



WATERLOO METRO QUARTER OVERSTATION DEVELOPMENT

Environmental Impact Statement Appendix T – Services & Utilities Infrastructure Report

SSD-10441 Concept Amending DA

State Significant Development, Development Application

Prepared for WL Developer Pty Ltd 30 September 2020



Reference	Description
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1. Glossary and Abbreviations

Reference	Description
ACHAR	Aboriginal Cultural Heritage Assessment Report
ADG	Apartment Design Guide
AfC	Application for Connection
AHD	Australian height datum
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



Reference	Description
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 report has been prepared by Waterloo Developer and WSP Pty Ltd to accompany a concept State significant development (SSD) development application (DA) for the Waterloo Metro Quarter over station development (OSD). This concept SSD DA is submitted as an 'amending DA', that modifies the previously approved concept SSD DA issued for the site (SSD 9393). The modifications contained within the amending DA relate to the northern precinct and central building only. No change is proposed to the original concept SSD DA as it relates to the southern precinct of the Waterloo Metro Quarter site.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the amending concept SSD DA (SSD 10441).

This report concludes that the proposed amending concept DA for the Waterloo Metro Quarter OSD is 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 WMQ precinct buildings development construction
- Proceed with Sydney Water Notice of Requirements application for Northern, Central and Southern Precinct, and associated conditions of consent for connection of Potable Water, Sewer and Stormwater services
- Proceed with Ausgrid contestable works approval process for Northern (Including Central precinct and Basement) and Southern Precinct, 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, Central and Southern Precinct, and associated conditions of consent for connection of Stormwater services
- Proceed with Jemena connection application for Northern, Central and Southern Precinct, and associated conditions of consent for connection of Natural Gas services
- Proceed with Carrier and Communication provider applications for connection process for Northern, Central and Southern Precinct, and associated conditions of consent for connection of carrier communication services
- Proceed with NBN application for connection process for Northern, Central and Southern Precinct, and associated conditions of consent for connection of NBN communication services

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



3. Introduction

This report has been prepared to accompany a concept SSD DA for the over station development (OSD) at the Waterloo Metro Quarter site. The concept DA seeks consent for an amended building envelope and description of development for the northern precinct and central building of the Waterloo Quarter site approved under SSD 9393. For clarity, this concept DA (formerly referred to as a 'Stage 1' DA) is made under Section 4.22 of the *Environmental Planning and Assessment Act* 1979 (EP&A Act).

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 concept DA seeks to modify the approved building envelope for the northern precinct (previously comprising 'Building A', 'Building B', 'Building C' and 'Building D' under SSD 9393) through:

- increasing the maximum building height for the southern portion of the building envelope from RL56.2 to RL72.60
- removing the 'tower component' of the northern precinct, reducing the overall height of the tower envelope from RL116.9 to RL90.40, to enable the redistribution of floor space to commercial office floor plates
- amending the description of development to refer to a mid-rise (approximately 17 storey) commercial office building, comprising approximately 34,125sqm of commercial office floor space within the northern portion of the site, rather than a third residential tower.

The concept DA seeks to modify the central building approved building envelope (previously comprising 'Building E' under SSD 9393) through:

modifying the eastern extent of the podium envelope.

This proposal will not exceed the permissible building height for the site under the Sydney Local Environmental Plan 2012 (SLEP) or the maximum height approved under SSD 9393. Separate detailed SSD DA (s) will be lodged concurrently for the detailed design, construction and operation of the northern precinct and central building. No changes are proposed to the original concept DA as it relates to the southern precinct.

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)
9. Utilities	Identify the existing capacity to service the existing Concept Proposal and any augmentation requirements for utilities to service the Amending Concept	8. Utility Demand Design Development



Item Description of Requirement		Section Reference (this report)
	Proposal in consultation with relevant	
	agencies.	

Table 2 SEARs Requirements



4. The Site

The site is located within the City of Sydney Local Government Area (LGA). The site is situated approximately 3.3 kilometres south of Sydney CBD and approximately 8 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 located 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 (the site) is a rectangular shaped allotment and 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 boundaries of the site the subject of the amending concept DA is identified at Figure 5.1. 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 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.



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 in Figure 2.



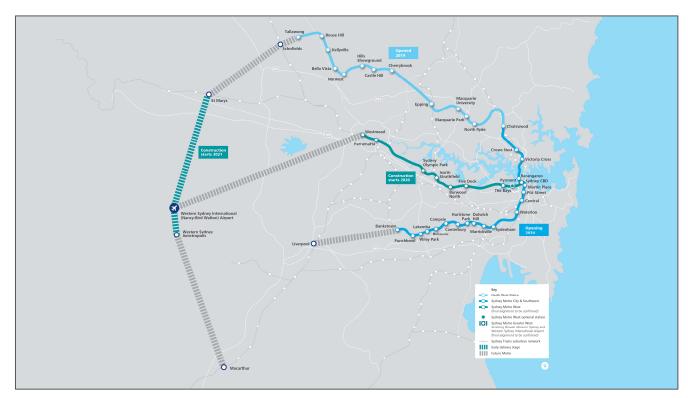


Figure 2 Sydney Metro alignment map Source: Sydney Metro

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 3.



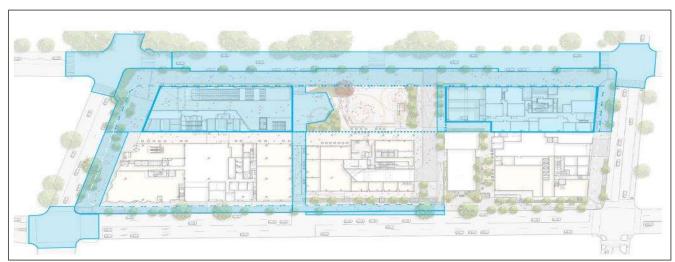


Figure 3 CSSI Approval scope of works Source: WL Developer Pty Ltd

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.

This concept DA has been prepared and submitted to the DPIE and proposes 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.

A concurrent detailed SSD DA will seek development consent for the OSD located within the southern precinct of the site, consistent with the parameters of the original concept approval. Separate SSD DAs have been prepared and will be submitted for the northern precinct, central building, and basement proposed across the Waterloo Metro Quarter site consistent with the amending concept DA.



6. Proposed Development

The amending concept DA seeks consent for an amended building envelope and description of development for the northern precinct of the Waterloo Metro Quarter site approved under SSD 9393. Specifically, the proposal seeks to modify the approved building envelope for the northern precinct (previously comprising 'Building A', 'Building B', 'Building C' and 'Building D' under SSD 9393) through:

- increasing the maximum building height for the southern portion of the Northern Precinct from RL56.2 to RL72.60
- removing the 'tower component' of the Northern Precinct, reducing the overall height of the tower envelope from RL116.9 to RL90.40, to enable the redistribution of floor space to commercial office floor plates
- amending the description of development to refer to a mid-rise (approximately 17 storey) commercial office building, comprising approximately 34,125sqm of commercial office floor space within the northern portion of the site, rather than a third residential tower.

The concept DA seeks to modify the central building approved building envelope (previously comprising 'Building E' under SSD 9393) through:

modifying the eastern extent of the podium envelope.

The modification of the approved concept SSD DA will enable the detailed design of a new commercial building (comprising office and retail premises) to be pursued on the site, significantly increasing the proportion of employment generating floor space on the Waterloo Metro Quarter site. This new commercial building is proposed in replacement of four building envelopes approved under SSD 9393, which comprised one residential tower, and three mid-rise residential buildings.

This proposal will not exceed the permissible building height for the site under the SLEP or the maximum height approved under SSD 9393. As noted above, separate detailed SSD DA(s) will be lodged concurrently for the detailed design, construction and operation of the northern precinct, and central building.

This amending concept DA does not propose to the amend the original concept approval as it relates to the southern precinct.



7. Utility Demand Design Development

This section highlights the changes in the demand assessment from the previously approved initial concept SSD DA to this (amending) concept SSD DA as the design develops.

7.1 Sydney Water

Tables below highlight the difference in the demand assessment for Sydney Water connection

between the Initial Concept DA and the Amending Concept DA design.

7.1.1 Potable Cold Water

Potable water demand in the current amending Concept DA submission is calculated based on the methods described within DIN1988-300 and AS3500.1.

	Northern Precinct – BLD 1	Central Precinct – BLD 2	Southern Precinct – BLD3&4
Initial Concept DA	Potable Water: 590 ±15% kL/day (Maximum Daily Demand);1		
Amending Concept DA	~80 kL/day	~90 kL/day	~72 kL/day

Table 3 Potable Water Supply Demand Assessment

As detailed within the above table the estimated total daily potable water demand for the amended concept SSD DA, is equivalent to ~242kL / day, which is significantly less than the approved SSD 9393, which estimated 590kL /day. Based on this assessment the amendment to the concept SSD DA (SSD 9393) is supported as it improves the Waterloo Metro Quarter site in relation to potable water consumption.

7.1.2 Fire Services

The expected water use demand for the sprinkler system has been sized to cater for the highest hazard plus allowance for several operational drenchers.

	Northern Precinct – BLD 1	Central Precinct – BLD 2	Southern Precinct - BLD3&4
Initial Concept DA	As contained in Potable Water demand.		
Amending Concept DA			38L/s and,
	110kL Fire Tank ²		96kL Fire Tank

Table 4 Fire Services Supply Demand Assessment

As detailed within the above table the estimated total fire water demand for the amended concept SSD DA, is equivalent to 90kL/s, which drawn from the authority potable water supply and the onsite fire tank within the respective buildings. Based

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¹ Appendix P – Utilities, Section 2.0 Scope of assessment, "Indicative building service loads"

² Flow and fire tank capacity for BLD1 and BLD2 has been designed considering the worst case for combined flow.



on this assessment the amendment to the concept SSD DA (SSD 9393) is supported as it improves the Waterloo Metro Quarter site in relation to potable water consumption.

7.1.3 Wastewater

	Northern Precinct – BLD 1	Central Precinct – BLD 2	Southern Precinct – BLD3&4
Initial Concept DA	Wastewater: 3.6 ±15% L/s (Average Dry Weather Flow); ³ 311kL±15% L/day		
Amending Concept DA	49kL/day	52kL/day	57.6kL/day

Table 5 Fire Services Supply Demand Assessment

As detailed within the above table the estimated total daily wastewater demand for the amended concept SSD DA, is equivalent to 158.6kL / day, which is significantly less than the approved SSD 9393, which estimated 311kL /day. Based on this assessment the amendment to the concept SSD DA (SSD 9393) is supported as it improves the Waterloo Metro Quarter site in relation to wastewater discharge.

7.2 Natural Gas Services

Table below highlights the difference in the demand assessment for Jemena gas supply connection between the Initial Concept DA and the Amending Concept DA design.

	Northern Precinct	Central Precinct	Southern Precinct
	– BLD 1	– BLD 2	– BLD3&4
Initial Concept DA	Gas: 1,700 ±15% m3 / day (Daily Demand, residential usage only included); ⁴ conversion ~62900 mj/day, ~2620mj/hr.		
Amending Concept DA	6 off (inclusive of the Community Tenancies for future, and the 1 tenancy from the Metro Box) = 3000mj/hr	12 off (inclusive of the Community Tenancies for future) = 6000mj/hr	Gym, Makerspace, Domestic Hotwater and Southern Station Retail spaces = 5900mj/hr

Table 6 Gas Supply Demand Assessment

As detailed within the above table the estimated total peak natural gas demand for the amended concept SSD DA, is equivalent to 14900 mj /hr, which is significantly more than the approved SSD 9393, which estimated 2620mj /hr. We attribute this to an error with the original concept SSD DA, as the natural gas proposed for the development is less than similar benchmark commercial and residential buildings. This is explained as the commercial building 1 and residential building 2 contain no gas for heating systems which would be evident in similar benchmark buildings. And all residential buildings (2,3,4) have electric based cooktops.

³ Appendix P – Utilities, Section 2.0 Scope of assessment, "Indicative building service loads"

⁴ Appendix P – Utilities, Section 2.0 Scope of assessment, "Indicative building service loads"



Further the natural gas authority has been contacted, and it has been confirmed that there is sufficient natural gas capacity within the local natural gas network, to service the development without the need for amplification. Refer to appendix 3 for advice from Jemena.

Based on this assessment the amendment to the concept SSD DA (SSD 9393) is supported for the Waterloo Metro Quarter site in relation to natural gas consumption.

7.3 Stormwater Services

Table below highlights the difference in the Permissible site discharge and Onsite detention volume between the Initial Concept DA and the Amending Concept DA design. Current Design demonstrate the civil works and stormwater strategy necessary to comply with the requirements of the City of Sydney and Sydney Water.

	Northern Precinct – BLD 1	Central Precinct – BLD 2	Southern Precinct – BLD3&4	Metro Station
Initial Concept DA	PSD = 503L/s Onsite Detention Vo = 208m ³⁵	lume		
Amending Concept DA	PSD = 186L/s ⁶ Bypass Flow Discharge =26L/s Captured Flow Discharge = 152L/s Onsite Detention Volume = 74m ³	PSD = 94L/s ⁷ Bypass Flow Discharge =41L/s Captured Flow Discharge = 30L/s Onsite Detention Volume = 78m ³	PSD = 188L/s ⁸ Bypass Flow Discharge =164L/s ⁹ Captured Flow Discharge = 29L/s Onsite Detention Volume ¹⁰	PSD = 32L/s ¹¹ Bypass Flow Discharge =56L/s ¹² Captured Flow Discharge = 0L/s Onsite Detention Volume ¹³

Table 7 Stormwater PDS and OSD Assessment

As detailed within the above table the estimated total permissible discharge for the amended concept SSD DA, is equivalent to 498L/s which is less than the approved SSD 9393, which estimated 503L/s. Based on this assessment the amendment to the concept

⁵ Appendix T - Section 4.4.1 Permissible Site Discharge (PSD) and On-Site Detention Requirements

⁶ PSD target values

⁷ PSD target values

⁸ PSD target values

⁹ PSD and Bypass Flow Discharge for the southern precinct does not include the Station allowances which are 32L/s and 56L/s respectively, and remain below the Stage 1 DA PSD.

¹⁰ OSD volume for the Public Plaza and Metro Station are proposed to go to the BLD2 OSD Tank.

¹¹ PSD target values

¹² PSD and Bypass Flow Discharge for the southern precinct does not include the Station allowances which are 32L/s and 56L/s respectively, and remain below the Stage 1 DA PSD.

¹³ OSD volume for the Public Plaza and Metro Station are proposed to go to the BLD2 OSD Tank.



SSD DA (SSD 9393) is supported as it improves the Waterloo Metro Quarter site in relation to stormwater discharge.

7.4 High Voltage Electrical

Table below highlights the difference in the expected electrical use demands between the Initial Concept DA and the Amending Concept DA design.

	Northern Precinct – BLD 1	Central Precinct – BLD 2	Southern Precinct - BLD3&4
Initial Concept DA	Electrical: 8.6 +15% MVA (Peak Demand); 14		
Amending Concept DA	3.075 MVA (4438Amps/phase)	1.012 MVA (1460Amps/phase)	1.435 MVA (2113Amps/phase)

Table 8 Electrical Supply Demand Assessment

As detailed within the above table the estimated total peak electrical demand for the amended concept SSD DA, is equivalent to 5.518MVA, which is significantly less than the approved SSD 9393, which estimated 8.6MVA. Based on this assessment the amendment to the concept SSD DA (SSD 9393) is supported as it improves the Waterloo Metro Quarter site in relation to electrical consumption.

7.5 Communication and Data

The WMQ northern precinct BLD1 and Central Precinct BLD2 expected communications requirements will be further designed during the next design stage.

	Northern Precinct – BLD 1	Central Precinct – BLD 2	Southern Precinct – BLD3&4
Initial Concept DA	Telecommunications: Unable to be calculated as per other services; ¹⁵		
Amending Concept DA	To be detailed in the detail design phase post DA submission	To be detailed in the detail design phase post DA submission	To be detailed in the detail design phase post DA submission

Table 9 Communication and Data Supply Demand Assessment

Based on this assessment that the telecommunications will be further detailed during the detail design phase the amendment to the concept SSD DA (SSD 9393) is supported as it maintains the original assessment for the Waterloo Metro Quarter site in relation to Telecommunications.

¹⁴ Appendix P – Utilities, Section 2.0 Scope of assessment, "Indicative building service loads"

¹⁵ Appendix P – Utilities, Section 2.0 Scope of assessment, "Indicative building service loads"



8. Assessment and Findings

The technical assessment of the utility requirements for WMQ precinct buildings, has determined that all connections to services as anticipated in the Stage 1 DA, will be consistent and of a similar size to the connections to services required for the amendment to the Stage 1 DA

8.1 Cumulative impacts

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

8.1.1 Northern Precinct

The amendment to the Stage 1 DA has converted the majority of the WMQ Northern precinct into a commercial building. This amendment will increase the electrical maximum demand, natural gas, and reduce the potable water, wastewater for the northern precinct when compared with the Stage 1 DA scheme.

The increase in electrical demand is attributed to the commercial building having a higher maximum demand when compared to a residential building. However, the electrical maximum demand submitted with the Stage 1 DA allowed for adjusted increases to the site and as such the overall electrical demand as required by this amendment will not increase the allowances approved with the Stage 1 DA.

The natural gas allowances within the amending are smaller than benchmark commercial buildings of similar size as the heating hot water and domestic hot water systems are electric, and the only gas within the precinct is for the Retail spaces. The increase in natural gas from the Stage 1 DA to the northern precinct has been coordinated with the gas authority and there is sufficient capacity in existing mains without amplification, refer to appendix 3 of this report.

8.1.2 Central Precinct

The amendment to the Stage 1 DA has made minor adjustments to the WMQ Central precinct residential building. This amendment will increase the natural gas, and reduce the electrical maximum demand, potable water, wastewater for the central precinct when compared with the Stage 1 DA scheme.

The natural gas allowances within the amending are smaller than benchmark residential buildings of similar size as the apartment cooktops and the heating hot water, domestic hot water systems are all electric, and the only gas within the precinct is for the Retail spaces. The increase in natural gas from the Stage 1 DA to the central precinct has been coordinated with the gas authority and there is sufficient capacity in existing mains without amplification, refer to appendix 3 of this report.

8.1.3 Southern Precinct

The amendment to the Stage 1 DA has made no adjustments to the WMQ Southern precinct student accommodation and social housing buildings This amendment will increase the natural gas, and reduce the electrical maximum demand, potable water, wastewater for the southern precinct when compared with the Stage 1 DA scheme.



The natural gas allowances within the amending are smaller than benchmark residential buildings of similar size as the cooktops are. The increase in natural gas from the Stage 1 DA to the southern precinct has been coordinated with the gas authority and there is sufficient capacity in existing mains without amplification, refer to appendix 3 of this report.

8.1.4 Station Precinct

The amendment to the Stage 1 DA has made minor adjustments to the WMQ Northern precinct commercial building. This amendment will not change the Stage 1 DA proposed interface with the Station in relation to building services and utilities infrastructure.

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 Station retail building services, this is further outlined in the OSD Integration Report.

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.

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



9. Mitigation Measures

To ascertain the required utility modifications for the WMQ Precinct buildings, due to the amendment to the Stage 1 DA, the following mitigation measures will need to be followed:

- Disconnection and demolition of the existing utilities and services to allow the proposed WMQ precinct buildings development construction
- Proceed with Sydney Water Notice of Requirements application for Northern, Central and Southern Precinct, and associated conditions of consent for connection of Potable Water, Sewer and Stormwater services
- Proceed with Ausgrid contestable works approval process for Northern (Including Central and Basement) and Southern Precinct, 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, Central and Southern Precinct, and associated conditions of consent for connection of Stormwater services
- Proceed with Jemena connection application for Northern, Central and Southern Precinct, and associated conditions of consent for connection of Natural Gas services
- Proceed with Carriers and communication providers applications for connection process for Northern, Central and Southern Precinct, and associated conditions of consent for connection of carrier communication services
- Proceed with NBN application for connection process for Northern, Central and Southern Precinct, and associated conditions of consent for connection of NBN communication services
- The mitigation measures and application processes as outlined above have been provisionally commenced and are recognised as a condition of consent for the WMQ Precincts development applications and associated works.



10. Conclusion

10.1 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 amendment to the WMQ precinct will be able to achieve the required utilities and building services statutory requirements.

10.2 Assumptions and Constraints

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

- 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 in the next design stage
- 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 are submitted for each building.



11. Appendices





Appendix 1 – Waterloo Station Utility Design



LOCALITY PLAN NOT TO SCALE

DRAWING INDEX

UTILITIES

WMQ-SITE-WSP-UT-DWG-U8900 WMQ-SITE-WSP-UT-DWG-U8901

VMQ-SITE-WSP-UT-DWG-U8971 VMQ-SITE-WSP-UT-DWG-U8972 COVER SHEET AND DRAWING INDEX GENERAL NOTES AND LEGEND

UTILITIES GENERAL ARRANGEMENT PLAN SHEET : UTILITIES GENERAL ARRANGEMENT PLAN SHEET :

FOR REVIEW

| Recording and continued and the information above no ministration above no ministratio

LEGEND

GENERAL

PROPOSED UTILITIES

EXISTING CADASTRAL BOUNDARY

ROAD DESIGN

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

COPE STREET mirvac J<u>O</u>HN HOLLAND

PRINCIPAL AEO



DESIGNED_____J. CEREZO________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

DATE DESCRIPTION

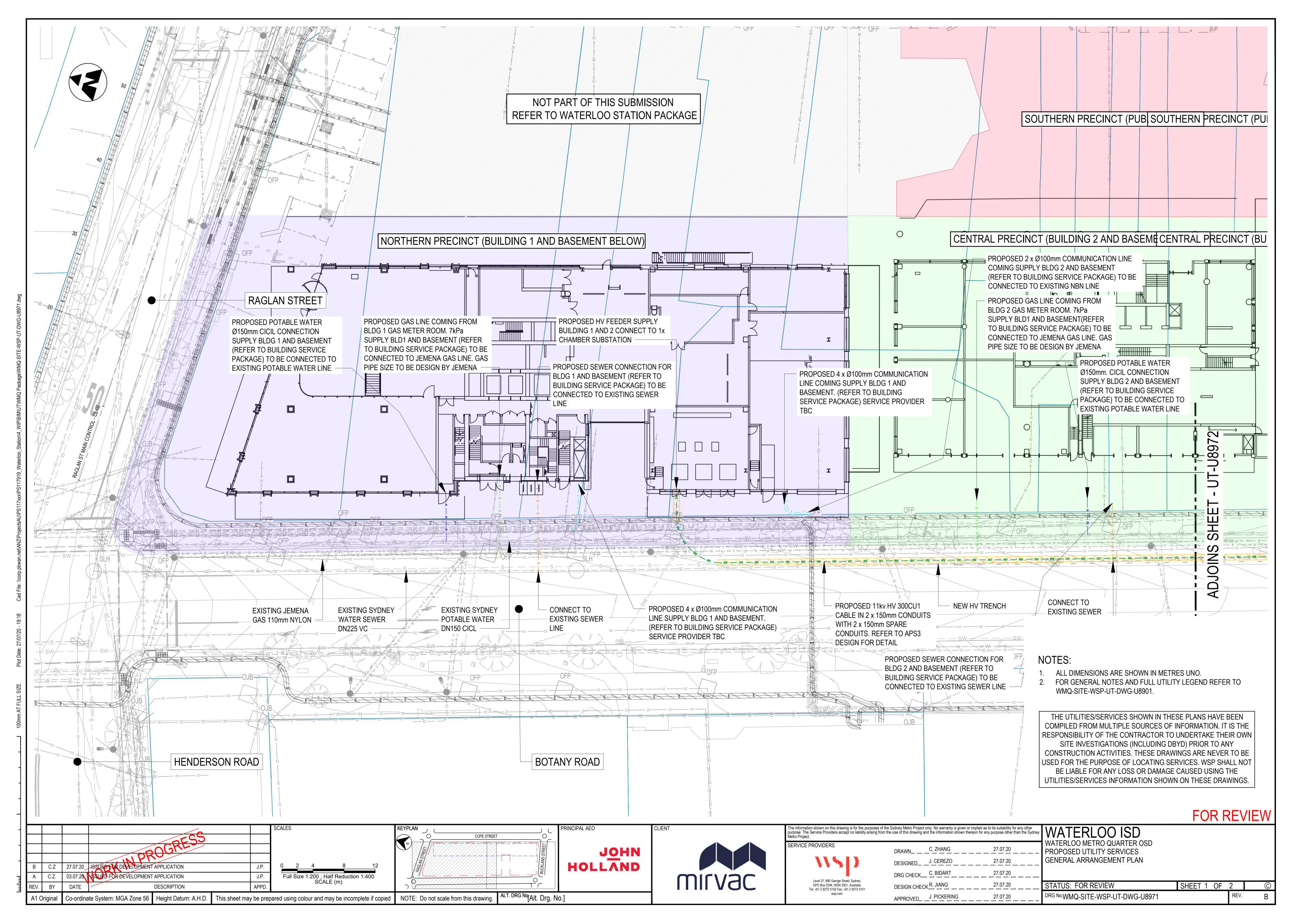
C.Z. 03.07.20 ISSUED FOR DEVELOPMENT APPLICATION

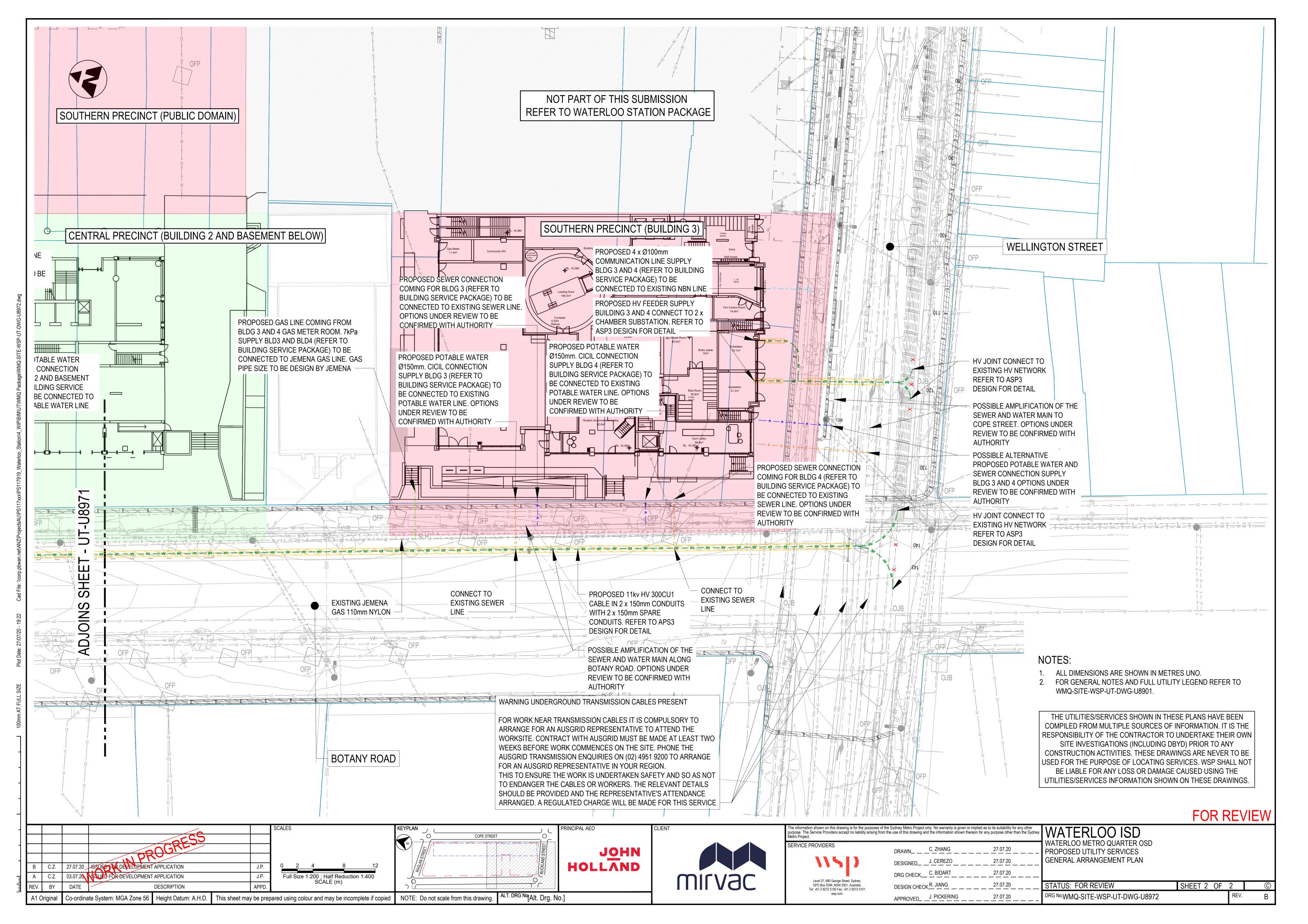
A1 Original Co-ordinate System: MGA Zone 56 Height Datum: A.H.D. This sheet may be prepared using colour and may be incomplete if copied

SCALES

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.

Case No: 185224

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.

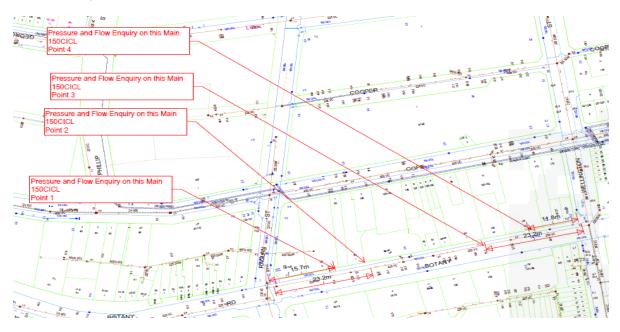
For a list of authorised Coordinators, either visit www.sydneywater.com.au > Plumbing, building & developing > Developing > Providers > Lists or call **13 20 92.**

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





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.

Case No: 185224

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.

10

To get approval for your connection, you will need to lodge an application with Sydney Water Tap inTM. 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.





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





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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

CAUTION: This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and are expecting the content or attachment from the sender. 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



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

wsp.com

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From: Zachary Kennett [mailto:Zachary.Kennett@jemena.com.au]

Sent: Thursday, 18 June 2020 11:42 AM **To:** Jiang, Ray <<u>Ray.Jiang@wsp.com</u>>

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





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From: Jiang, Ray < Ray.Jiang@wsp.com>
Sent: Wednesday, 17 June 2020 2:23 PM

To: Neale Hilton < <u>Neale.Hilton@jemena.com.au</u>>

Cc: Pickering, John < john.pickering@wsp.com >; Ramajoo, Jonathan < Jonathan.Ramajoo@wsp.com >;

<u>patrick.garland@mirvac.com</u>; 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

CAUTION: This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and are expecting the content or attachment from the sender. 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

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From: Andrew Haigh [mailto:Andrew.Haigh@jemena.com.au]

Sent: Wednesday, 17 June 2020 2:05 PM **To:** Jiang, Ray <<u>Ray.Jiang@wsp.com</u>>

Cc: Pickering, John <<u>john.pickering@wsp.com</u>>; Ramajoo, Jonathan <<u>Jonathan.Ramajoo@wsp.com</u>>; <u>patrick.garland@mirvac.com</u>; Neale Hilton <<u>Neale.Hilton@jemena.com.au</u>>; Stephen Angel <<u>Stephen.Angel@jemena.com.au</u>>; Zachary Kennett <<u>Zachary.Kennett@jemena.com.au</u>>

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 <<u>john.pickering@wsp.com</u>>; Ramajoo, Jonathan <<u>Jonathan.Ramajoo@wsp.com</u>>;

patrick.garland@mirvac.com

Subject: Waterloo Over Station Development - Jemena Gas Connection

CAUTION: This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and are expecting the content or attachment from the sender. 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:

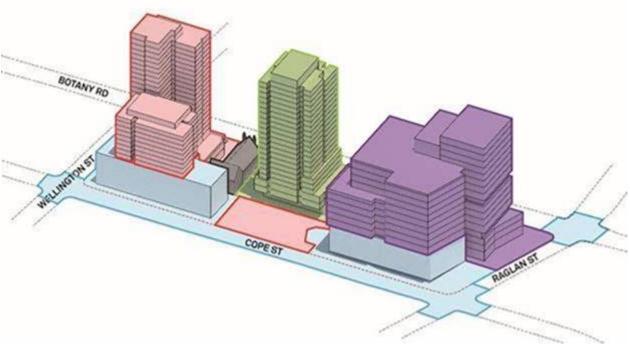
- What is the existing capacity of your current network in the precinct area.
- Does Jemena have any plans to upgrade its existing network in the precinct area.

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

N. 0.427 207 244

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

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

wsp.com

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Appendix 4 – Ausgrid Application for Connection AN21263



New Connection Above 100 AMP

Reference Code: 0099922



LOCATION

Land Title Type

Strata

Lot Number

5

Nearest Cross Street

Wellington Street

Location Address

Botany Road, Waterloo, 2017

Land Zoning

Urban

Location Diagram

File name Ausgrid filename reference Size

SixMaps.pdf LocationAttachmentFilePath_1 2.627 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

2500 Amps

Proposed Maximum Demand Number Of Phases: Phase A: 2113 Phase B: 2113 Phase C: 2113

3

Proposed Maximum Demand Calculation

File name Ausgrid filename reference Size

Waterloo South_Maximum Demand.pdf WFAMaxDemandCalc_1 1.029 MB

Are You Intending To Connect Controlled Load At This Premises?

Νo

ADDITIONAL DEVELOPMENT DETAILS

RESIDENTIAL	
No Of Residential Premises:	506
Average No Of Bedrooms Per Unit:	1
Gas Hot Water:	Yes
Gas Cooktop:	Yes
COMMERCIAL	
Number Of Commercial Premises:	1
Total Floor Area With Air-Conditioning In M2:	1000
HOUSE SERVICES	
Number Of House Service Premises:	1
Proposed Maximum Demand Number Of Phases:	3
Phase A:	111
Phase B:	111
Phase C:	111
Total Number Of Premises:	508

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

02-Jan-2022

When Do You Wish To Electrify The Premises?

14-Mar-2022

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?

Nc

Do You Wish To Underground / Relocate Electricity Assets In Conjunction With This Connection Application?

Yes

Underground / Relocation Details

Install 2 Off 1000kva Standard Surface Chamber Distribution Substations. Redirect Existing Underground 11kv Feeder In The Street.

Comments

The 2 Chamber Substations Are Below The 1:100 Flood Levels, There Is A Chance That These Substation Location Might Be Relocated To The Back Courtyard (Northern Side) Of The Building With Ausgrid'S Right Of Way Being Coordinated.

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

200421_DRP Meeting_Buildings 3&4 (1).pdf AdditionalAttachment_1 18.201 MB

WMQ-BLD3-BSA-AR-DRG-DA100_C.pdf AdditionalAttachment_2 0.737 MB

EXPEDITED CONNECTION

Do you want to expedite your connection offer for all premises?

Yes	No

DECLARATION

Applicant Name

Mr Patrick Garland

Application Date

22-May-2020

Price Description

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

Above 100 Amps Connection Offer 507 x 19.58

Total Price

Price Including GST AUD \$452.80 AUD \$9.927.06

AUD \$10,379.86

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.







PROPOSED DESIGN SCOPE

DATE: To: Ausgrid - Contestable Connections From: ASP Company: contestability@ausgrid.com.au **ASP Representative: Authorisation Number:** Phone: Ausgrid reference: Email: **Project Description: Project Address:** Include description of existing and proposed load fields below **Connection Details** HV Supply (i.e. HVC) LV Supply Existing Load: Phases **Amps** Proposed Load: Phases **Amps** Total: Amps Proposed connection Date: **HV** Proposal **Proposed Distribution Centre:** include substation type, size, LV panel layout (e.g. L type kiosk, 1000kVA, 1600/400 panels) Proposed Zone/Feeder: **HV Network Proposal:** describe the HV connection proposal (e.g. loop in new new substation between HS01234 and HS09876) **HV** Relocation Proposal: LV and/or SL Proposal, including comms LV and/or SL Network Proposal: LV/SL Relocation Proposal: Does this proposal involve modification of Ausgrid's transmission, ADSS or pilot cable system(s)? YES If YES, please include on sketch Do you require fault level information that is not on WebGIS:? ☐ YES ☐ NO Sketch - proposed method of connection[⋆] Attachments: Master plan (if multi stage subdivision)* Sketch – System Diagram (for HV Items marked with X are Photographs works)* mandatory
Items with * asterisk are Development Site Plans Other mandatory if applicable to ☐ includes large/disturbing loads*

Ausgrid Use Only	Date Offer Accepted:	Load Cycle:						
	Ausgrid Project Number:	CPC:						
Planning: Response / Comments / Recommendations: (use additional pages if necessary)								

□ Design Contract Acceptance
 □

the project type/application

WATERLOO SOUTH - MAXIMUM DEMAND CALCULATION



Project No: PS112210

Date: 21/04/2020 Prepared By: AXA Reviewd By: Approved By:

Building 3 Maximum Demand

		I	Induction		Uı	nit Mix QTY			
Area Description	GFA	GBA	Cooktop (kVA)	1 BED	2 BED	3 BED	4 BED	Elec Load (kVA)	House Load (VA)
Student Accomodation									
Refer to Building 3 MD Tab									
Residential Subtotals	12,847 m2	17,890 m2		416	39	0	0	930kVA	25kVA
Podium Retail /Shared House				Lift Load	QTY				
Refer to Building 3 MD Tab									
Retail/House Subtotals	2.068 m2	264 m2						245 kVA	78 kVA

B3 Total (kVA)								1,277 kVA	
			Residential 95 Retail 24 Shared House 78	5 kVA	1,405 A/ph 360 A/ph 115 A/ph		Maximum Demand Diversit Diversified Load	0.8	
Building 4 / Station Retail			% Induction		Unit	Mix QTY			
Level	GFA	GBA	Cooktop (kVA)	1 BED	2 BED	3 BED	4 BED	Elec Load (kVA)	House Load (VA)
Social Housing			, y						(/
Refer to Building 4 MD Tab									
Residential Subtotals	5,810 m2		28		34	7	1	205 kVA	62 kVA
Station Retail / House	GFA	GBA							
Refer to Building 4 MD Tab									
Retail/House Subtotals	m2							250 kVA	kVA

 B4 Total kVA
 517 kVA

 Residential 267 kVA 393 A/ph Maximum Demand 517 kVA Diversity 0.8 Station Retail 250 kVA 368 A/ph Diversified Load 413 kVA

 Shared House WA

TOTAL

Notes; MD is based on gas cooking B3 Retail power allowance has been made for Gym use

mini-chamber Sub 2x1000kVA

Available Current Load (Amps) Spare Capacity Rating (Non-Firm) - TBC Amps/ph 2,800 2,800 Amps/ph 2,113 Amps/ph 32.51%

Site Maximum Demand

1,435 kVA 2,113 Amps

PAGE - 2/3

WATERLOO SOUTH - MAXIMUM DEMAND CALCULATION



Retail and House Load Allowance HOUSE 250 VA/m2 Mech and Elec Project No: PS112210 Date: 21/04/2020 10 VA/m2 15 VA/m2 Prepared By: Residential mix load Allowance Reviewd By: 2.0kVA 2.5kVA 1 Bed / Studio 2 Bed / Twin Studio Approved By: 3 Bed 4 Bed 3.0kVA Diversified Induction CooktopLoad Allowance per unit Unit Mix QTY Building 3 / Podium Retail % Induction Cooktop House Load GFA GBA 1 BED 2 BED 3 BED 4 BED (kVA) Elec Load (kVA) 566 435 Level 24 - Roof 0.0kVA 19.0kVA 47.0kVA 7 21 21 21 21 21 21 22 21 20 20 20 20 20 20 20 20 19 Level 22 590 m2 570 m2 kVA 885 kVA kVA kVA 47.0kVA 47.0kVA 47.0kVA Level 21 Level 20 885 885 Level 19 Level 18 885 47.0kVA 47.0kVA 47.0kVA 47.0kVA 46.5kVA 44.5kVA kVA kVA 885 885 Level 17 kVA kVA kVA 885 885 855 Level 16 Level 15 evel 14 kVA kVA 44.5kVA 45.0kVA 45.0kVA 45.0kVA 45.0kVA 45.0kVA 45.0kVA 45.0kVA 45.0kVA 45.0kVA 855 855 evel 13 Level 12 kVA kVA kVA kVA kVA 855 855 855 Level 11 Level 10 evel 9 855 855 evel 8 Level 7 570 m2 570 m2 570 m2 570 m2 570 m2 337 m2 kVA kVA kVA 855 855 855 _evel 6 _evel 5 Level 4 _evel 3 _evel 2 - Communal 43.0kVA 0.0kVA 506 12,847 m Lift Load 122.3kVA 122.3kVA 1,100 1,100 2,640 evel 2 - Gym evel 1 - Gym

Ground Leve	1,090 m2							10,900
Lift (25kVA/Lift)			25 kVA/Lift	3				62,500
Retail/House Subtotals	2,068 m2	264 m2	832		0	0	245 kVA	78 kVA

B3 Total kVA 1,277 kVA

TOTAL

Residential 954 kVA Retail 245 kVA Retail 245 kV.

Shared House 78 kVA

Maximum Demand 1,277 kV Diversity 0.8 Diversified Load 1,021 kVA 1,504 Amps 1,881 Amps

MD is based on gas cooking

Retail area power allowance has been made for Gym use

PAGE - 3/3

WATERLOO SOUTH - MAXIMUM DEMAND CALCULATION



Retail and House Load Allowance Mech and Elec HOUSE RETAIL Project No: PS112210 21/04/2020 By: AXA House
Residential mix load Allowance
1 Bed / Studio
2 Bed / Twin Studio
3 Bed
4 Bed Date: Prepared By: Reviewd By: Approved By: 10 VA/m2 2.5kVA 3.0kVA 4.0kVA 4.5kVA Diversified Induction CooktopLoad Allowance per unit

	4 Bed 4.5KV	Α									
Building 4 / Station Retail			% Induction			Unit M	ix QTY				
Level	GFA	GBA	Cooktop (kVA)	1 BED		2 BED	3 BED		4 BED	Elec Load (kVA)	House Load (VA)
Social Housing											
Level 14 -Communal Rooftop	315 m2									0.0kVA	3,150
Level 14	180 m2		kVA					1		4.5kVA	270
Level 13	663 m2		kVA	2	5		1			24.0kVA	995
Level 12	663 m2		kVA	4	4		1			26.0kVA	995
Level 11	663 m2		kVA	4	4		1			26.0kVA	995
Level 10	663 m2		kVA	4	4		1			26.0kVA	995
Level 09	663 m2		kVA	4	4		1			26.0kVA	995
Level 08	663 m2		kVA	4	4		1			26.0kVA	995
Level 07	663 m2		kVA	4	4		1			26.0kVA	995
Level 06	599 m2		kVA	2	5					20.0kVA	899
Ground Level - Lift (25kVA/Lift)	75 m2			25 kVA/Lift	2						750 50,000
Residential Subtotals	5,810 m2			28	34		7	1		205 kVA	62 kVA

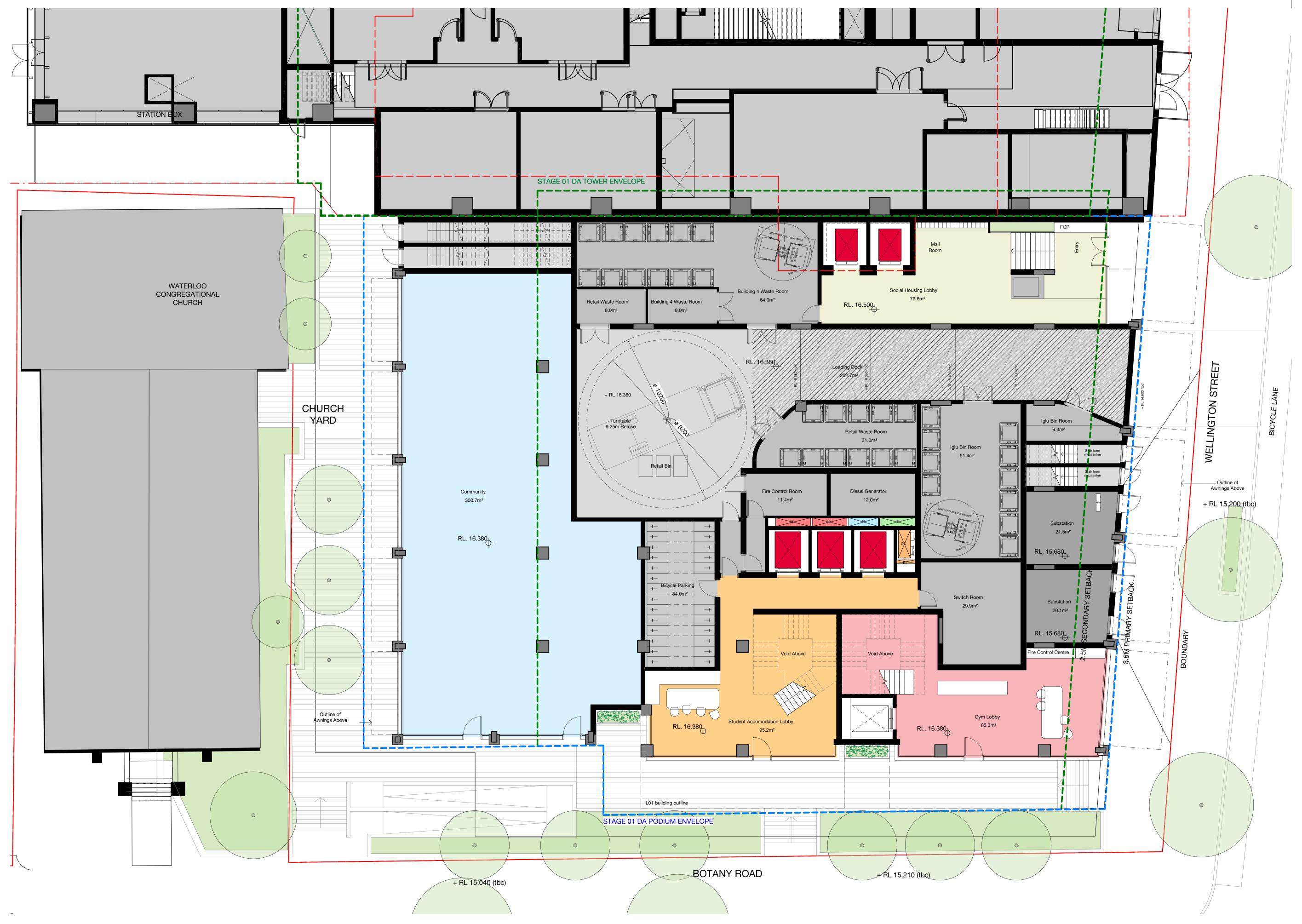
Station Retail / House	GFA	GBA		
Retail 01		125 kVA	125.0kVA	
Retail 02		125 kVA	125.0kVA	
Retail/House Subtotals	m2		250 kVA	kVA

TOTAL

Residential 267 kVA Retail 250 kVA Shared House kVA

Maximum Demand Diversity 0.9
Diversified Load 465 kVA 685 Amps 761 Amps

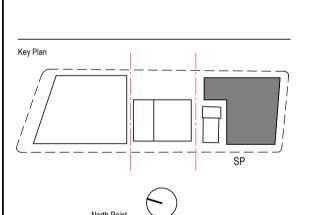
Notes; MD is based on gas cooking



PRELIMINARY

Recent revision history # Status A MV/JHG COST PLAN B 30.03.20 ISSUE FOR INFORMATION 17.04.20 B MV ISSUE FOR INFORMATION 24.04.20 C MV

> No material may be reproduced without prior permission Contractor must verify all dimensions on site before commencing Do not scale drawings.





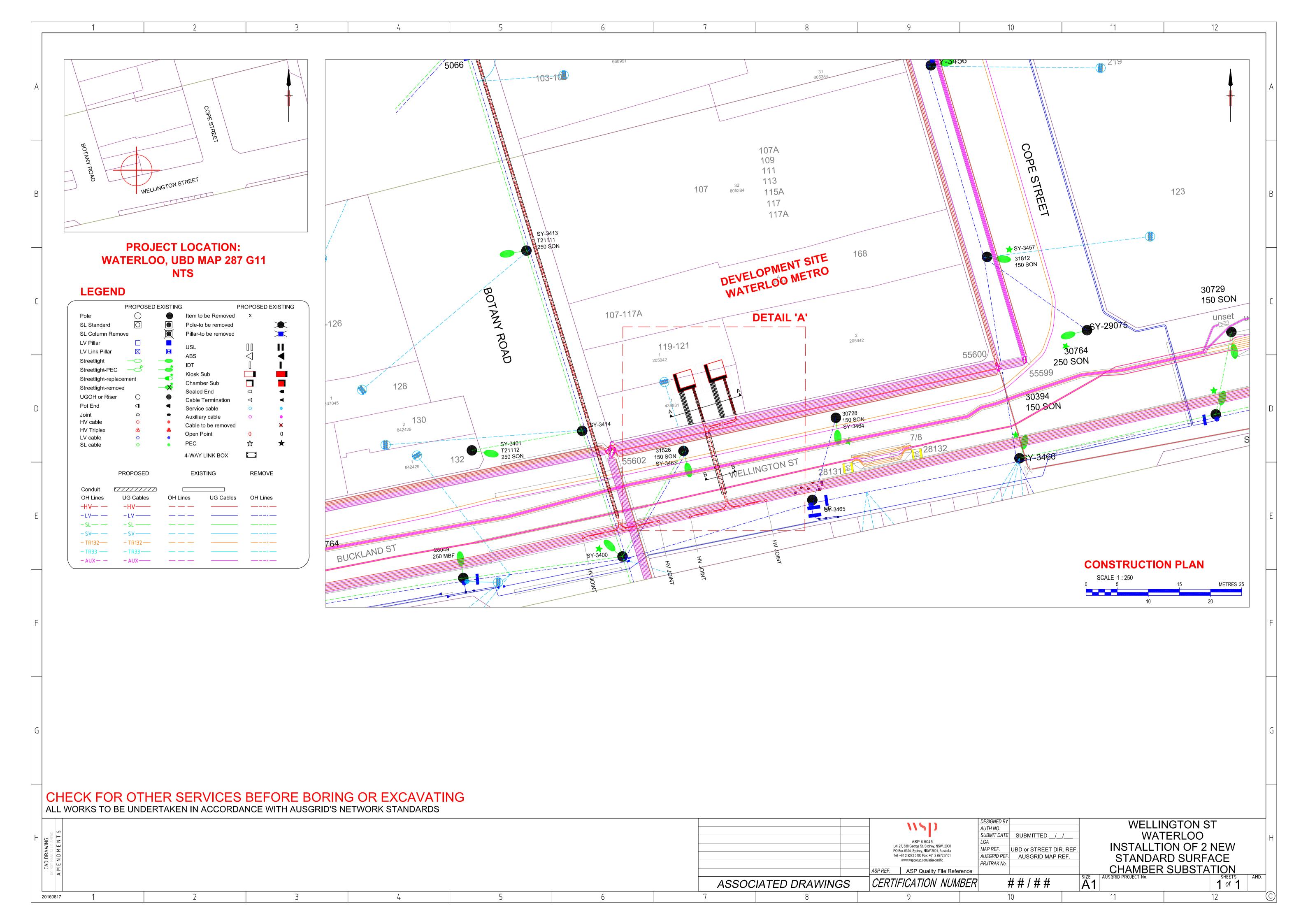


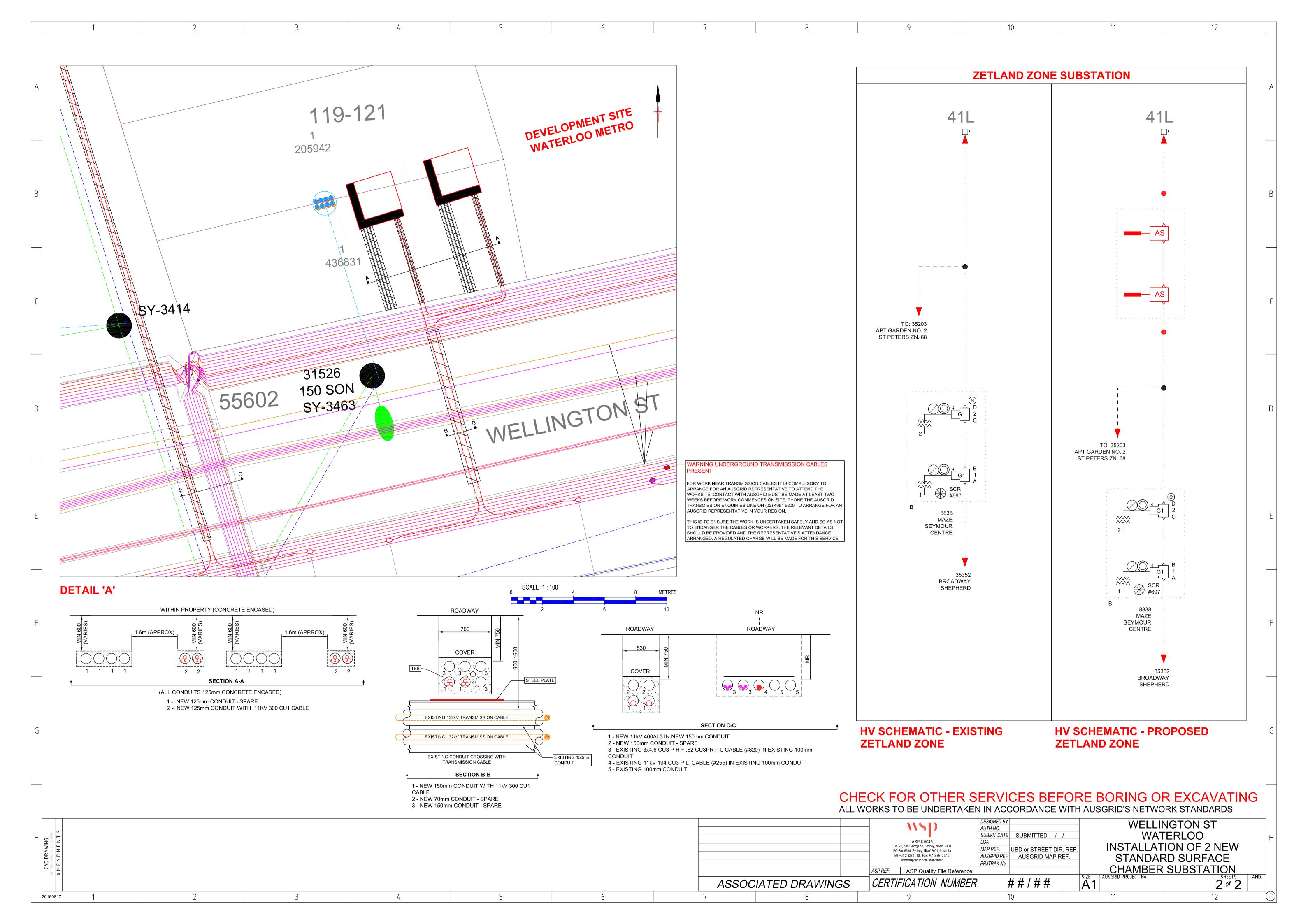
BATESSMART.

WATERLOO METRO QUARTER DEVELOPMENT

Ground Floor Plan

-DRG-WMQ-BLD3-BSA-AR-DRG-DA100 C









Appendix 5 – Ausgrid Application for Connection AN21264



New Connection Above 100 AMP

Reference Code: 0109479



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

Proposed Service Type

Underground

Service Voltage

Low Voltage 230/400v

Service Size

Other (5461 A)

Proposed Maximum Demand

Number Of Phases:

Phase A:

5461 Phase B:

5461 Phase C:

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?

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

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?

Total Number Of Premises:

14-Sep-2021

Ausgrid Has Provided A Certified Design Number(Cdn) For A Network Augmentation Project Associated With The Premises

Asp 1 Has Been Appointed

Do You Have Development Consent (Da) For Your Proposal?

Do You Wish To Underground / Relocate Electricity Assets In Conjunction With This Connection Application?

Underground / Relocation Details

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

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)	* Basic connection services - over 100 Amps connections (Download here)	Y
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

Total Price

AUD \$452.80 AUD \$452.80

Price Including GST

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: To: Ausgrid - Contestable Connections From: ASP Company: contestability@ausgrid.com.au **ASP Representative: Authorisation Number:** Phone: Ausgrid reference: Email: **Project Description: Project Address:** Include description of existing and proposed load fields below **Connection Details** HV Supply (i.e. HVC) LV Supply Existing Load: Phases **Amps** Proposed Load: Phases **Amps** Total: Amps Proposed connection Date: **HV** Proposal **Proposed Distribution Centre:** include substation type, size, LV panel layout (e.g. L type kiosk, 1000kVA, 1600/400 panels) Proposed Zone/Feeder: **HV Network Proposal:** describe the HV connection proposal (e.g. loop in new new substation between HS01234 and HS09876) **HV** Relocation Proposal: LV and/or SL Proposal, including comms LV and/or SL Network Proposal: LV/SL Relocation Proposal: Does this proposal involve modification of Ausgrid's transmission, ADSS or pilot cable system(s)? YES If YES, please include on sketch Do you require fault level information that is not on WebGIS:? ☐ YES ☐ NO Sketch - proposed method of connection[⋆] Attachments: Master plan (if multi stage subdivision)* Sketch – System Diagram (for HV Items marked with X are Photographs works)* mandatory
Items with * asterisk are Development Site Plans Other mandatory if applicable to ☐ includes large/disturbing loads*

Ausgrid Use Only	Date Offer Accepted:	Load Cycle:						
	Ausgrid Project Number:	CPC:						
Planning: Response / Comments / Recommendations: (use additional pages if necessary)								

□ Design Contract Acceptance
 □

the project type/application

PRELIMINARY MAXIMUM DEMAND SUMMARY PAGE

Project Aurecon Reference Client Revision Date Waterloo Integrated Station Development (MQD Works)

509191 Mirvac 3

ate 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) Substation Capacity (A) 3 x 1500 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)	
Diveristy Factor	
Diversified Maximum Demand (kVA	.)
Diversified Maximum Demand (A)	

4087
0.7
3783
5461

Diversity factor applied to Building 2 Load

Spare Capacity

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	вон	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	вон	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		1.19	
8	Amenities	103	15	1.55	
9	Commercial	2475	40		
9	Fire Stairs	53		0.27	
9	Lobby	79		1.19	
9	Amenities	103	15	1.55	
9	Terrace	552	2	1.10	Minimal outdoor lighting only
10	Commercial	2528	40		
10	Fire Stairs	52	5	0.26	

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

T : 10 : 114D	3,075 kVA	
Total Commercial MD	4,438 Amps	

BUILDING 2 MAXIMUM DEMAND

Project Aurecon Reference Client Waterloo Integrated Station Development (MQD Works)

509192 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		Lighting and small power to community space
GF	Lobby	68	25		Small power and lighting in lobby with allowance for feature lighting
GF	Stair case and meter room	65.5	5	0.3	
GF	Fire Control Room	13	40		Lighting and small power for workstation
GF	Amenities	47	15	0.7	General lighting and hand dryers etc
1	Childcare	555	40	22.2	General lighting and hand dryers etc
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		Lighting and small power to shared space
23	Plant	469	5		Plant lighting
23	Apt Lobby Lighting	1080	5	5.4	Traine lighting
	Apt Stair Case	320	5	1.6	
	Lifts	320			Assumed 20kW per lift, 3 lifts. Final load to be confimed by WSP
	Total GFA	17447	m2	33.0	Assumed 20kW per int, 5 mis. I mai load to be committed by Wor
	Total GIA	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			, , , , , , , , , , , , , , , , , , , ,
		Tota	Mech	550.7	kVA
			ıl Hyd	89.2	

Total Residential MD	1011.8 kVA
Total Residential MD	1460.4 A

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

Apartments
Worst Loaded phase

15	5
5	2

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



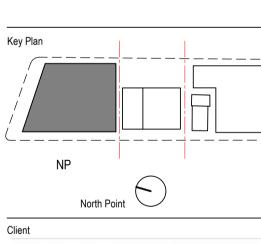
Notes

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Contractor must verify all dimensions on site before commencing work or preparing shop drawings.

Do not scale drawings.









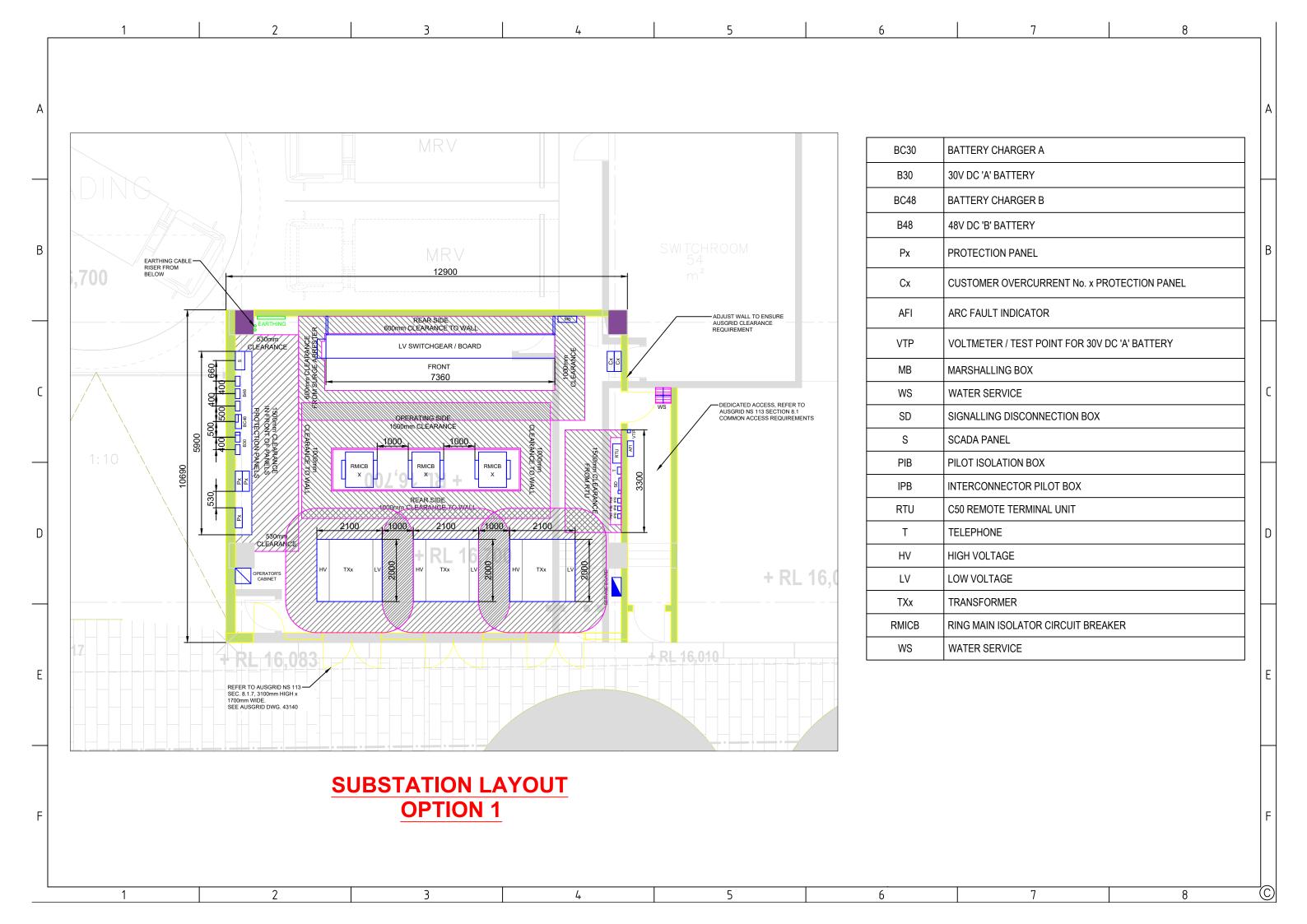
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WATERLOO METRO QUARTER DEVELOPMENT

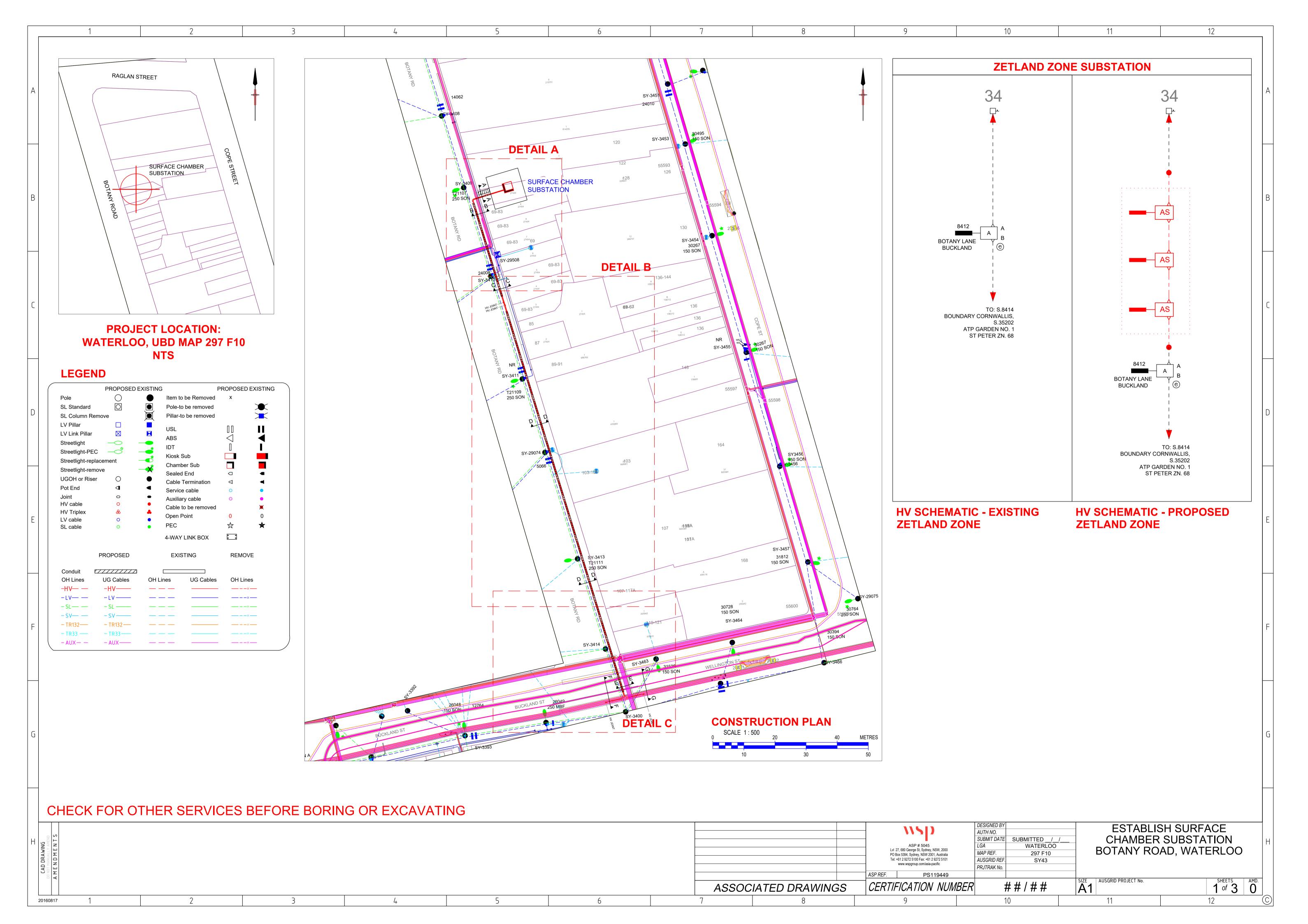
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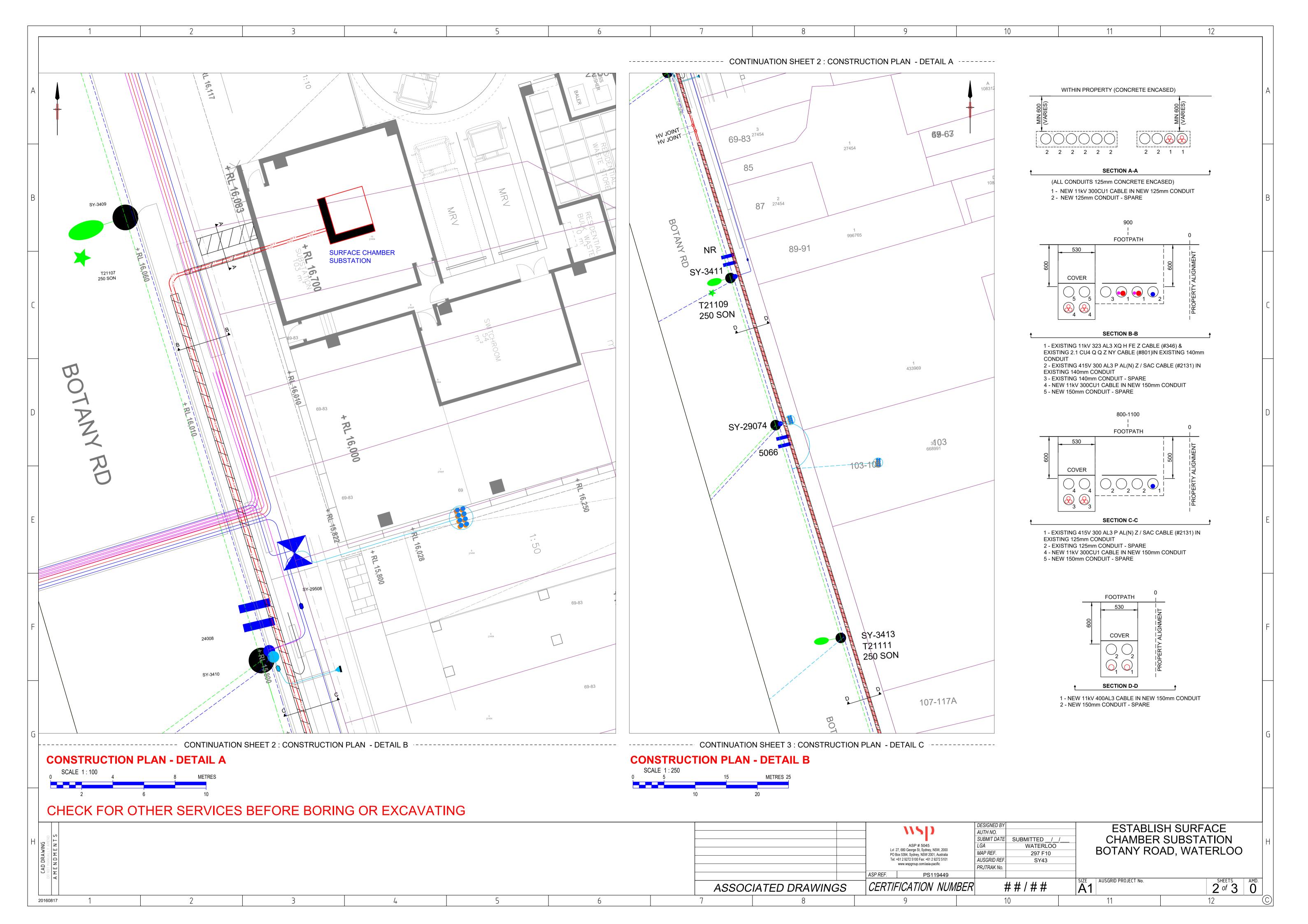
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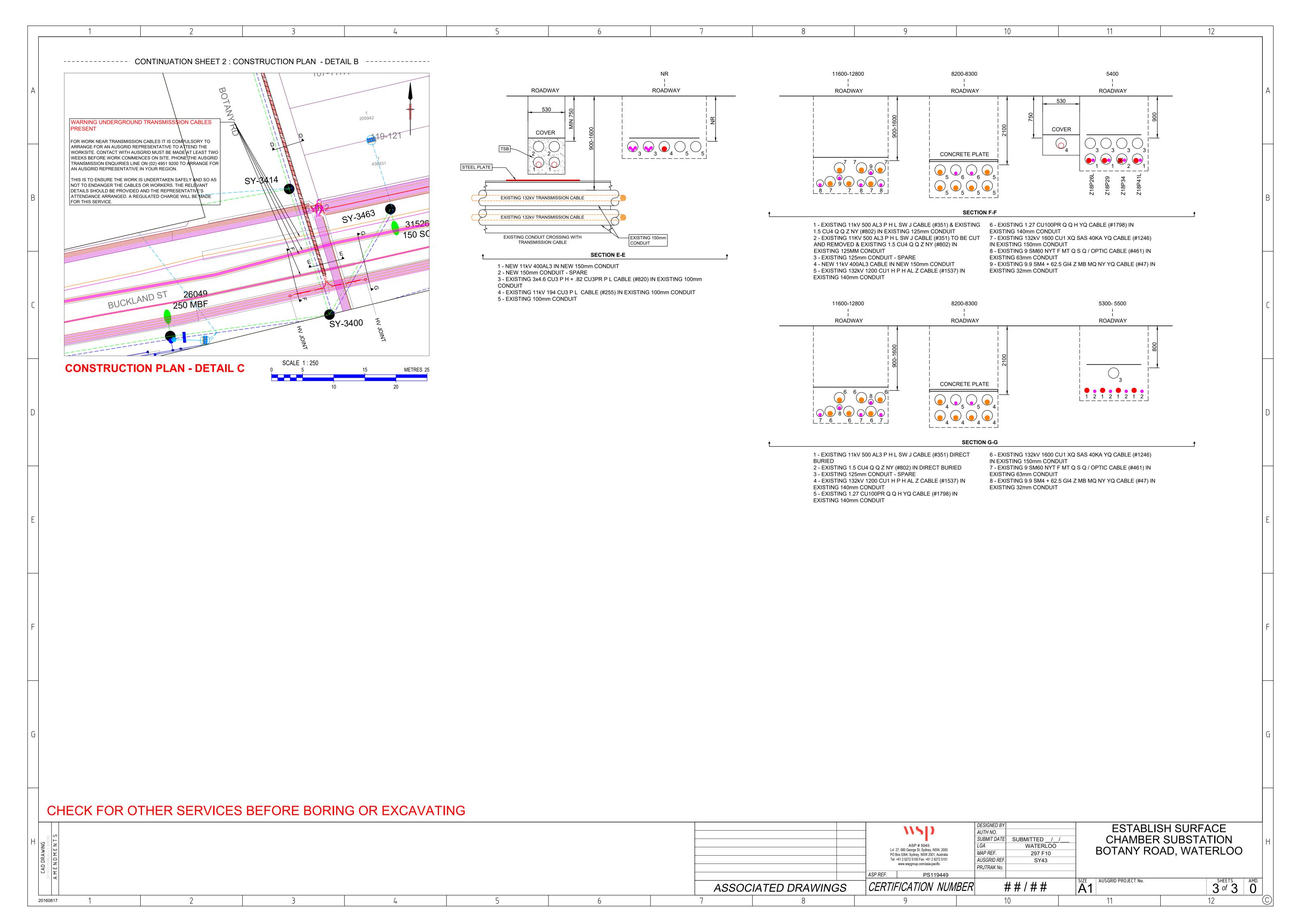
BUILDING 1 - GROUND LEVEL

Status
FOR INFORMATION
Sheet number Revision
WMQ-BLD1-WBG-AR-DRG-A1000 E









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

A QUALITY LEVEL DESCRIBES THE ACCURACY OF INFORMATION THAT IS 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
- 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 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 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.









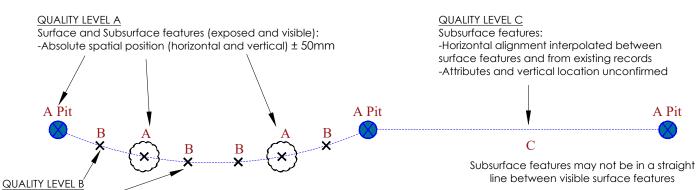






VARYING QUALITY LEVELS

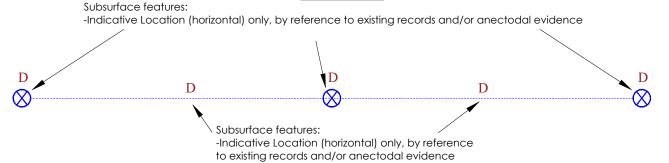
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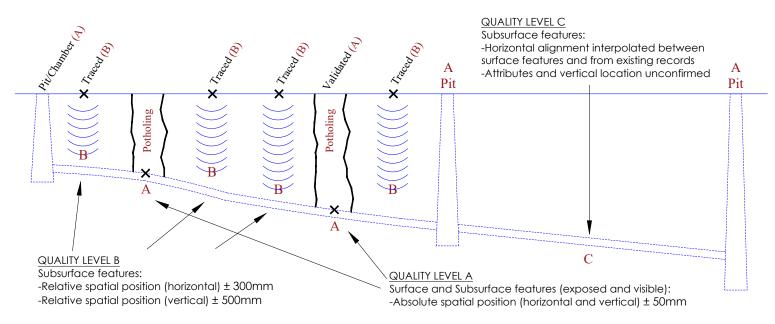
Subsurface features: -Relative spatial position (horizontal) ± 300mm

-Relative spatial position (vertical) ± 500mm

QUALITY LEVEL D



PLAN VIEW



LONGITUDINAL SECTION

ISSUE	DATE	AMMENDMENT	BY	DISCLAIMER:
Α	03/06/20	ORIGINAL UTILITIES PLAN	J.V.	SUBSURFACE FEATURES SHOWN IN THIS PLAN WERE LOCATED OR IDENTIFIED
				THROUGH A RANGE OF TECHNIQUES. AS SUCH THE ACCURACY AND
				ASSOCIATED INFORMATION IS LIMITED BY THE ASSOCIATED QUALITY LEVEL AS PER
				AS5488. VERIS CANNOT GUARANTEE THE PLAN IS WITHOUT FLAW AND EXPRESSLY
				DISCLAIMS ALL LIABILITY FOR ERRORS OR OMISSIONS OF ANY KIND WHATSOEVER
				OR FROM ANY LOSS, DAMAGE OR OTHER CONSEQUENCES WHICH MAY ARISE
				FROM ANY PERSON RELYING ON THIS PLAN. IN PARTICULAR, VERIS RECOMMENDS
				THAT USERS SATISFY THEMSELVES AS TO THE LOCATION OF SUBTERRANEAN
				FEATURES WHICH MAY OR MAY NOT BE SHOWN ON THE PLAN.



ead Office (NSW) Suite 1, Level 5, 8 Australia Ave Olympic Park NSW 2127 PO Box 6606. Silverwater. NSW 212 CLIENT

1300 765 315 1300 765 316 ABN 53 615 735 727

PROJECT TITLE	
WATERLOO STATION	
GENERAL NOTES AND LEGEND	LOCATED BY: L.B.
	SURVEYED BY: Y.M./A.D.
DRAWING TITLE	DRAFTED BY: J.V.
SUB-SURFACE LITH ITY PLAN	CHECKED BY: K.S./B.M./J.A.

DIAL BEFORE YOU DIG www.1100.com.ou
THIS PLAN DOES NOT REPLACE DBYD PLANS

DR NUM

UNABLE TO LOCATE

UNABLE TO TRACE

LINARI E TO OPEN

D.M

DENOTES INVESTIGATION AREA

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www.1100.com.au	DATE OF SURVEY: 24/06/2020	DATE OF PLAN: 03/06/
	HEIGHT DATUM: AHD71	CO-ORD: MGA94
NOT REPLACE DBYD PLANS	DBYD JOB#: 19449303/22/34	DBYD DATE: 30/04/20
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NUMBER	DRAWIN	G NUMBER / ISSUE
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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?) — Qš — — DZ — COMMUNICATION LINE (C) — c— TELEPHONE LINE (TN) — т — TELEPHONE HOUSE CONNECTION (TY) ____ TH ____ — тz — TELEPHONE LINE - DIGITISED (TZ) - OU -OPTICAL FIBRE - UNDERGROUND (OU) OPTICAL FIBRE - DIGITISED (OZ) — oz — WATER HYDRANT (PWHY) WATER STOP VALVE (PWSV) WATER FIRE HYDRANT (PWFB) WATER METER (PWMR) METER (PGMR) PIPELINE MARKER (PGPM) GAS MANHOLE COVER (PGHL) TELSTRA SINGLE CONC. PIT (PTSP a TELSTRA TWIN CONC. PIT (PTTP) TELSTRA DISTRIBUTION PILLAR OPTICAL FIBRE PIT (POFP) ELECTRIC CABLE MANHOLE (PEMH) POLE - LIGHT (PLPL) POLE - POWER & LIGHT (PPLP) ELECTRIC CABLE JUNCTION BOX (PEJB) TRAFFIC SIGNAL CONTROLLER (PSCL) POWER SERVICE PILLAR - UNDERGROUND (PEUP) GULLY PIT POINT (PGUL) DRAINAGE PIT (DP) DRAINAGE JUNCTION MANHOLE (PDJM) SEWER MANHOLE COVER (PSMH) POTHOLE INDICATOR END OF TRACE EOT

VERIS LEGEND

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— FU —

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GAS MAIN - QENOS HIGH PRESSURE PIPELINE (HG)

GAS MAIN - QENOS LOW PRESSURF (I G

FLECTRIC LINE - MINOR TRANSMISSION (F) ELECTRIC LINE - UNDERGROUND (EU)

ELECTRIC HOUSE CONNECTION (EY)

ELECTRIC LINE - DIGITISED (EZ)

SEWER HOUSE CONNECTION (SY)

SEWER MAIN (SM

DRAINAGE PIPE - (Ø225)

DRAINAGE PIPE - (Ø300)



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

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PROJECT TITLE
WATERLOO STATION
KEY PLAN
DRAWING TITLE

WAILKLOO SIAIION	
KEY PLAN	LOCATED BY: L.B.
	SURVEYED BY: Y.M./A.D.
RAWING TITLE	DRAFTED BY: J.V.
SUB-SURFACE UTILITY PLAN	CHECKED BY: K.S./B.M./J.A.
30D 30KI / KCE OTIEIT I E/KIV	APPROVED BY: D.M.

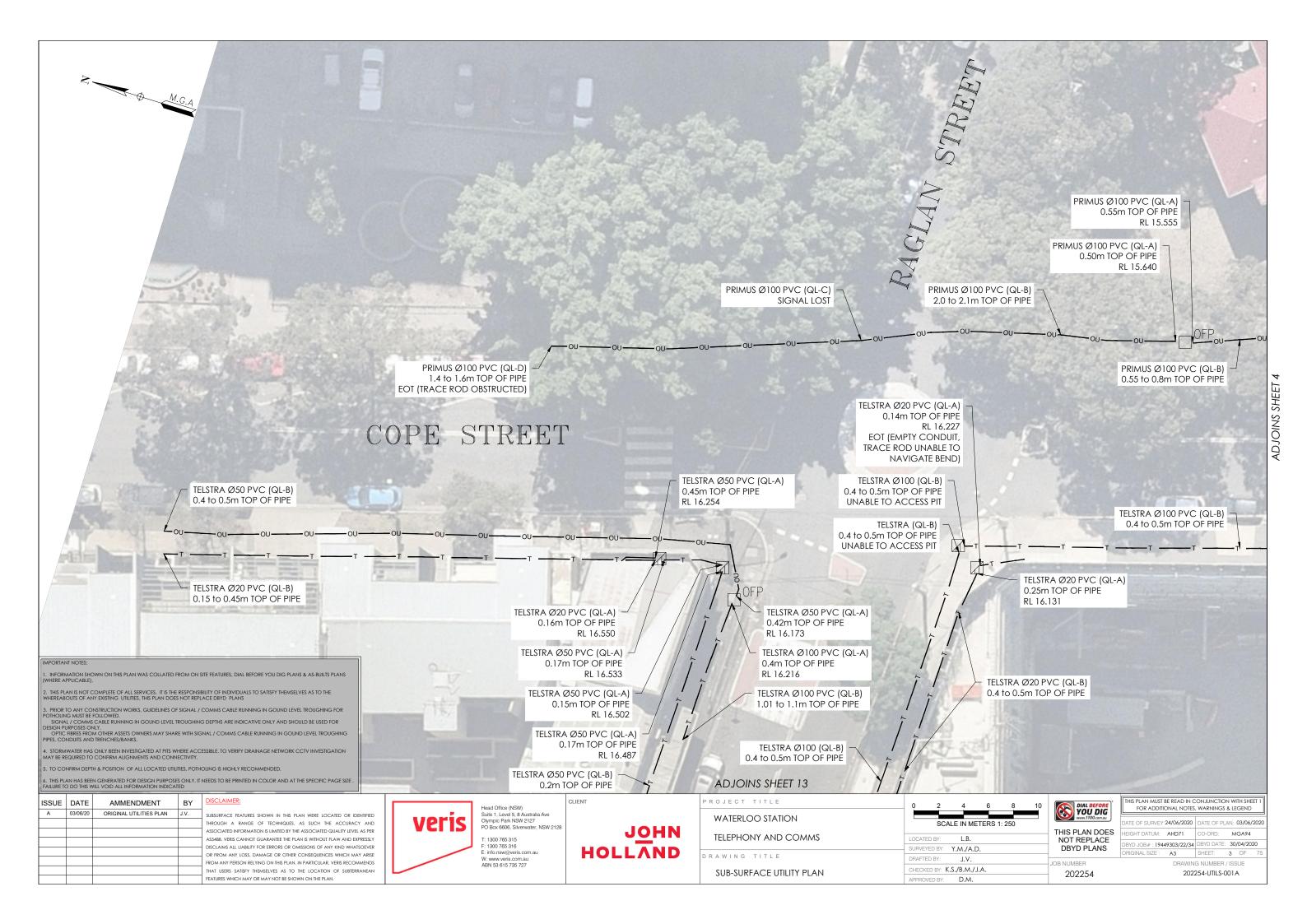
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www.1100.com.au	DATE OF SURVEY: 24/06/2020	DATE OF PLAN: 03/06/2020	
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NOT REPLACE	DBYD JOB# : 19449303/22/34	DBYD DATE: 30/04/2020	

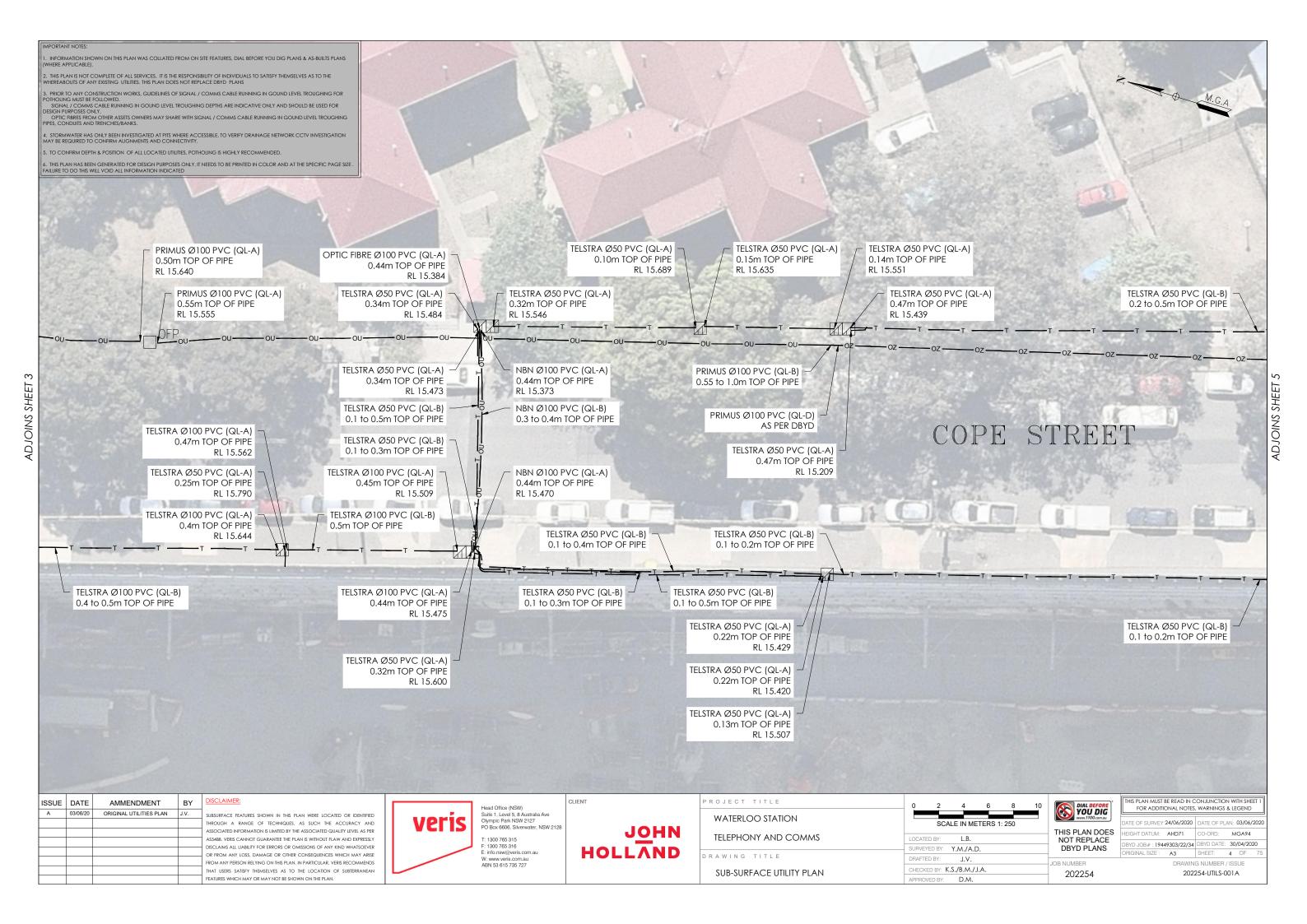
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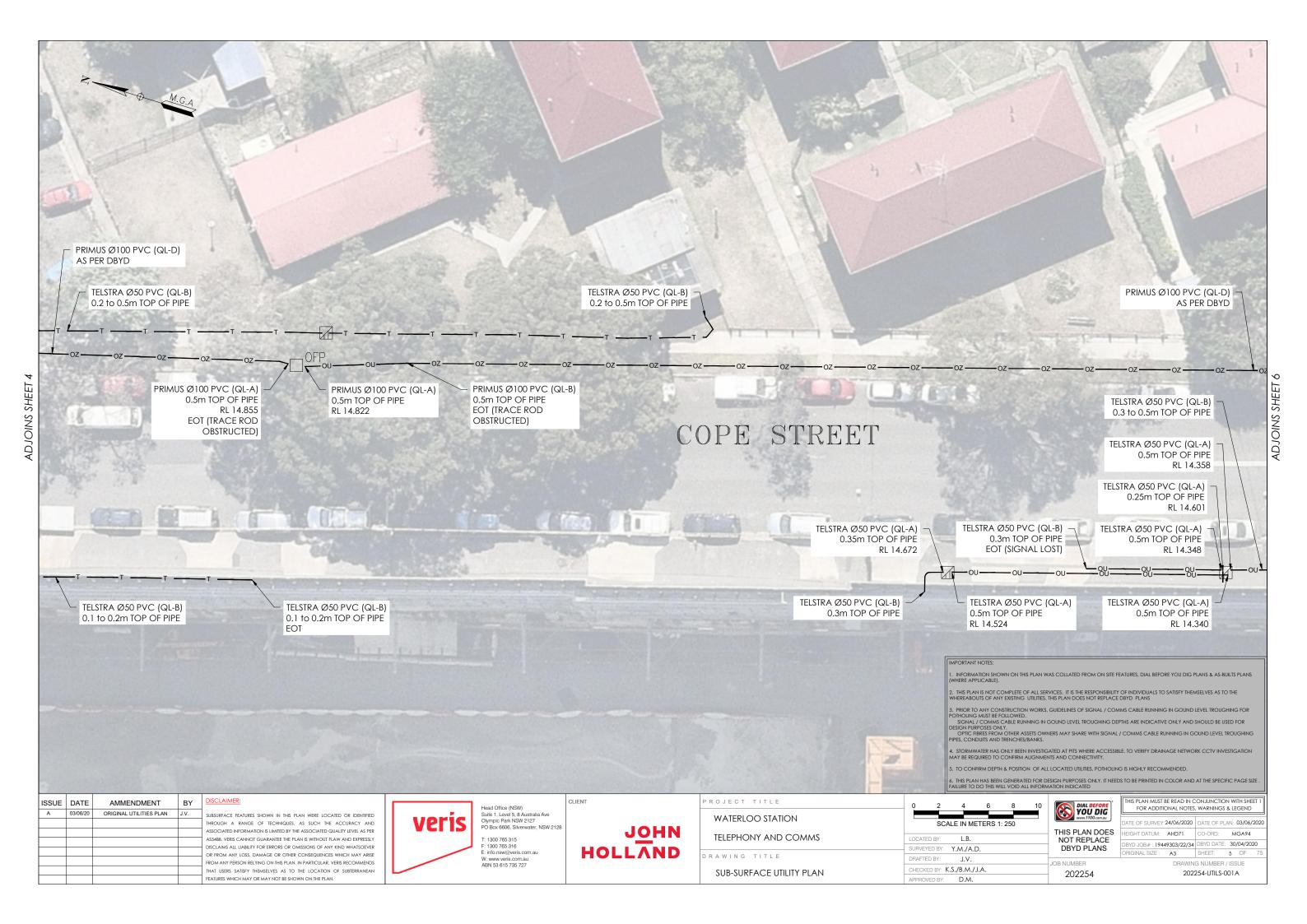
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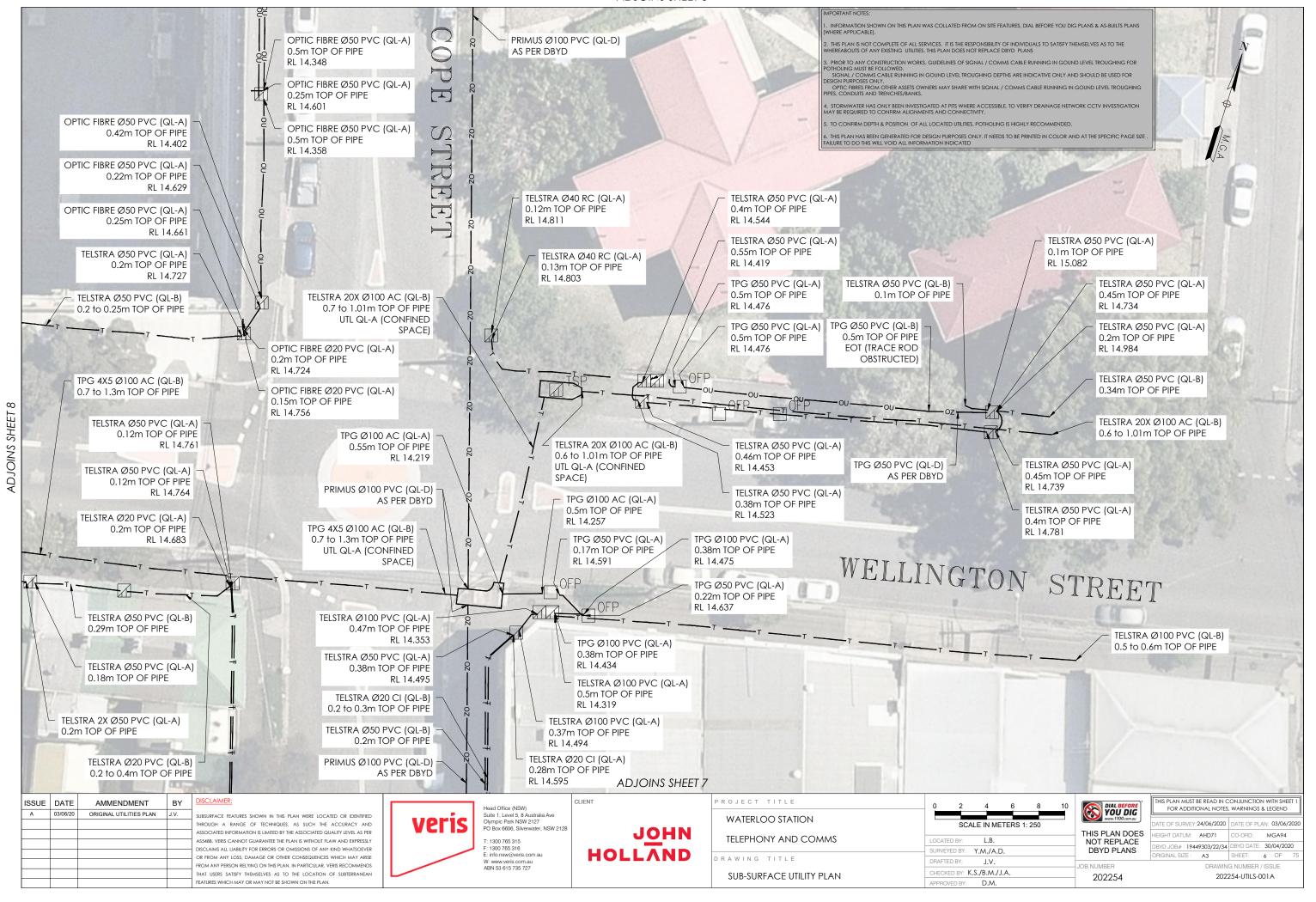


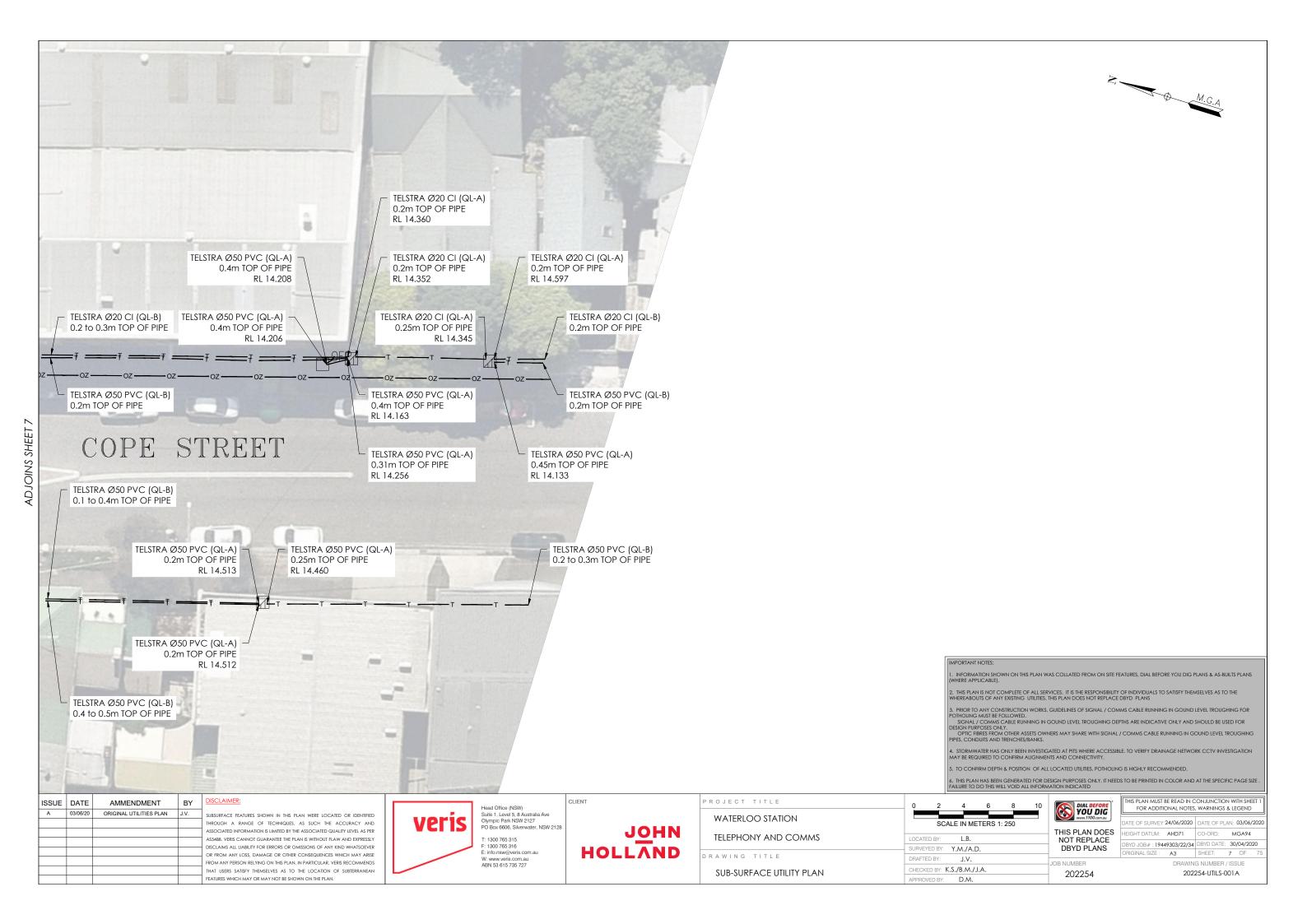
Appendix 6 - Utilities Survey

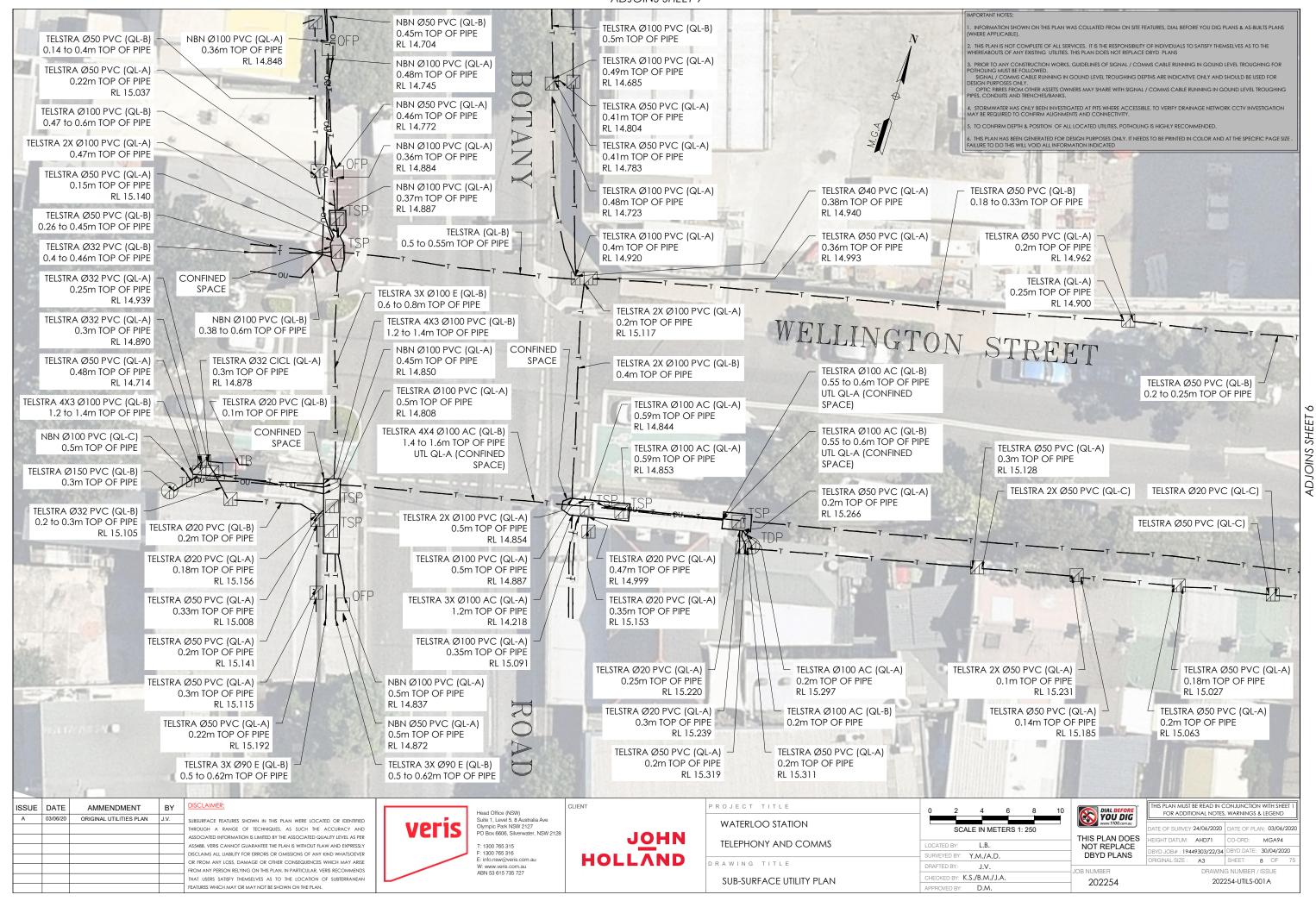


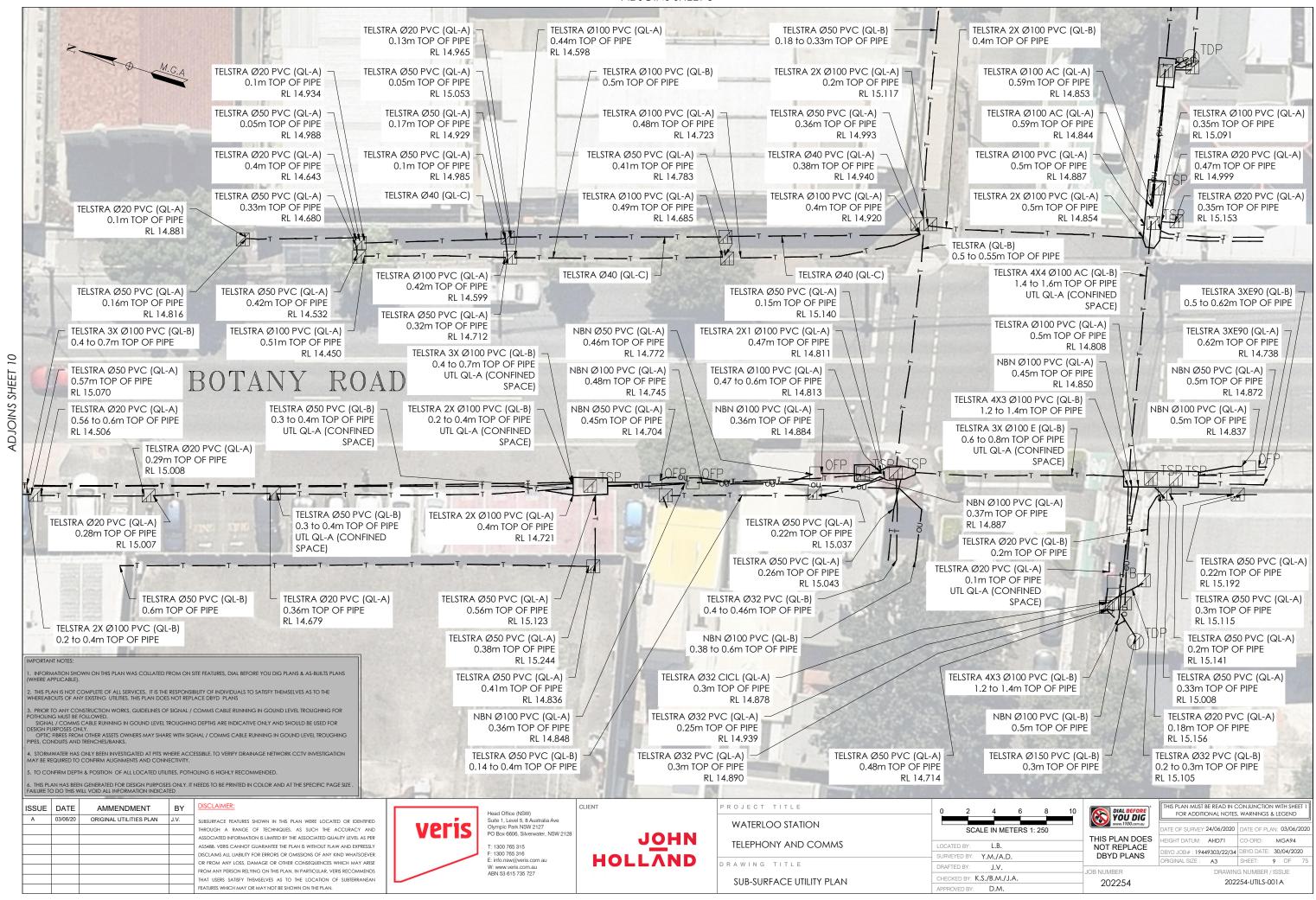


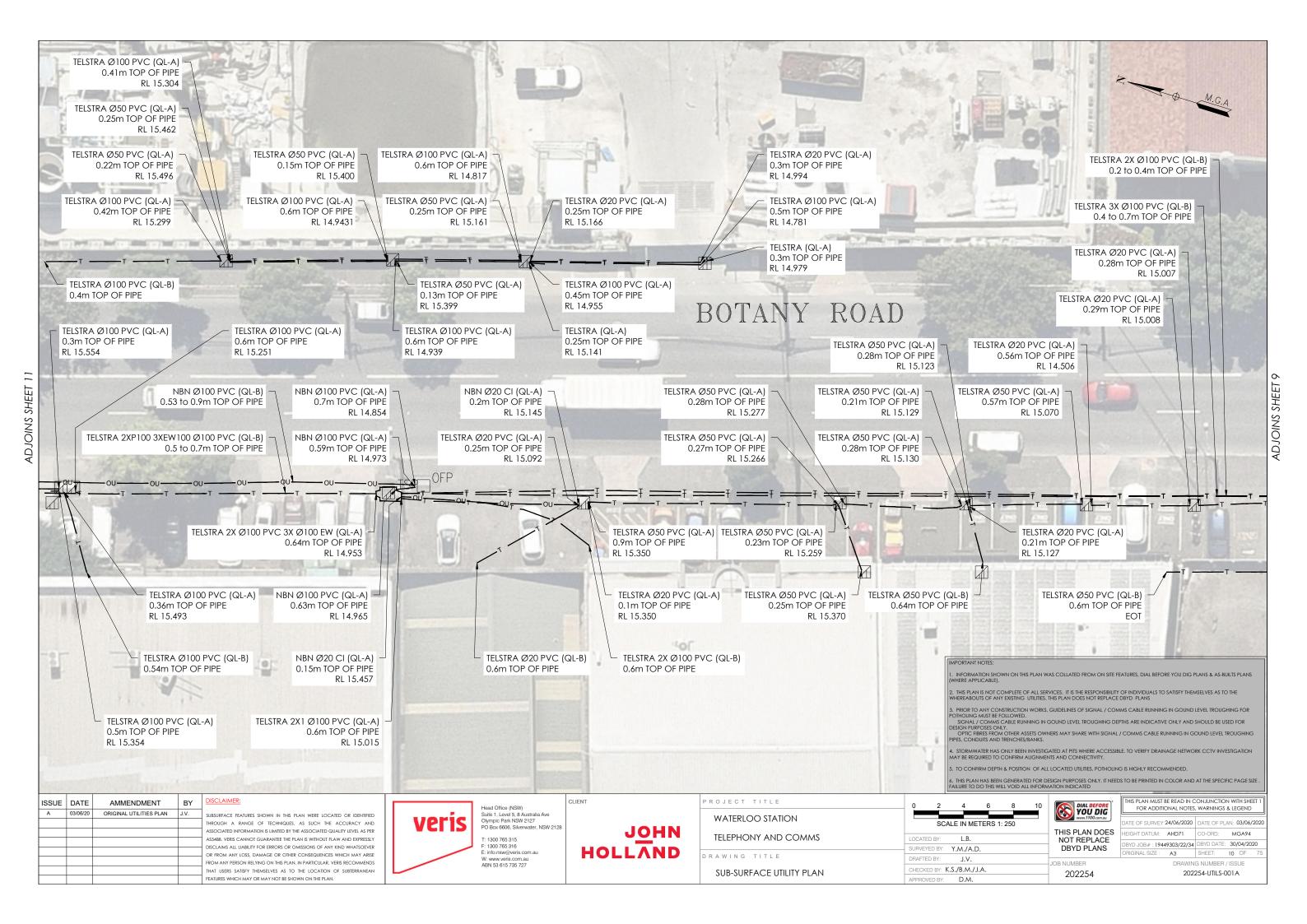


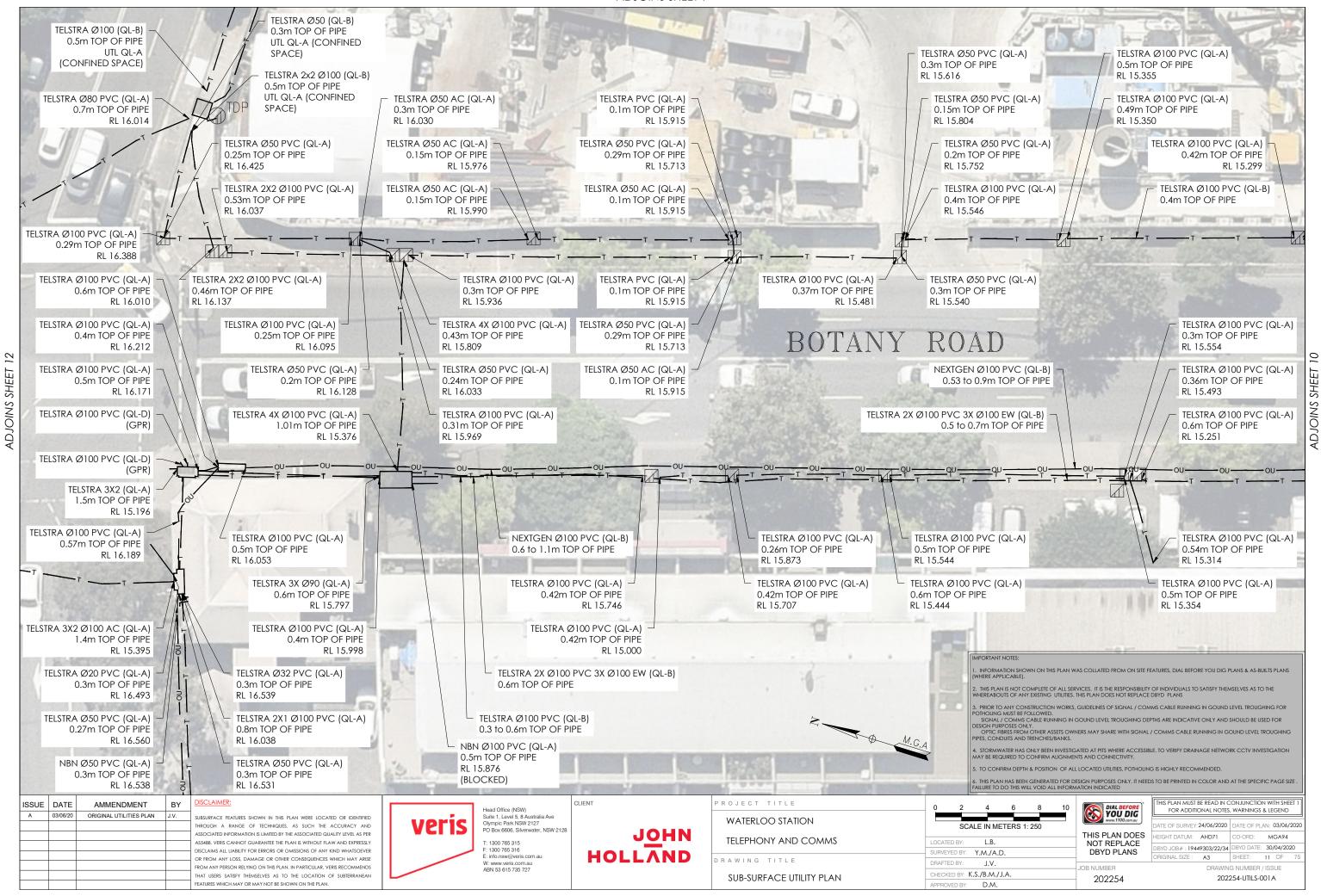


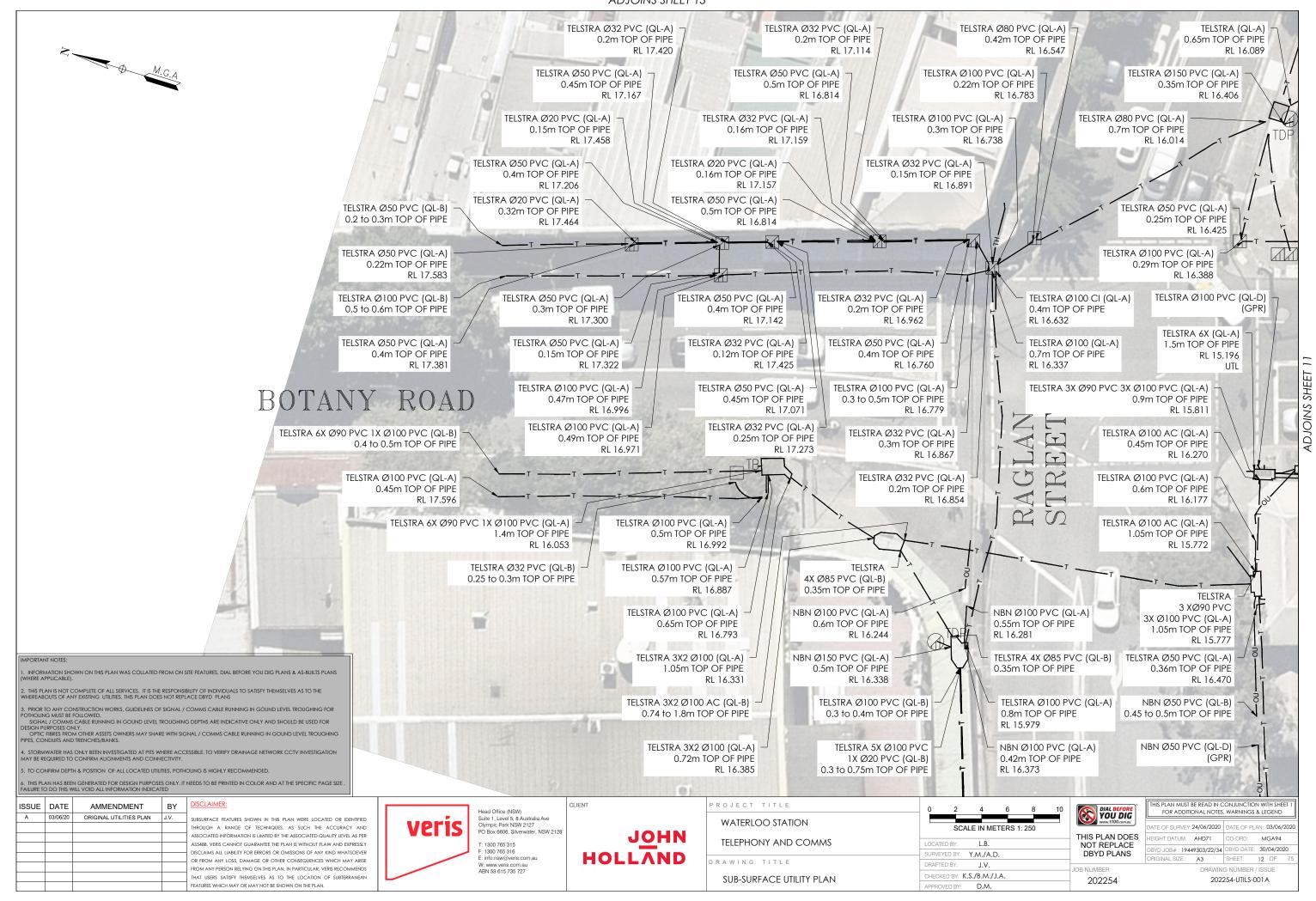


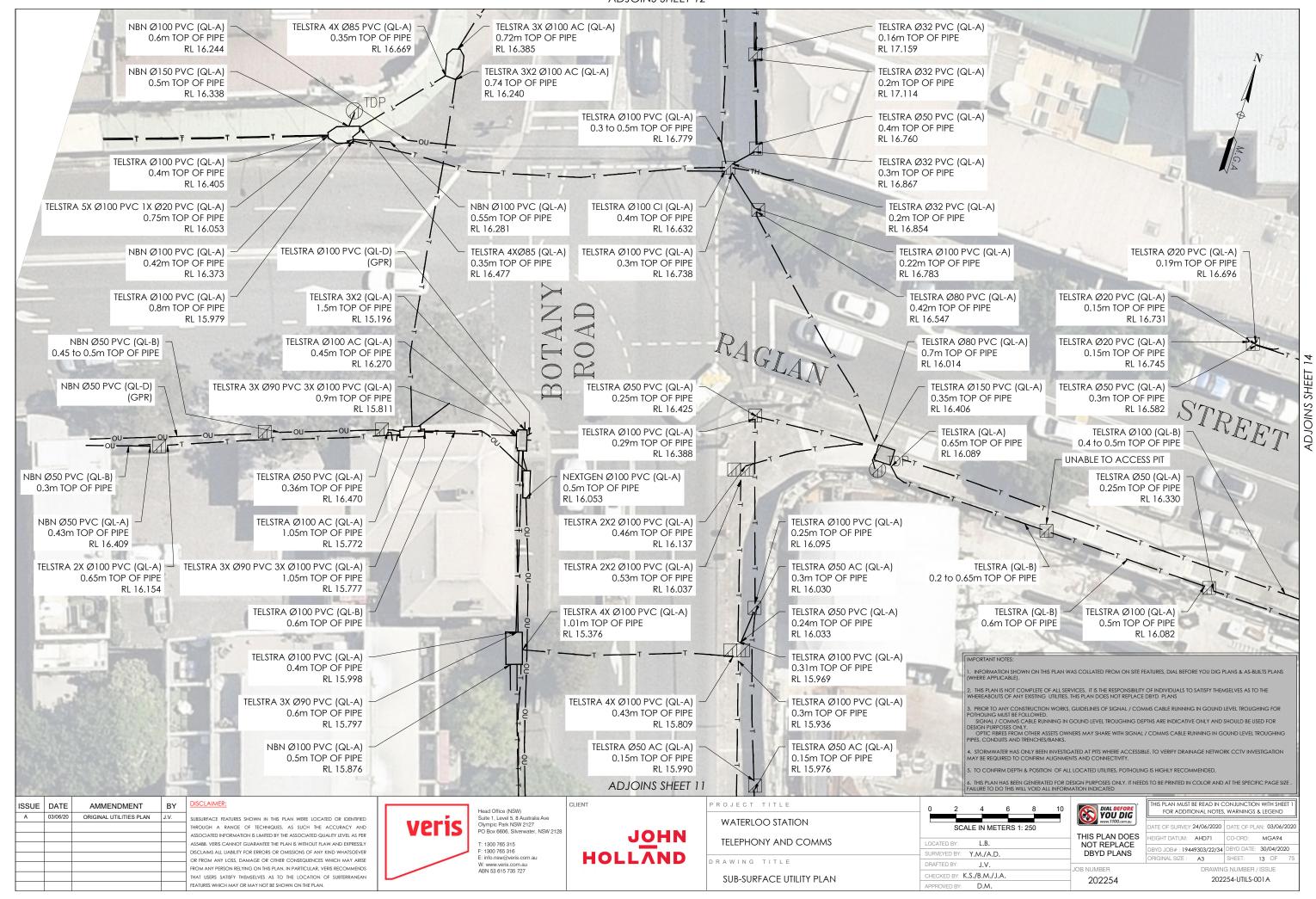


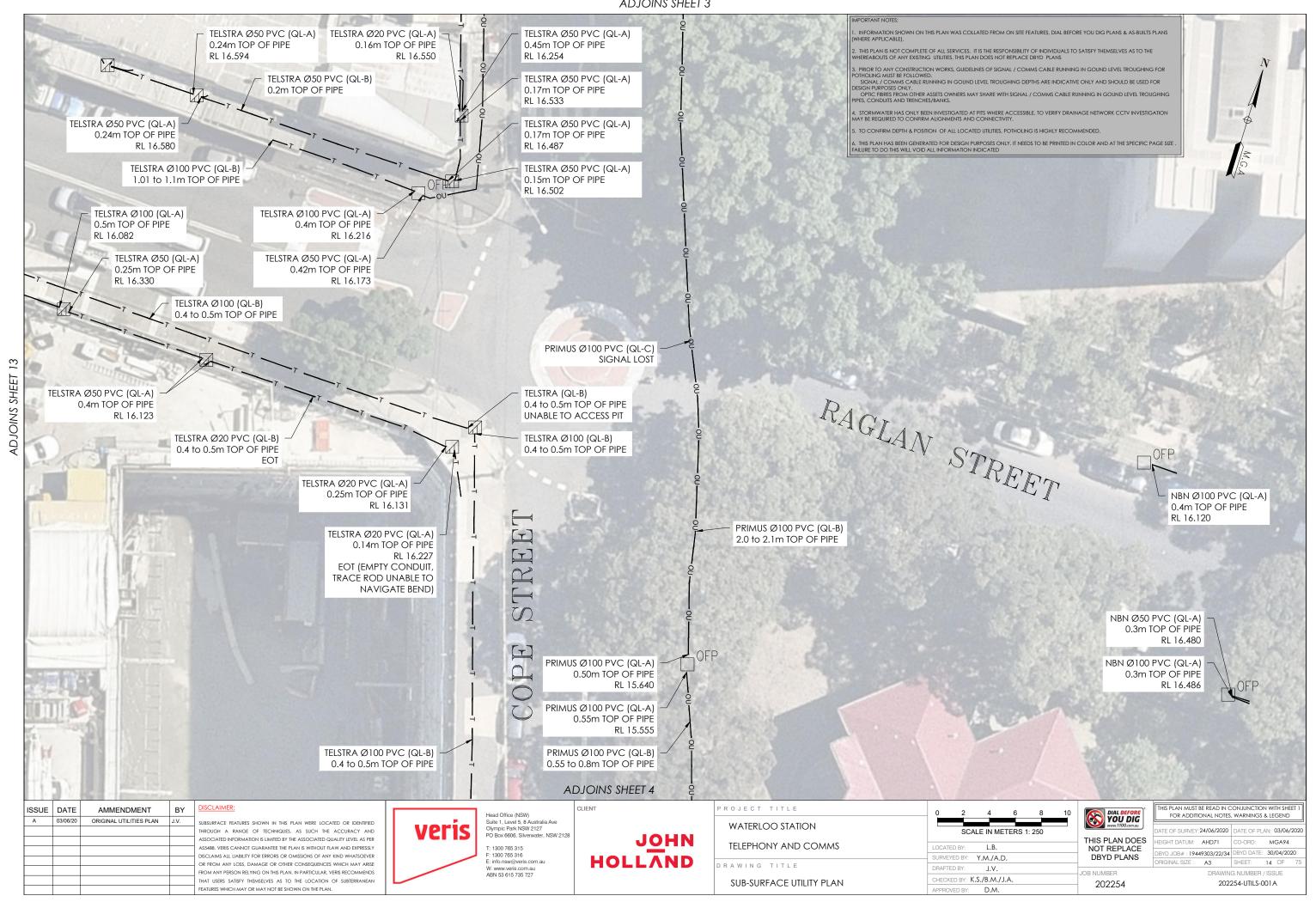


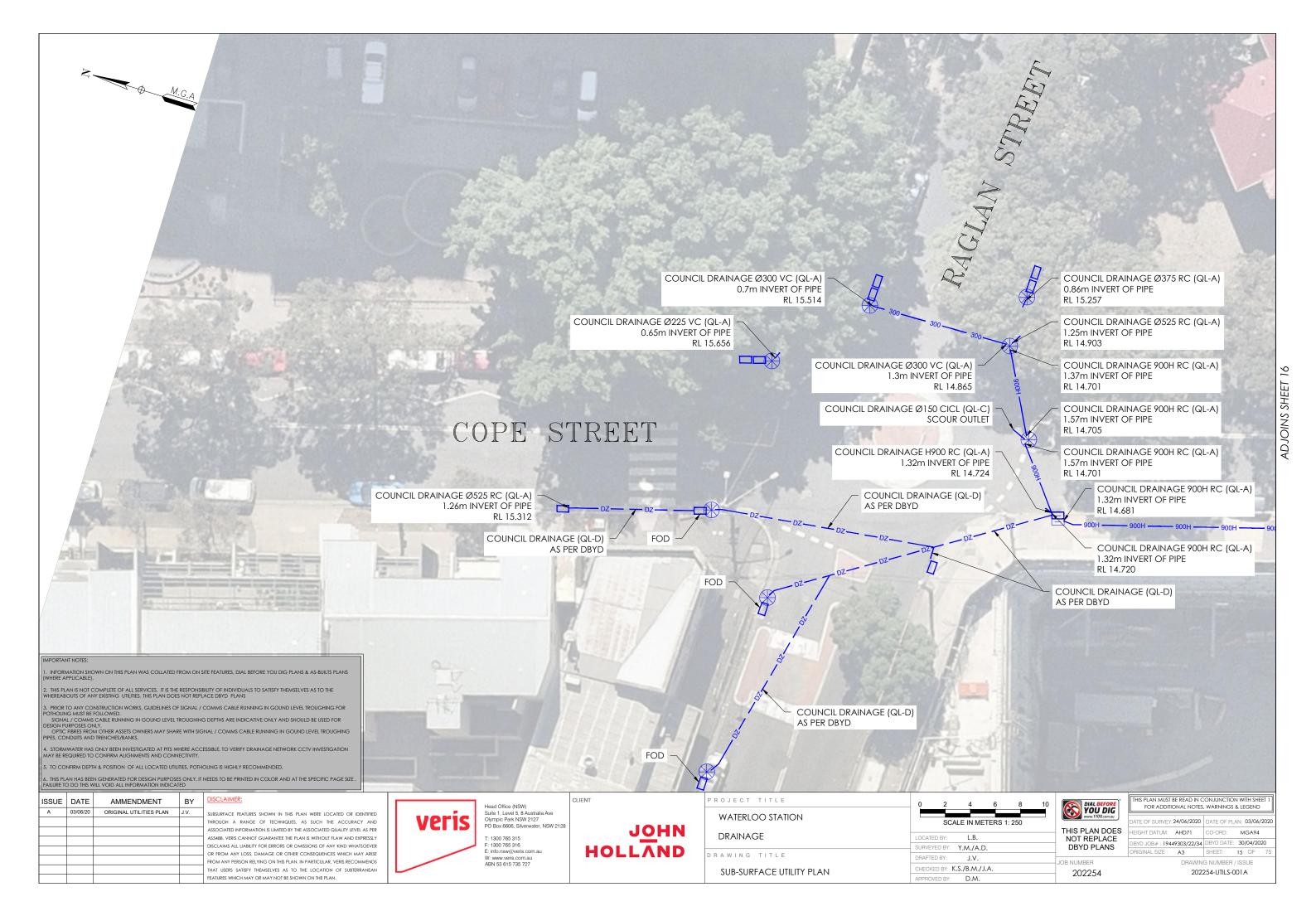


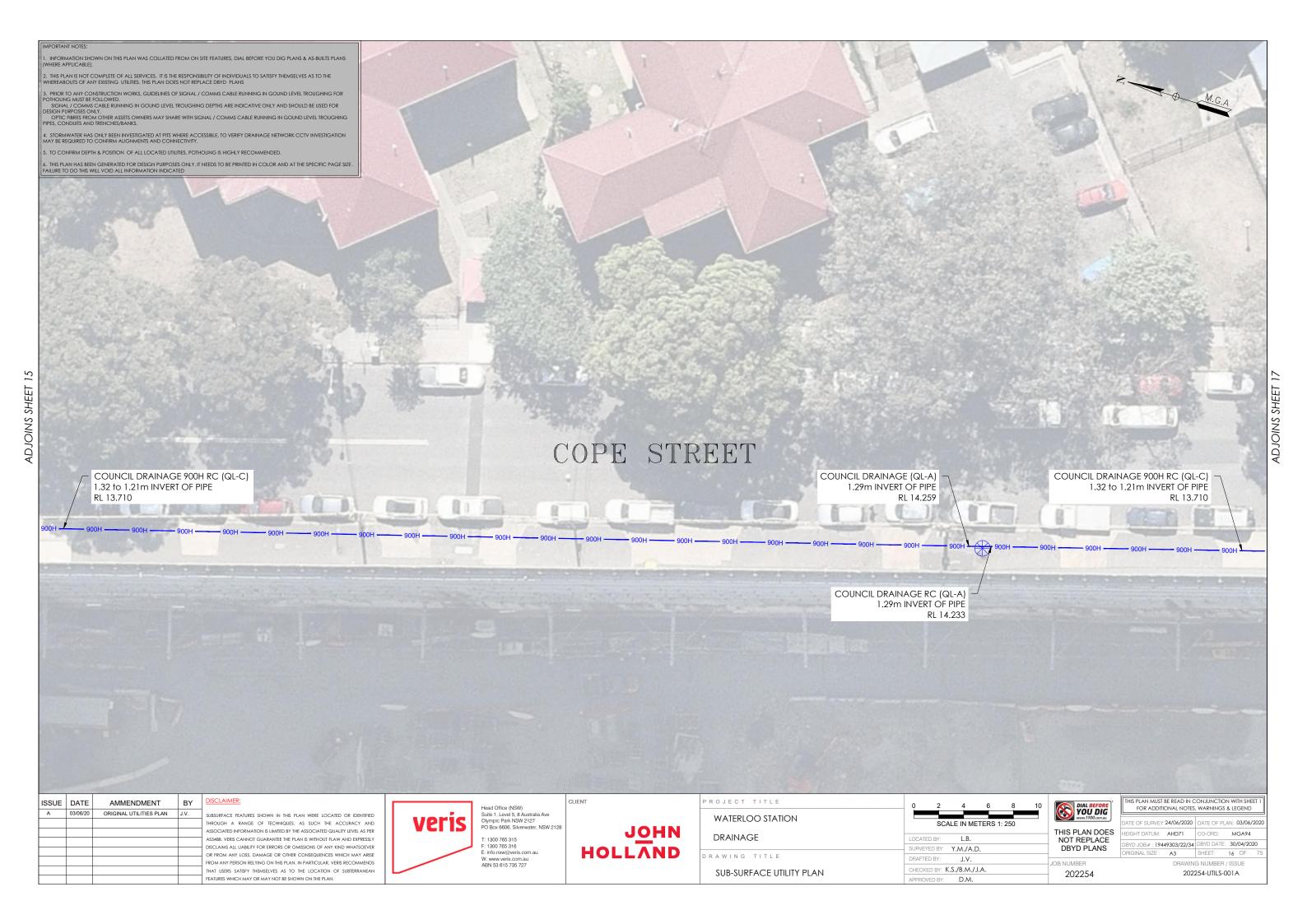


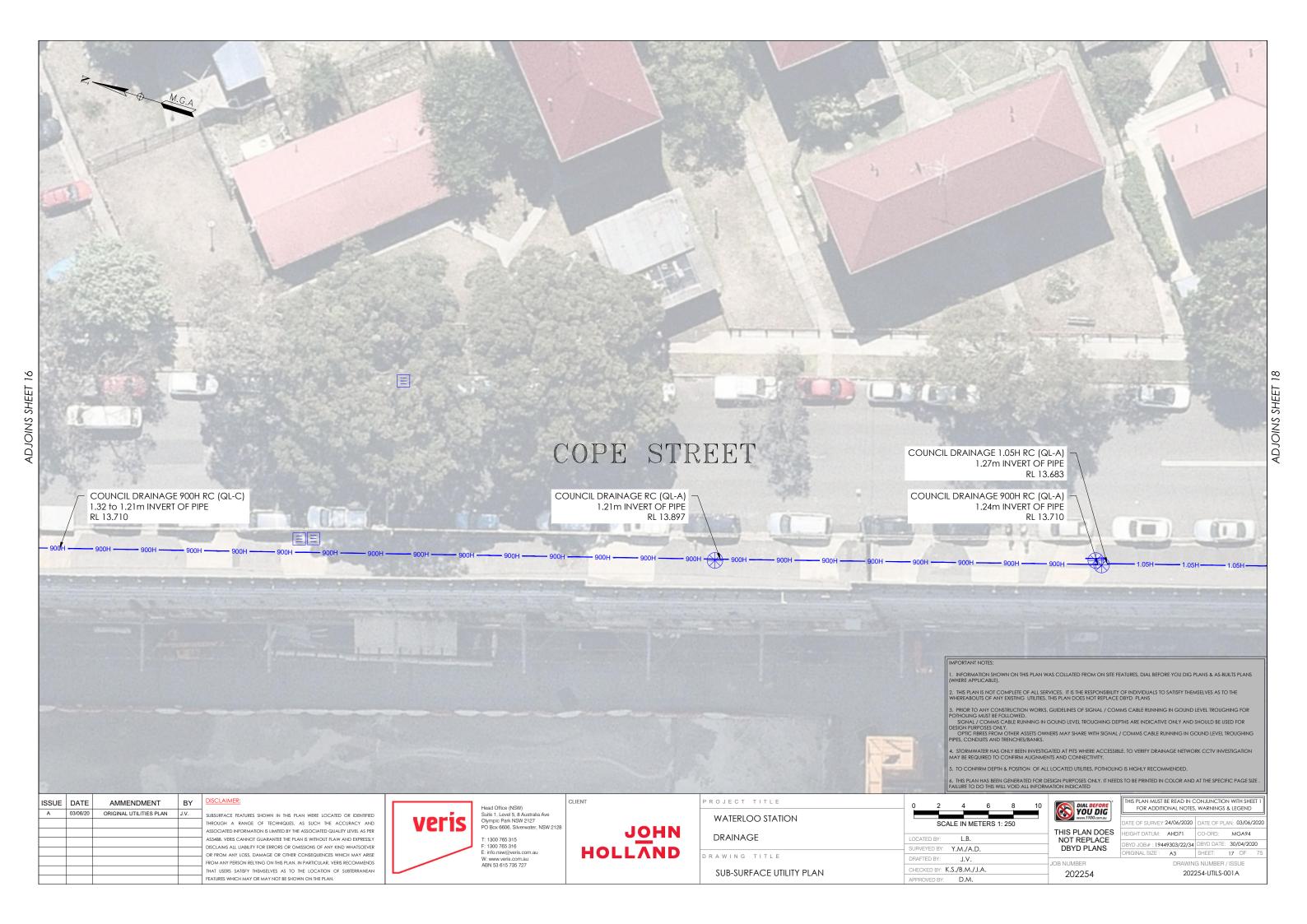


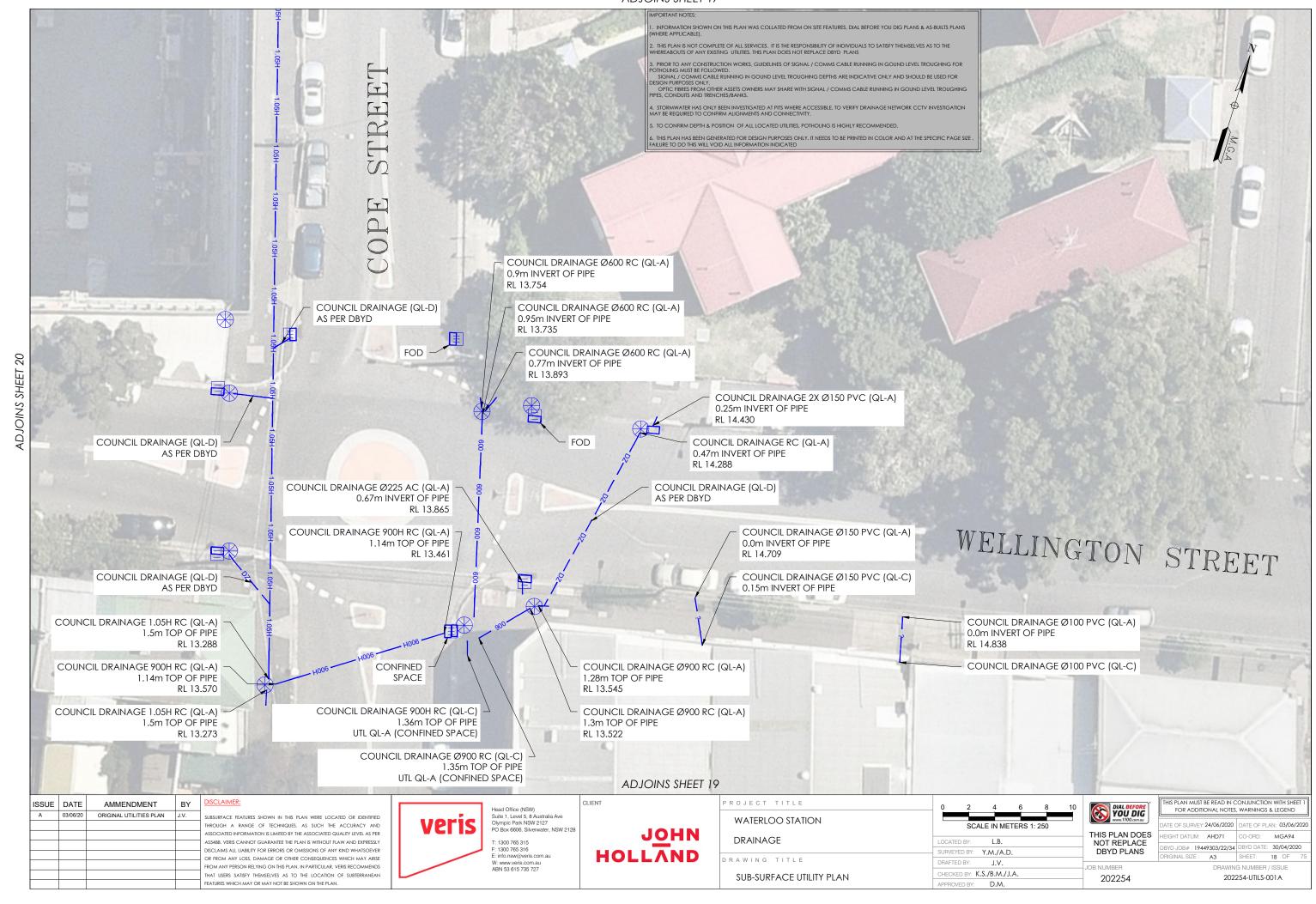














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2. THIS PLAN IS NOT COMPLETE OF ALL SERVICES, IT IS THE RESPONSIBILITY OF INDIVIDUALS TO SATISFY THEMSELVES AS TO THE WHEREABOUTS OF ANY EXISTING UTILITIES. THIS PLAN DOES NOT REPLACE DBYD PLANS

3. PRIOR TO ANY CONSTRUCTION WORKS, GUIDELINES OF SIGNAL / COMMS CABLE RUNNING IN GOUND LEVEL TROUGHING FOR POTHOLING MUST BE FOLLOWED.

SIGNAL / COMMS CABLE RINNING IN GOUND LEVEL TROUGHING DEPTHS ARE INDICATIVE ONLY AND SHOULD BE USED FOR DESIGN PURPOSES ONLY.

OPTIC THREST FROM OTHER ASSETS OWNERS MAY SHARE WITH SIGNAL / COMMS CABLE RUNNING IN GOUND LEVEL TROUGHING PIPES, CONDUITS AND TRENCHES/BANKS.

4. STORMWATER HAS ONLY BEEN INVESTIGATED AT PITS WHERE ACCESSIBLE, TO VERIFY DRAINAGE NETWORK CCTV INVESTIGATION MAY BE REQUIRED TO CONFIRM ALIGNMENTS AND CONNECTIVITY.

5.	TO CONFIRM DEPTH & POSITION	OF ALL LOCATED UTILITIES,	POTHOLING IS HIGHLY	RECOMMENDED

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ISSUE	DATE	AMMENDMENT	BY	DIS
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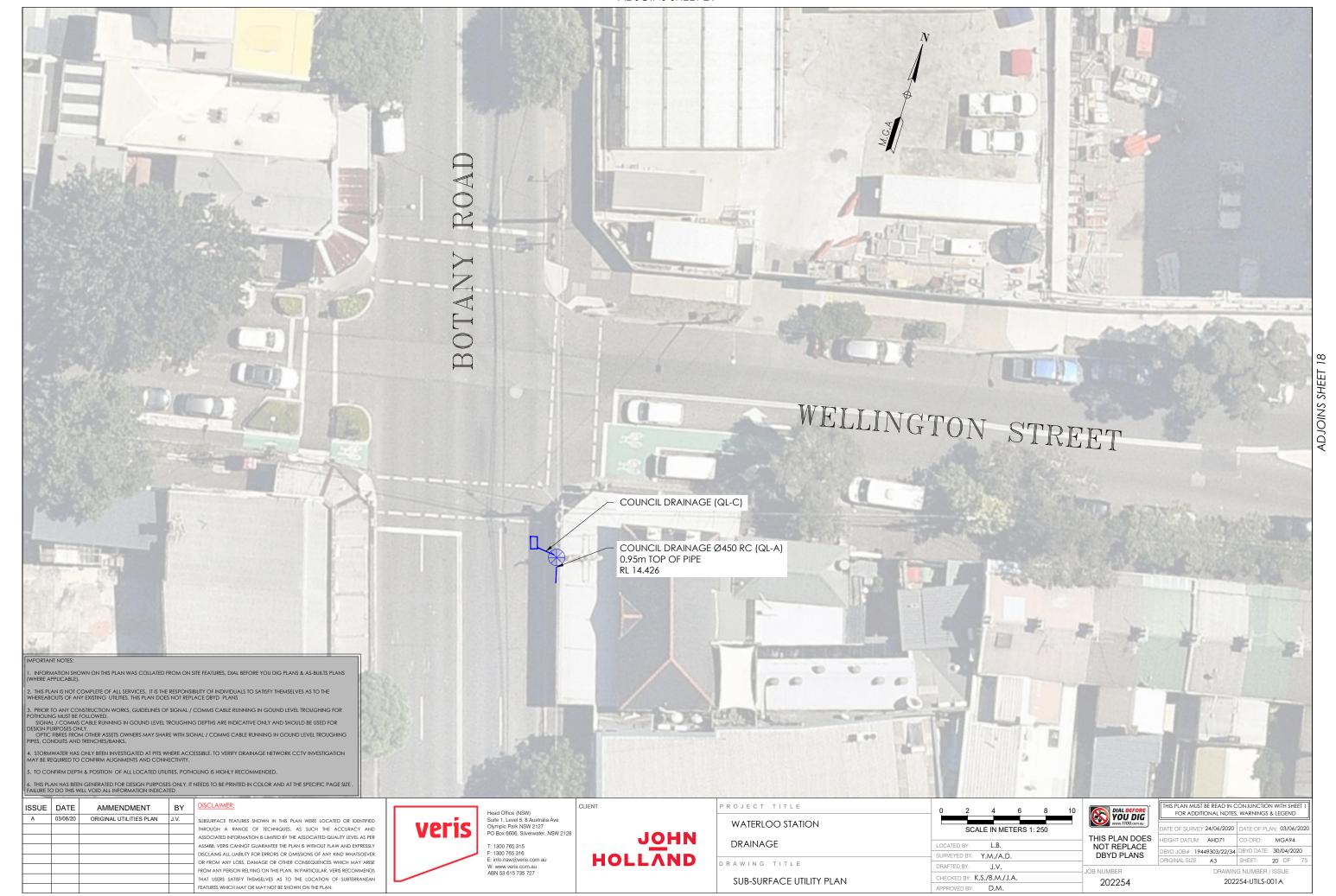
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WATERLOO STATION	SCALE IN METERS 1: 250
DRAINAGE	LOCATED BY: L.B. THIS PLAN DO NOT REPLA
	SURVEYED BY: Y.M./A.D. DBYD PLAN
A WIN G TITLE	DRAFTED BY: J.V. JOB NUMBER
SUB-SURFACE UTILITY PLAN	CHECKED BY: K.S./B.M./J.A. 202254
JOD JOHN ACE OHEN I LANG	APPROVED BY: D.M.

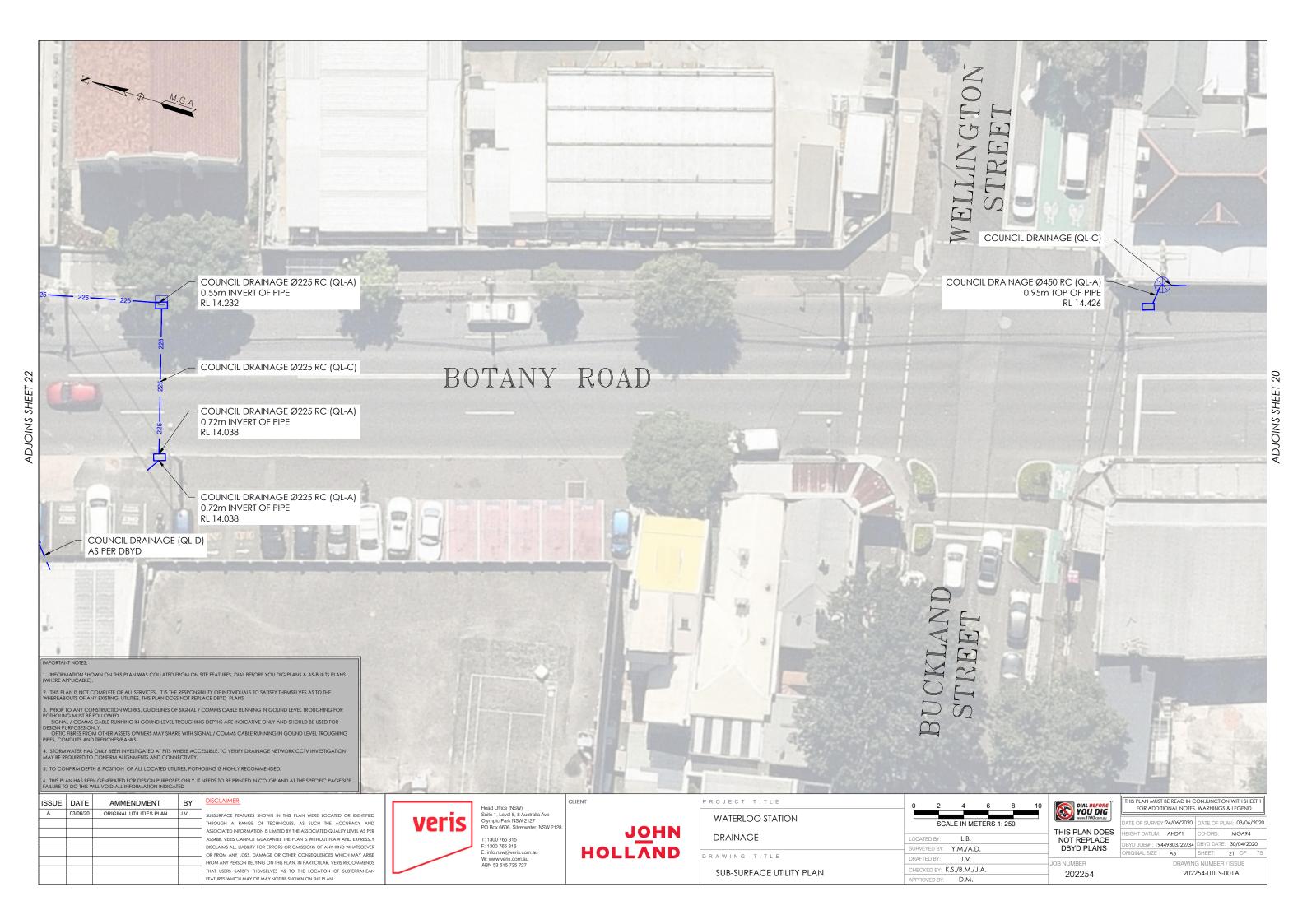
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	THIS PLAN DOES NOT REPLACE DBYD PLANS

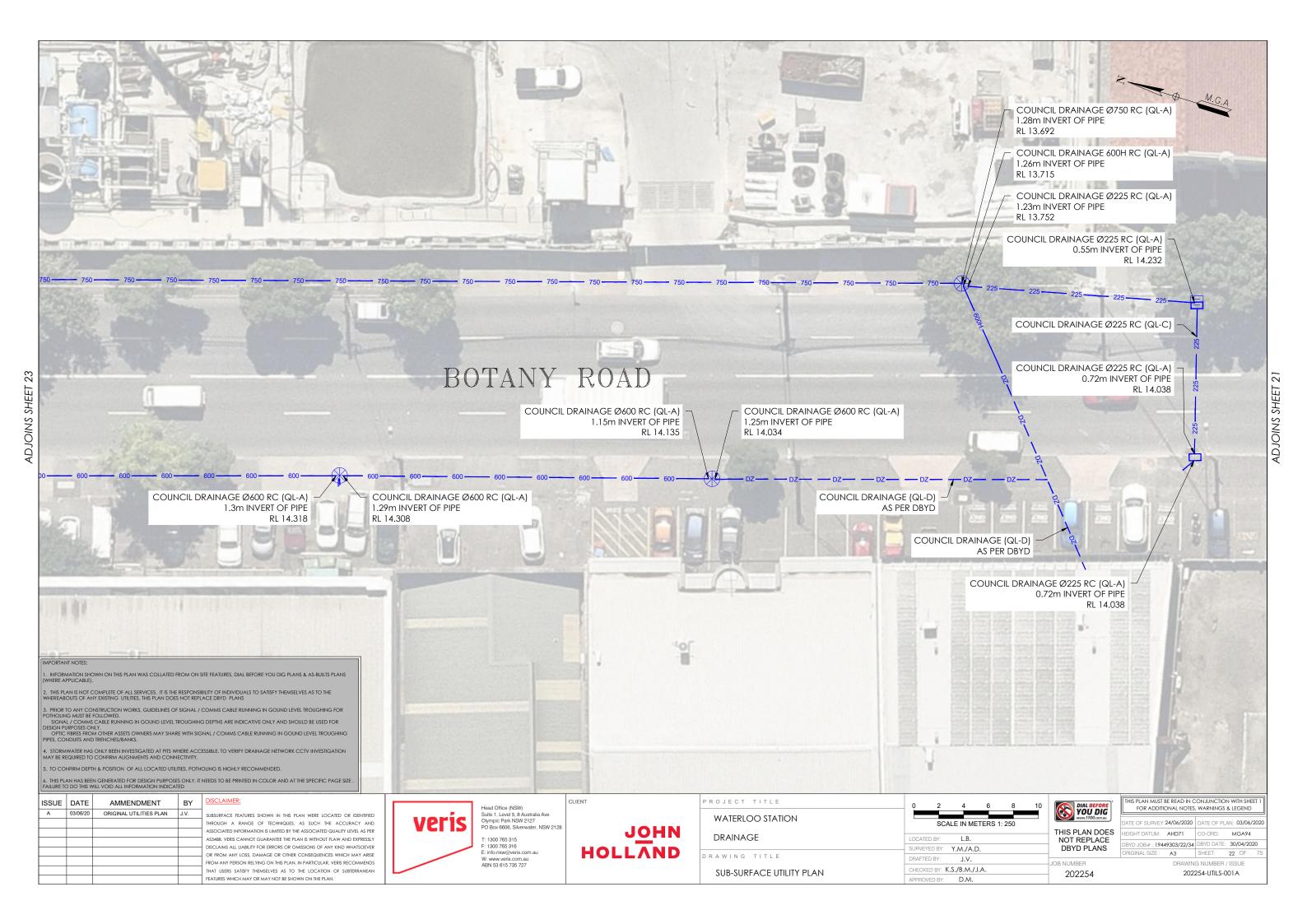
S PLAN DOES	FOR ADDITIONAL NOTES, WARNINGS & LEGEND	
	DATE OF SURVEY: 24/06/2020	DATE OF PLAN: 03/06/202
	HEIGHT DATUM: AHD71	CO-ORD: MGA94
	DBVD_IOR# : 19449303/22/34	DBYD DATE: 30/04/2020

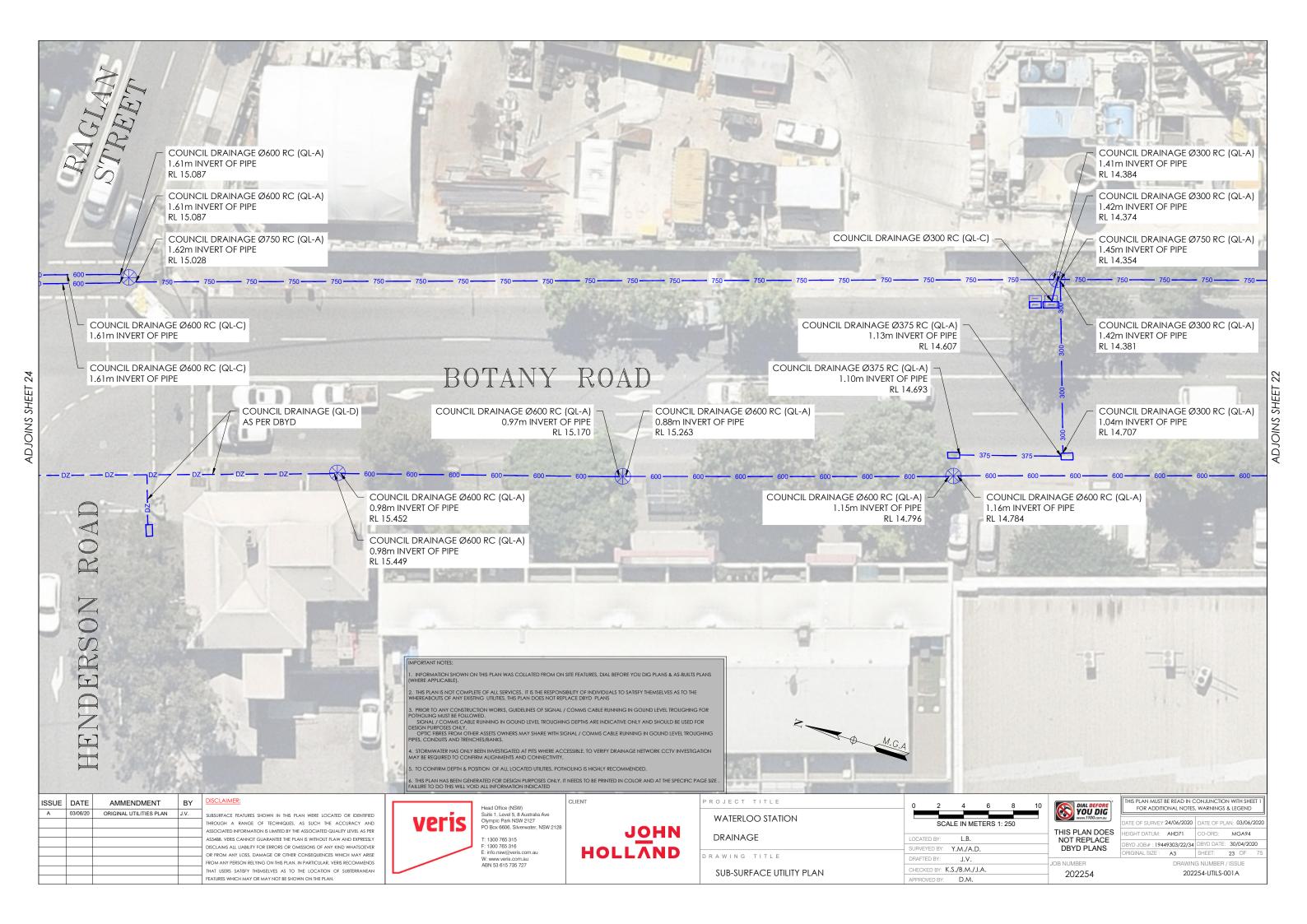
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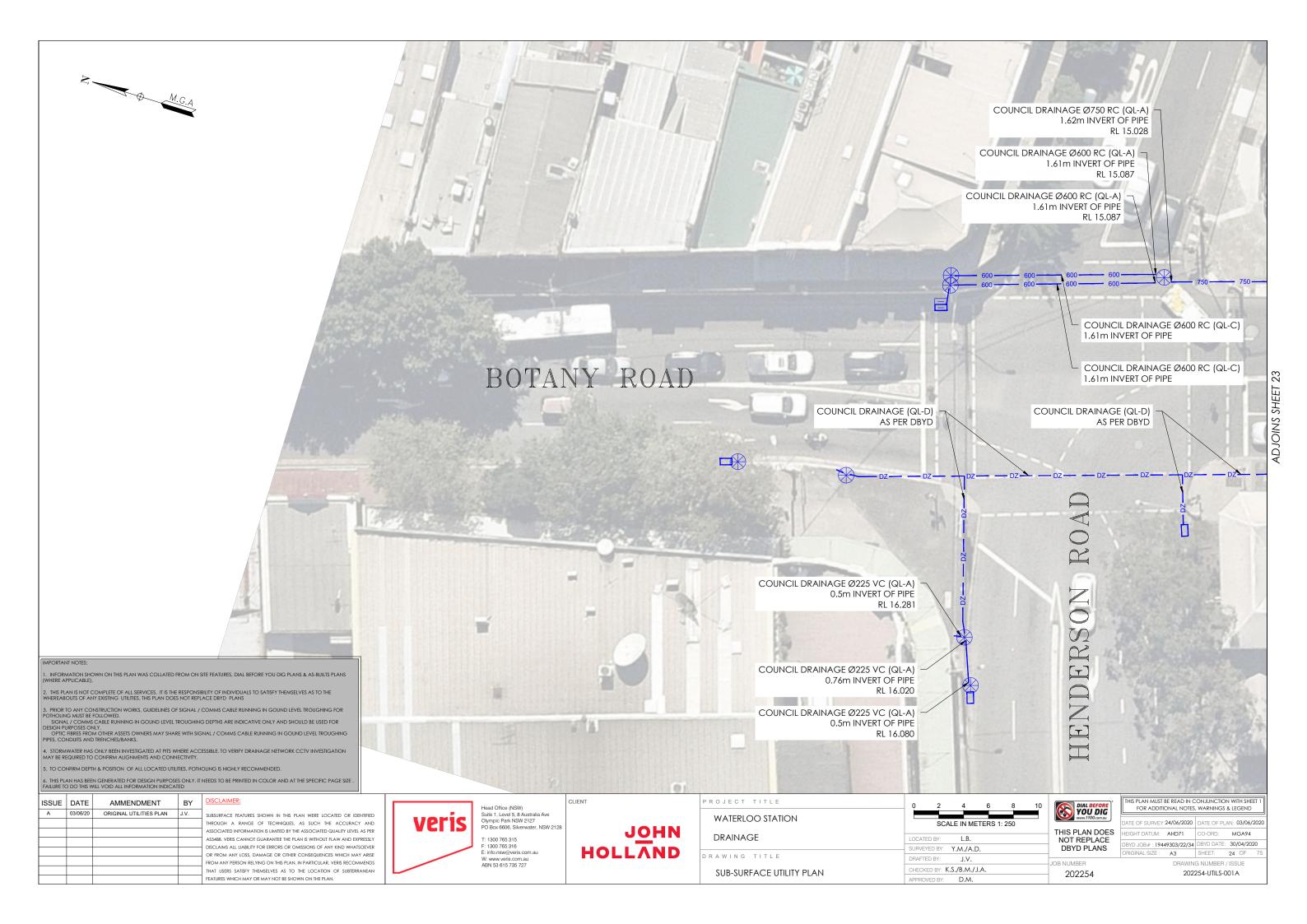
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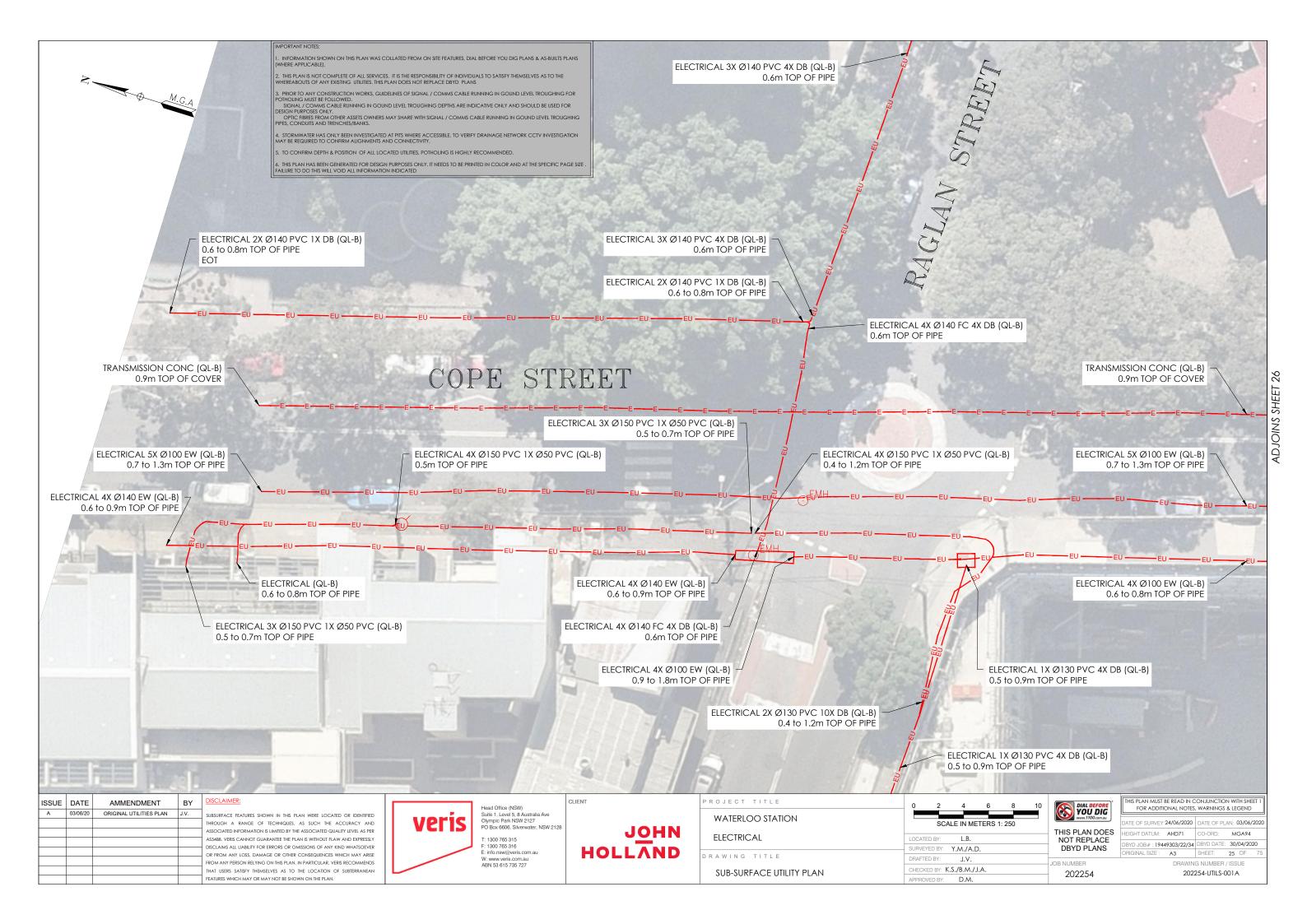


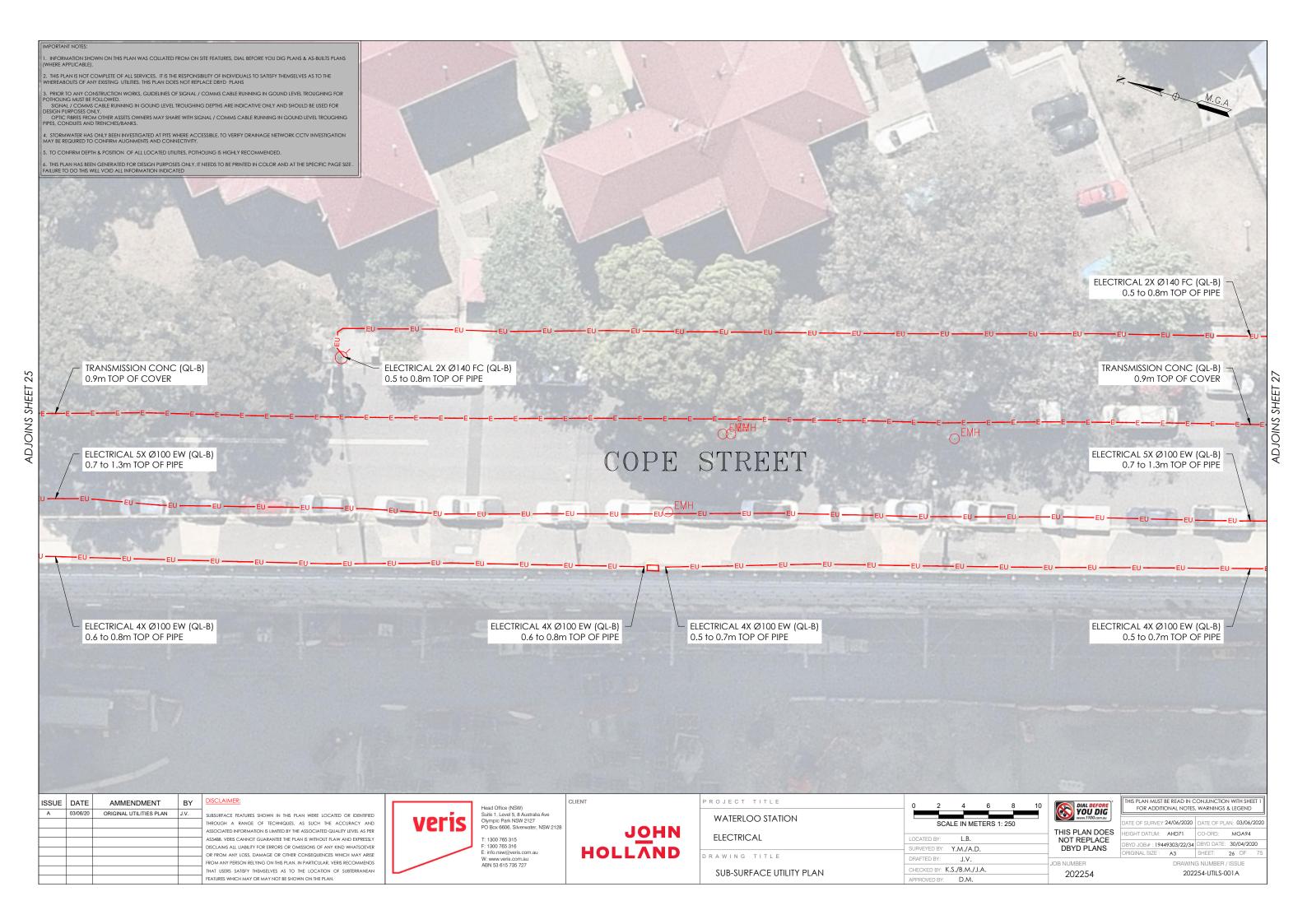


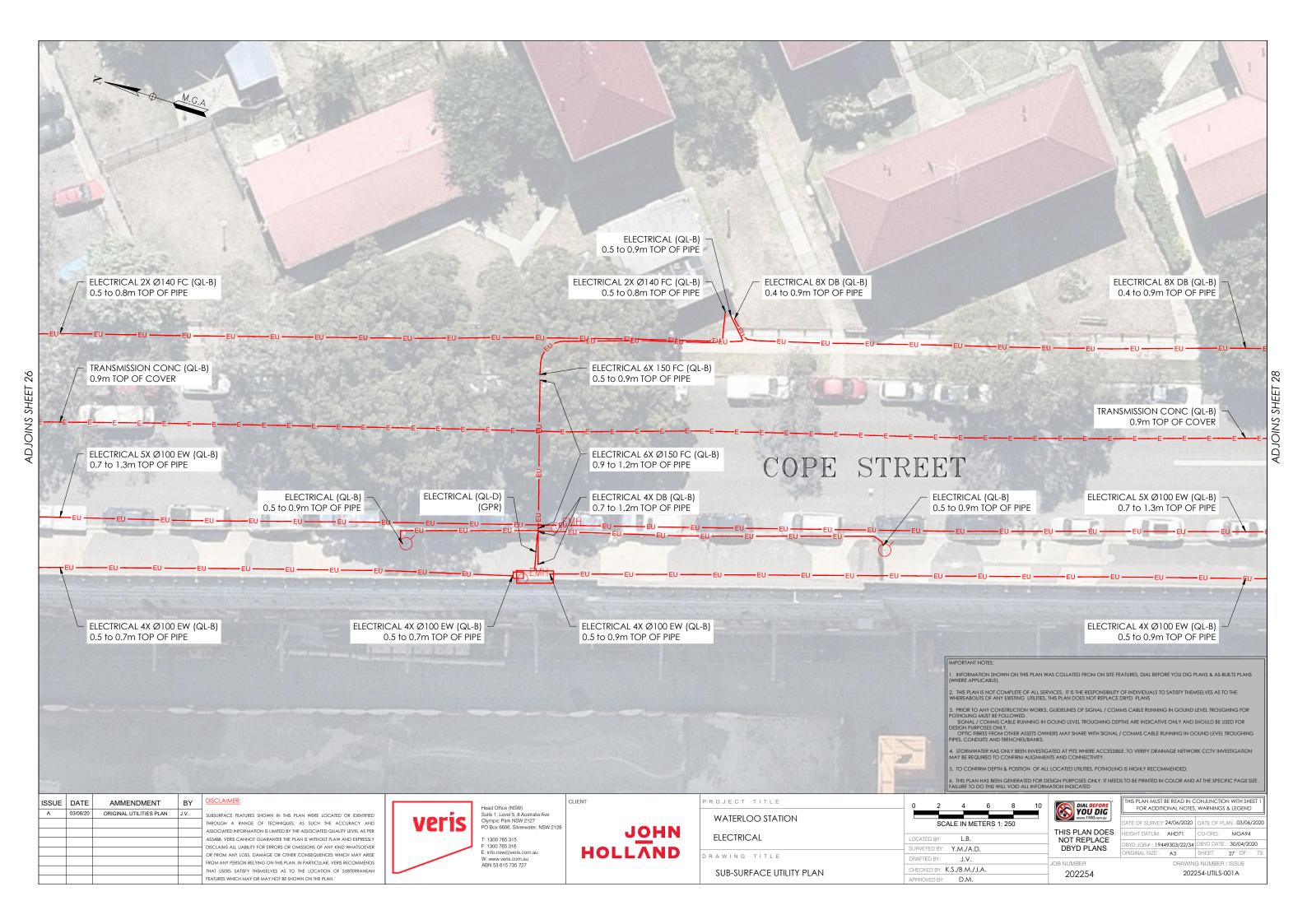


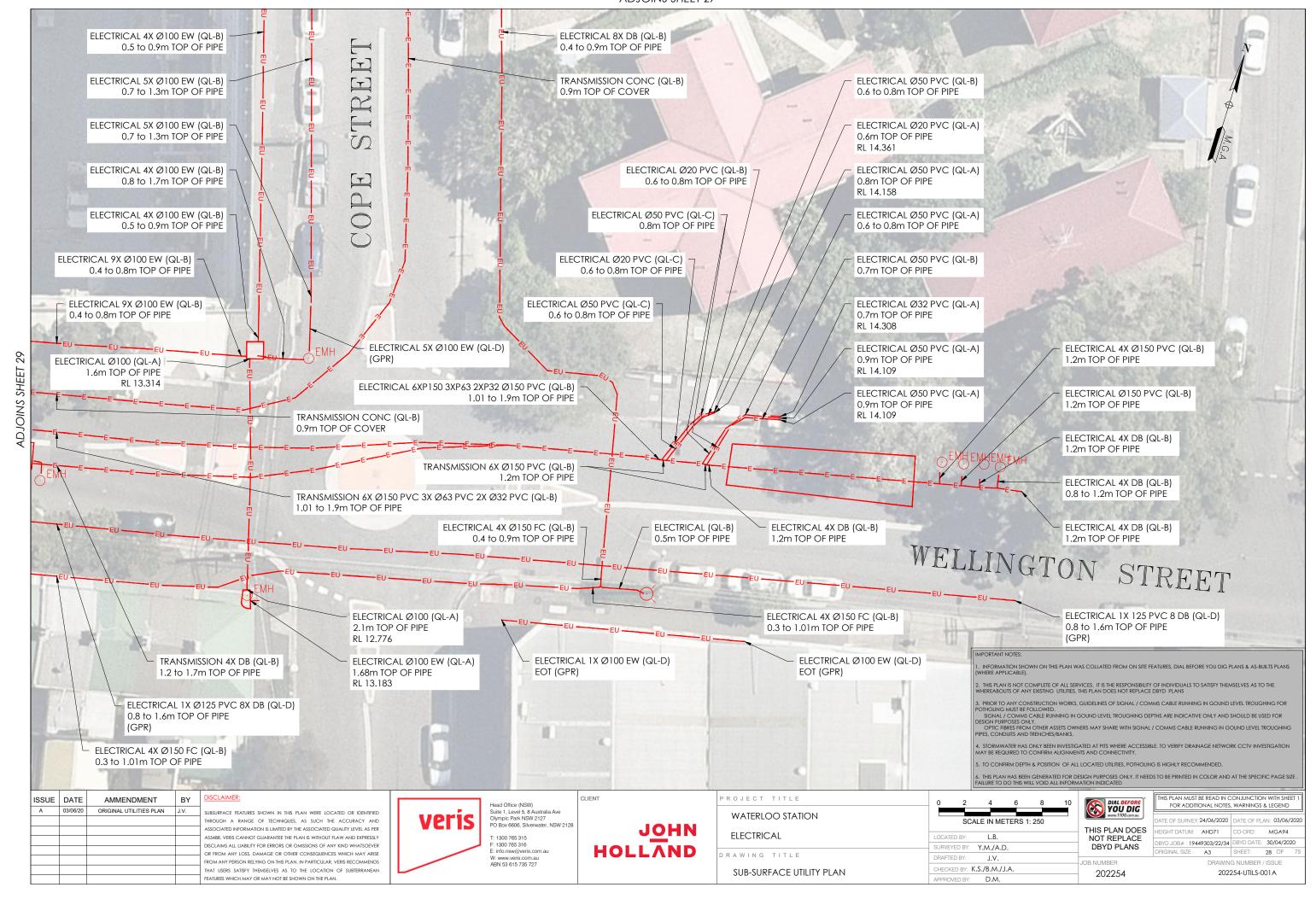


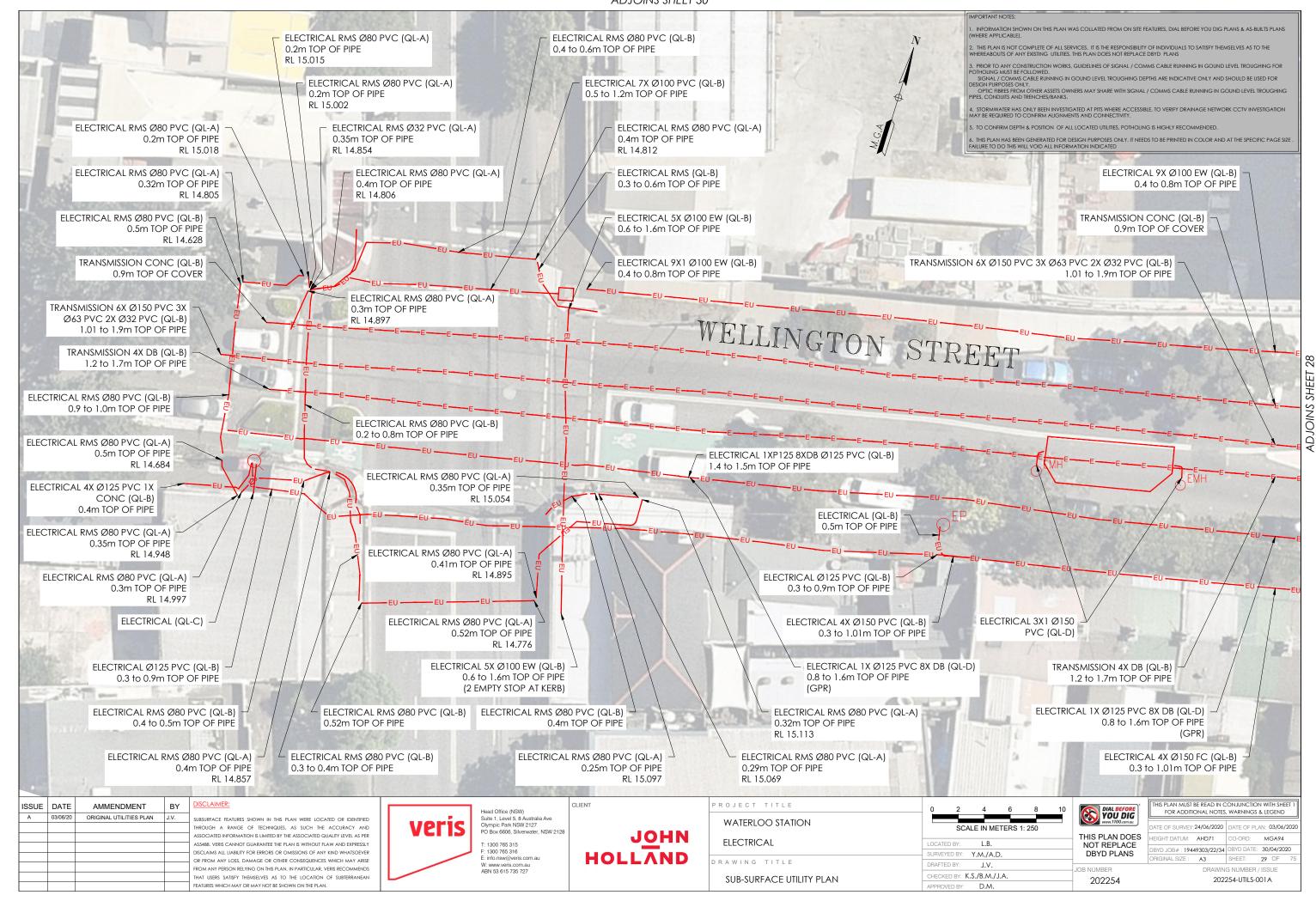


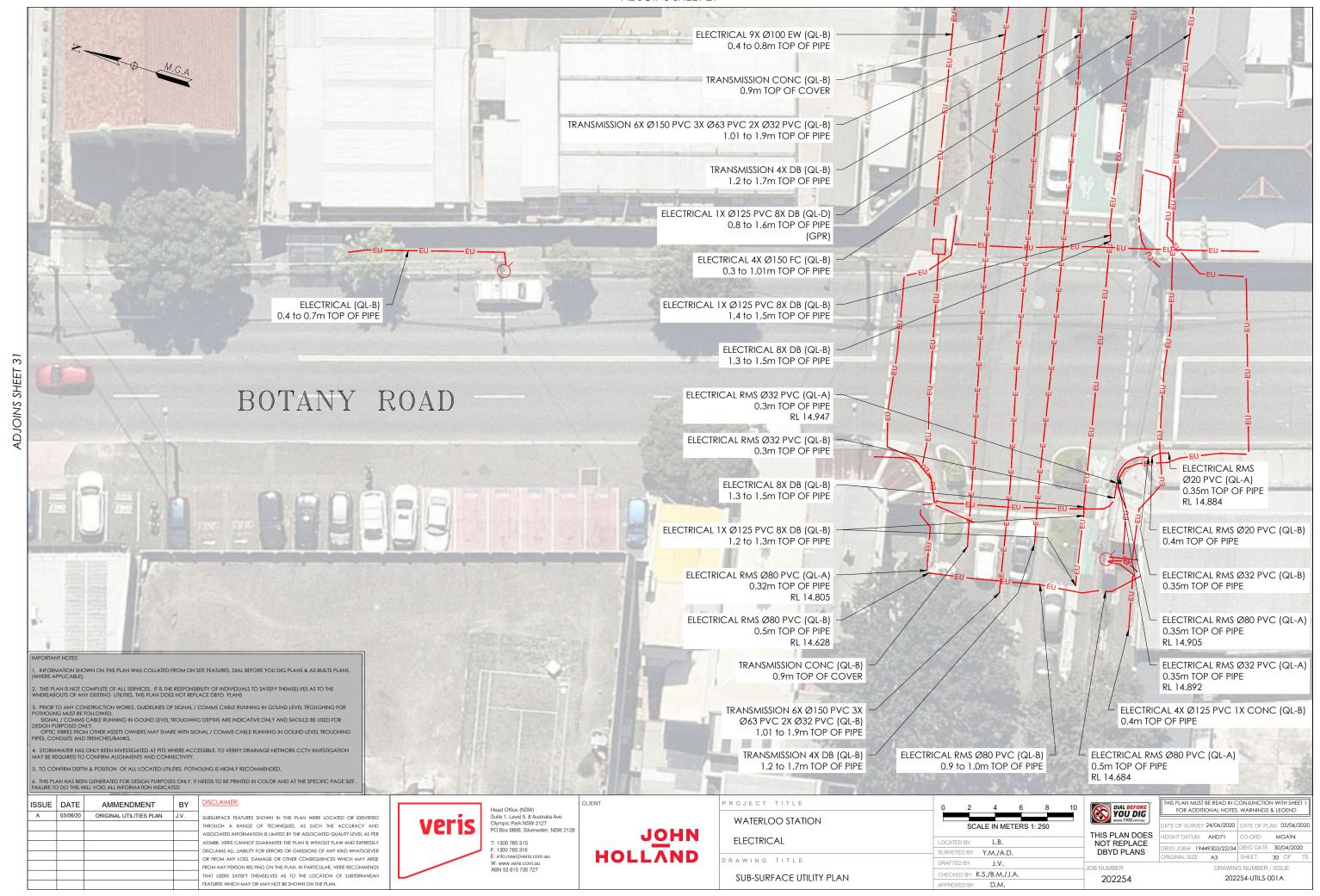


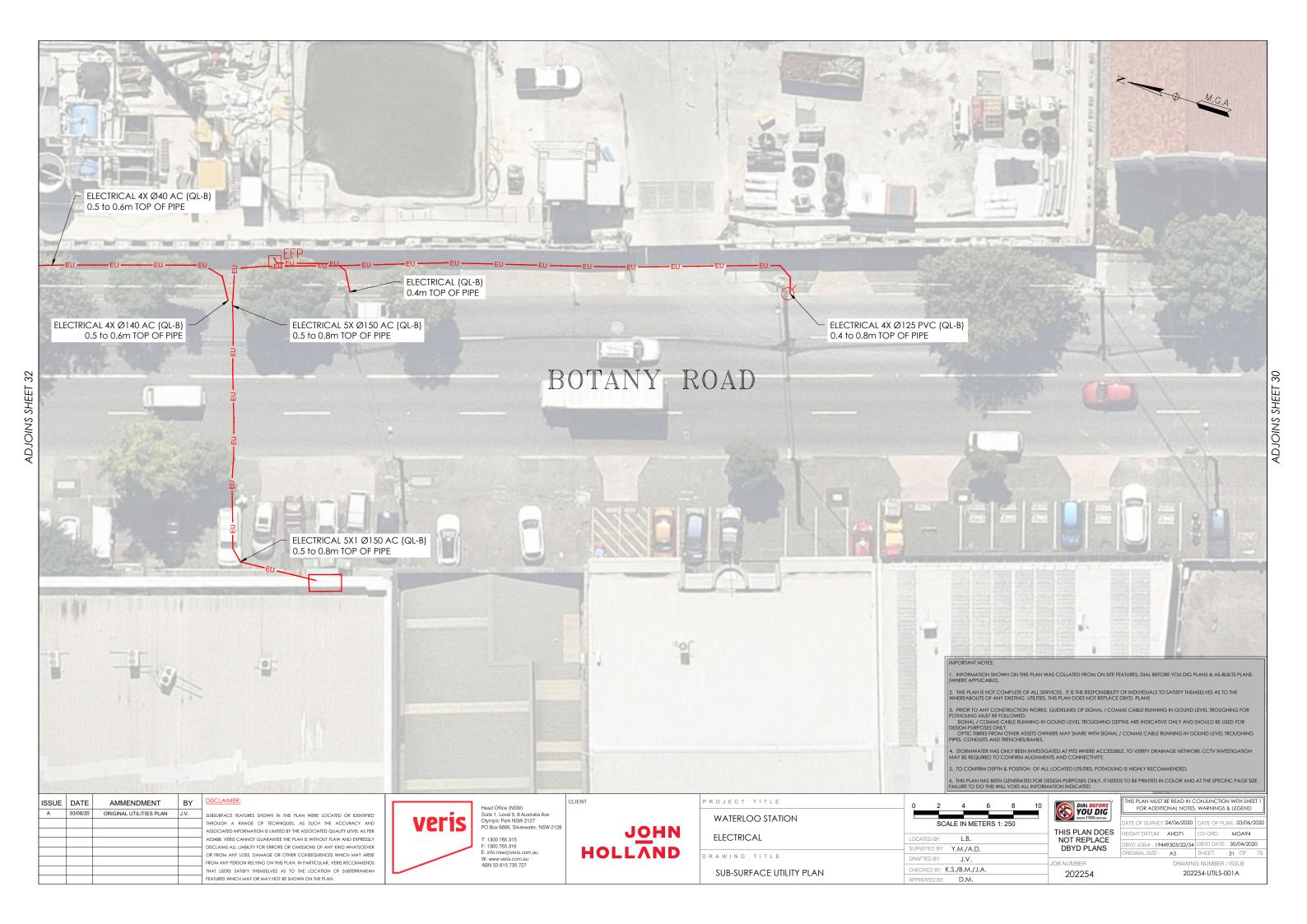


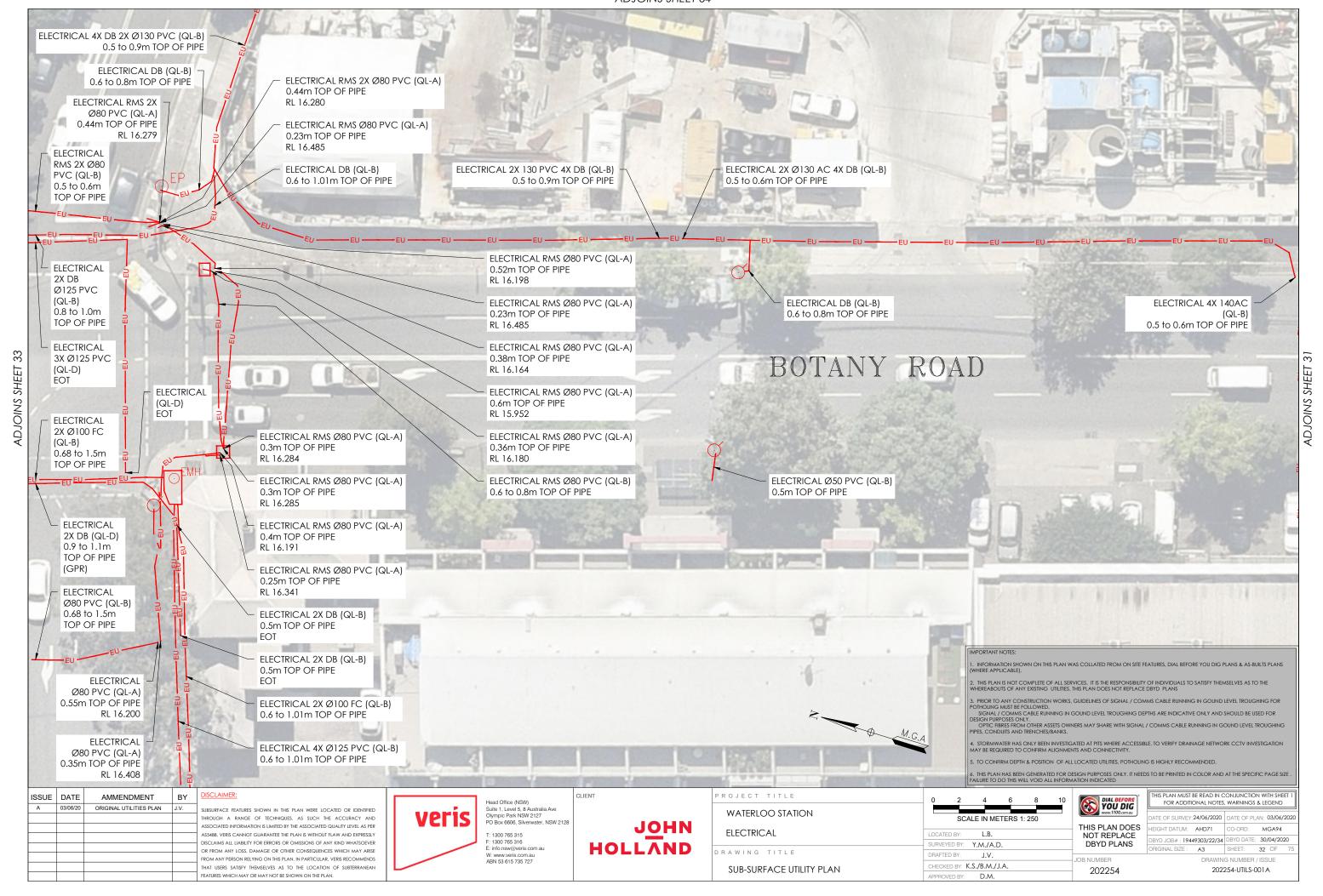


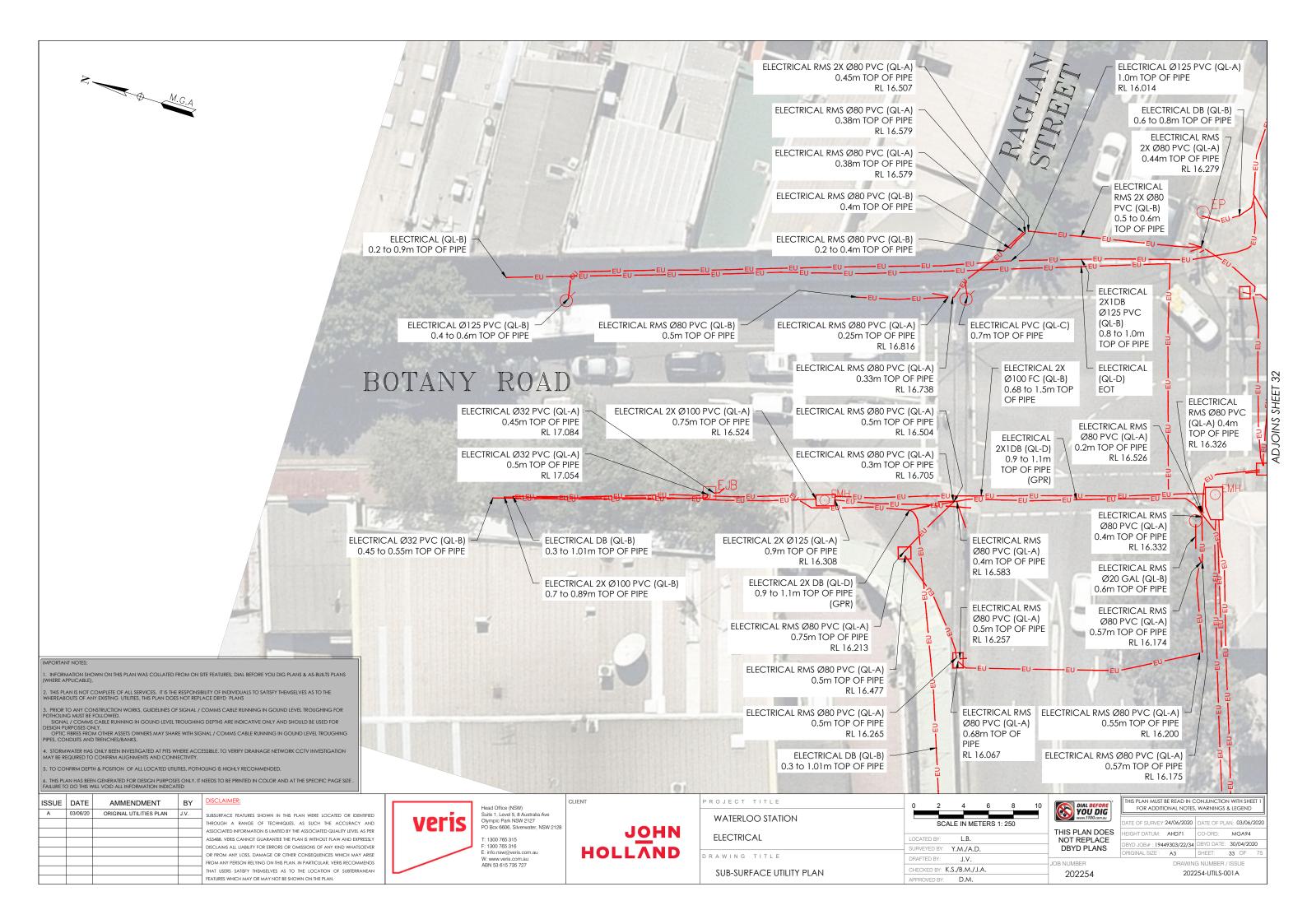


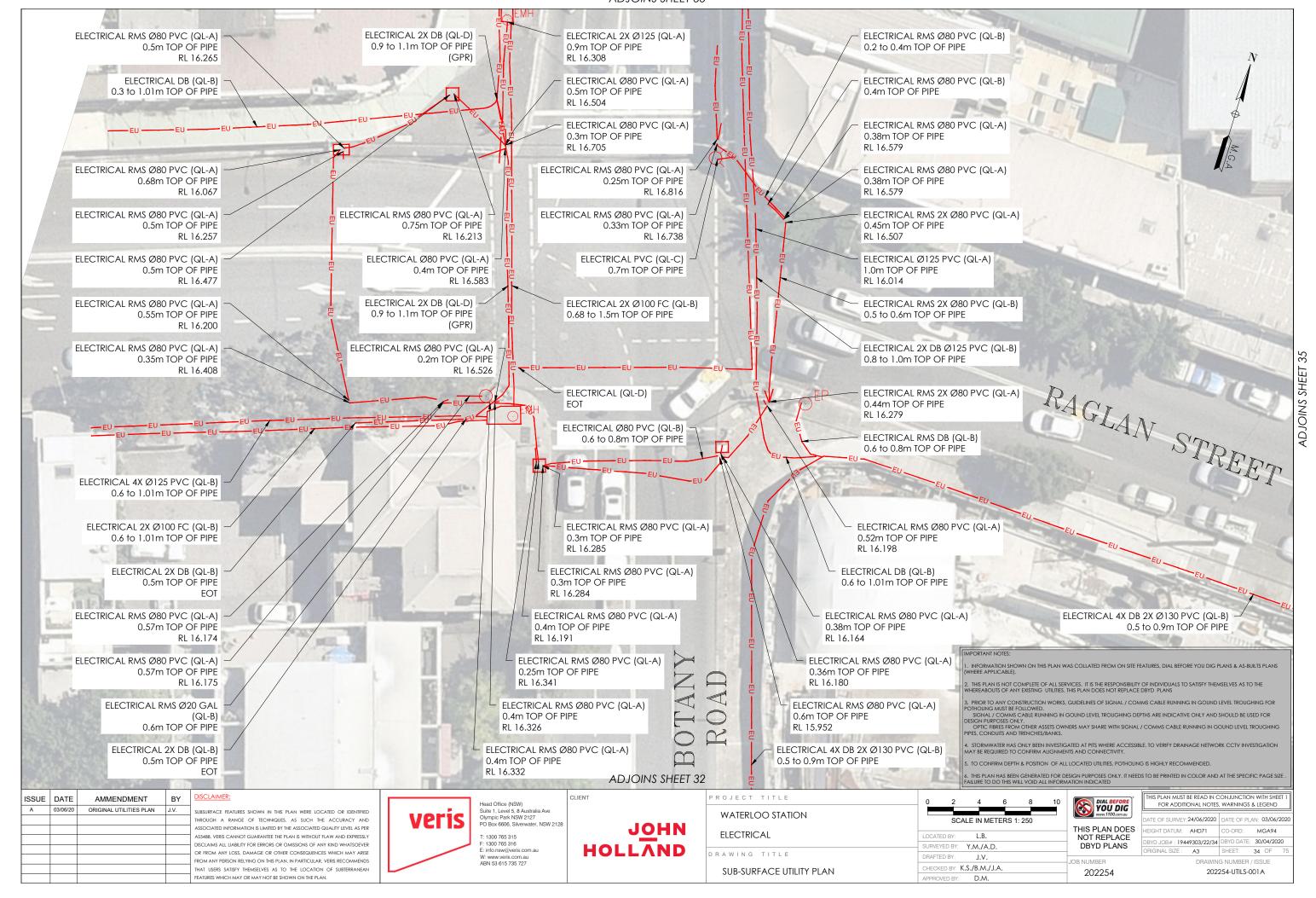


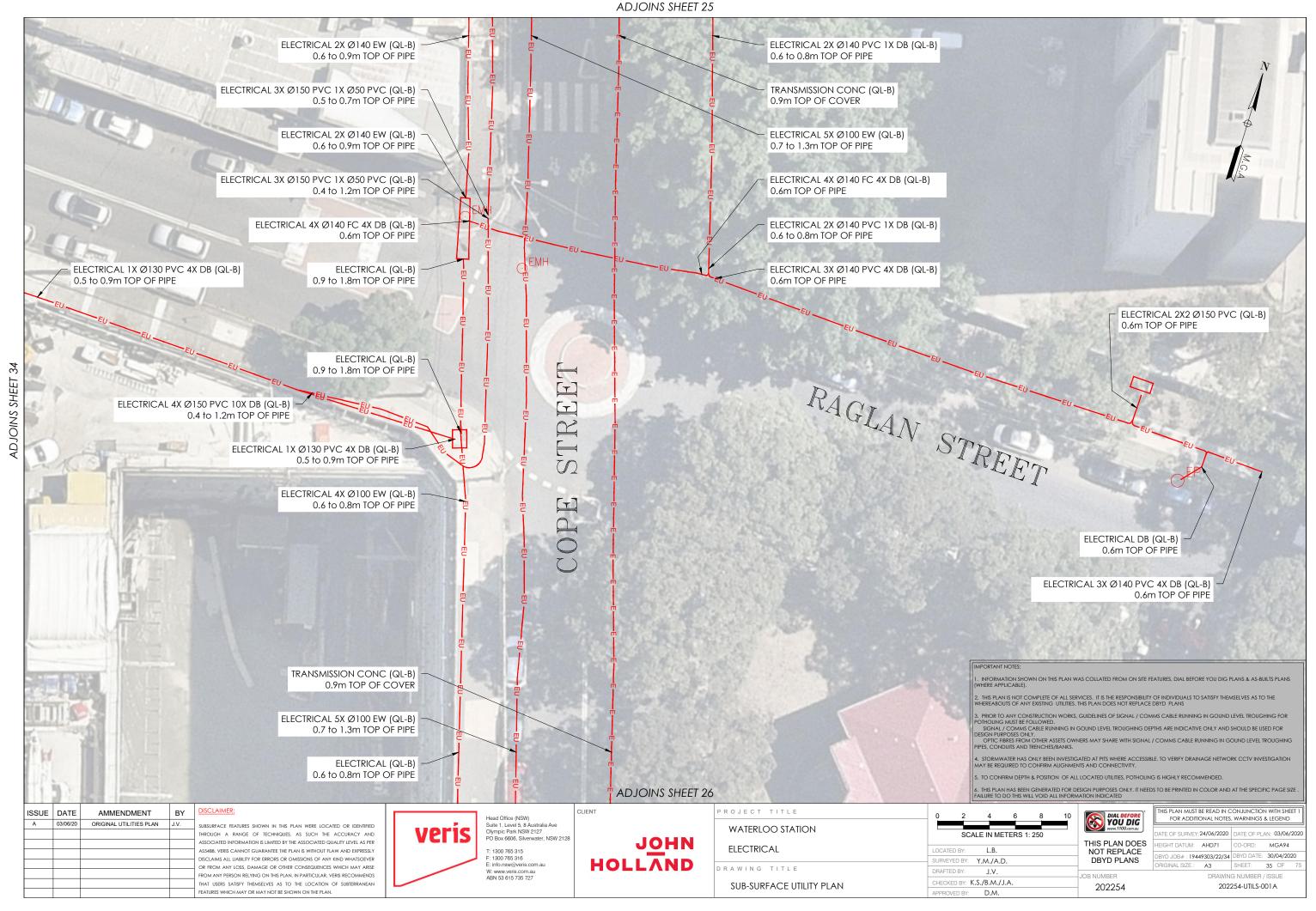


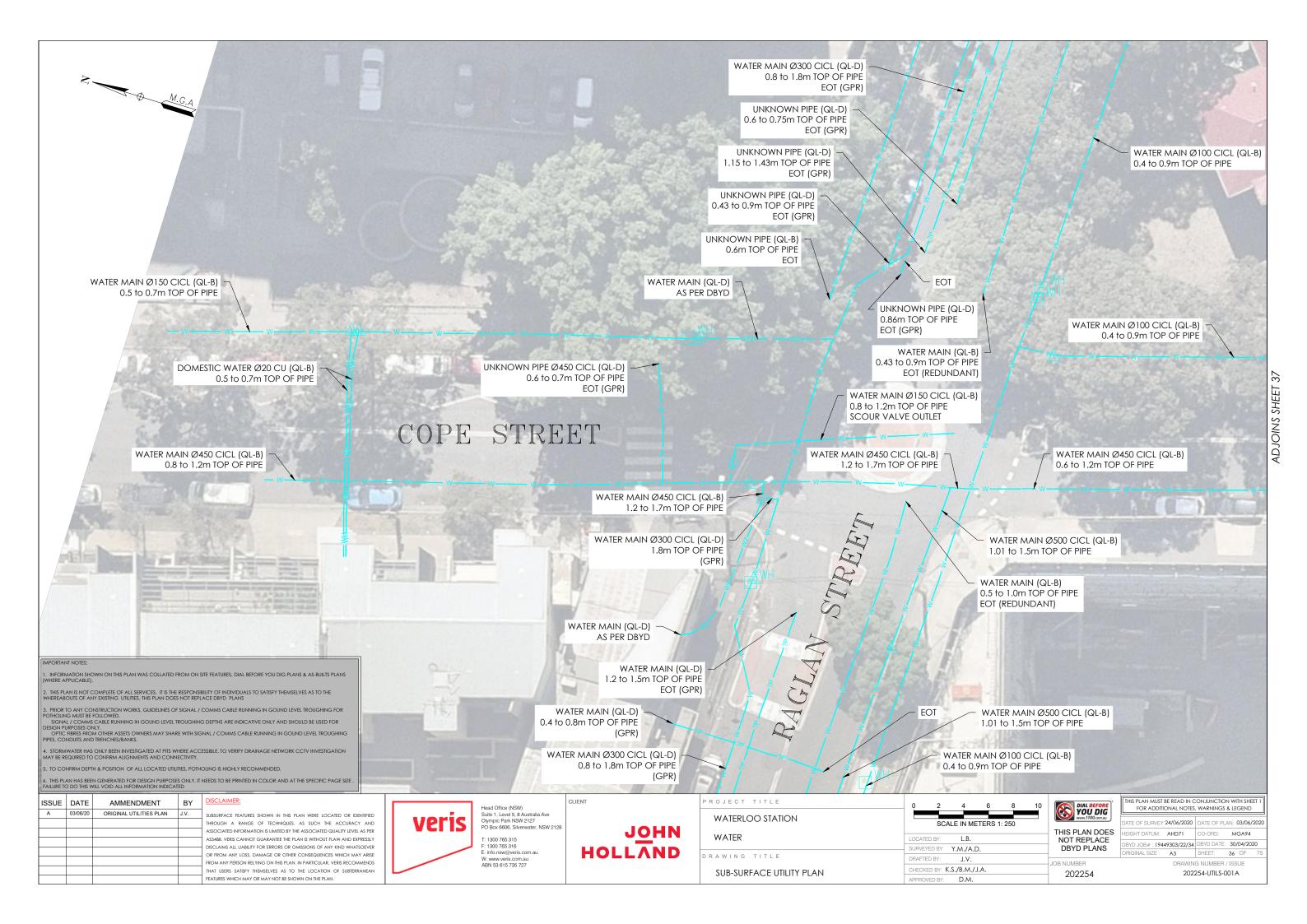


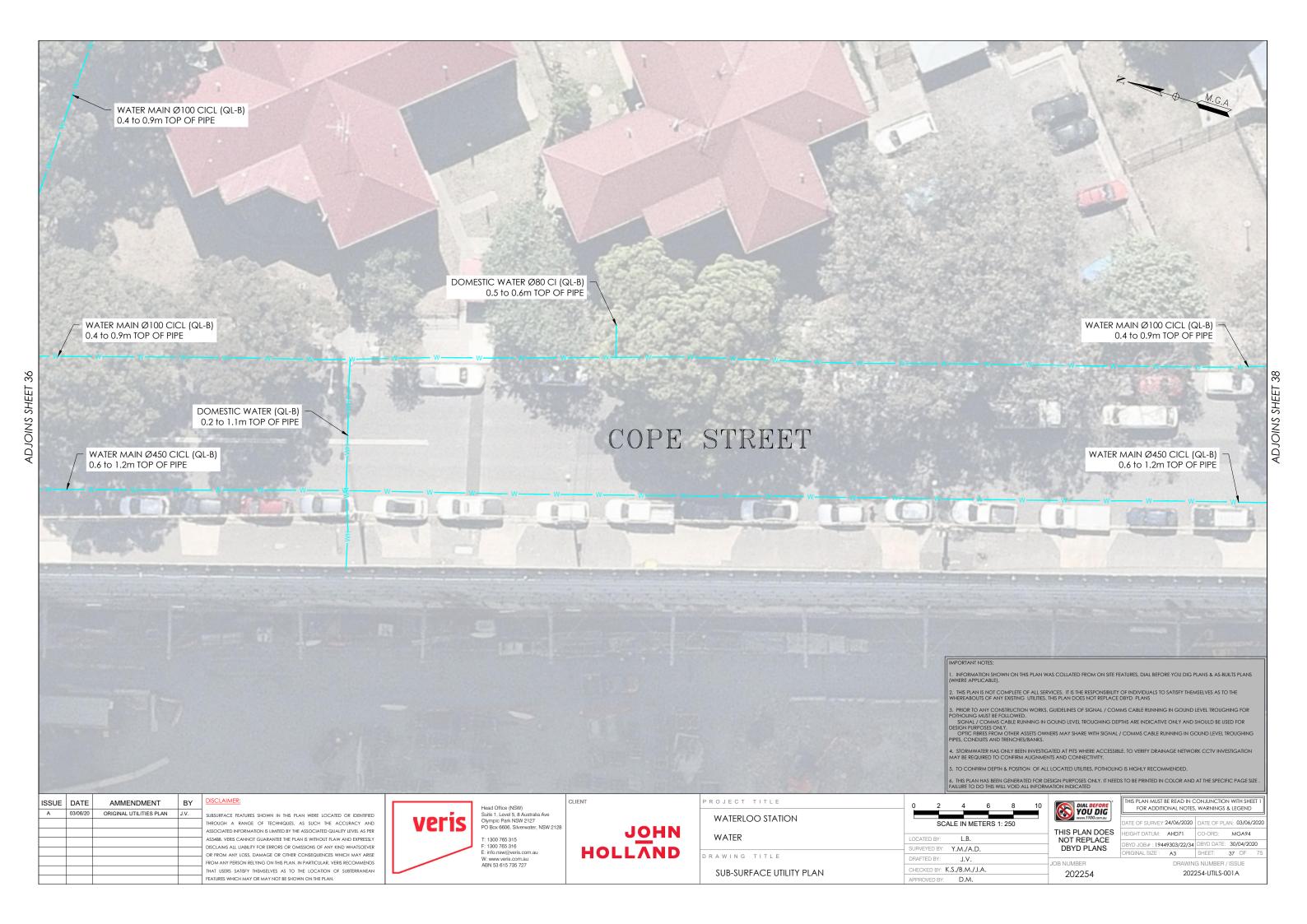




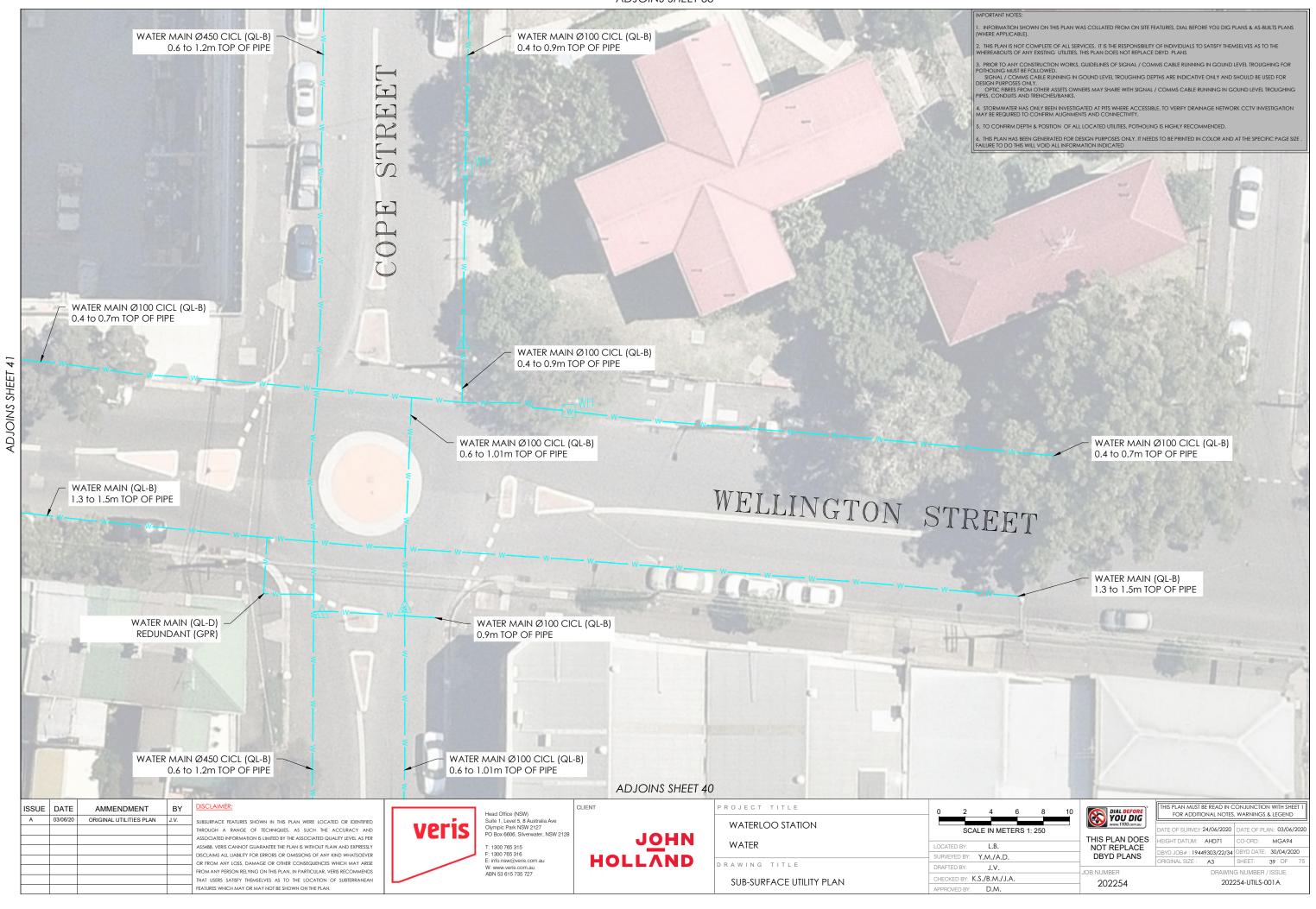


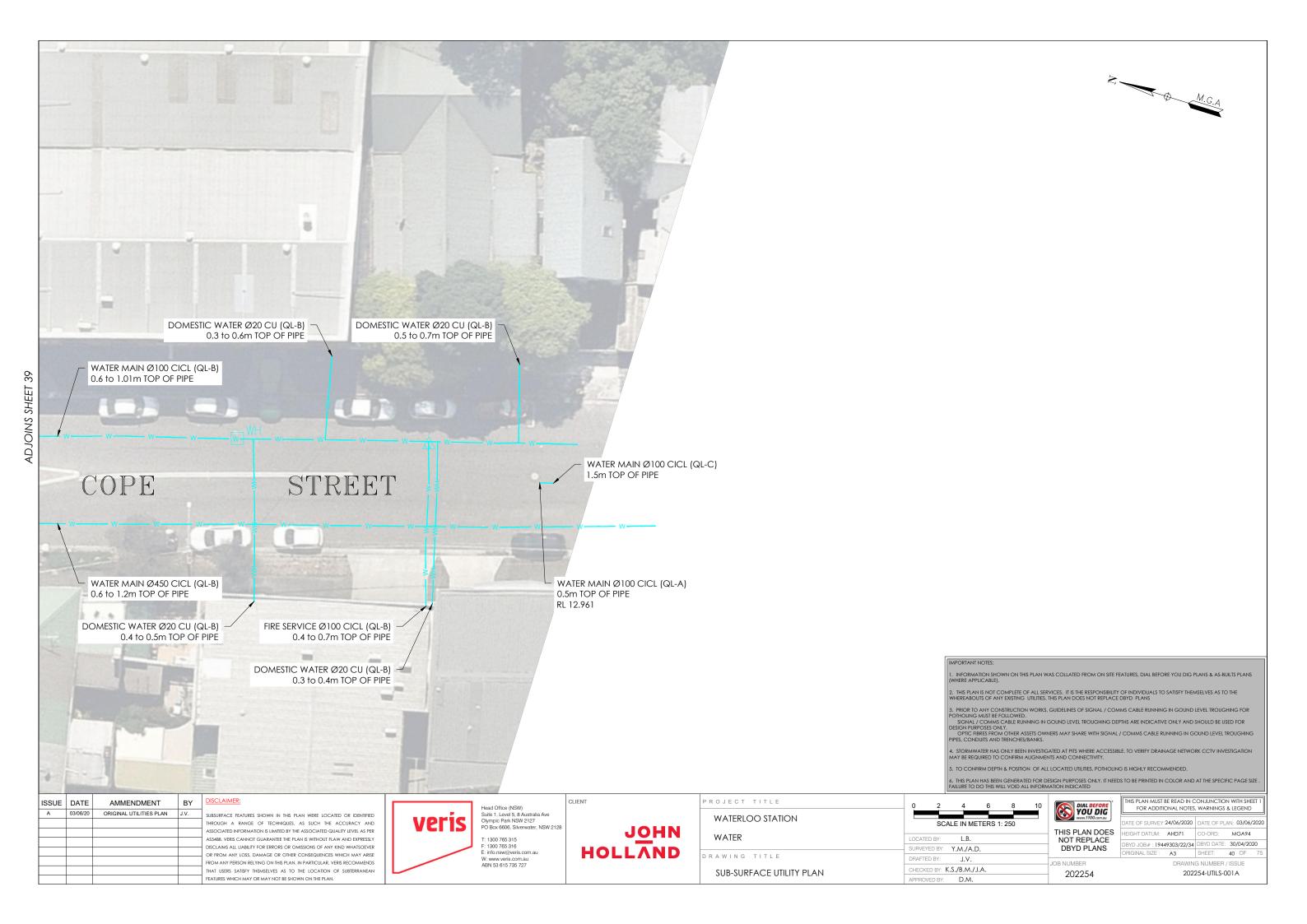


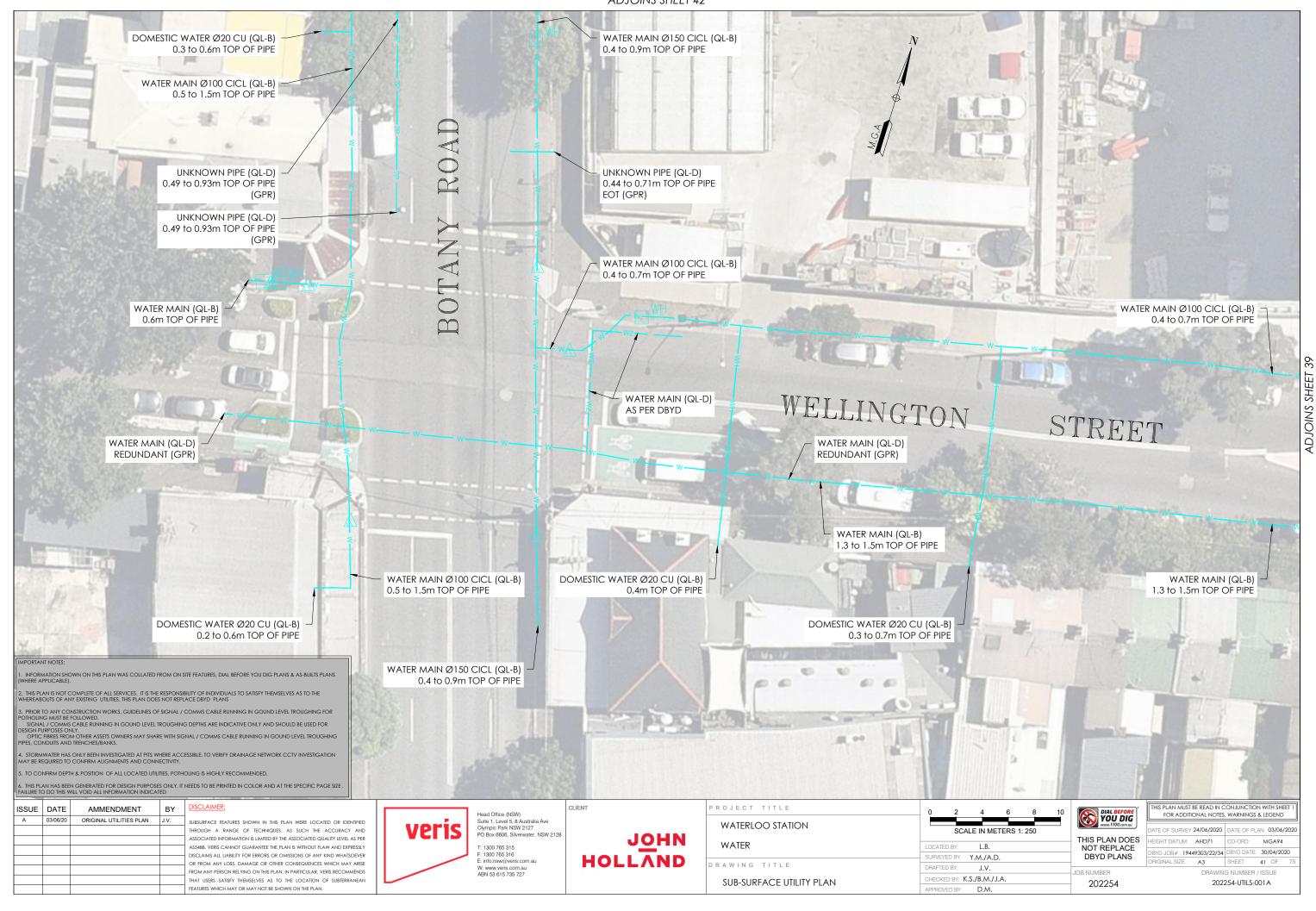


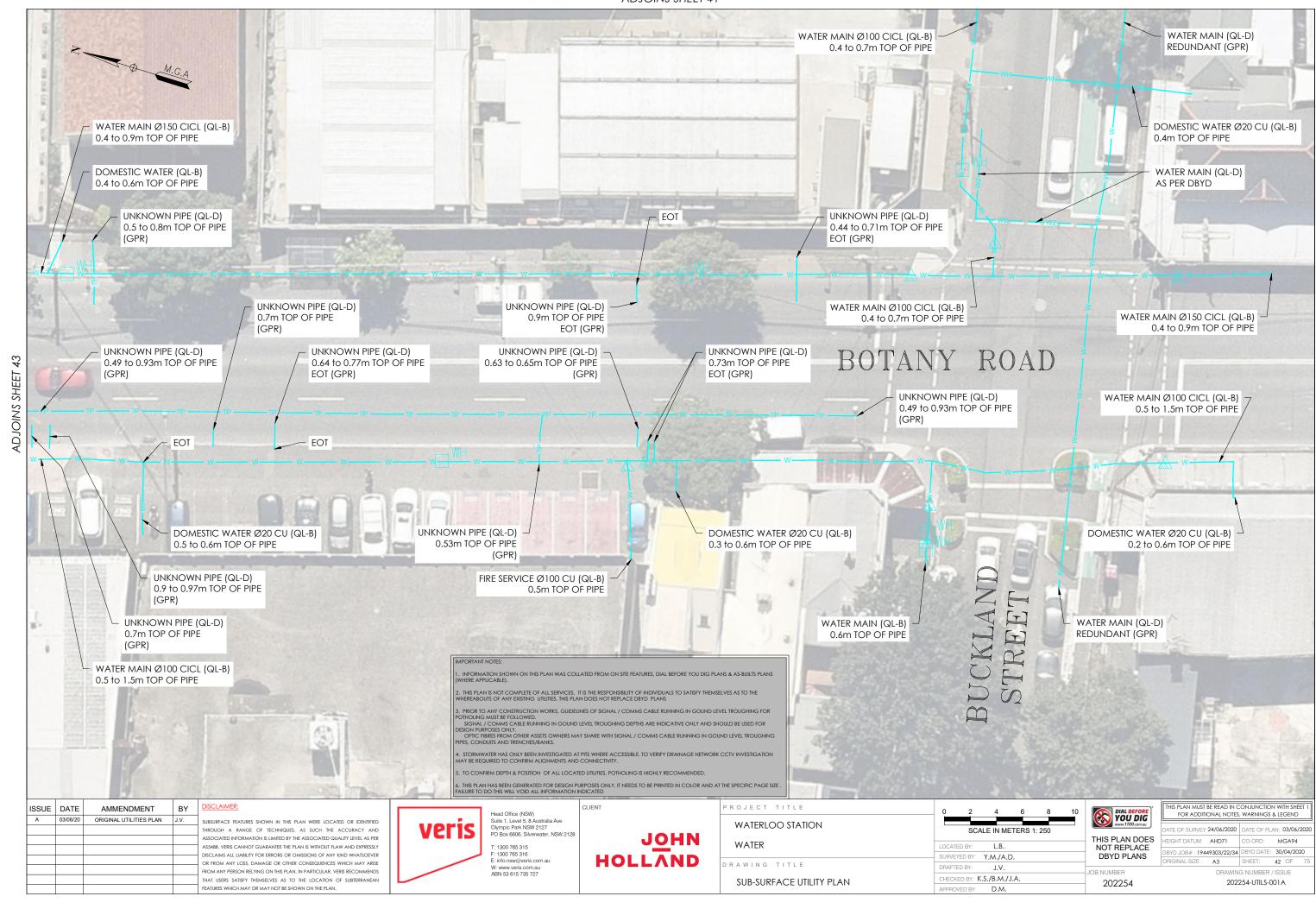


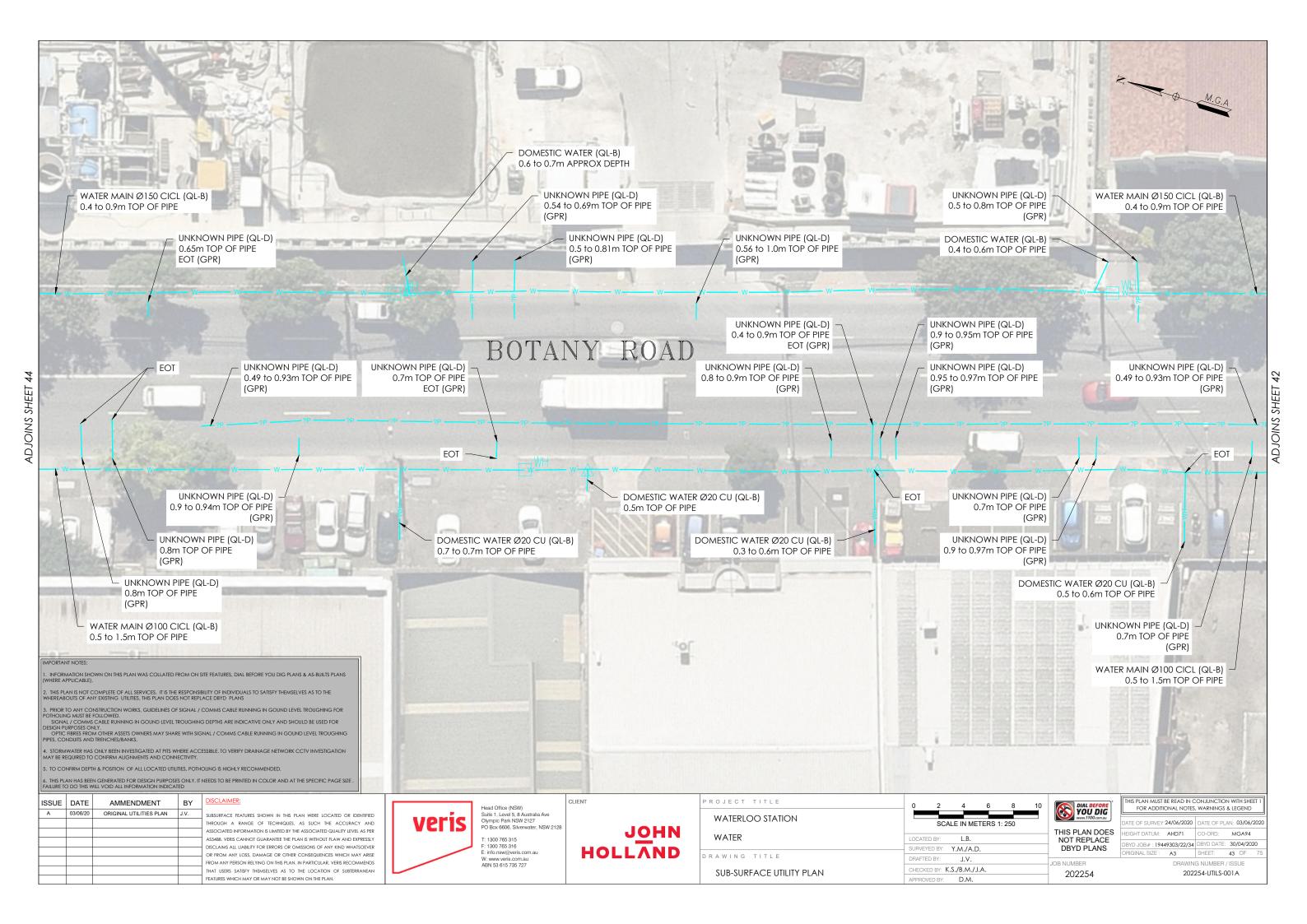


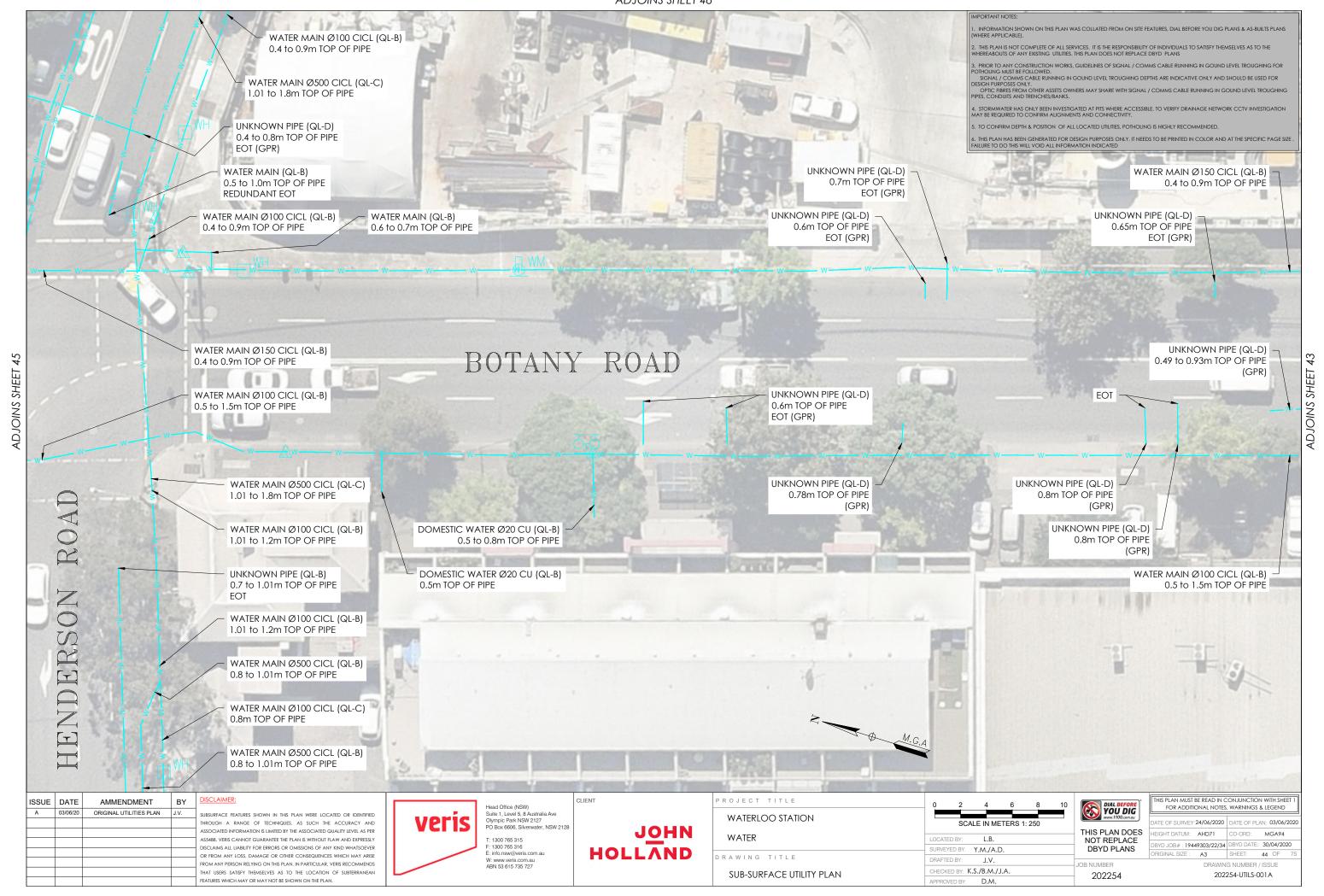


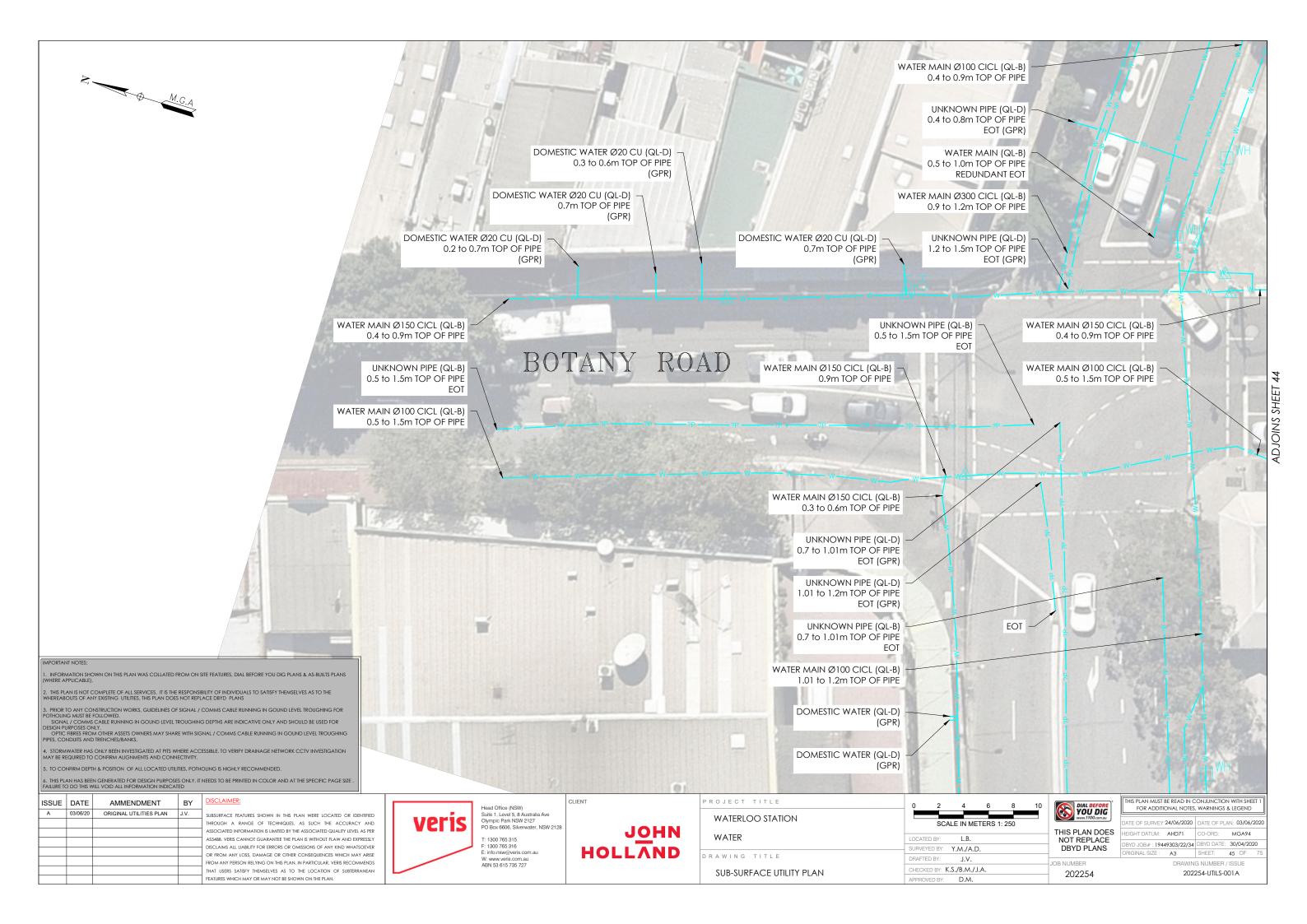


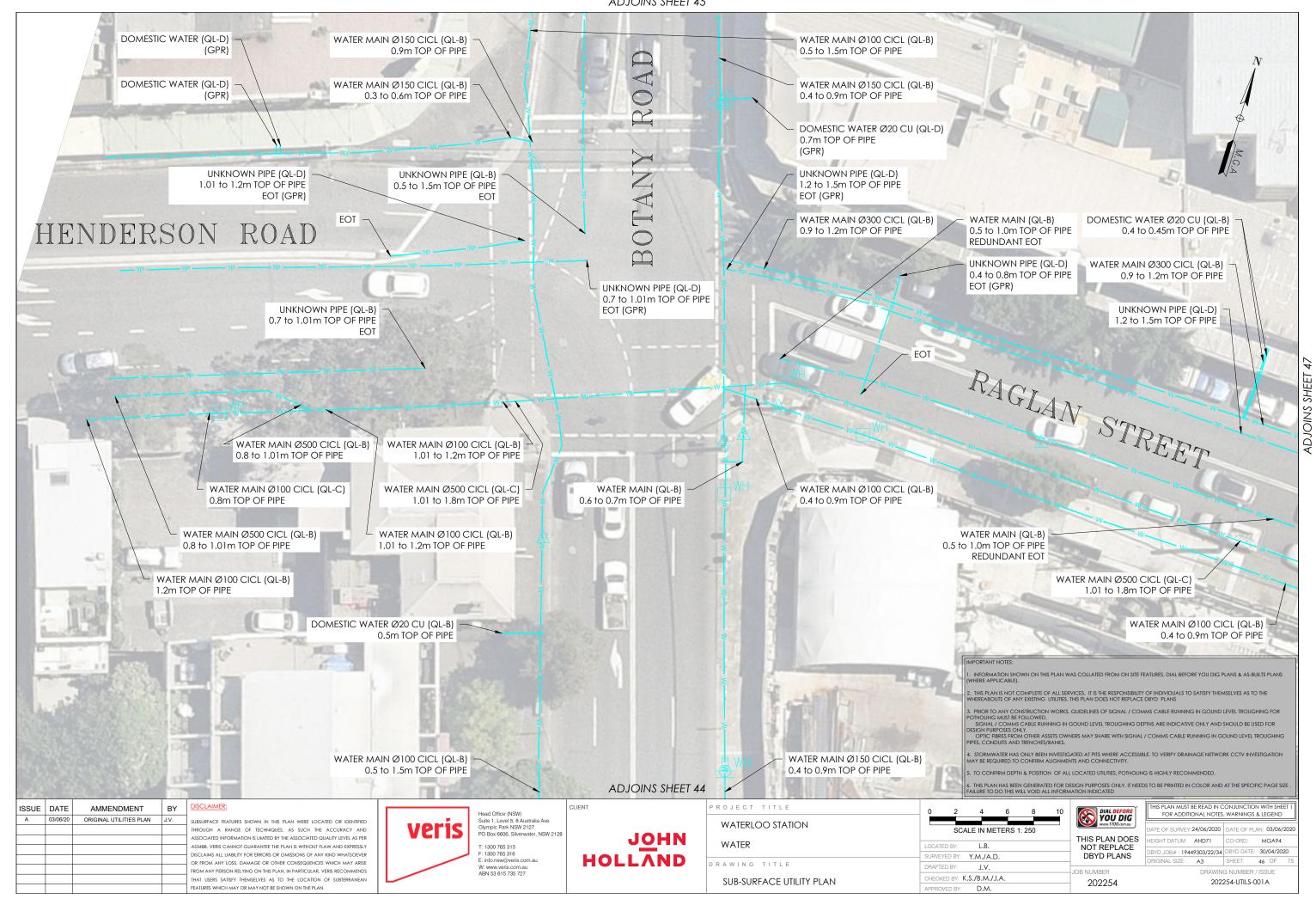


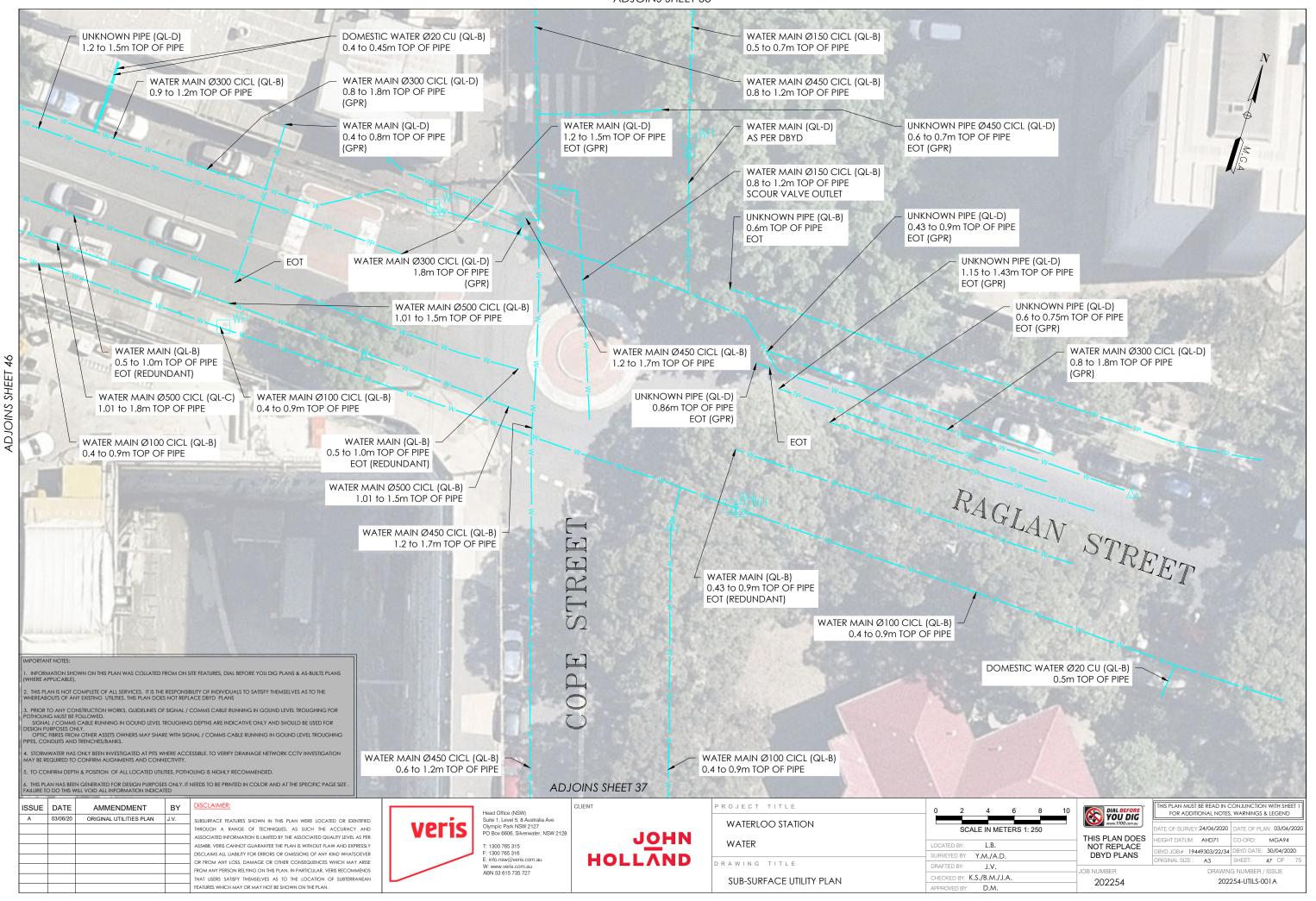


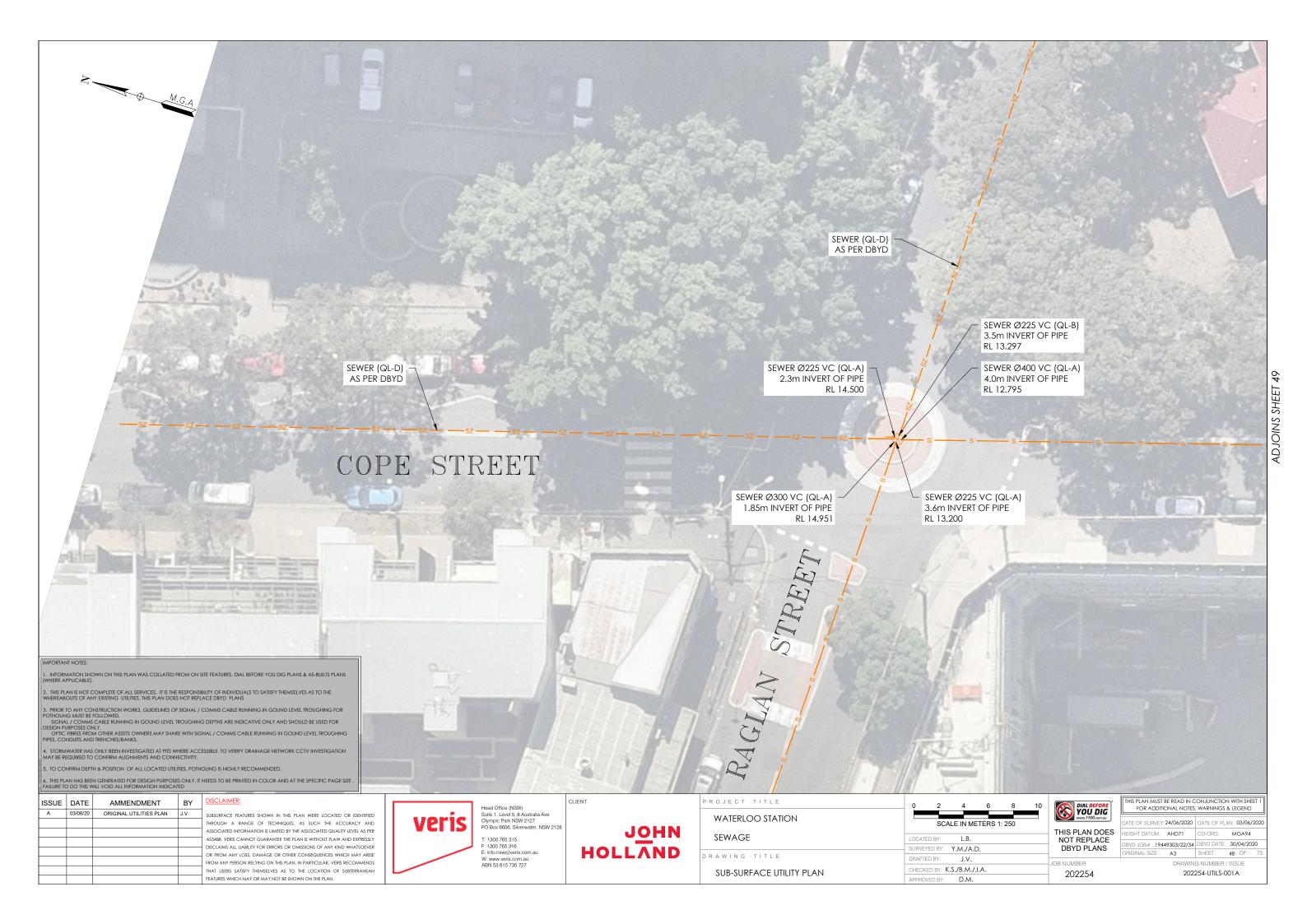


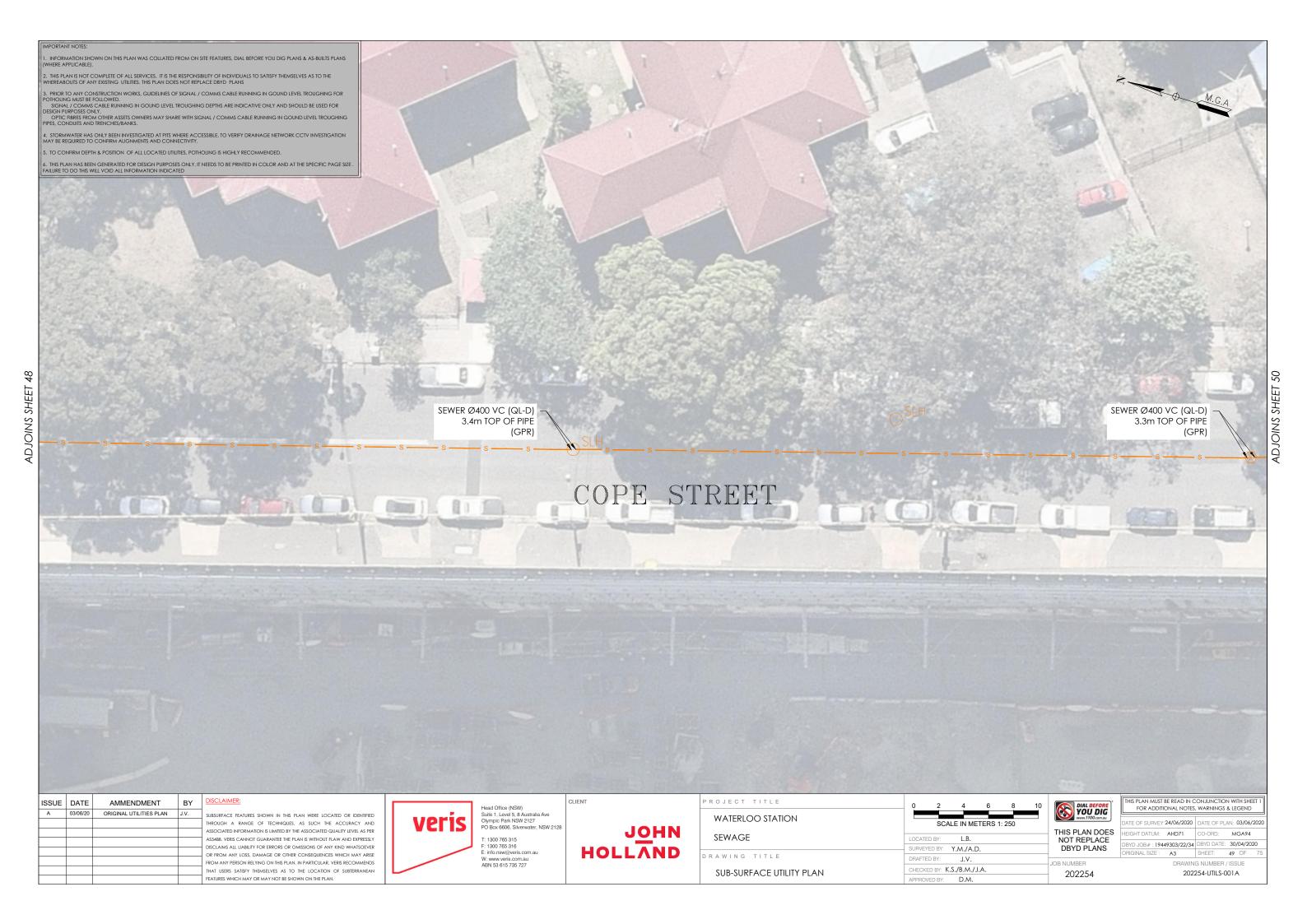




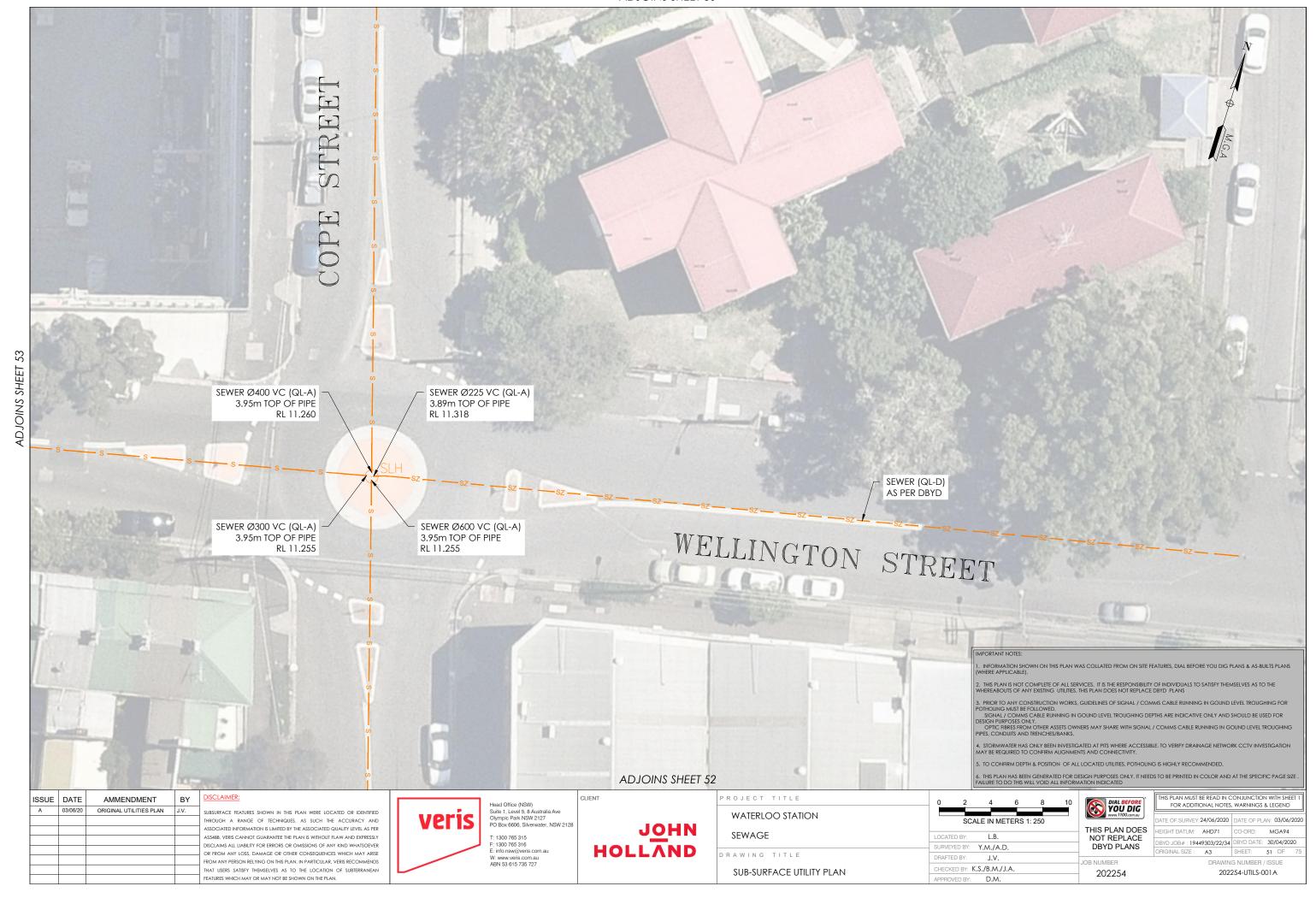














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ROJECT TITLE	0 2 4 6 8 10	
WATERLOO STATION	SCALE IN METERS 1: 250	
SEWAGE	LOCATED BY: L.B.	THIS NO
	SURVEYED BY: Y.M./A.D.	DB
RAWING TITLE	DRAFTED BY: J.V.	JOB NU
SUB-SURFACE UTILITY PLAN	CHECKED BY: K.S./B.M./J.A.	
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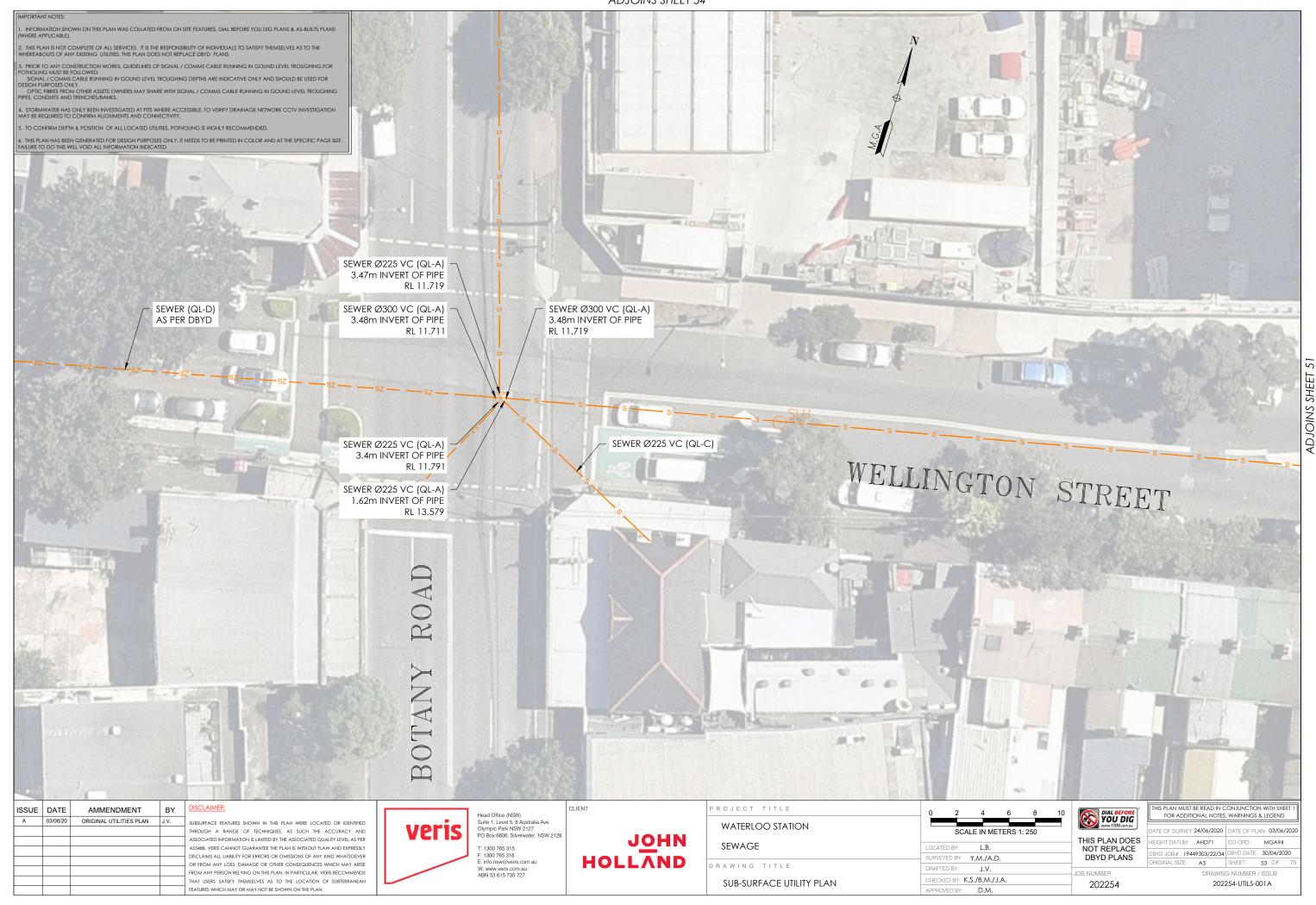
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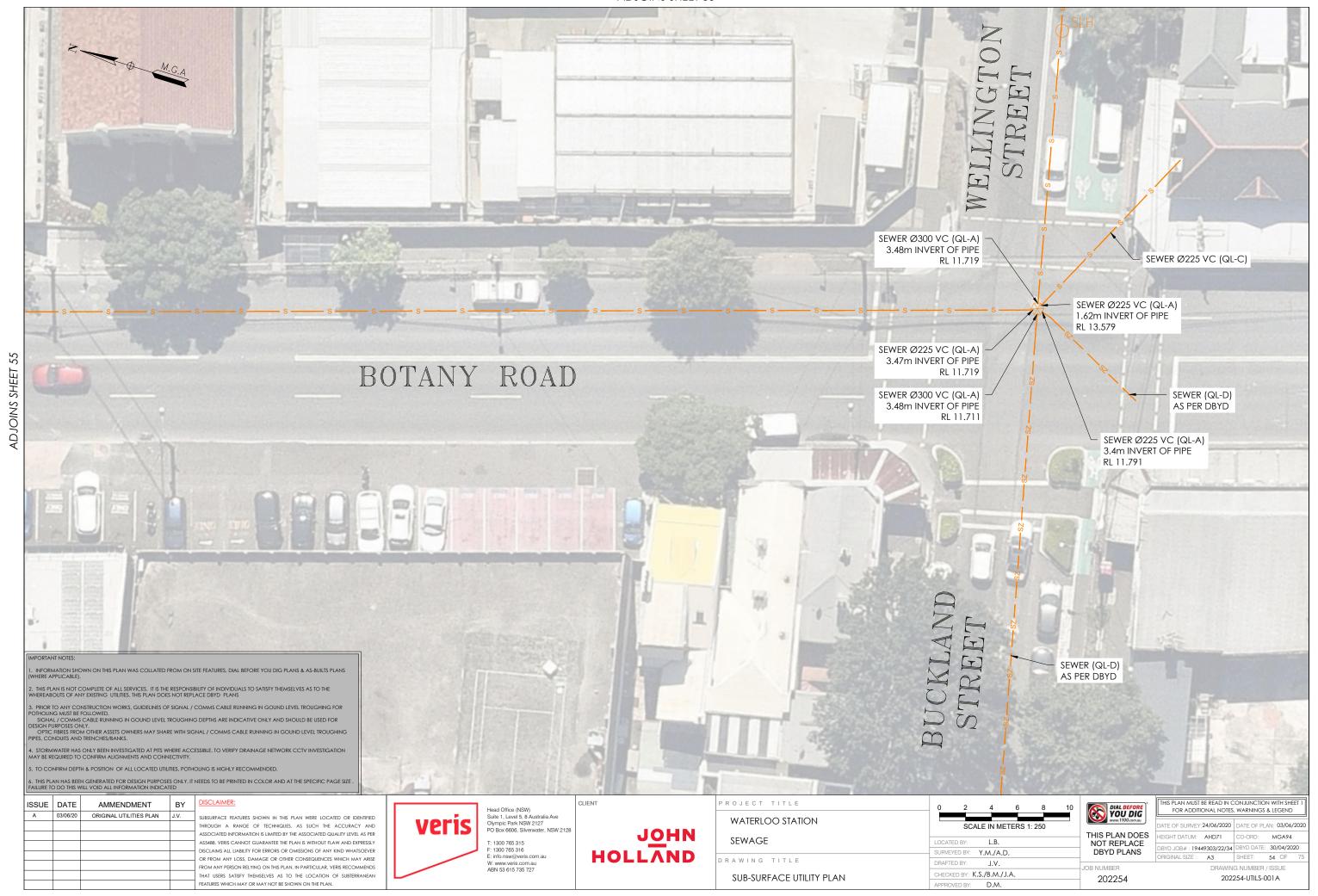
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N DOES	HEIGHT DATUM: AHD71	CO-ORD: MG/

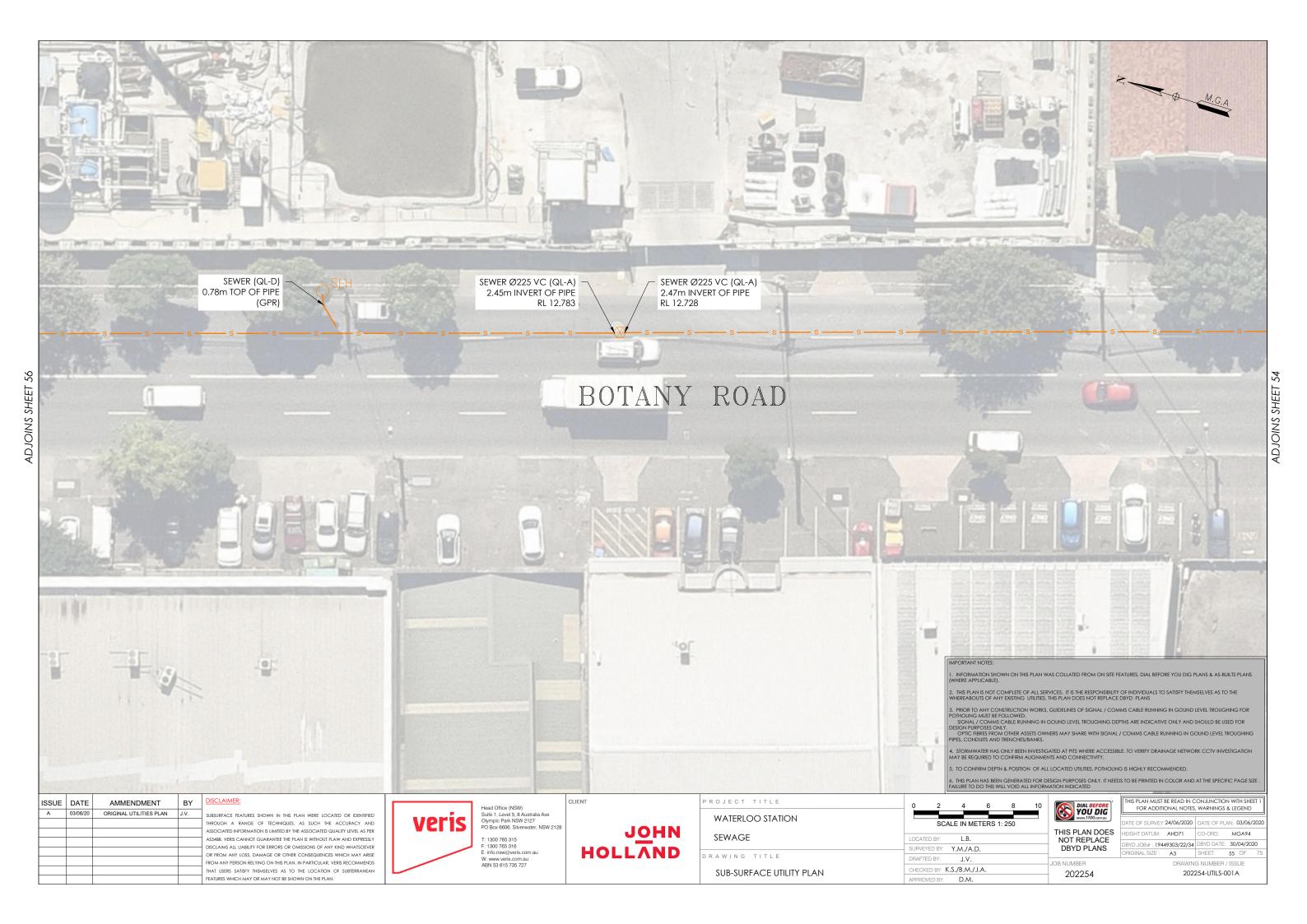
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ORIGINAL SIZE: A3	SHEET: 52 OF 75	
DRAWING NUMBER (ISSUE		

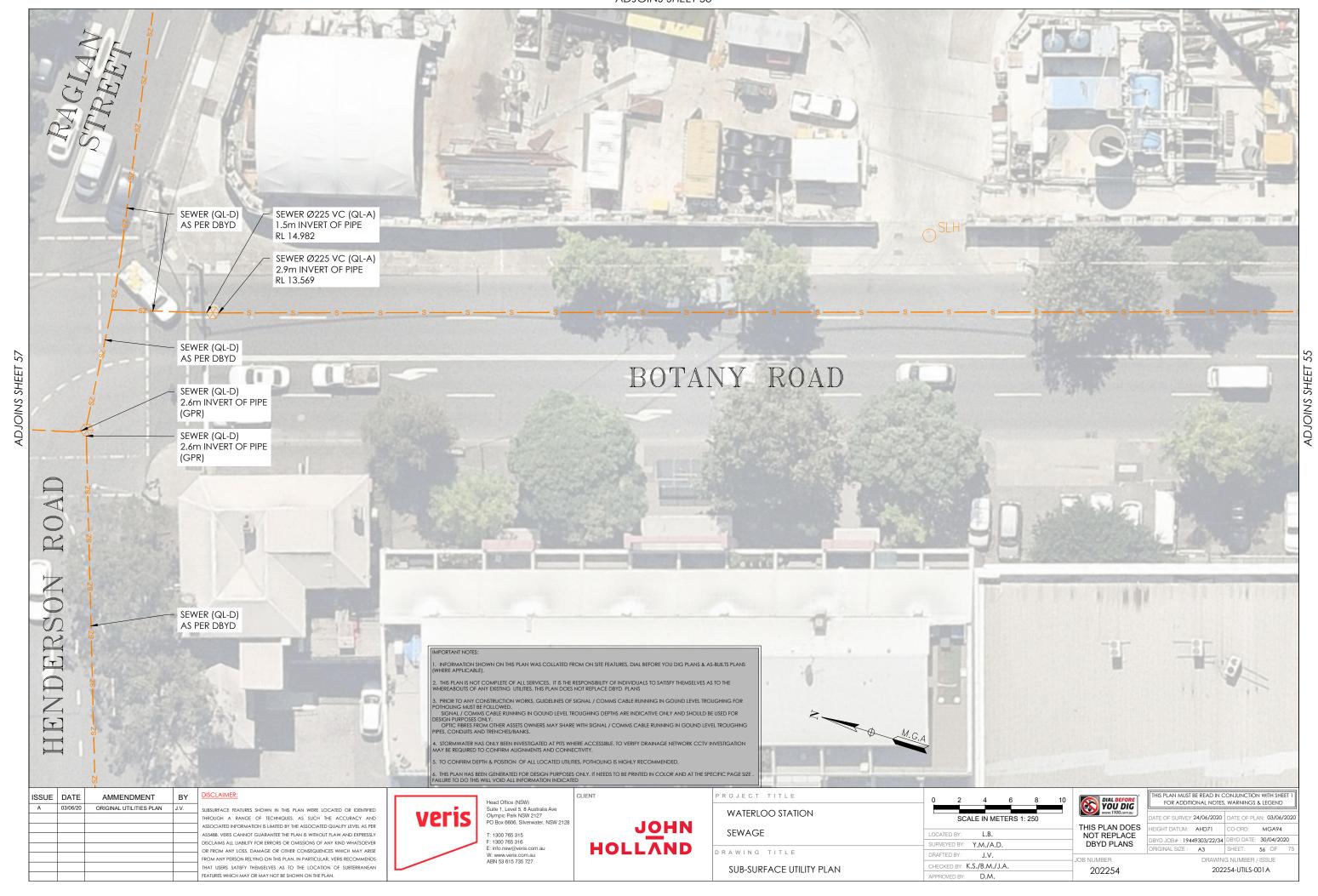
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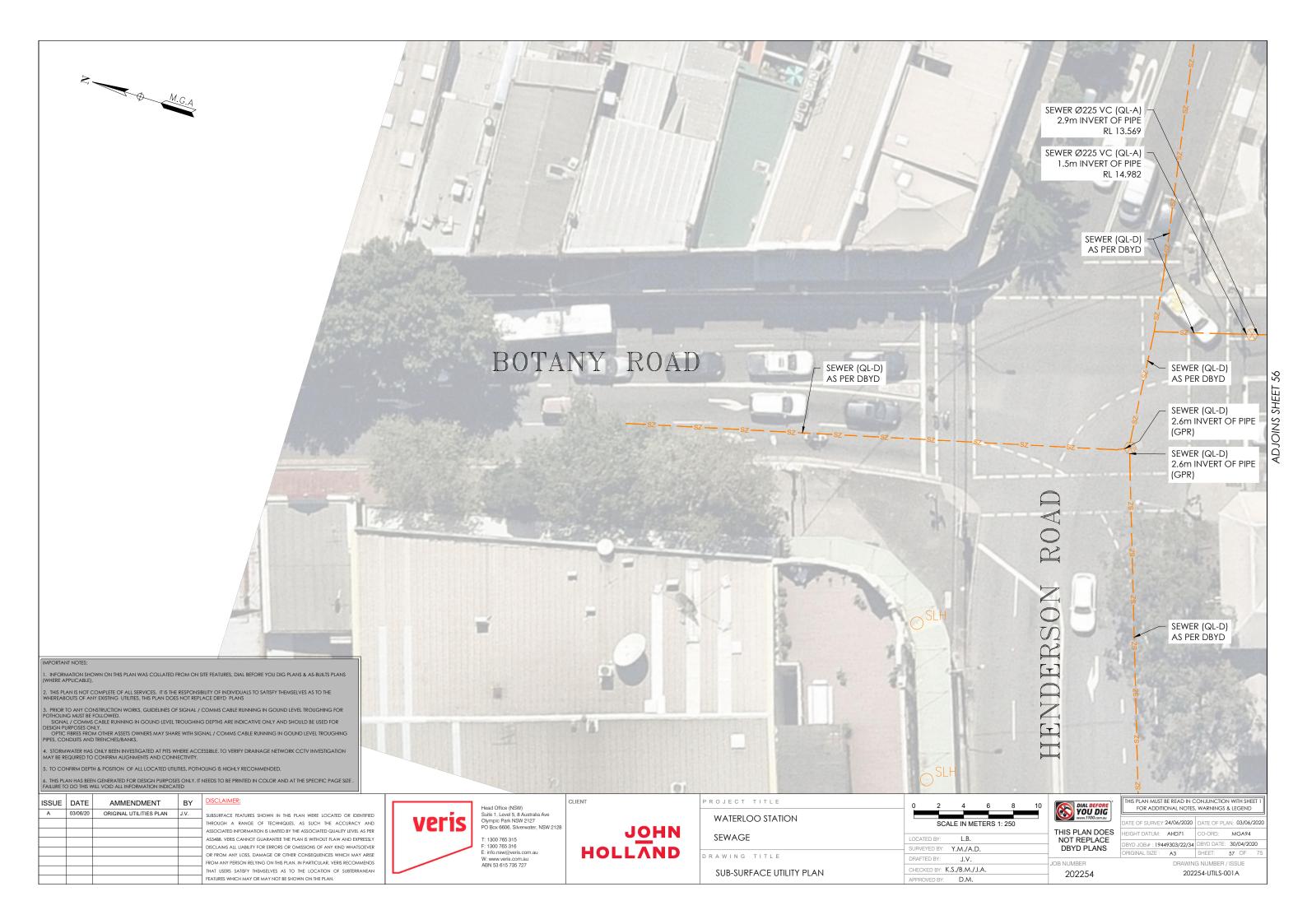
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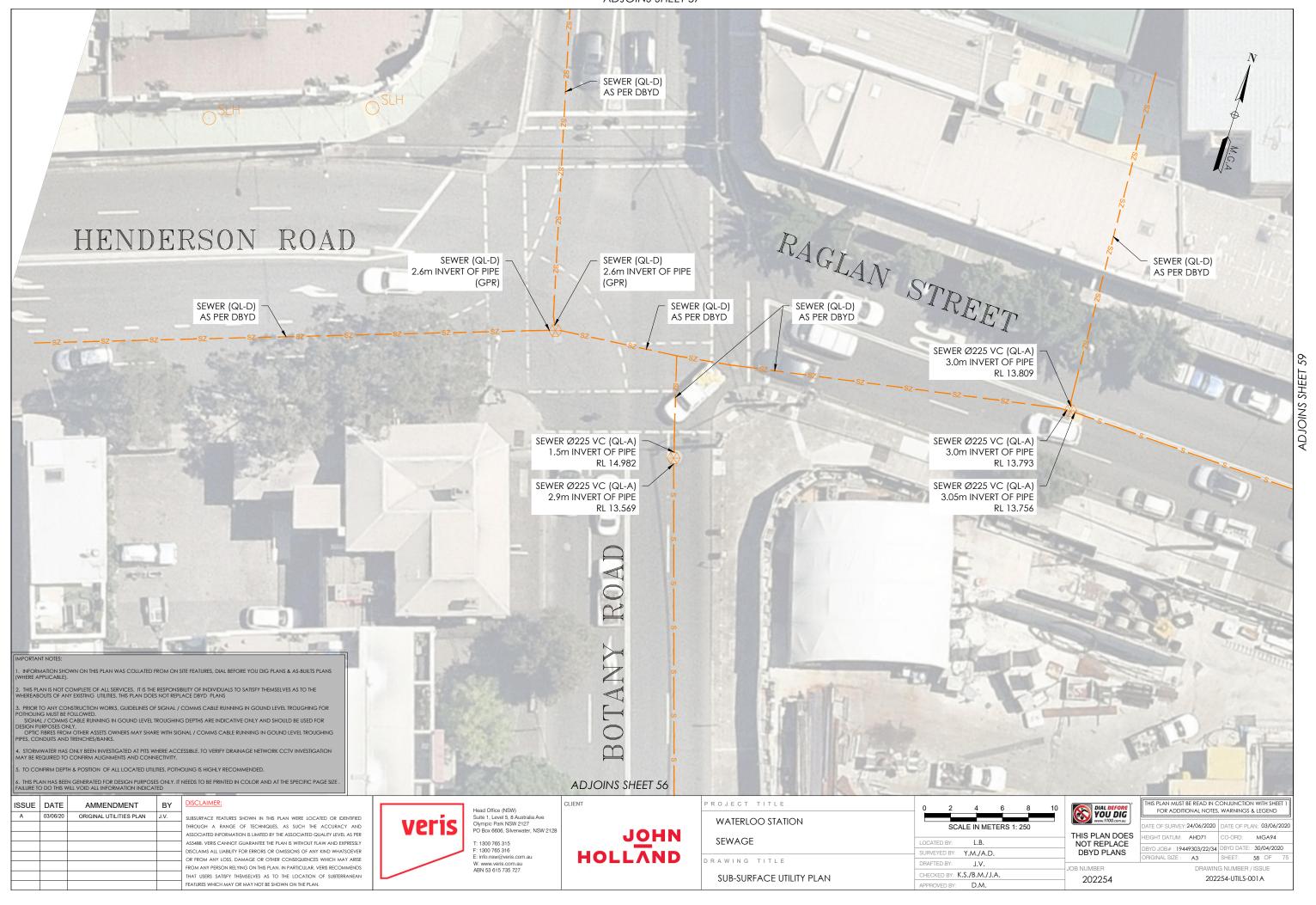


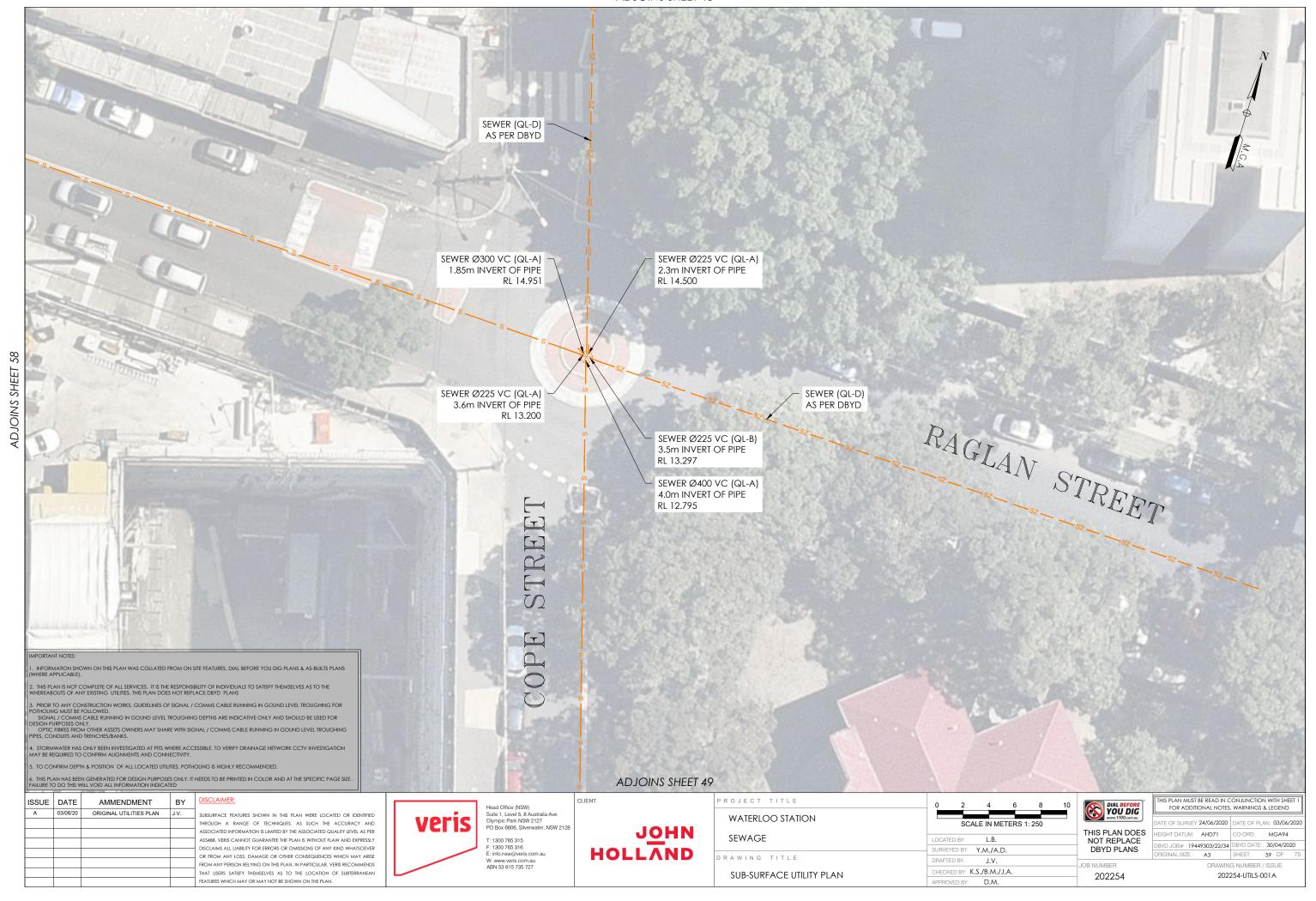


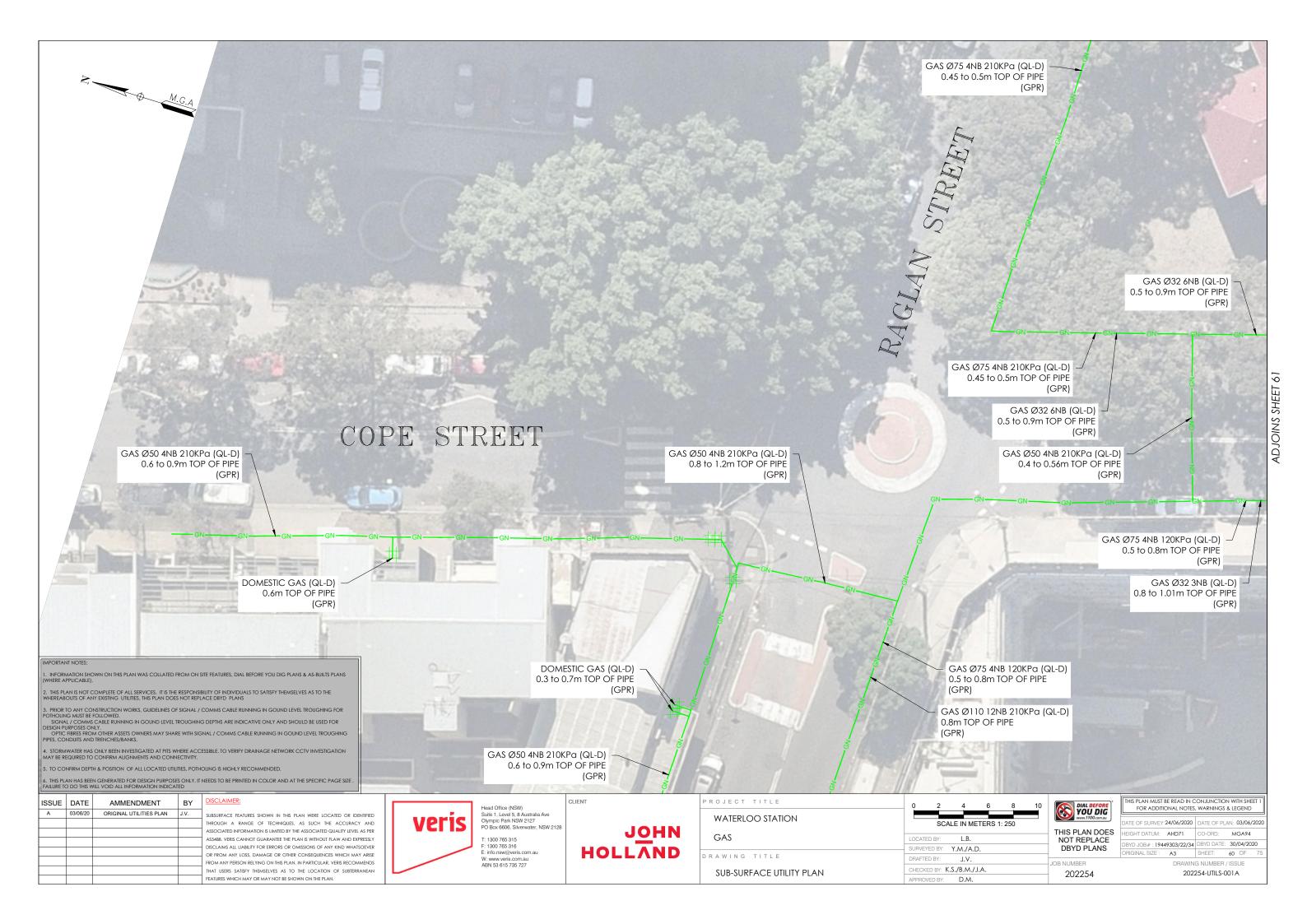


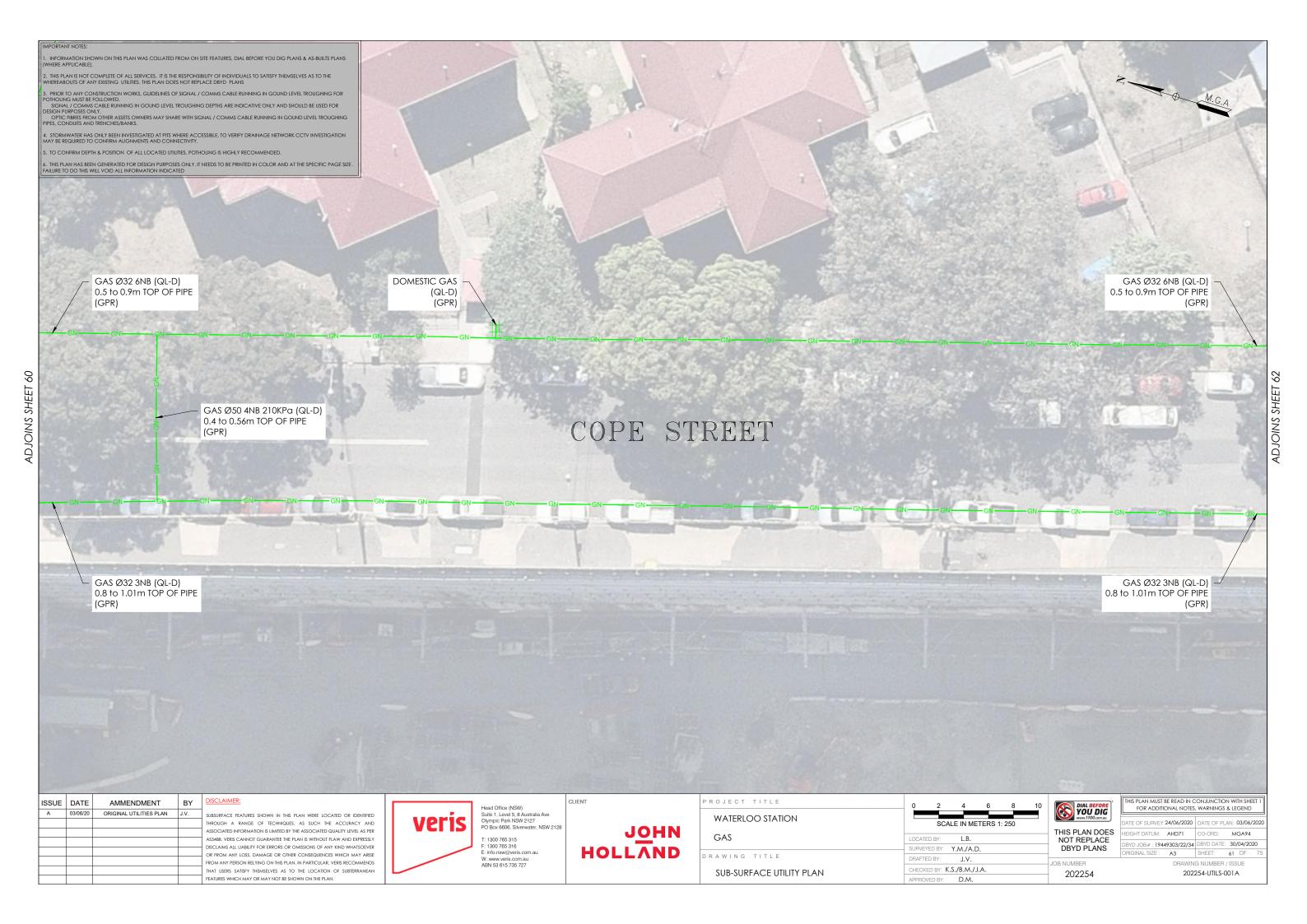


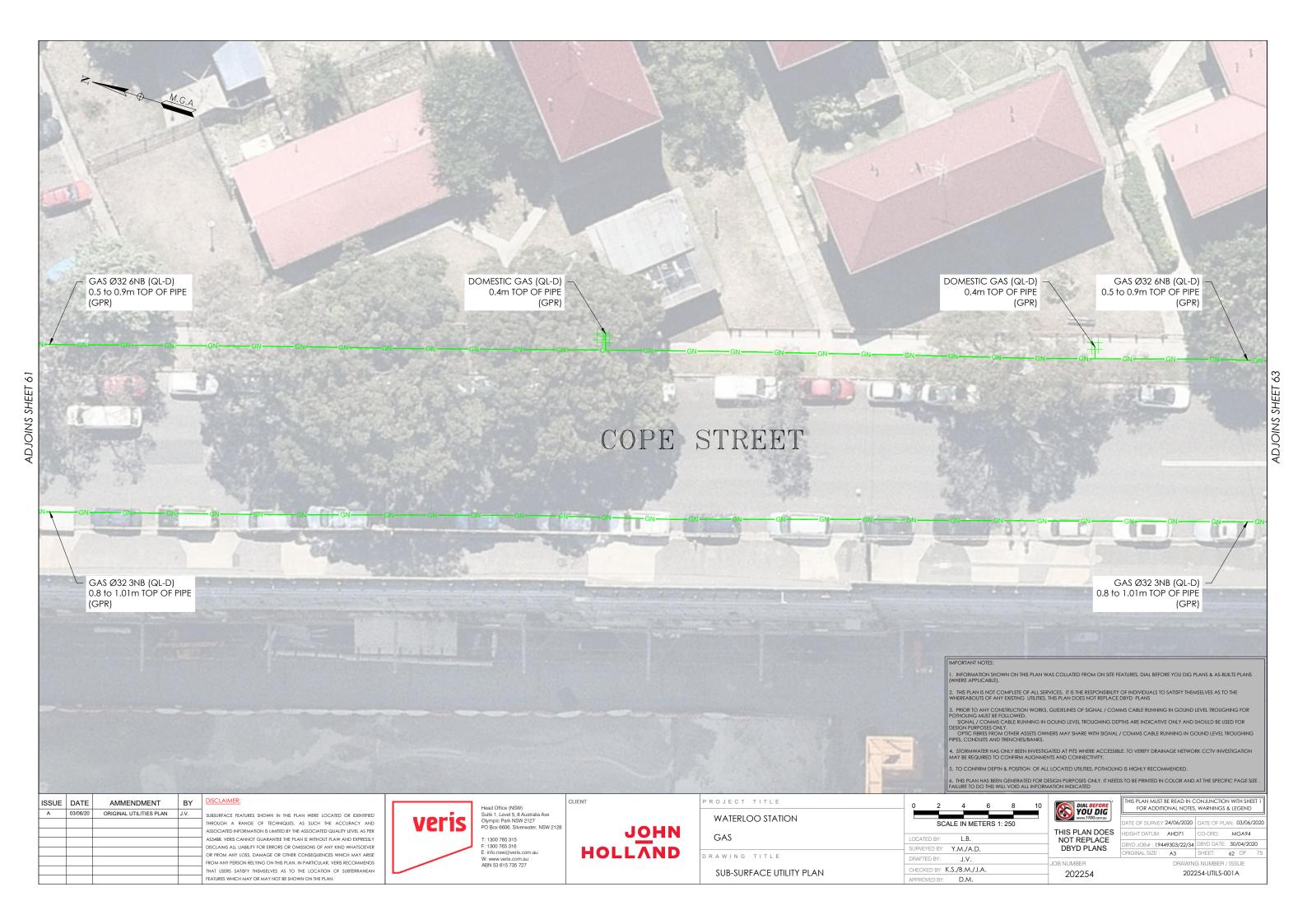


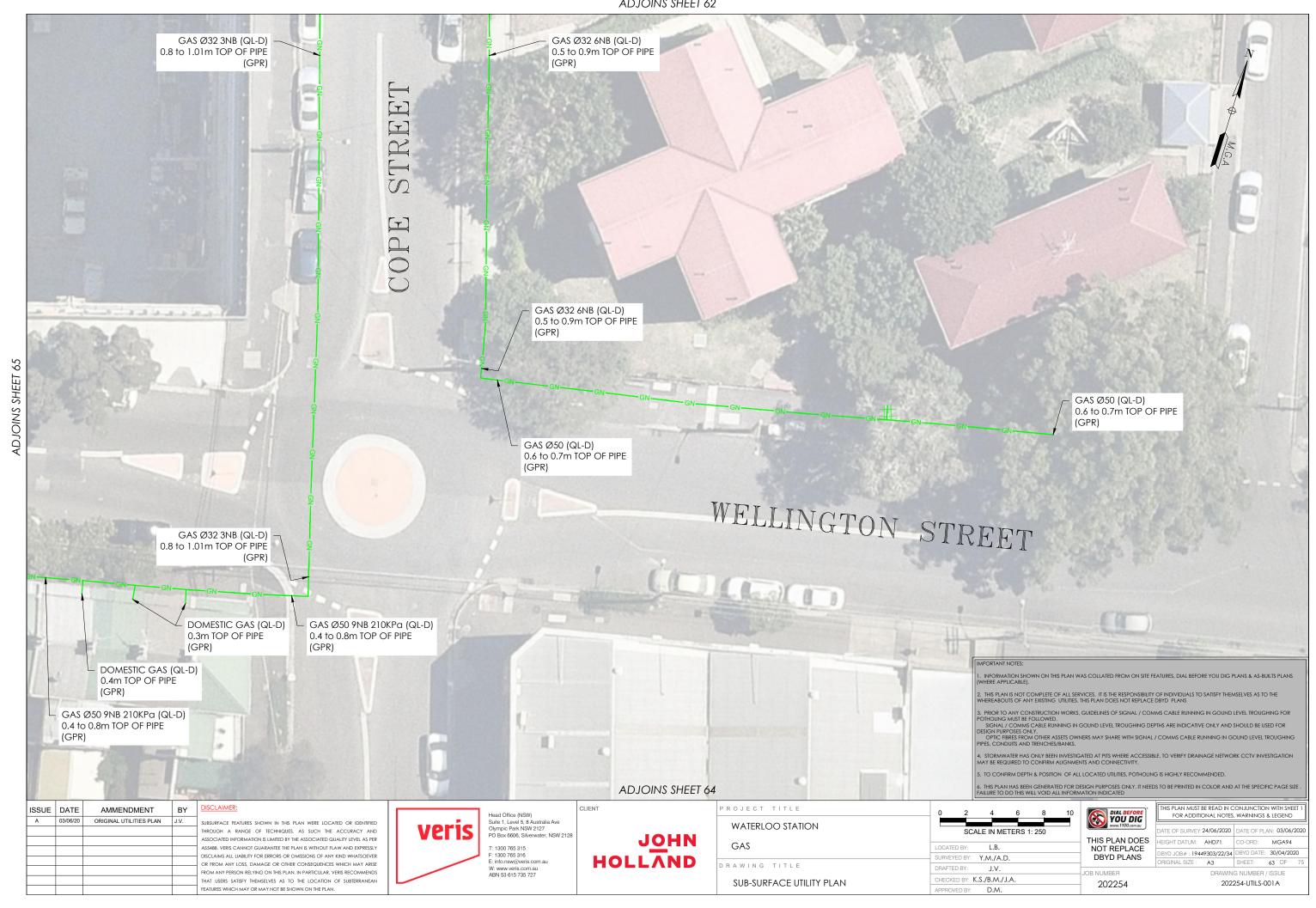














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ROJECT TITLE	0 2 4 6 8 10	ſ
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	SURVEYED BY: Y.M./A.D.	1
RAWING TITLE	DRAFTED BY: J.V.	JC
SUB-SURFACE UTILITY PLAN	CHECKED BY: K.S./B.M./J.A.]"
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APPROVED BY: D.M.

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J	DATE OF SURVEY: 24/06/2020	DATE OF PLAN: 03/06/202		
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	DBYD JOB#: 19449303/22/34	DBYD DATE: 30/04/2020		

ORIGINAL SIZE: A3 SHEET: 64 OF 75 DRAWING NUMBER / ISSUE

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