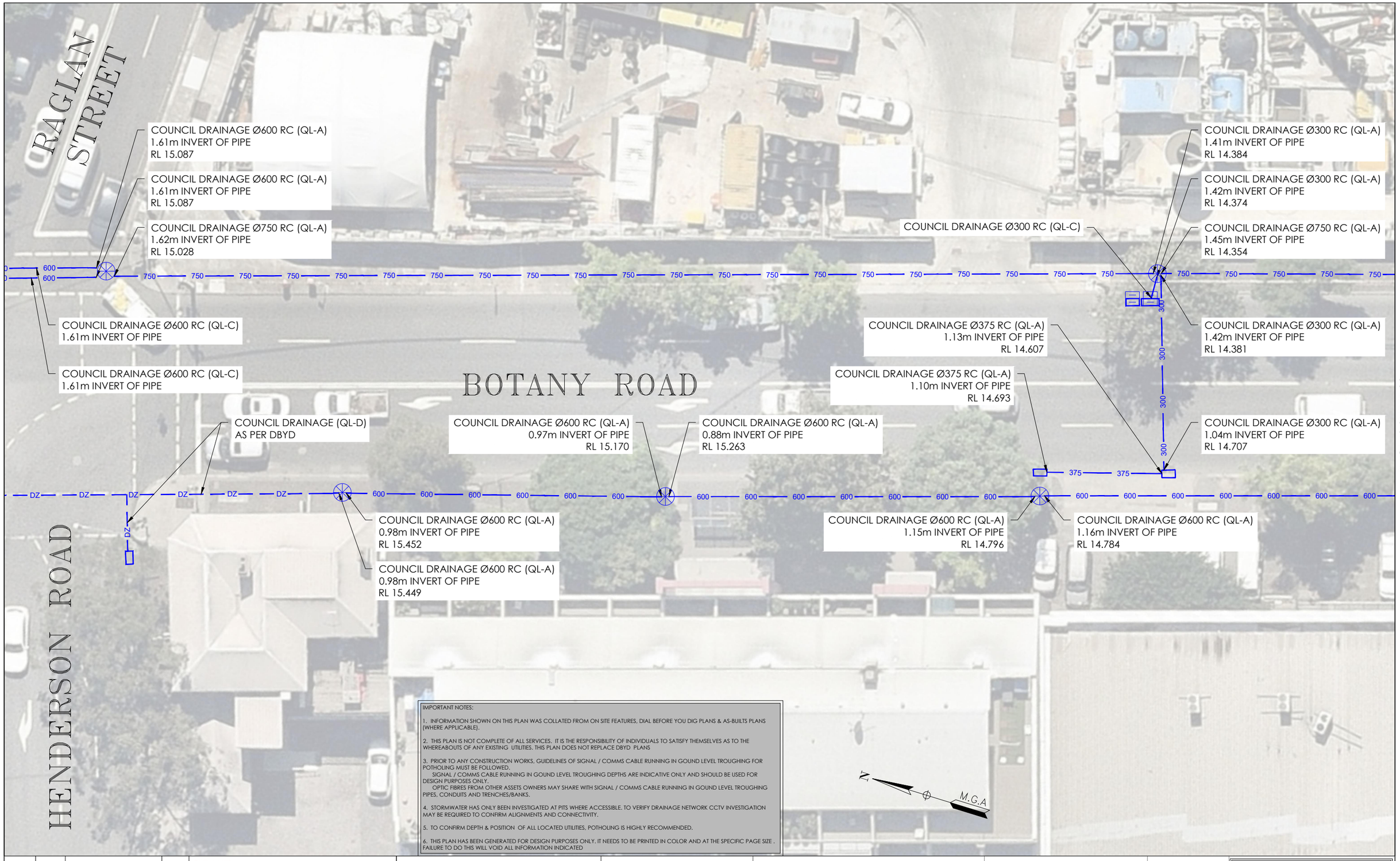
DATE OF SURVEY:	24/06/2020	DATE OF PLAN:	03/06/2020
HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	22 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A



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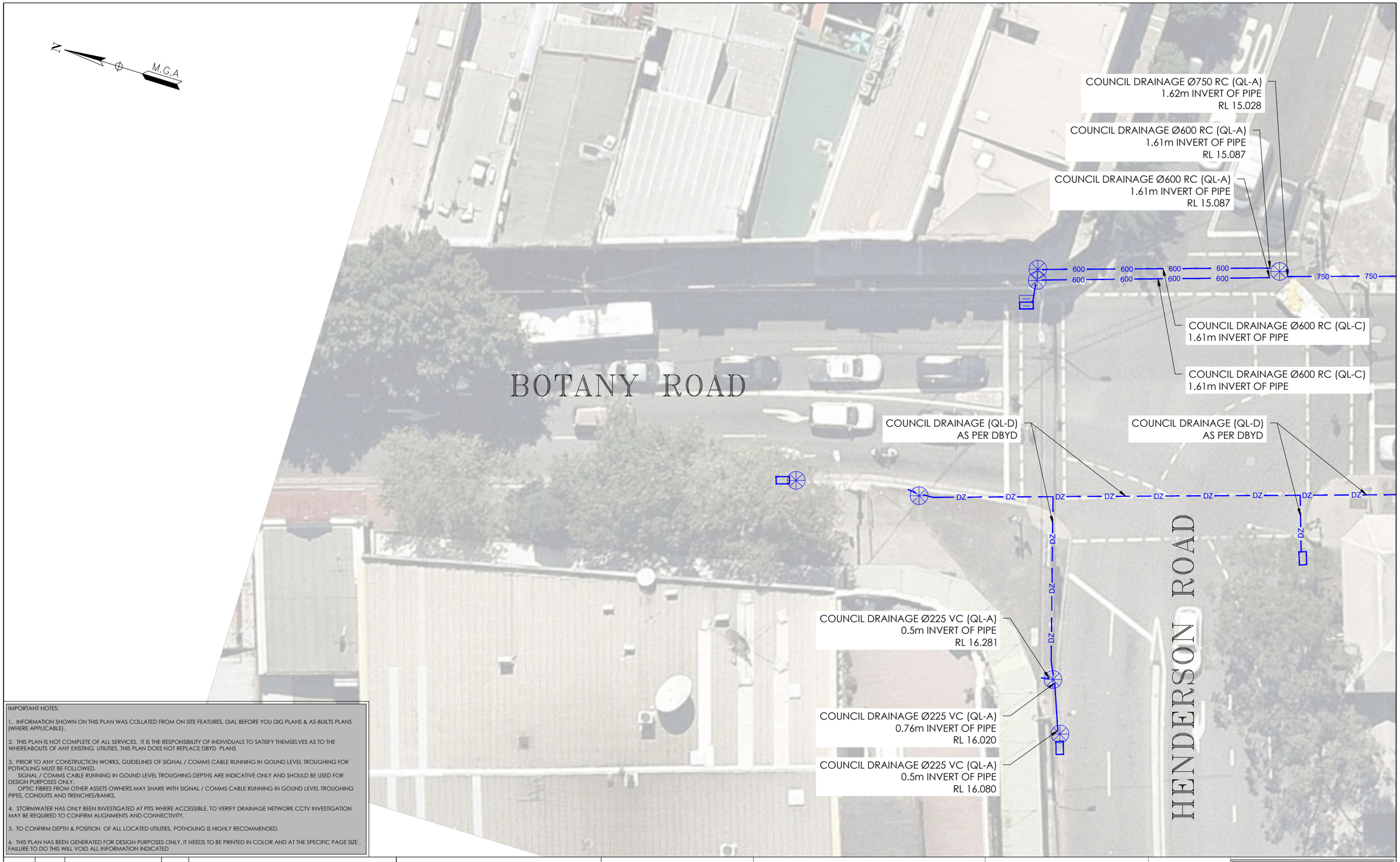

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N

M.G.A

ELECTRICAL 3X Ø140 PVC 4X DB (QL-B)
0.6m TOP OF PIPE

RAGLAN STREET

ELECTRICAL 2X Ø140 PVC 1X DB (QL-B)
0.6 to 0.8m TOP OF PIPE
EOT

ELECTRICAL 3X Ø140 PVC 4X DB (QL-B)
0.6m TOP OF PIPE

ELECTRICAL 2X Ø140 PVC 1X DB (QL-B)
0.6 to 0.8m TOP OF PIPE

ELECTRICAL 4X Ø140 FC 4X DB (QL-B)
0.6m TOP OF PIPE

COPE STREET

TRANSMISSION CONC (QL-B)
0.9m TOP OF COVER

TRANSMISSION CONC (QL-B)
0.9m TOP OF COVER

ELECTRICAL 3X Ø150 PVC 1X Ø50 PVC (QL-B)
0.5 to 0.7m TOP OF PIPE

ELECTRICAL 5X Ø100 EW (QL-B)
0.7 to 1.3m TOP OF PIPE

ELECTRICAL 4X Ø150 PVC 1X Ø50 PVC (QL-B)
0.5m TOP OF PIPE

ELECTRICAL 4X Ø150 PVC 1X Ø50 PVC (QL-B)
0.4 to 1.2m TOP OF PIPE

ELECTRICAL 5X Ø100 EW (QL-B)
0.7 to 1.3m TOP OF PIPE

ELECTRICAL 4X Ø140 EW (QL-B)
0.6 to 0.9m TOP OF PIPE

EMH

EMH

ELECTRICAL (QL-B)
0.6 to 0.8m TOP OF PIPE

ELECTRICAL 4X Ø140 EW (QL-B)
0.6 to 0.9m TOP OF PIPE

ELECTRICAL 4X Ø100 EW (QL-B)
0.6 to 0.8m TOP OF PIPE

ELECTRICAL 3X Ø150 PVC 1X Ø50 PVC (QL-B)
0.5 to 0.7m TOP OF PIPE

ELECTRICAL 4X Ø140 FC 4X DB (QL-B)
0.6m TOP OF PIPE

ELECTRICAL 4X Ø100 EW (QL-B)
0.9 to 1.8m TOP OF PIPE

ELECTRICAL 1X Ø130 PVC 4X DB (QL-B)
0.5 to 0.9m TOP OF PIPE

ELECTRICAL 2X Ø130 PVC 10X DB (QL-B)
0.4 to 1.2m TOP OF PIPE

ELECTRICAL 1X Ø130 PVC 4X DB (QL-B)
0.5 to 0.9m TOP OF PIPE

ADJOINS SHEET 26

ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

ELECTRICAL

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	25 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

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N
M.G.A

ADJOINS SHEET 25

ADJOINS SHEET 27

ELECTRICAL 2X Ø140 FC (QL-B)
0.5 to 0.8m TOP OF PIPE

TRANSMISSION CONC (QL-B)
0.9m TOP OF COVER

ELECTRICAL 2X Ø140 FC (QL-B)
0.5 to 0.8m TOP OF PIPE

TRANSMISSION CONC (QL-B)
0.9m TOP OF COVER

ELECTRICAL 5X Ø100 EW (QL-B)
0.7 to 1.3m TOP OF PIPE

ELECTRICAL 5X Ø100 EW (QL-B)
0.7 to 1.3m TOP OF PIPE

EMH

EMH

EMH

COPE STREET

ELECTRICAL 4X Ø100 EW (QL-B)
0.6 to 0.8m TOP OF PIPE

ELECTRICAL 4X Ø100 EW (QL-B)
0.6 to 0.8m TOP OF PIPE

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ISSUE	DATE	AMMENDMENT	BY
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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

ELECTRICAL

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
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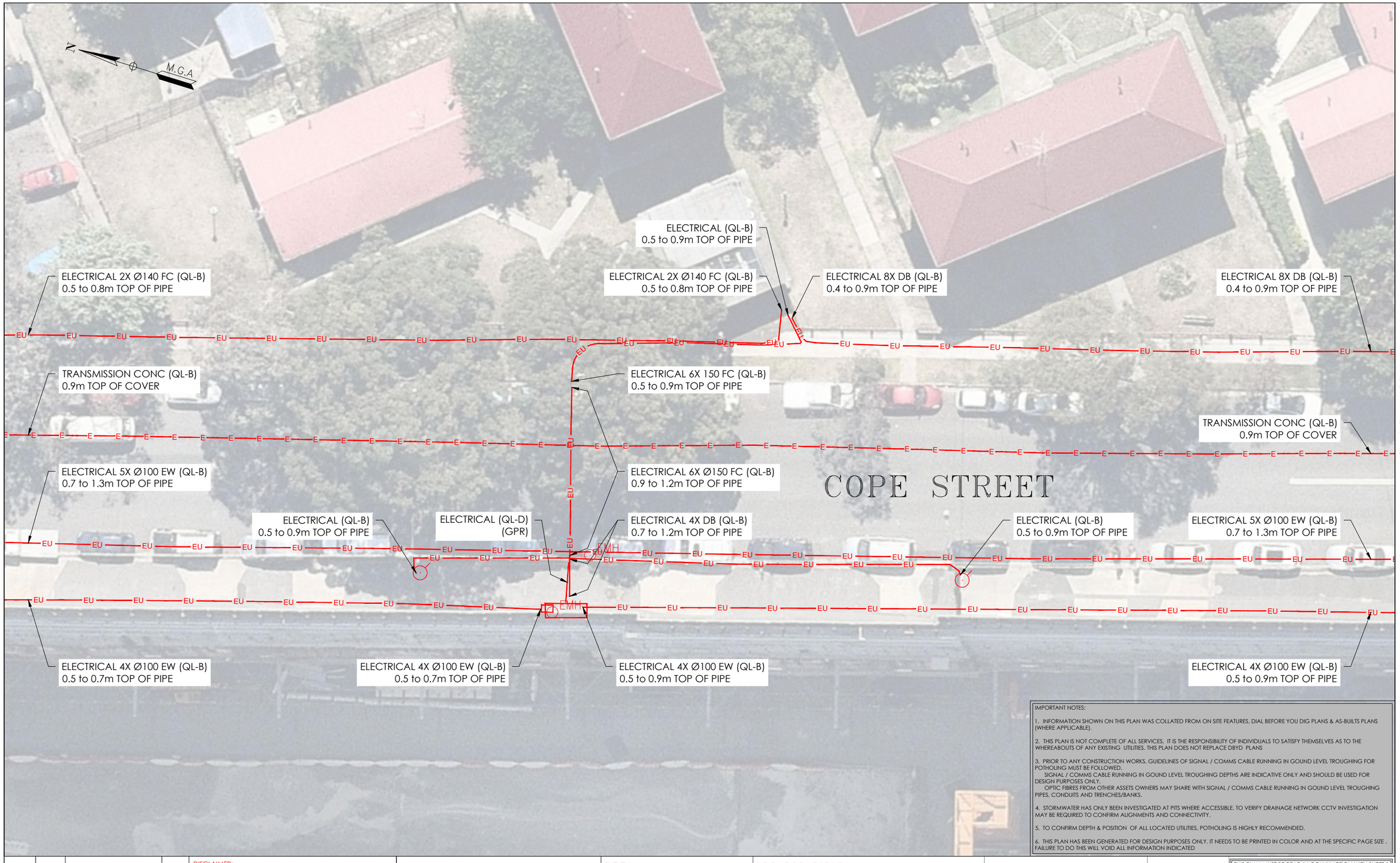

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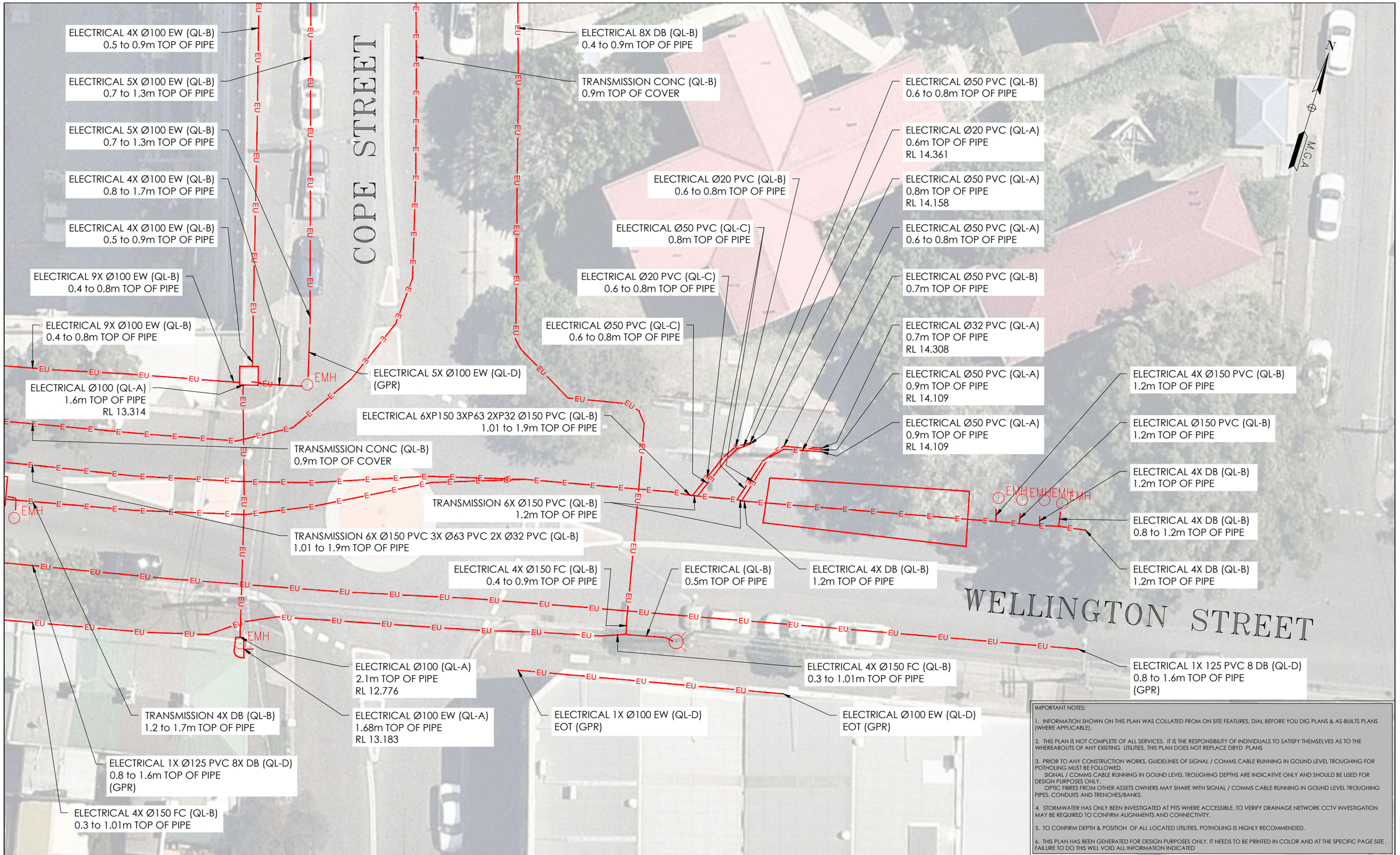
ADJOINS SHEET 27

ADJOINS SHEET 29



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E: info.nsw@veris.com.au
W: www.veris.com.au
ABN 53 615 735 727

CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

ELECTRICAL

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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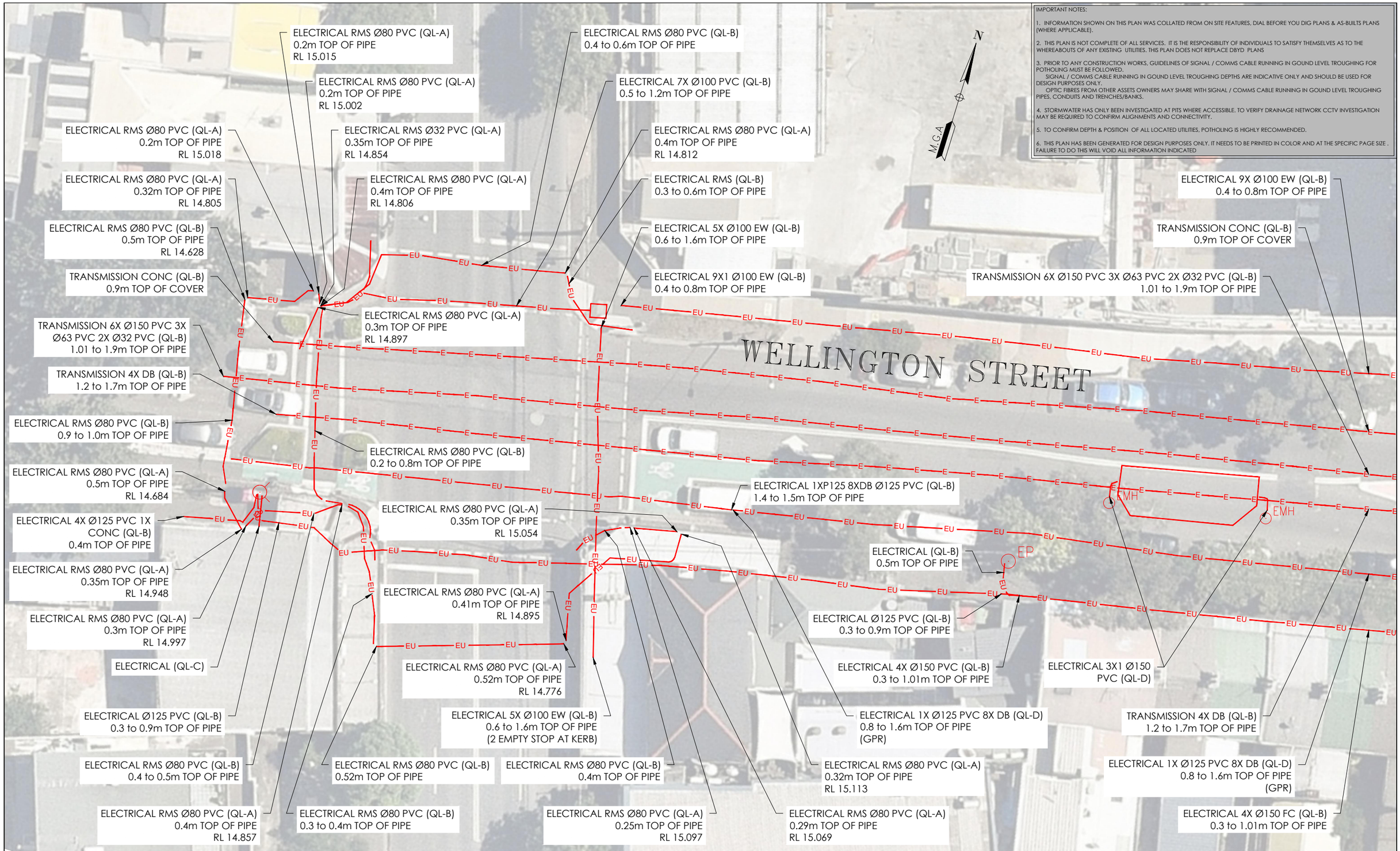
DATE OF SURVEY: 24/06/2020	DATE OF PLAN: 03/06/2020
HEIGHT DATUM: AHD71	CO-ORD: MGA94
DBYD JOB# : 19449303/22/34	DBYD DATE: 30/04/2020
ORIGINAL SIZE : A3	SHEET: 28 OF 75

JOB NUMBER 202254

DRAWING NUMBER / ISSUE 202254-UTILS-001A

ADJOINS SHEET 30



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ADJOINS SHEET 28

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PROJECT TITLE

WATERLOO STATION

ELECTRICAL

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

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SCALE IN METERS 1: 250

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SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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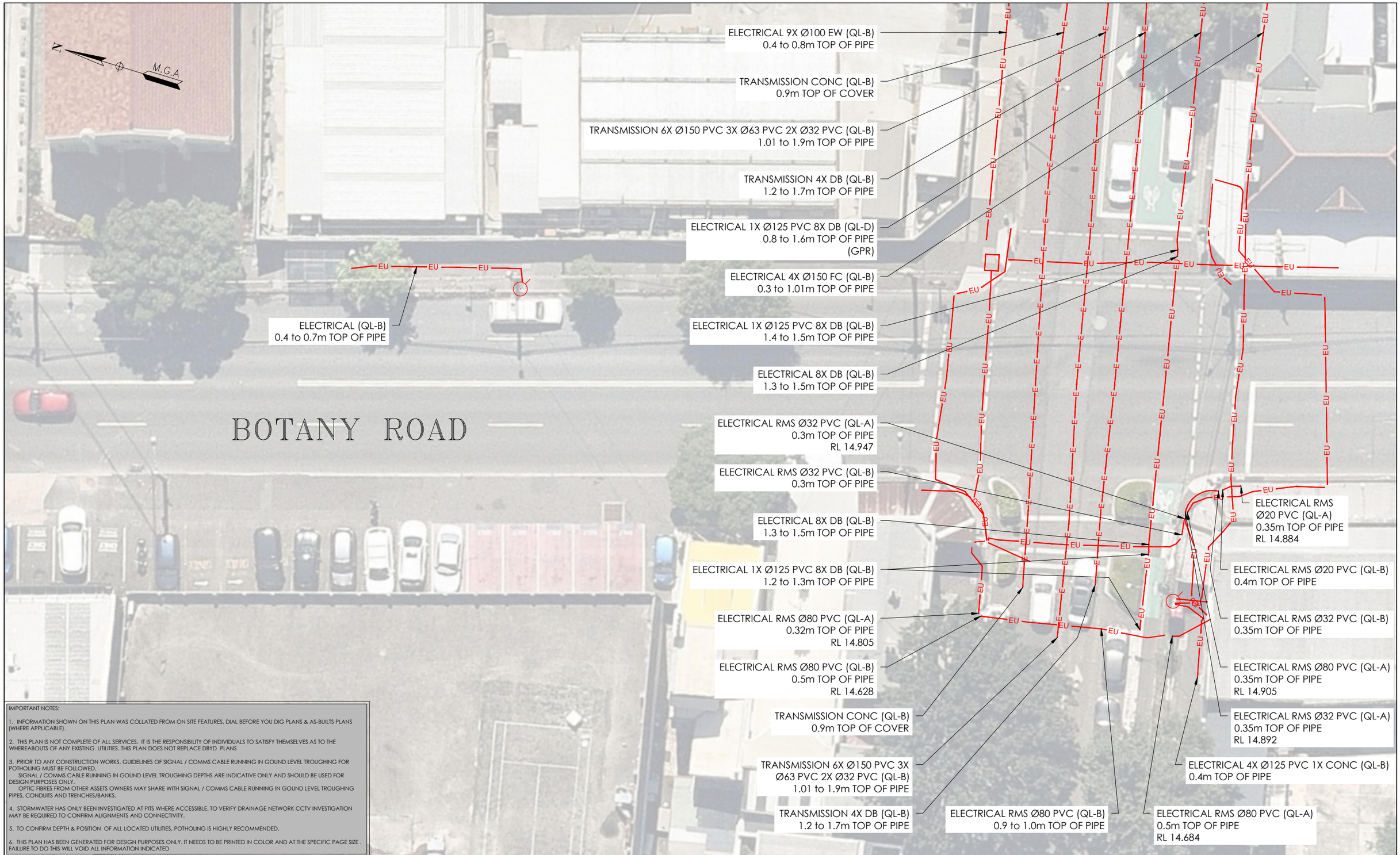
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	29 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 29

ADJOINS SHEET 31



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CLIENT: JOHN HOLLAND

PROJECT TITLE: WATERLOO STATION

ELECTRICAL

DRAWING TITLE: SUB-SURFACE UTILITY PLAN

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SCALE IN METERS 1: 250

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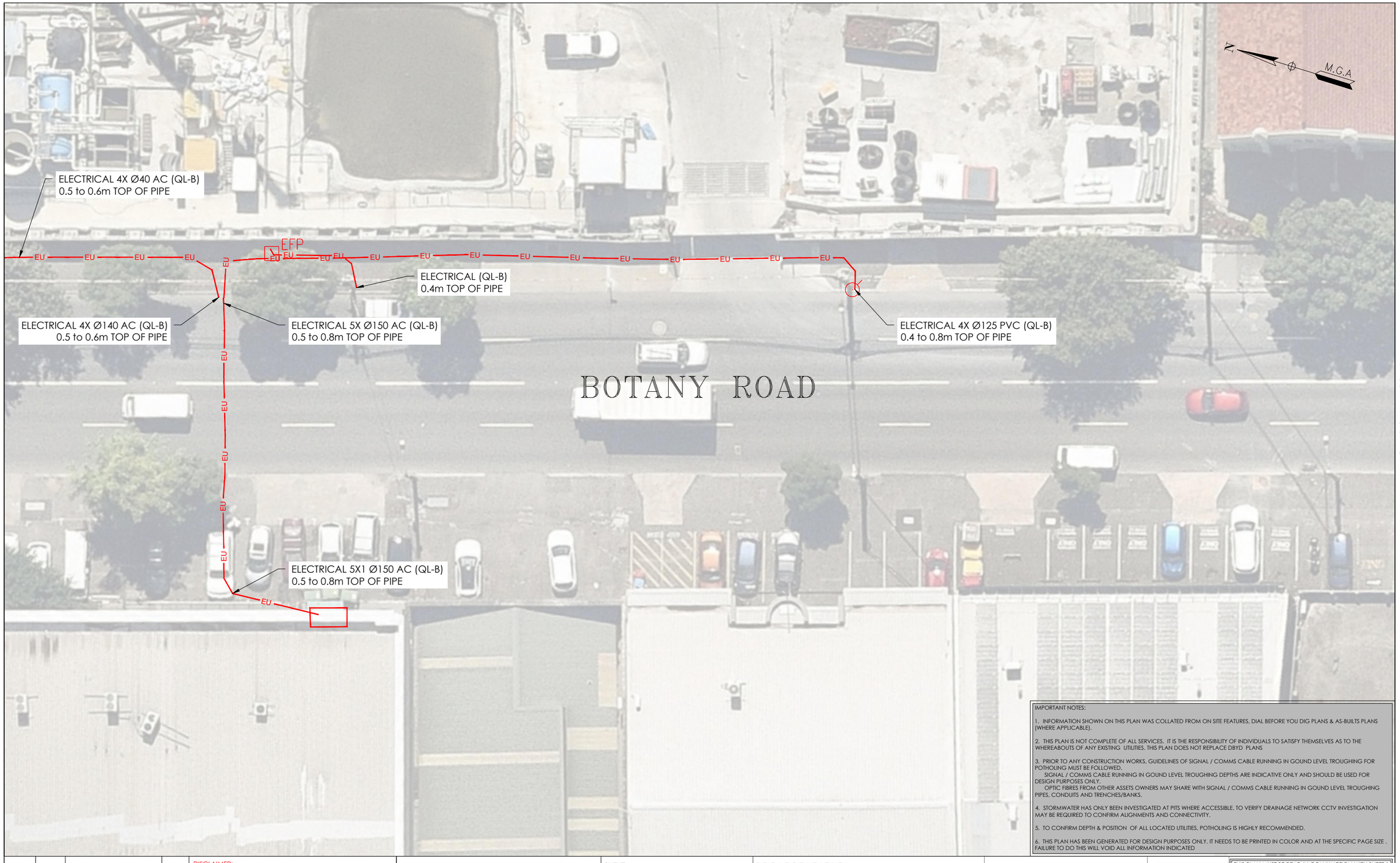

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ELECTRICAL

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

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SCALE IN METERS 1: 250

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ORIGINAL SIZE :	A3	SHEET:	31 OF 75

JOB NUMBER
202254

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202254-UTILS-001A

ADJOINS SHEET 34

ADJOINS SHEET 33

ADJOINS SHEET 31

ELECTRICAL 4X DB 2X Ø130 PVC (QL-B)
0.5 to 0.9m TOP OF PIPE

ELECTRICAL DB (QL-B)
0.6 to 0.8m TOP OF PIPE

ELECTRICAL RMS 2X
Ø80 PVC (QL-A)
0.44m TOP OF PIPE
RL 16.279

ELECTRICAL
RMS 2X Ø80
PVC (QL-B)
0.5 to 0.6m
TOP OF PIPE

ELECTRICAL RMS 2X Ø80 PVC (QL-A)
0.44m TOP OF PIPE
RL 16.280

ELECTRICAL RMS Ø80 PVC (QL-A)
0.23m TOP OF PIPE
RL 16.485

ELECTRICAL DB (QL-B)
0.6 to 1.01m TOP OF PIPE

EP

ELECTRICAL 2X 130 PVC 4X DB (QL-B)
0.5 to 0.9m TOP OF PIPE

ELECTRICAL 2X Ø130 AC 4X DB (QL-B)
0.5 to 0.6m TOP OF PIPE

ELECTRICAL
2X DB
Ø125 PVC
(QL-B)
0.8 to 1.0m
TOP OF PIPE

ELECTRICAL
3X Ø125 PVC
(QL-D)
EOT

ELECTRICAL RMS Ø80 PVC (QL-A)
0.52m TOP OF PIPE
RL 16.198

ELECTRICAL RMS Ø80 PVC (QL-A)
0.23m TOP OF PIPE
RL 16.485

ELECTRICAL RMS Ø80 PVC (QL-A)
0.38m TOP OF PIPE
RL 16.164

ELECTRICAL RMS Ø80 PVC (QL-A)
0.6m TOP OF PIPE
RL 15.952

ELECTRICAL RMS Ø80 PVC (QL-A)
0.36m TOP OF PIPE
RL 16.180

ELECTRICAL RMS Ø80 PVC (QL-B)
0.6 to 0.8m TOP OF PIPE

ELECTRICAL DB (QL-B)
0.6 to 0.8m TOP OF PIPE

ELECTRICAL 4X 140AC
(QL-B)
0.5 to 0.6m TOP OF PIPE

BOTANY ROAD

ELECTRICAL
(QL-D)
EOT

ELECTRICAL
2X Ø100 FC
(QL-B)
0.68 to 1.5m
TOP OF PIPE

ELECTRICAL RMS Ø80 PVC (QL-A)
0.3m TOP OF PIPE
RL 16.284

ELECTRICAL RMS Ø80 PVC (QL-A)
0.3m TOP OF PIPE
RL 16.285

ELECTRICAL RMS Ø80 PVC (QL-A)
0.4m TOP OF PIPE
RL 16.191

ELECTRICAL RMS Ø80 PVC (QL-A)
0.25m TOP OF PIPE
RL 16.341

EMH

ELECTRICAL Ø50 PVC (QL-B)
0.5m TOP OF PIPE

ELECTRICAL
2X DB (QL-D)
0.9 to 1.1m
TOP OF PIPE
(GPR)

ELECTRICAL
Ø80 PVC (QL-B)
0.68 to 1.5m
TOP OF PIPE

ELECTRICAL 2X DB (QL-B)
0.5m TOP OF PIPE
EOT

ELECTRICAL 2X DB (QL-B)
0.5m TOP OF PIPE
EOT

ELECTRICAL
Ø80 PVC (QL-A)
0.55m TOP OF PIPE
RL 16.200

ELECTRICAL 2X Ø100 FC (QL-B)
0.6 to 1.01m TOP OF PIPE

ELECTRICAL
Ø80 PVC (QL-A)
0.35m TOP OF PIPE
RL 16.408

ELECTRICAL 4X Ø125 PVC (QL-B)
0.6 to 1.01m TOP OF PIPE

M.G.A

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0 2 4 6 8 10
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DRAFTED BY:	J.V.
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DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	32 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

N
M.G.A

RAGLAN STREET

BOTANY ROAD

ELECTRICAL RMS 2X Ø80 PVC (QL-A)
0.45m TOP OF PIPE
RL 16.507

ELECTRICAL Ø125 PVC (QL-A)
1.0m TOP OF PIPE
RL 16.014

ELECTRICAL RMS Ø80 PVC (QL-A)
0.38m TOP OF PIPE
RL 16.579

ELECTRICAL DB (QL-B)
0.6 to 0.8m TOP OF PIPE

ELECTRICAL RMS Ø80 PVC (QL-A)
0.38m TOP OF PIPE
RL 16.579

ELECTRICAL RMS
2X Ø80 PVC (QL-A)
0.44m TOP OF PIPE
RL 16.279

ELECTRICAL RMS Ø80 PVC (QL-B)
0.4m TOP OF PIPE

ELECTRICAL
RMS 2X Ø80
PVC (QL-B)
0.5 to 0.6m
TOP OF PIPE

ELECTRICAL (QL-B)
0.2 to 0.9m TOP OF PIPE

ELECTRICAL RMS Ø80 PVC (QL-B)
0.2 to 0.4m TOP OF PIPE

ELECTRICAL Ø125 PVC (QL-B)
0.4 to 0.6m TOP OF PIPE

ELECTRICAL RMS Ø80 PVC (QL-B)
0.5m TOP OF PIPE

ELECTRICAL RMS Ø80 PVC (QL-A)
0.25m TOP OF PIPE
RL 16.816

ELECTRICAL PVC (QL-C)
0.7m TOP OF PIPE

ELECTRICAL
2X1DB
Ø125 PVC
(QL-B)
0.8 to 1.0m
TOP OF PIPE

ELECTRICAL RMS Ø80 PVC (QL-A)
0.33m TOP OF PIPE
RL 16.738

ELECTRICAL 2X
Ø100 FC (QL-B)
0.68 to 1.5m TOP
OF PIPE

ELECTRICAL
(QL-D)
EOT

ELECTRICAL Ø32 PVC (QL-A)
0.45m TOP OF PIPE
RL 17.084

ELECTRICAL 2X Ø100 PVC (QL-A)
0.75m TOP OF PIPE
RL 16.524

ELECTRICAL RMS Ø80 PVC (QL-A)
0.5m TOP OF PIPE
RL 16.504

ELECTRICAL
RMS Ø80 PVC
(QL-A) 0.4m
TOP OF PIPE
RL 16.326

ELECTRICAL Ø32 PVC (QL-A)
0.5m TOP OF PIPE
RL 17.054

ELECTRICAL RMS Ø80 PVC (QL-A)
0.3m TOP OF PIPE
RL 16.705

ELECTRICAL
2X1DB (QL-D)
0.9 to 1.1m
TOP OF PIPE
(GPR)

ELECTRICAL RMS
Ø80 PVC (QL-A)
0.2m TOP OF PIPE
RL 16.526

ELECTRICAL Ø32 PVC (QL-B)
0.45 to 0.55m TOP OF PIPE

ELECTRICAL DB (QL-B)
0.3 to 1.01m TOP OF PIPE

ELECTRICAL 2X Ø125 (QL-A)
0.9m TOP OF PIPE
RL 16.308

ELECTRICAL RMS
Ø80 PVC (QL-A)
0.4m TOP OF PIPE
RL 16.583

ELECTRICAL RMS
Ø80 PVC (QL-A)
0.4m TOP OF PIPE
RL 16.332

ELECTRICAL 2X Ø100 PVC (QL-B)
0.7 to 0.89m TOP OF PIPE

ELECTRICAL 2X DB (QL-D)
0.9 to 1.1m TOP OF PIPE
(GPR)

ELECTRICAL RMS
Ø20 GAL (QL-B)
0.6m TOP OF PIPE

ELECTRICAL RMS Ø80 PVC (QL-A)
0.75m TOP OF PIPE
RL 16.213

ELECTRICAL RMS
Ø80 PVC (QL-A)
0.5m TOP OF PIPE
RL 16.257

ELECTRICAL RMS
Ø80 PVC (QL-A)
0.57m TOP OF PIPE
RL 16.174

ELECTRICAL RMS Ø80 PVC (QL-A)
0.5m TOP OF PIPE
RL 16.477

ELECTRICAL RMS Ø80 PVC (QL-A)
0.5m TOP OF PIPE
RL 16.265

ELECTRICAL
RMS Ø80 PVC
(QL-A)
0.68m TOP OF
PIPE
RL 16.067

ELECTRICAL RMS Ø80 PVC (QL-A)
0.55m TOP OF PIPE
RL 16.200

ELECTRICAL DB (QL-B)
0.3 to 1.01m TOP OF PIPE

ELECTRICAL RMS Ø80 PVC (QL-A)
0.57m TOP OF PIPE
RL 16.175

EP
EJB
EMH
EU

ADJOINS SHEET 32

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ISSUE	DATE	AMMENDMENT	BY
A	03/06/20	ORIGINAL UTILITIES PLAN	J.V.

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CLIENT

JOHN HOLLAND

PROJECT TITLE

WATERLOO STATION

ELECTRICAL

DRAWING TITLE

SUB-SURFACE UTILITY PLAN

0 2 4 6 8 10
SCALE IN METERS 1: 250

LOCATED BY:	L.B.
SURVEYED BY:	Y.M./A.D.
DRAFTED BY:	J.V.
CHECKED BY:	K.S./B.M./J.A.
APPROVED BY:	D.M.

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THIS PLAN DOES NOT REPLACE DBYD PLANS

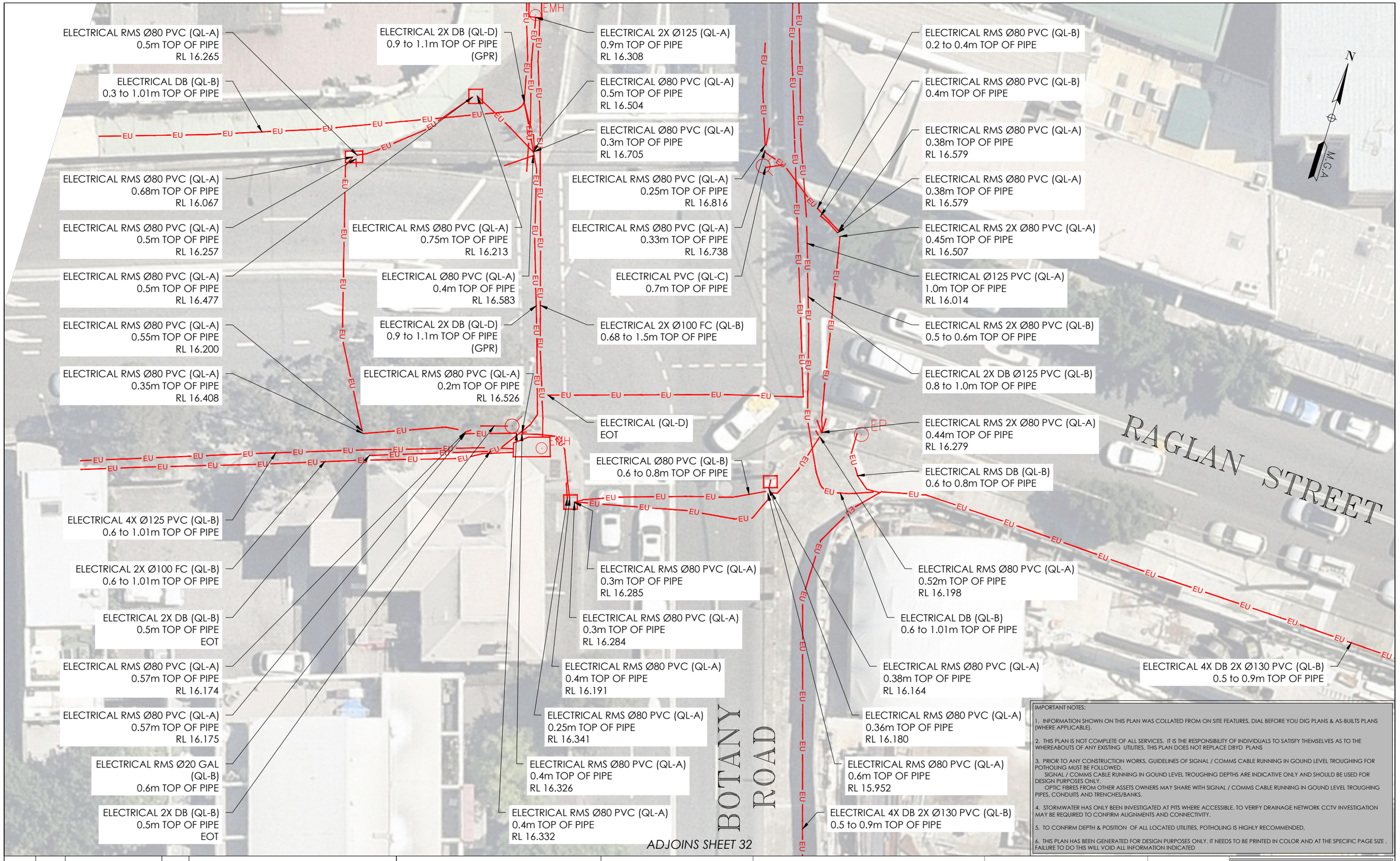
THIS PLAN MUST BE READ IN CONJUNCTION WITH SHEET 1 FOR ADDITIONAL NOTES, WARNINGS & LEGEND

DATE OF SURVEY:	24/06/2020	DATE OF PLAN:	03/06/2020
HEIGHT DATUM:	AHD71	CO-ORD:	MGA94
DBYD JOB# :	19449303/22/34	DBYD DATE:	30/04/2020
ORIGINAL SIZE :	A3	SHEET:	33 OF 75

JOB NUMBER
202254

DRAWING NUMBER / ISSUE
202254-UTILS-001A

ADJOINS SHEET 33



ADJOINS SHEET 32

ADJOINS SHEET 35

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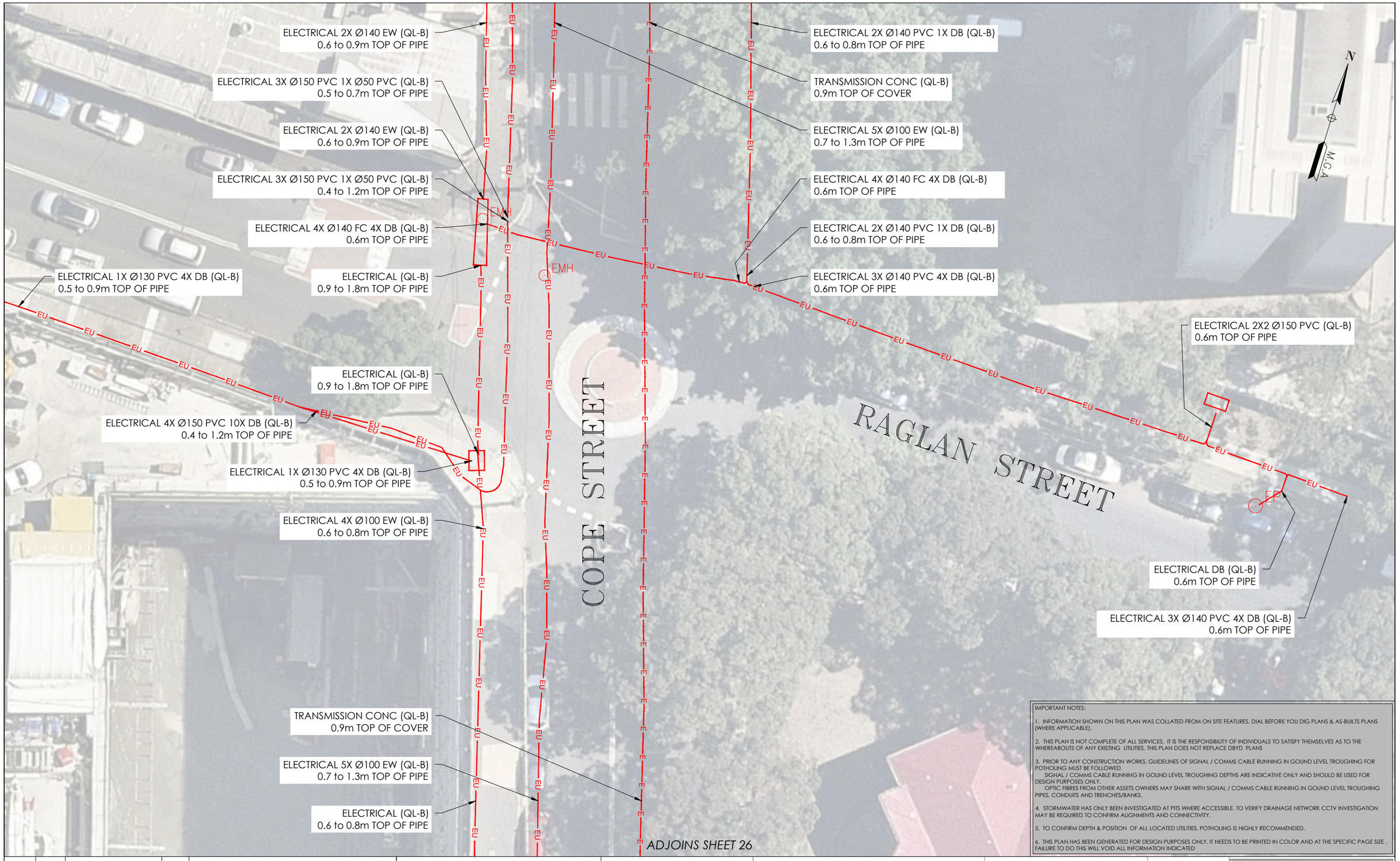
ADJOINS SHEET 25

ADJOINS SHEET 34



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ELECTRICAL

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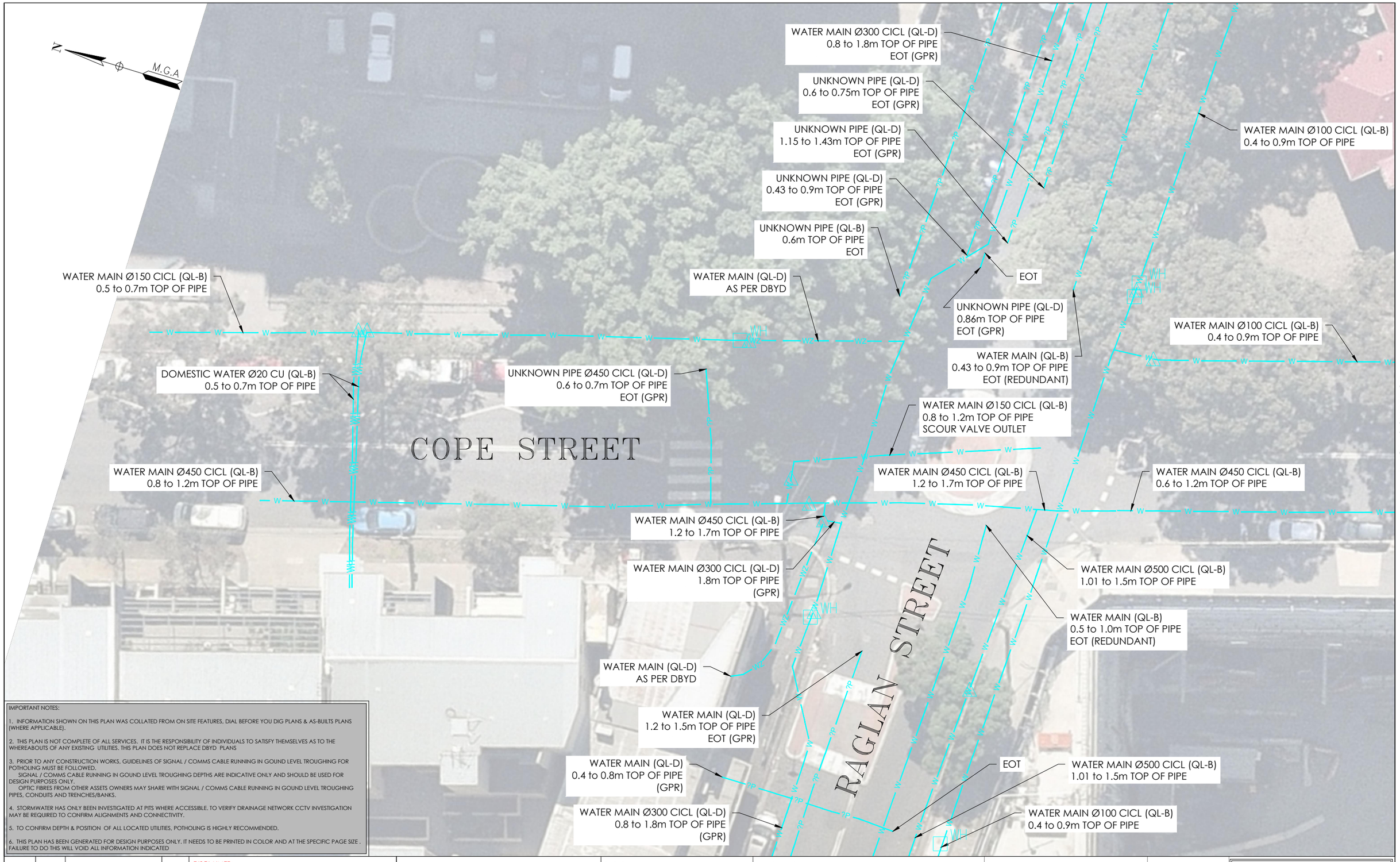

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WATER

DRAWING TITLE

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