



Port of Newcastle

**Proposed Commercial Development – 46 Fitzroy Street,
Carrington, NSW (Lot 33/DP1078910)**

Services Assessment

March 2021

Executive summary

This report aims to provide assessment and recommendations relating to the existing water, sewer, gas, electrical and communications infrastructure servicing the proposed multi storey development located at 46 Fitzroy Street, Carrington NSW 2294 (Lot 33/DP1078910).

A preliminary services assessment has been completed and the following recommendations relating to services supply to the site are as follows:

- Establish a new water connection and install a new DN50 water meter assembly.
- Establish a new Sewer Connection and raise the existing Manhole to HWC regulations.
- Establish a new Fire Water Connection and install a new Fire Booster Assembly.
- The possible requirement of an onsite Fire Pump system.
- Establish a new LV consumer Electrical Connection and install a new kiosk substation and considerable other external supporting electrical infrastructure works.
- Establish a new NBN connection and install a new MDF.
- Establish a Natural Gas Connection and install a new meter assembly.

The total estimated cost for hydraulic service with 30% contingency is approximately: **\$115,000**.

The total estimated cost for electrical and communications with a 30% contingency is approximately: **\$635,000**.

Table of contents

1.	Introduction	1
1.1	Project background	1
1.2	Purpose of this report	1
1.3	Scope and limitations	1
1.4	Assumptions	2
2.	Site hydraulic service connections	3
2.1	Domestic water demands and connection	3
2.2	Sewer flows and connection	4
2.3	Wet fire systems	5
2.4	Natural gas demand and connection	6
2.5	Opinion of costs	7
3.	Site electrical and ICT service connections	8
3.1	Electrical power demands and connection	8
3.2	Communications network access	10
3.3	Recommended works and opinion of costs	11

Table index

Table 2-1	Approximate development fixture unit loading for domestic water	3
Table 2-2	Approximate development fixture unit loading for sewer	4
Table 3-1	Estimated electrical demand load	9

Appendices

Appendix A – Hunter Water Corporation Services Diagram
Appendix B – Sewer and Water Supply/Connections Concept Design
Appendix C – Hunter Water Corporation Statement of Available Pressure
Appendix D – Ausgrid WebGIS and nearmaps historical aerial data
Appendix E – Dial Before You Dig communications services
Appendix F – Hunter Water Corporation Notice of Formal requirements for Proposed Development
Appendix G – Jemena Group Gas Services Diagram
Appendix H – Electrical Supply/Connections Concept Design

1. Introduction

1.1 Project background

Port of Newcastle is investigating the services feasibility to develop a multi storey commercial building and have engaged GHD to undertake investigations to assist them for Development Application (DA) purposes. The area under investigation is located at 46 Fitzroy Street, Carrington NSW 2294 (Lot 33/DP1078910).

1.2 Purpose of this report

This report provides assessment and recommendations relating to the existing water, sewer, gas, electrical and communications infrastructure servicing the site specifically as follows:

- Outline the existing authority infrastructure and identify any major constraints
- Informally assess the capacity of the existing infrastructure to serve the proposed development
- Provide upgrade recommendations for authority supply, including associated opinion of costs

These recommendations will enable and guide the Port of Newcastle to make informed decisions regarding the feasibility of any upgrade works relating to the existing authority infrastructure to service the proposed development.

1.3 Scope and limitations

This report: has been prepared by GHD for Port of Newcastle and may only be used and relied on by Port of Newcastle for the purpose agreed between GHD and the Port of Newcastle as set out in Section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Port of Newcastle arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared. Specifically, this Report does not take into account the effects, implications and consequences of or responses to COVID-19, which is a highly dynamic situation and rapidly changing. These effects, implications, consequences of and responses to COVID-19 may have a material effect on the opinions, conclusions, recommendations, assumptions, qualifications and limitations in this Report, and the entire Report must be re-examined and revisited in light of COVID-19. Where this Report is relied on or used without obtaining this further advice from GHD, to the maximum extent permitted by law, GHD disclaims all liability and responsibility to any person in connection with, arising from or in respect of this Report whether such liability arises in contract, tort (including negligence) or under statute.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (Section 1.4 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Port of Newcastle and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

GHD has prepared the preliminary opinion of costs set out in sections 2 and 3 of this report using information reasonably available to the GHD employee(s) who prepared this report; and based on assumptions and judgments made by GHD.

The opinion of costs has been prepared for the purpose of project feasibility and must not be used for any other purpose.

The opinion of costs is a preliminary estimate only. Actual prices, costs and other variables may be different to those used to prepare the opinion of costs and may change. Unless as otherwise specified in this report, no detailed quotation has been obtained for actions identified in this report. GHD does not represent, warrant or guarantee that the project can or will be undertaken at a cost which is the same or less than the opinion of costs.

1.4 Assumptions

Certain information and data in this report has been rightfully provided by third parties or outside sources, derived from examination of records and from interviews with individuals with information about the issues. No warranties or representations, whether expressed or implied, regarding the accuracy of such information, is accepted or implied, nor is accountability or responsibility in the event of inaccuracy accepted.

Flood studies or modelling has not been considered as part of this report.

Formal electrical, communications and gas authority capacity applications/submissions have not been completed as part of this report. Information provided is based on informal/preliminary authority advice.

Information obtained by verbal reference has been taken at face value. This review has not given rise to concerns that would lead us to doubt the validity of such verbal advice.

Design capacities have not been checked nor have performance measurements been taken; where performance or capacities are noted in the report, these are estimates and indicative only.

2. Site hydraulic service connections

This section investigates the existing authority water, sewer and gas services located within the vicinity of the proposed development. Demands, loads and connection sizes for these services have been estimated in accordance with current standards, industry practice and our previous experience with the design and construction of commercial buildings.

Hunter Water Corporation (HWC) are the local authority for the development site. Drawings of the existing services infrastructure within the vicinity of the proposed development were obtained from HWC and a copy of these drawings has been provided in Appendix A.

Water and sewer calculations listed in sections 2.1 & 2.2 below are based on the proposed development containing end of trip facilities, amenities, café and commercial offices on the ground floor. Amenities and commercial offices on levels one to three and plant and landscaped areas as per the architectural drawings issued for coordination prepared by Rainsford Architecture + Design.

2.1 Domestic water demands and connection

2.1.1 Water supply

A review of the HWC infrastructure plans indicate that the following water mains are located within proximity to the site:

- Denison Street – DN150 CICL-S water main.
- Fitzroy Street – DN150 DICL water main.

A single new connection to the existing water main on Fitzroy Street is required to service the proposed commercial development. Refer to Appendix B for proposed potable water connections to the site.

A new authority water meter is to be installed for the site. The existing lot DN25 potable water supply and DN25 property water meter (Meter No GVB90721) are to become redundant (in accordance with Hunter Water Corporation requirements). The existing property water meter is to be returned to the Hunter Water Corporation.

2.1.2 Demand

A preliminary service sizing for the development has been carried out in accordance with the Australian Standard AS/NZS 3500 - National Plumbing and Drainage – Part 1: Water services.

Table 2-1 Approximate development fixture unit loading for domestic water

Area	Total Water Loading Units
Café (assumed)	20
Ground amenities and commercial	59
First floor amenities and commercial	41
Second floor amenities and commercial	41
Third floor amenities and commercial	41
Plant level (assumed 3 x hose taps)	18
External (landscaping etc - assumed 3 x hose taps)	18
Total	238

Probable simultaneous demand (PSD) for plumbing fixtures contained within the proposed development based on the total amount of loading units = **1.97 L/sec**.

Flow rate for two fire hose reel flowing simultaneously = **0.66 L/sec**.

Total flow rate for the development = **2.63 L/s**.

A flow rate of **2.63 L/s** has a velocity of 1.45 m/s using a 50 mm copper pipe which is within normal pipe sizing design parameters.

2.1.3 Proposed domestic water connection

The existing HWC 150 mm water main located in Fitzroy has the capacity to accommodate the domestic flow required to service the proposed development. The “*Statement of Available Pressure*” received from HWC for this main confirms that adequate flow is available to service the plumbing fixtures within the development. Preliminary hydraulic calculations indicate that sufficient pressure is available in the water main delivering an approximate static pressure of 400 kPa to the level 3 fixtures, negating the need for on-site domestic water pumps. Refer to Appendix C – Statement of Available Pressure

2.1.4 Hunter Water Corporation Notice of Formal Requirements Letter (Section 50 Application)

Hunter Water Corporation’s response to the submitted Section 50 application formally indicates that no amplification of the existing water infrastructure is required to service the proposed development. Yet it does nominate that it is the developers responsibility to investigate the exact location of the existing water infrastructure to determine its depth and if necessary lower the main under a major works contract to ensure minimum depth requirements are met. It also states that the water infrastructure should be protected during construction. Refer to Appendix F – Hunter Water Corporation Notice of Formal requirements for Proposed Development.

2.2 Sewer flows and connection

2.2.1 Sewer

A review of Hunter Water Corporation infrastructure plans indicates that a DN150 concrete sewer main is installed parallel with Northern boundary and currently services the site. This main grades to the East and includes two maintenance holes (MH) within the site that are both suitable points of connection for the development. Based on a proposed ground floor RL of 2.500, there is approximately 3,000 – 3,410 mm of depth to the existing invert of the sewer main, ensuring that gravity fall is possible for the development. Refer to Appendix A - Hunter Water Corporation – Services Diagram

Based on Table 6.2 of AS/NZS 3500 Part 2: Sanitary Plumbing and Drainage and Table 2-2 below, an approximate total of 269 sewer fixture units will be applicable for the proposed development. Table 3.3.1 of AS/NZS 3500.2 indicates that the minimum pipe size that can be used is DN150 which is suitable for up to 855 sewer fixture units at a minimum grade of 1.0%.

Table 2-2 Approximate development fixture unit loading for sewer

Area	Total Sewer Fixture Units
Café (assumed)	20
Ground amenities and commercial	72
First floor amenities and commercial	59
Second floor amenities and commercial	59
Third floor amenities and commercial	59
Total	269

2.2.2 Hunter Water Corporation Notice of Formal Requirements Letter (Section 50 Application)

Hunter Water Corporation's response to the submitted Section 50 application formally indicates that no amplification of the existing sewer infrastructure is required to service the proposed development. Yet it does nominate that the development must comply with Hunter Water's Building Over Sewer Assets Policy. Based on the current architectural documentation, the requirements of this policy may be negated due to the proximity of the building to the existing sewer main (approximately 6.4 m) this would need to be verified during the detailed design of the development.

Hunter Water also note that if the existing sewer MH's 12S and 11P are located within the proposed driveway, they are required to be raised to the finished pavement level and the lid replaced with a Class D heavy duty lid and surround. Also curb and gutters are not to be installed within 1.5m of any MH.

Refer to Appendix F – Hunter Water Corporation Notice of Formal requirements for Proposed Development.

2.3 Wet fire systems

The Building Code of Australia-Part E1 – Fire Fighting Equipment nominates that all Class 5 (commercial) buildings with a floor area greater than 500 m² requires the following fire services.

- Fire Hydrant System in accordance with AS 2419.1-2005
- Fire Hose Reel System in accordance with AS 2441-2005

2.3.1 Fire hydrant system

Authority street fire hydrants are located within the vicinity of the proposed development along Denison and Fitzroy Streets. Fire hydrant coverage to the proposed development is not achievable from street hydrants. Therefore, coverage must be provided by an onsite fire hydrant system.

We assume the largest fire compartment within the new development will be the Level 1 commercial space, having a floor area greater than 1000 m², but not greater than 5000 m². As defined by AS2419.1, the site's most disadvantaged fire hydrant shall flow at no less than **20 L/sec**, at a minimum pressure of **250 kPa**.

The Hunter Water Corporation Statement of Available Pressure indicates that the Fitzroy Street water main can deliver 20 L/sec flow, at a pressure of 480 kPa. Adequate flow is available from the main and provision for on-site water storage is not necessary. However, the main may not have adequate pressure to supply the hydrant system without a pump. The available mains pressure of 480 kPa is considered reasonable, yet not adequate for multi storey buildings. After factoring in pipeline friction losses and system head losses, our preliminary calculations indicate that a residual pressure at the disadvantaged hydrant on Level 3 will be around 260 kPa (on the limit of the 250 kPa minimum requirement). Exact system hydraulic calculations will need to be completed as part of the detailed design to verify if a fire hydrant pump is required.

If required, the pump set must be located in a fire rated room opening directly to a fire isolated passage or open space. The approximate floor area for a typical fire pump room is 24 m². Alternatively, an external pump room could be installed if located greater than 6 m from the building.

The final locations of the Hydrant system components will be determined and verified during the detailed design.

Proposed firefighting water connection and booster assemblies

Due to the size, location and constraints of the proposed development, a fire booster assembly will be required. Based on the received architectural documentation, Fitzroy Street will include the main building frontage and main building entrance, while the rear of the property and main carpark will be on Denison Street. On this basis, the main water connection and fire booster assembly would be required on the Fitzroy Street frontage to comply with AS2419.1 – Fire Hydrant installations. The fire hydrant booster assembly must be located as follows:

- At the boundary of the site and within sight of the main entry to the building
- Located not less than 10 m from the external wall of the building
- Adjacent the principle vehicular access to the site
- In a position not less than 10 m from any high voltage electrical distribution equipment (kiosks or main distribution boards)

The final location of this connection is to be determined in detailed design and in consultation with Hunter Water.

With regard to the fire hose reel system water supply; this system must be fed from the metered domestic water service.

2.3.2 Fire hose reel systems

The National Construction Code deemed to satisfy provision states that a fire hose reel system must be provided for any fire compartment with a floor area greater than 500 m². A fire hose reel system (connected to the proposed potable water supply) is required to serve the proposed development.

Based on the architectural drawings, it is likely that fire hose reels will be required within each ground floor tenancy and adjacent to each fire stair on levels 1 to 3. The hose reels shall be located within 4 m of exit doors.

2.4 Natural gas demand and connection

2.4.1 Existing Gas Supply

Jemena Gas operate the gas distribution network in the Newcastle area. A review of the existing Jemena infrastructure drawings indicates that a DN50 nylon gas main is installed on the eastern side of Denison Street, operating at high pressure (210 kPa). A copy of this drawing has been provided in Appendix E – Jemena Group Gas Services Diagram.

2.4.2 Demand

We assume a centralised gas fired hot water plant and commercial cooking appliances within the cafe will be the only gas supplied appliances installed within the building, based on previous commercial facilities completed by GHD. Our preliminary calculations indicate that the combined gas load of the hot water plant and cooking appliances will be approximately 1,000 MJ/hr.

2.4.3 Proposed Gas Connection

A new connection to the Denison Street DN50 gas main will be necessary to service the development. Jemena have advised there is sufficient capacity in the Denison Street high pressure gas main to accommodate the proposed load. However, this will need to be formally confirmed with the submission of final gas loads, gas design drawings and application during the detailed design phase.

2.5 Opinion of costs

Our opinion of costs specific to each of the hydraulic services detailed above is as follows:

Items	Estimated Cost
Water Connection and DN50 water meter assembly	\$15,000
Sewer Connection and MH raising	\$25,000
Fire Water Connection and Fire Booster assembly	\$25,000
Fire Pump (excluding room and internal site pipe reticulation)	\$35,000
Natural Gas Connection and meter assembly	\$15,000
Total	\$115,000

Note: Estimates include a 30% contingency

3. Site electrical and ICT service connections

This section investigates the existing authority electrical power and communication services located within the vicinity of the proposed development. Demands, loads and connection sizes for these services have been estimated in accordance with current standards, industry practice and our previous experience with the design and construction of commercial buildings.

Whilst the address of the site is on Denison Street, perhaps a more adept listing would be along Fitzroy Street; this will be the front of the property and main building entrance, while the rear of the property and main carpark will be on Denison Street.

Ausgrid are the local energy authority for the development site. Drawings of the existing electrical services infrastructure within the vicinity of the proposed development were obtained from Ausgrid's online WebGIS portal, and prior historical Ausgrid installation works were explored using the past aerial photometry available on nearmaps.com. A copy of the WebGIS information and supporting historical nearmaps photometry has been provided in Appendix D.

NBNCo are the primary communications provider for the development site. Drawings of the existing communication infrastructure within the vicinity of the proposed development are not generally available from the service provider. However, dial-before-you-dig (DBYD) inquiries indicate that communications service exist in the nearby vicinity. A copy of these results has been provided in Appendix E.

3.1 Electrical power demands and connection

3.1.1 Existing high voltage (HV)

A review of the Ausgrid WebGIS data indicates that 11 kV overhead feeder 82701 is available on both the Dennis Street and Fitzroy Street boundaries of the project site. This feeder supplies most of the Carrington suburb and is supplied from Ausgrid's Tighes Hill Zone Substation, located approximately 1.5 km northwest of the project site, at the intersection of Pacific Coast Highway (Hannell Street) and Elizabeth Street.

3.1.1.1 Denison Street

The Denison Street branch of the feeder runs uninterrupted from north to south along the eastern boundary of the project site. There is no existing underground to overhead (UGOH) transition risers, or HV to LV substations in the immediate vicinity of the project.

Installing a new pole top substation on Denison Street and running overhead LV to the proposed building is feasible but would result in overhead lines crossing the entirety of the carparks. A new UGOH and pad-mounted kiosk substation along Denison Street is also feasible and would "hide" the kiosk at the back of the lot. However, the underground consumer mains routing would run the entire length of the property, and the concept design plans provided to GHD show the utility rooms on the opposite (Fitzroy Street) side of the building, which would complicate any underground service conduit routing.

Additionally, Ausgrid facilities along the Fitzroy Street frontage require works in any instance and having works on both sides of the property could be more costly.

GHD would recommend that taking a LV service from Denison Street is not a preferred option.

3.1.1.2 Fitzroy Street

The Fitzroy Street branch of the feeder also runs north to south and terminates at an existing UGOH on the southwest corner of the site. However, the Fitzroy branch feeder is actually located approximately 10 metres within the project side boundary along the western side and consists of an overhead line and three poles. As the main entrance to the proposed building is along Fitzroy Street, it is expected that undergrounding all of the existing poles is desirable.

The southernmost Ausgrid Pole (indicated as JU-31077 on the WebGIS) serves as a UGOH riser that provides an underground service feed to the Thales Maritime Precinct (TMP) located on the southern side of the development site. This pole does not appear to conflict with the proposed building frontage but may be located in the middle of a proposed carpark exit driving aisle.

The midpoint Ausgrid pole (indicated as JU-37109 on the WebGIS) supports an overhead fused switch cut-out (indicated as HC-27413 on the WebGIS). This is likely the primary protection and disconnection point for the pad-mounted kiosks within the TMP site. This pole is located within a proposed landscaped area in the Fitzroy Street frontage carpark, directly in front of the building, about 10 metres from the southern building wall.

The northernmost Ausgrid pole (indicated as JU-31075 on the WebGIS) supports a 200 kVA pole top substation transformer (indicated as HP-26099 on the WebGIS). This pole top substation currently provides LV power to other electricity customers along Fitzroy Street as well as Council maintained street lighting assets. This pole is currently located in the direct path of the proposed main lobby entrance.

All three of these poles are currently located within the proposed project boundary. It is not known at this time whether or not they are within a registered utility easement, but available information seems to suggest that they are.

It is recommended that all three of the existing poles, and all overhead HV and LV cables be removed and replaced with underground conductors relocated to the road reserve, rather than on the project site. It is recommended that this be done regardless of the electrical service connection to present a clean and professional frontage of the new proposed building along Fitzroy Street.

3.1.2 Existing low voltage (LV)

There is no existing low voltage infrastructure on the site; the site is a cleared vacant lot and all aboveground low voltage facilities (with the exception of the Authority LV consumer mains discussed above) have been removed.

3.1.3 Estimated electrical demand

Estimated electrical demand of the proposed building was calculated using Table C3 of AS/NZS-3000:2018 – Electrical Installations (aka “Wiring Rules”).

Table 3-1 Estimated electrical demand load

Building Area	m ²	Area classification	VA/m ²	Estimated Demand (VA)
G – Lobby & Amenities	253	Light Industrial	15	3,795
G – Office 1	207	Office + Rev cycle AC	75	15,525
G – Office 2	367	Office + Rev cycle AC	75	27,525
G – Café	83	Tavern	80	6,640
1 – Amenities	135	Light Industrial	15	2,025
1 – Office	1,803	Office + Vari Volume AC	70	126,210

Building Area	m ²	Area classification	VA/m ²	Estimated Demand (VA)
2 – Amenities	135	Light Industrial	15	2,025
2 – Office	1,821	Office + Vari Volume AC	70	127,470
3 – Amenities	140	Light Industrial	15	2,100
3 – Office	1,600	Office + Vari Volume AC	70	112,000
4 – Plant Room	73	Light Industrial	15	1,095
4 – Lifts	n/a	Lift motor per each	15 kW	45,000
Carpark – Front (Fitzroy)	575	Open Air + EV charging	15	8,625
Carpark – Rear (Denison)	4,560	Open Air + EV charging	15	68,400
Spare	n/a	10% maximum	-	54,845
			Total	603,280

Notes:

- 1- Spare capacity is limited to no more than 10% due to the conservative nature of the AS/NZS-3000:2018 square meter values. Excessive spare capacity estimate could result in an oversized electrical supply. Additional spare capacity can be calculated when more detailed demand loads for the building are known.
- 2- HVAC loads are calculated as part of the area classifications and are not computed separately.
- 3- The calculated estimated demand indicates that an **1000 A three-phase 230/400 V** service may be adequate for the proposed project. However, this should be verified during the detailed design process.

3.2 Communications network access

3.2.1 NBN broadband services

According to the NBNCo DBYD records, the closest NBN connection point to the project site is a pillar located at the corner of Fitzroy and Cowper Streets, approximately 220 m of the project site.

3.2.2 Other communications services

The DBYD records indicate several other nearby communications facilities running near or adjacent to the project site:

- Two (2) 50 mm Telstra conduits run along the western side of Fitzroy street, across from the project site.
- One (1) 20 mm Telstra conduit appears to run along the northern boundary of the project site, from Fitzroy Street, and terminates at the dead-end of Marsden Street, just to north of the project site. The DBYD records show that this conduit continues into the project site from the end of Marsden Street and may have previously served the buildings that are no longer present.
- One (1) 20 mm Telstra conduit runs along the western side of Denison Street, entering the project site at the north-east corner and terminates approximately mid-point along the Denison Street frontage.

The DBYD data indicates that all these communication service conduits are “in-use” and serve active customers. However, it is fairly reasonable to assume that conduits that terminate within the project site are no longer actually in-service as the buildings and structures that may have been previously served from them are no longer extant.

3.3 Recommended works and opinion of costs

Carrington is a developed urban area with established and well maintained electrical and communications infrastructure.

While no significant upgrades or amplification is anticipated for Ausgrid electrical network or NBN communications network, consultation with the utilities will be required to confirm that there is sufficient network capacity for the proposed development and this should be undertaken once the concept design has been approved.

3.3.1 Energy authority connection

While a connection along Denison Street is feasible, we feel that this would not present a good aesthetic choice. Additionally, HV works are suggested along Fitzroy Street in any case, so an additional connection at Denison would only increase project costing.

We recommend the following HV and LV works along Fitzroy Street:

- Installing a new UGOH at the next pole to the north of the project site (indicated as JU-31074 on the WebGIS), in front of the HiVis Factory building.
- Extend the 11kV underground to a new pad-mounted kiosk substation in the front garden space for the development site. The kiosk rating would be selected based on the combined load of the proposed development plus the existing capacity demands for the other Fitzroy Street customers and street lighting loads (to be confirmed by Ausgrid during ASP3 design).
- Continue the 11 kV underground feeders to the south to re-supply the TMP site, joining to the existing underground feeder conductors at the location of existing pole JU-30177. The Ring Main Unit (RMU) on the kiosk primary could provide isolation for the TMP kiosk/s to reflect the function of existing fused switch HC-27413. This would need to be confirmed with Ausgrid during ASP3 design.
- The new kiosk's LV circuits would be re-connected to existing customers and streetlights along Fitzroy Street, using new underground LV consumer mains. Additionally, one new LV consumer main feeder would be extended to the new proposed development. The exact sizing and route of the new LV consumer mains would be determined during detailed design.

Engineer's opinion of possible estimated costs to complete this work (excl GST) are:

Items	Estimated Cost
ASP3 certified design	\$35,000
150m of trenching, backfill, compaction and surface reinstatement	\$34,000
75m of new LV consumer mains	\$15,000
New kiosk substation	\$475,000
Final Ausgrid connection and service coordination	\$15,000
Total	\$574,000

Note: Estimates include a 30% contingency

3.3.2 Communications connection

Whilst Telstra do have several nearby facilities and potential points of connection, it is believed that a NBNCo connection will offer the best option for connectivity. The closest NBN access point would be the pillar 220 m to the north of the project site. The connection would be a new services trench along the eastern boundary of Fitzroy street to enter the project site from the north-west. NBNCo may request that additional pits be placed along this route to potentially offer services to other customers along Fitzroy Street.

Engineer's opinion of possible estimated costs to complete this work (excl GST) are:

Items	Estimated Cost
Design of a certified NBN design	\$7,000
220 m of trenching, backfill, compactions and surface reinstatement	\$33,000
220 m of NBNCo conduit and pits	\$12,000
Final NBN connection and service coordination	\$10,000
Total	\$62,000

Note: Estimates include a 30% contingency

Appendices

Appendix A – Hunter Water Corporation Services Diagram



HUNTER WATER CORPORATION

A.B.N. 46 228 513 446

Enquiries: 1300 657 657

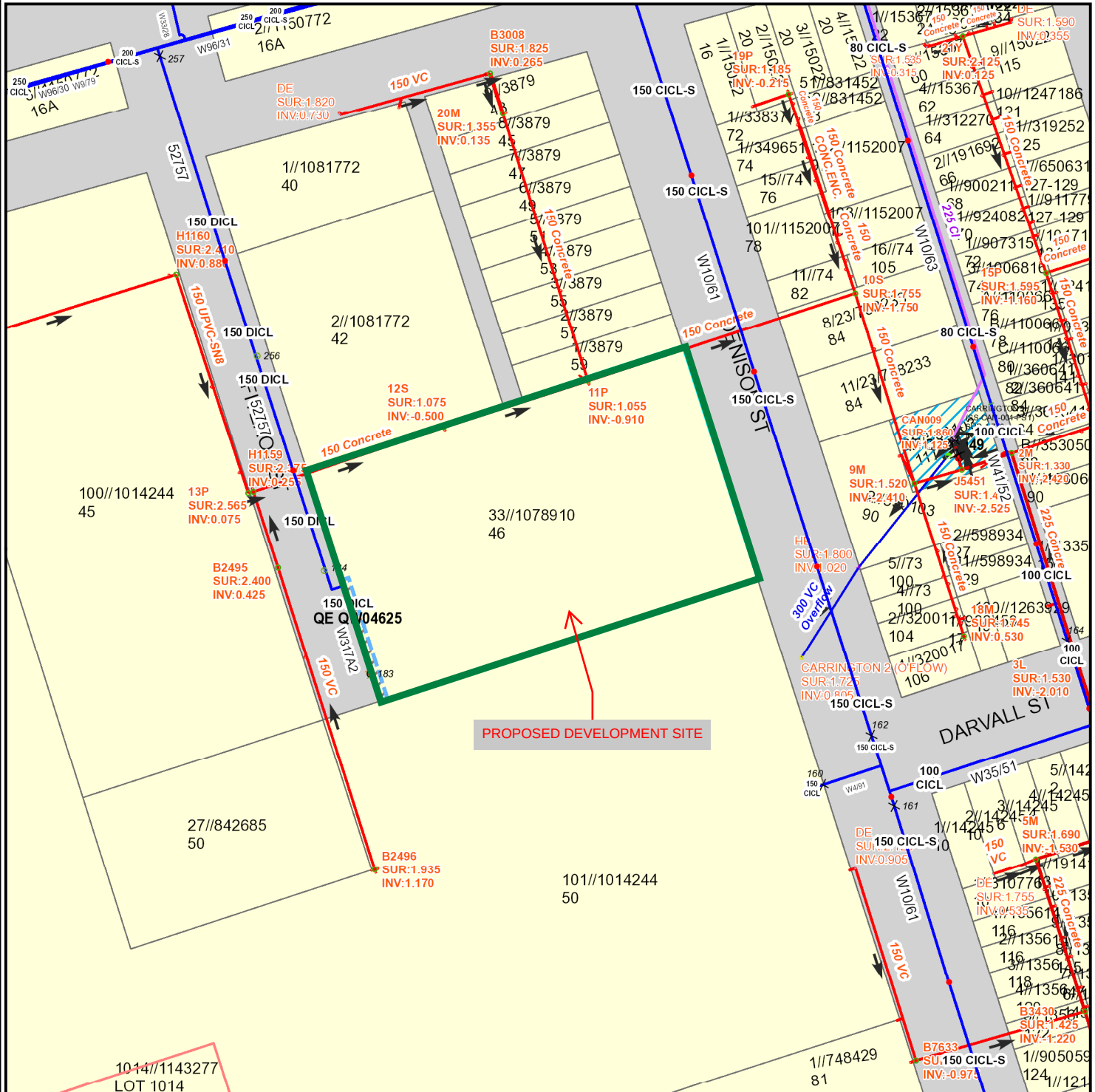
ArcGIS Web Map



RATEABLE_PREMISE_NO.: 6783510877

LOT/SECTION/DP: 33//1078910

PROPERTY ADDRESS: 46 FITZROY ST CARRINGTON, 2294



HUNTER WATER ASSETS POSITION ARE APPROXIMATE ONLY.
SUBJECT PROPERTY BOLDED.
ALL MEASUREMENTS ARE METRIC.

Date: 25/02/2021

Scale: at A4 1:2,000

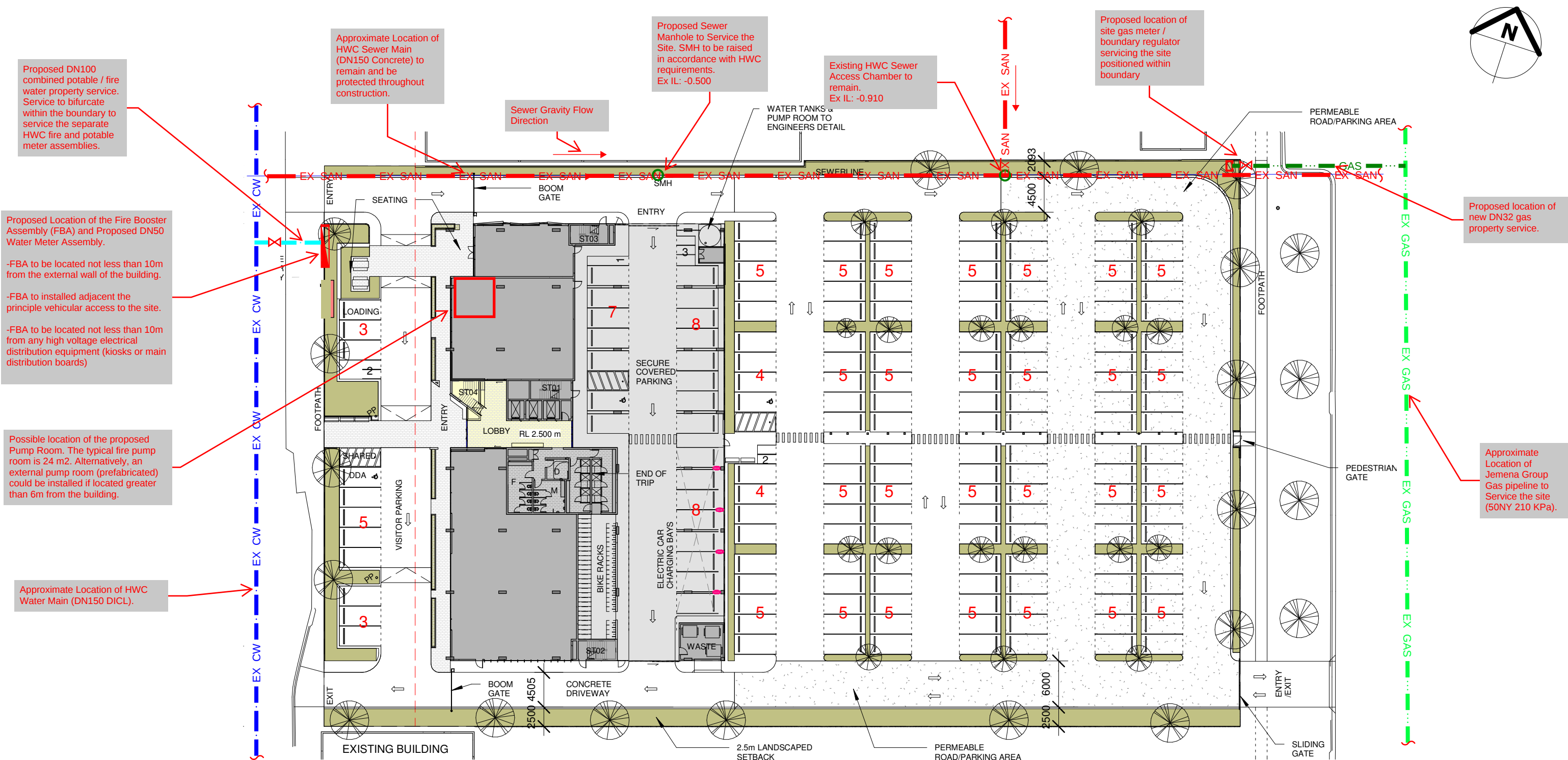
IMPORTANT:

ANY INFORMATION ON THIS PLAN MAY NOT BE UP TO DATE
AND THE CORPORATION ACCEPTS NO RESPONSIBILITY FOR ITS
ACCURACY.

CADASTRAL DATA © Department Finance,
Services & Innovation [Nov 2017].
Modified [25/02/2021]
CONTOUR DATA © AAMHatch
© Department of Planning

SEWER/WATER/RECYCLED WATER/
ELECTRICAL UTILITY DATA
© HUNTER WATER CORPORATION

Appendix B – Sewer and Water Supply/Connections Concept Design



GHD Tower, Level 3
24 Honeysuckle Drive, Newcastle NSW 2300 Australia
PO Box 5403 Hunter Rgn Mail Cent. NSW 2310
T 61 2 4979 9999 F 61 2 4979 9988
E ntmail@ghd.com W www.ghd.com

Conditions of Use: This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose.

scale | NTS for A1 job no. | 12547196
date | 24/03/2021 rev no. | 01

approved | GW | SK 001

Appendix C – Hunter Water Corporation Statement of Available Pressure



Hunter Water Corporation
ABN 46 228 513 446

PO Box 5171
HRMC NSW 2310
36 Honeysuckle Drive
NEWCASTLE NSW 2300
1300 657 657 (T)
hunterwater.com.au

GHD
L 2 24 Honeysuckle Drive
Newcastle NSW 2300

8/03/2021

Dear Sovisal,

Statement of Available Pressure and Flow

Thank you for your application for a Statement of Available Pressure and Flow. We have assessed the pressure expected to be available at the nearest hydrant under the demand conditions identified in the table below.

The pressure and flow information provide in the table is to be read in conjunction with notes on the following page.

Your REF: 2018-1258
Property Address: Lot 33 DP 1078910, 46 Fitzroy Street Carrington NSW 2294
Approximate Ground Level: 2.22 m AHD
Water Main Size and Location: DN150 mm DICL located in Fitzroy Street Carrington NSW 2294
Hydrant No. 1508525

Expected Pressure at Hydrant	Additional Fire Flow (L/s)	Pressure (kPa)
Maximum pressure (Average Day Demand)	0	600
Minimum pressure (Peak Day Demand)	0	485
Pressure expected under peak day demand conditions		
Fire hose reel (x2)	0.66	485
Pressure expected under 95%ile peak day demand conditions		
Fire hydrant /sprinkler installations	0.0 L/s	510
Fire hydrant /sprinkler installations	5.0 L/s	505
Fire hydrant /sprinkler installations	10.0 L/s	500
Fire hydrant /sprinkler installations	20.0 L/s	480
Fire hydrant /sprinkler installations	30.0 L/s	450

For further information, please direct enquiries to development.planning@hunterwater.com.au





Hunter Water Corporation
ABN 46 228 513 446

PO Box 5171
HRMC NSW 2310
36 Honeysuckle Drive
NEWCASTLE NSW 2300
1300 657 657 (T)
hunterwater.com.au

Notes

This Pressure and Flow Statement is valid for **12 months**.

The provision of additional flow for firefighting is not a requirement under Hunter Water Act or our Operating licence.

We use an InfoWorks hydraulic model for determining flow and pressure in our networks. Pressure and flow in the models are determined using theoretical system demands based on customer connections and peaking factors to adjust peak demand conditions.

While these models are intermittently calibrated using field testing, the accuracy of the results cannot be guaranteed due to ongoing modifications to our networks and increasing demands resulting from growth.

While we endeavour to maintain minimum firefighting pressure above 15m, this cannot be guaranteed into the future and adequate allowance should be made to any firefighting assessment.

The flow and pressure generated by the Info Works model is calculated at the centre of the pipe. Pressure losses due to flow through the hydrant or additional appurtenances, such as standpipes, are not included in the above results and must be factored into any fire flow assessment for the site.

It is the **applicant's responsibility** to ensure that minimum firefighting requirements for the subject site are satisfied.

The use of, and access to, stop valves and hydrants is restricted to Hunter Water employees only. It is an **offence** under Section 25 of the Hunter Water Act to interfere with our assets without prior consent.

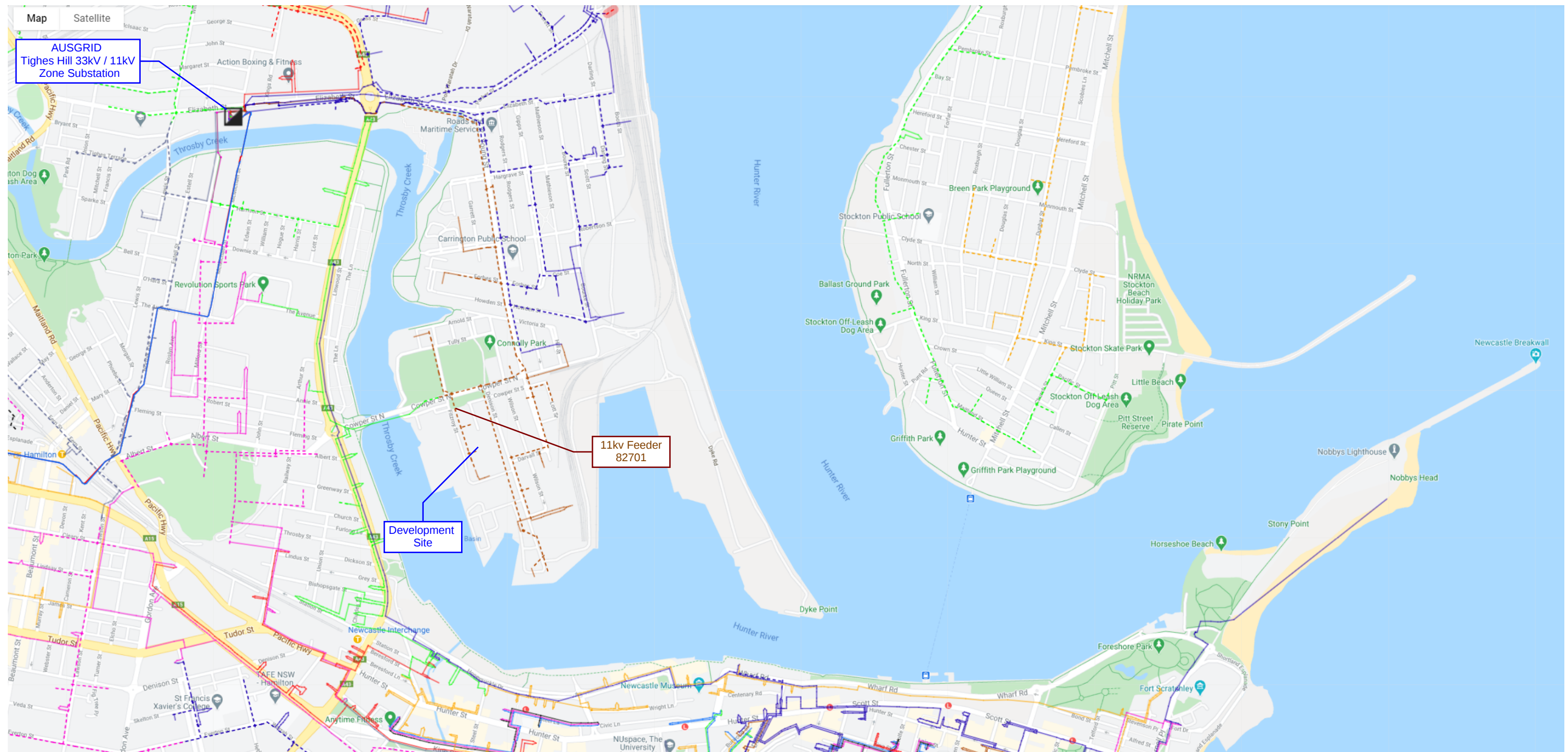
Persons accessing our assets without our prior consent may be issued with a **penalty** notice and will be held liable for all costs to repair, rectify and remediate the water supply system impacted by the unauthorised access.

If you require access to our network to perform a flow test please email development.planning@hunterwater.com.au for requirements.

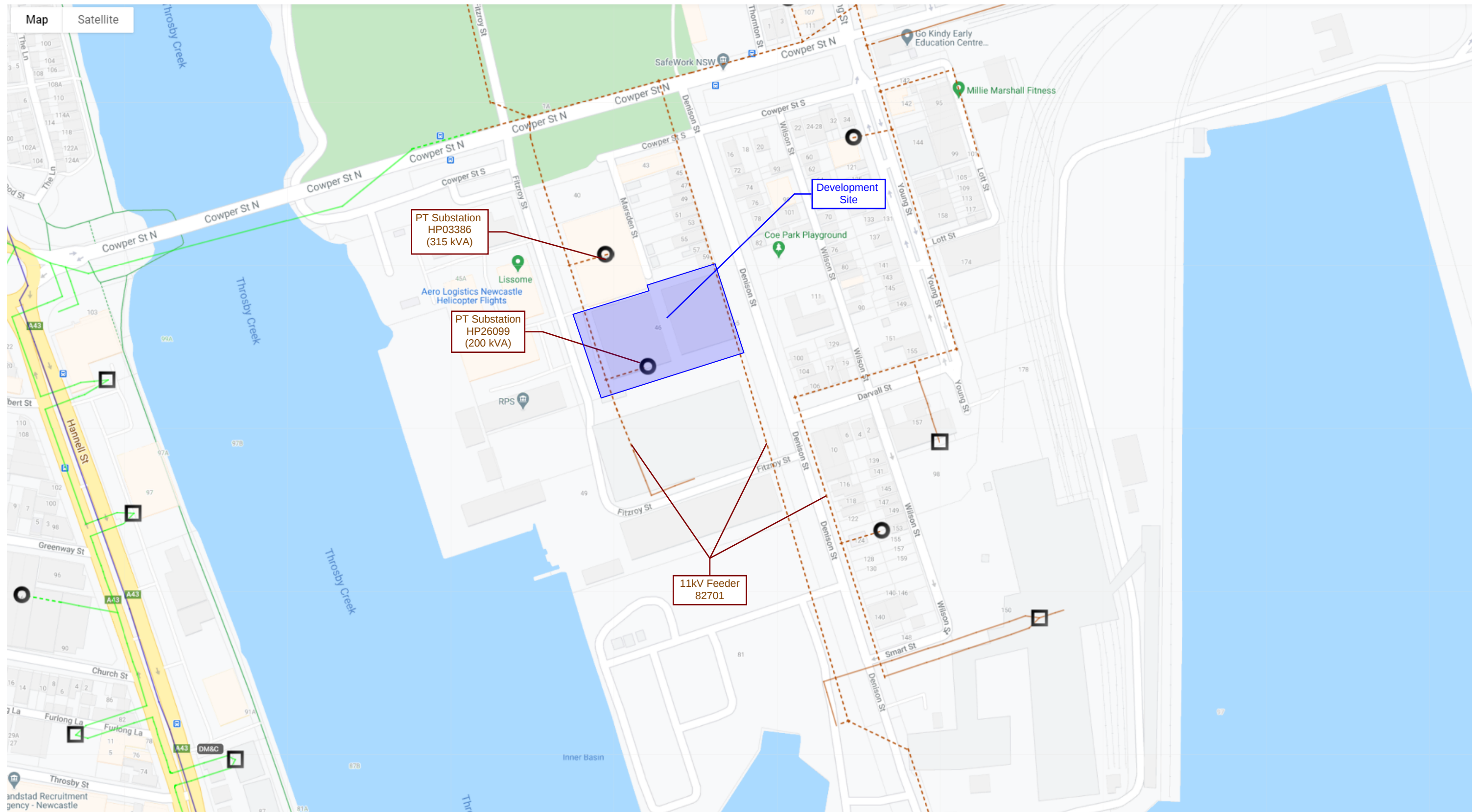


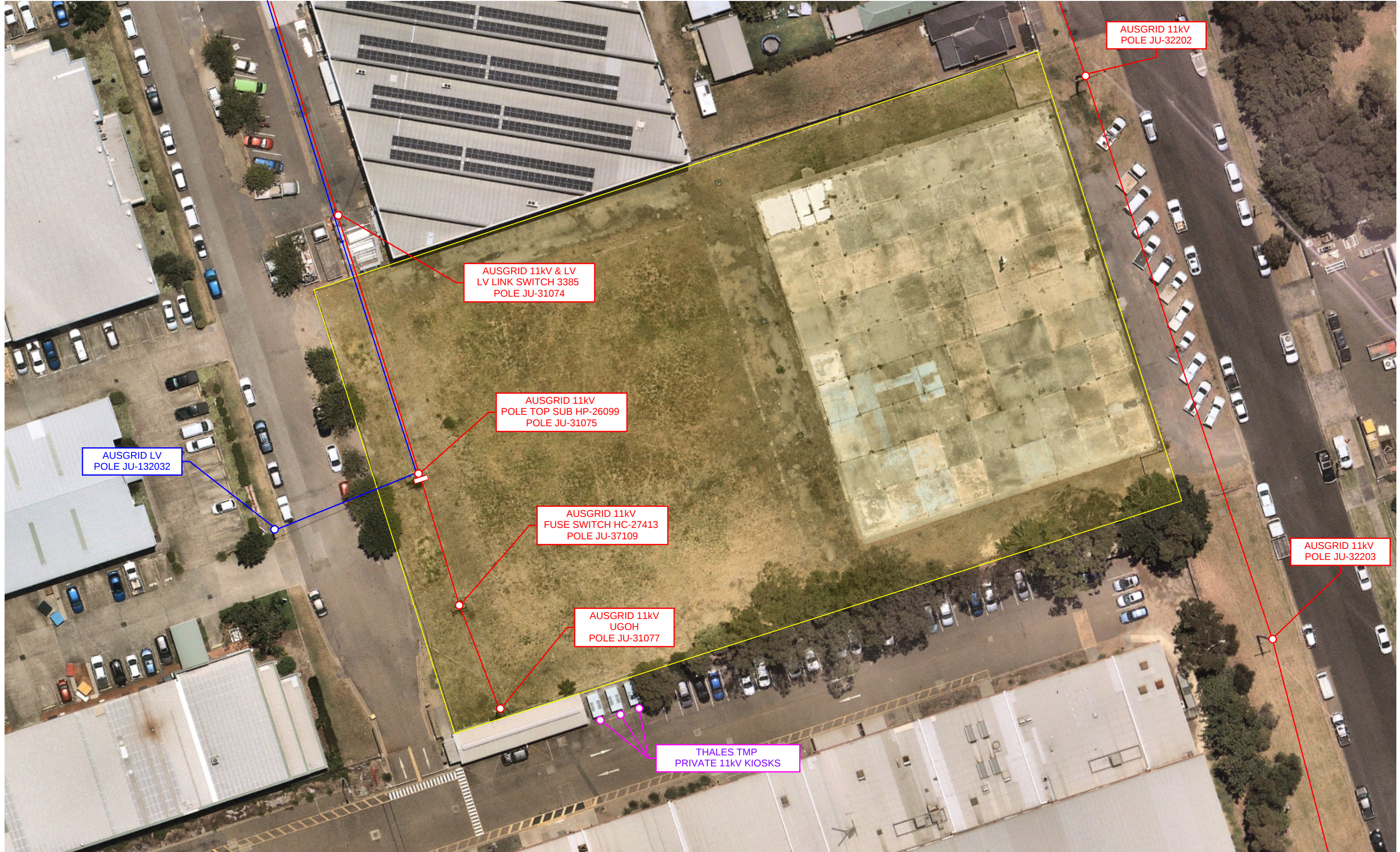
Appendix D – Ausgrid WebGIS and nearmaps historical aerial data

AUSGRID HV Network - Carrington



AUSGRID HV Network - Carrington





AUSGRID 11kV
POLE JU-32202

AUSGRID 11kV & LV
LV LINK SWITCH 3385
POLE JU-31074

AUSGRID 11kV
POLE TOP SUB HP-26099
POLE JU-31075

AUSGRID 11kV
FUSE SWITCH HC-27413
POLE JU-37109

AUSGRID 11kV
UGOH
POLE JU-31077

THALES TMP
PRIVATE 11kV KIOSKS

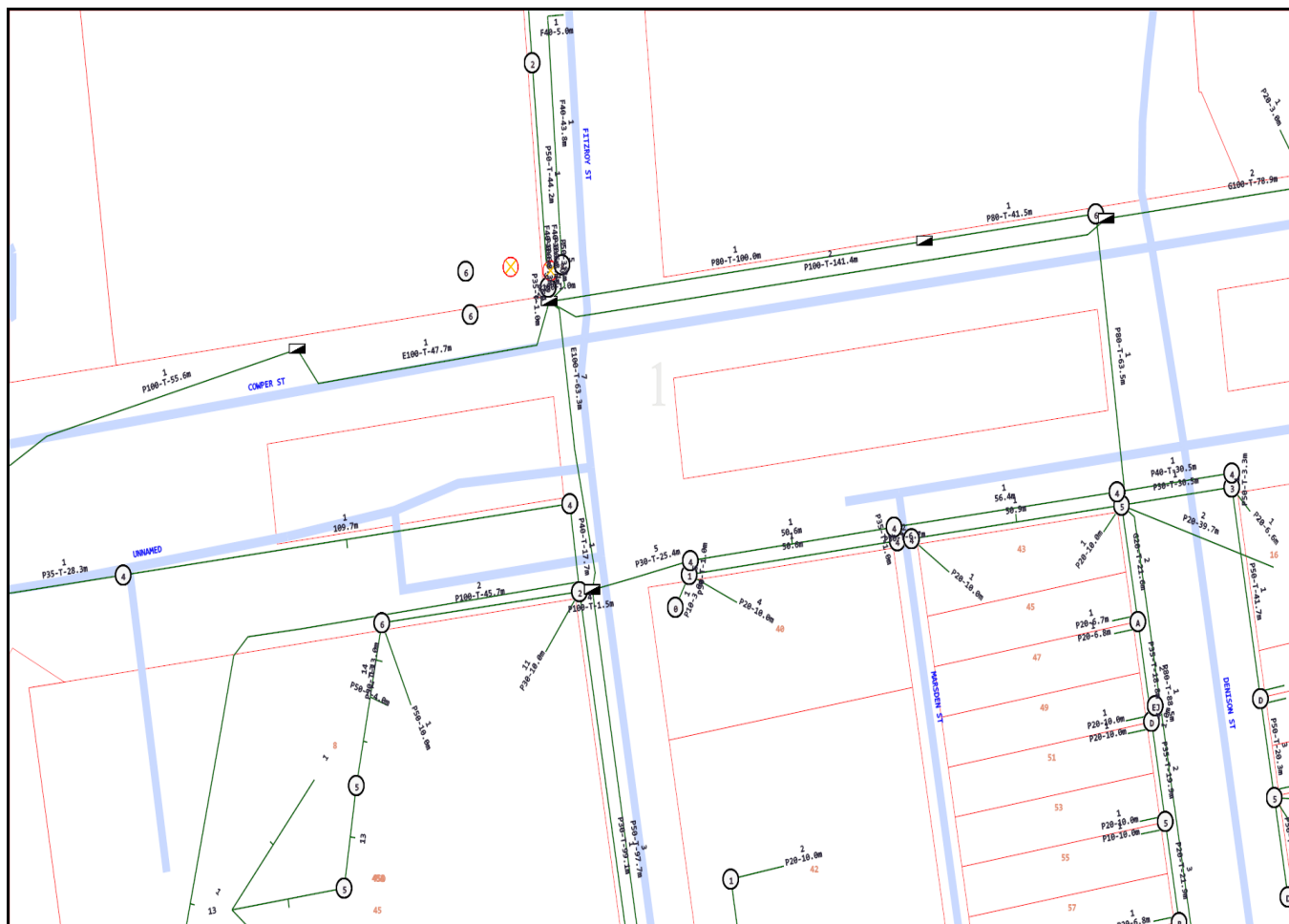
AUSGRID LV
POLE JU-132032

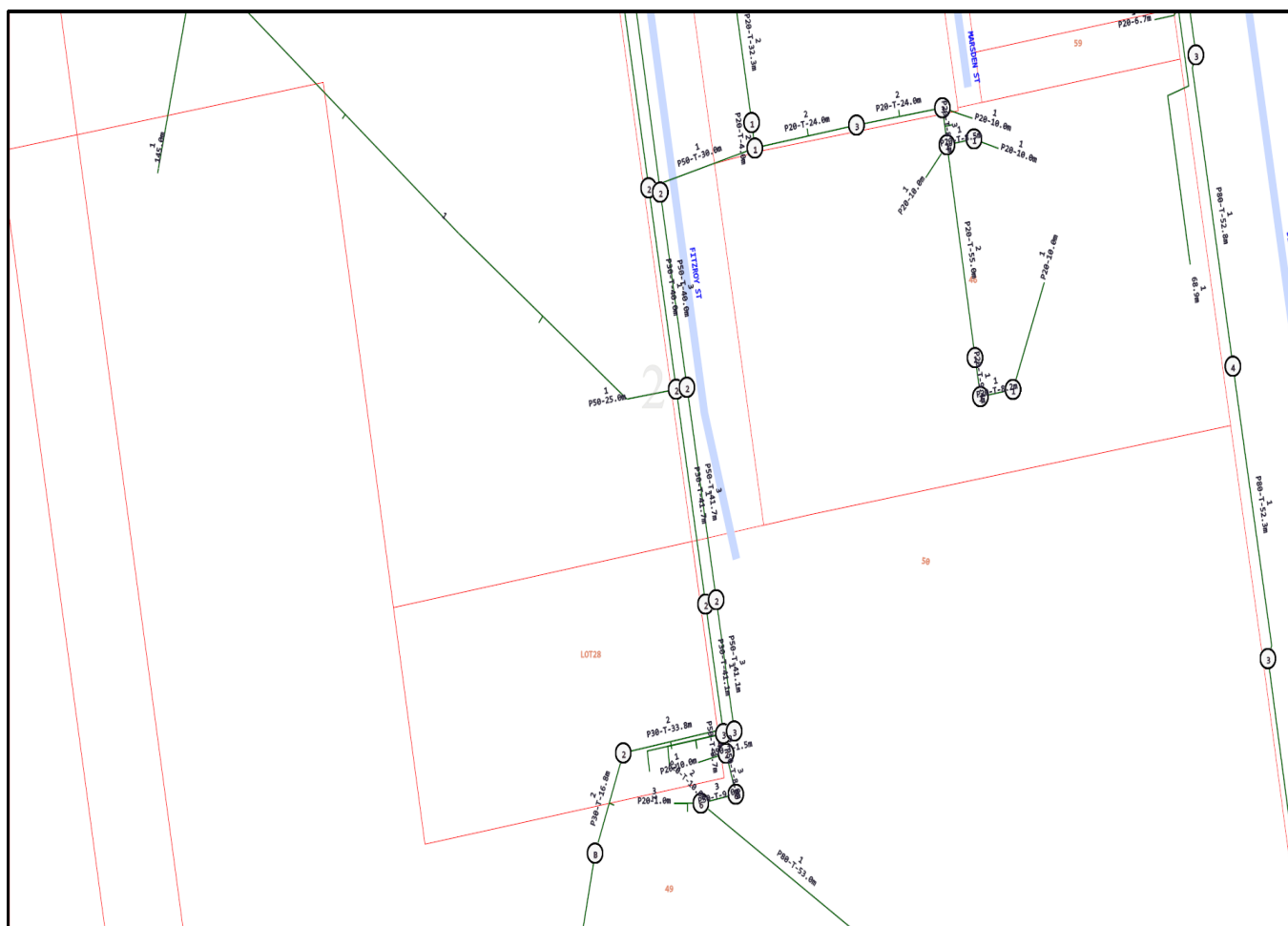
AUSGRID 11kV
POLE JU-32203

Appendix E – Dial Before You Dig communications services



Dial before you dig Job #:	21131964	 DIAL BEFORE YOU DIG www.1100.com.au
Sequence #	106882147	
Issue Date:	23/02/2021	
Location:	Fitzroy Street , Carrington , NSW , 2294	





Emergency Contacts

You must immediately report any damage to the **nbn™** network that you are/become aware of. Notification may be by telephone - 1800 626 329.

Appendix F – Hunter Water Corporation Notice of Formal requirements for Proposed Development



Hunter Water Corporation
ABN 46 228 513 446

PO Box 5171
HRMC NSW 2310
36 Honeysuckle Drive
NEWCASTLE NSW 2300
1300 657 657 (T)
(02) 4979 9625 (F)
hunterwater.com.au

04 March 2021

Ref:2021-258

Port of Newcastle Lessor Pty Ltd
C/- GHD Pty Ltd
P O Box 5403
HRMC NSW 2310

Dear Sir/Madam

RE NOTICE OF FORMAL REQUIREMENTS FOR PROPOSED DEVELOPMENT

Hunter Water's requirements for the provision of water and sewerage facilities to the development of a Commercial Office Building (8776m²) at Lot 33 DP 1078910, 46 Fitzroy Street, Carrington are as follows:

You Are Required To:

- 1 Submit the Development Consent Conditions determined by Council or the Complying Development Certificate for this specific development. Hunter Water will confirm that the final development description is consistent with the details supplied by you for this application. If there are any subsequent amendments to this development consent, Hunter Water will require you to submit a revision application.
- 2 Comply with Hunter Water's Building Over Sewer Assets Policy. The above development will be located over/adjacent to a 150mm concrete sewermain & sewer maintenance holes 12S and 11P sewermain located within the lot. As such:
 - a All buildings, structures, landscaping and improvements to the land which are located over or adjacent to the sewermain must not impose any loading on the sewermain nor interfere with or obstruct the sewer in conveying flows.
 - b Compliance with Hunter Water's Act with respect to the design and construction of all building, structures, landscaping and improvements is required. (Refer to the Building Over Sewer Assets Policy attached to this Notice of Requirements).
 - c Hunter Water's minimum cover requirements are to be maintained.
 - d Should existing sewer maintenance hole (MH) 12S be located in the proposed driveway you will need to replace the lid with a heavy duty lid and surround capable of accepting vehicular loadings. The MH's (12S and 11P) should be raised or lowered to the finished surface level as required. A minimum clearance of 1.5m from the centre of the MH's to any permanent structure must be maintained. No curb and gutter is to be constructed within 1.5m of the MH.

If any adjustments are require to either of the MH's contact should be made with Hunter Water and the works carried out under a Deed arrangement at the owner's cost.

- 3 Ensure that all due care is taken by all contractors in the course of construction activities including construction of the driveway and accessing the construction site as there is a watermain located in the footpath adjacent to the proposed development site.

The developer should confirm the depth of the watermain by site survey prior to construction to ensure Hunter Water's minimum cover requirements will be complied with in relation to the driveway. If this minimum cover requirement cannot be met, please contact Hunter Water to discuss options for protection of the watermain. An option may be lowering the watermain under a Major Works contract with Hunter Water.

Please note that it is Hunter Water's practice to seek the full costs of repairs should any damage occur to Hunter Water assets.

- 4 Your proposed development has been identified as having the potential to discharge trade waste into Hunter Water's sewerage system. You are required to contact Hunter Water's Technical Services Team on (02) 4979 9712 or via email plumbing@hunterwater.com.au in order to confirm if an application for a Trade Wastewater Agreement is required or if an existing agreement will need to be amended. The discharge of trade waste to the sewer will not be permitted without a valid agreement authorising that discharge. (Refer to the Trade Wastewater [factsheet](#) on Hunter Water's website for more information).
- 5 You will be required to submit an application for a hydraulic design assessment of internal water and sewerage services for this development, including rainwater tanks and any alternative water supply systems. Everything you need know when submitting an application for hydraulic assessment can be found on our [website](#). Please follow the 4 easy steps listed in our Hydraulic design assessment process. Alternately, if you need to confirm specific requirements for your development, you can contact our Technical Services Team via email plumbing@hunterwater.com.au.

Please note, the information shown on the plan provided with this letter may not be up to date and Hunter Water accepts no responsibility for its accuracy. Any contractor(s) or consultant(s) engaged by the developer should confirm all levels by field survey.

These requirements are valid for 12 months from the date of this letter and are specific to this development. All fees and charges are subject to adjustment using the Consumer Price Index (CPI) adjustment on 1 July each year.

Please refer to the attached Supplementary Information and Guidance which details the conditions under which water and sewer facilities are available to new customers. Hunter Water reserves its right to amend the requirements set out above prior to issuing a Section 50 Compliance Certificate.

Yours faithfully

For 
KYM LORENZ
Development Services

Unless specified in the above requirements, please direct all correspondence regarding this application to:

Enquiries: Kym Lorenz
Tel: 02 4979 9725
Email: kym.lorenz@hunterwater.com.au



Hunter Water Corporation
ABN 46 228 513 446

PO Box 5171
HRMC NSW 2310
36 Honeysuckle Drive
NEWCASTLE NSW 2300
1300 657 657 (T)
(02) 4979 9625 (F)
hunterwater.com.au

BUILDING OVER SEWER ASSETS

PURPOSE

Hunter Water maintains a network of sewer mains within its area of operation. Under its Operating Licence Hunter Water is required to meet specified levels of performance with respect to the operation of this sewerage system. The sewerage network requires regular maintenance to ensure its continued operation. Access to underground pipelines is a key factor in providing prompt and cost effective maintenance. The presence of a building or structure over a sewer main restricts or may preclude Hunter Water from accessing the asset for repairs.

SCOPE

This policy applies to all developments proposing to build over or adjacent to Hunter Water's sewer network assets.

POLICY STATEMENT

The policy of Hunter Water is to ensure compliance with the legislation (Hunter Water Act, 1991, as amended) and requires all sewer network assets to be diverted clear of proposed buildings, structures, landscaping and improvements so as to ensure ongoing access to operate and maintain the asset.

Where Hunter Water agrees that there may be a suitably low residual risk, Hunter Water may require that the asset be replaced in-situ with flexible and more durable plastic pipe prior to building works commencing. This work is at the landowner's expense and can usually be carried out by an accredited contractor. Where existing sewer mains are located on the development lot, the landowner is required to undertake work so that the sewer mains comply with the latest Hunter Water Edition, WSAA Design Manual guidelines.

APPLICATION OF POLICY

This policy applies to any development, subdivision, building (residential, commercial or industrial), or any structure proposed to be placed over or adjacent to a sewer asset of Hunter Water.

Where subdivision is proposed and the future building alignments are not known, Hunter Water requires the existing sewer mains to be relocated adjacent to boundaries in accordance with the latest Hunter Water Edition WSAA Design Manual

All footings crossing or adjacent to a sewer main should be strengthened or underpinned to prevent loading upon the sewer and to protect the stability of the structure in the event of subsidence of the sewer trench, collapse of the sewer, or excavation by Hunter Water to repair or maintain the sewer. In this regard, it may be necessary to consult a competent designer or structural engineer.

Special consideration to footing design should extend to land within the Zone of Influence. This is a nominal strip of land (usually about twice as wide as the sewer is deep) within which the sewer main is centrally located. Ground conditions are an important consideration in determining the likely zone of influence and it may be necessary for you to engage a qualified Geotechnical Engineer to determine the appropriate design parameters influencing the structural performance of proposed foundations, footings or piers. Hunter Water requires a minimum working clearance of 1.5 metres from the centre of any access chamber to a building wall.

The location of the sewer main can be determined from the plan attached to the Section 50 Notice of Requirements. A surveyor or building contractor engaged by the developer will confirm this location. Hunter Water Corporation will not accept responsibility for future maintenance on the shaft and/or branch contained in or under the structure. Conversion of the structure to a habitable area, with or without plumbing fixtures, is not compliant with Plumbing Code of Australia and Australian/New Zealand Standard 3500 (AS/NZS 3500:1).

Enquiries on Hunter Water Corporation's Building Over Sewer Assets Policy should be directed to Hunter Water's 1300 657 657 number.

POLICY ADMINISTRATION

Effective from	29 August 2014
Approved by	Chief Customer Service Officer
Policy Owner	Manager Development Services
Policy Administrator	Manager Development Services
Application	All Policies and Schedules of Hunter Water Corporation
Last review date	29 August 2014
Next review date	29 August 2017
Version	2.0
File reference	HW2007-2963/1.003

Published externally	Yes
Approval Signature	Managing Director / Company Secretary

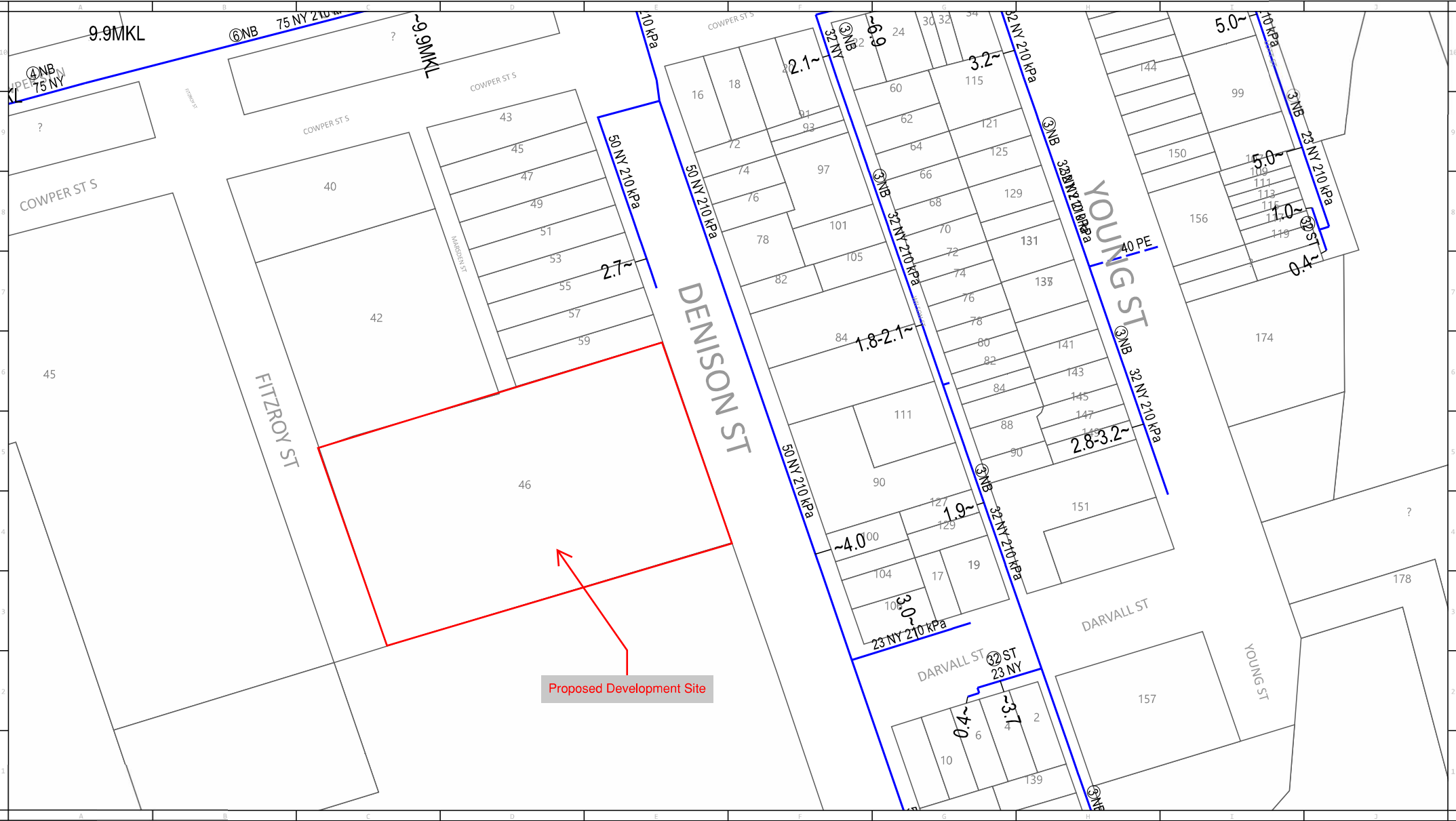
RELATED DOCUMENTS

[Building Over Easement or Property](#)

ASSOCIATED REGULATIONS AND STANDARDS

The Hunter Water Corporation Act (1991) requires that no building or structure is to impose any loading on a sewer nor interfere with or obstruct the sewer in conveying flows. Hunter Water's powers allow it to take legal action where there is a breach or threatened breach of the requirements and to recover associated costs from the landowner. Hunter Water may in any case where there is a threatened breach of these conditions; obtain an injunction to prevent any damage to, or interference with, its sewerage system or other works.

Appendix G – Jemena Group Gas Services Diagram



Proposed Development Site



For legend details, please refer to the Coversheet attachment provided as part of this DBYD response.



Scale: 1:2000

Issue Date: 23/02/2021

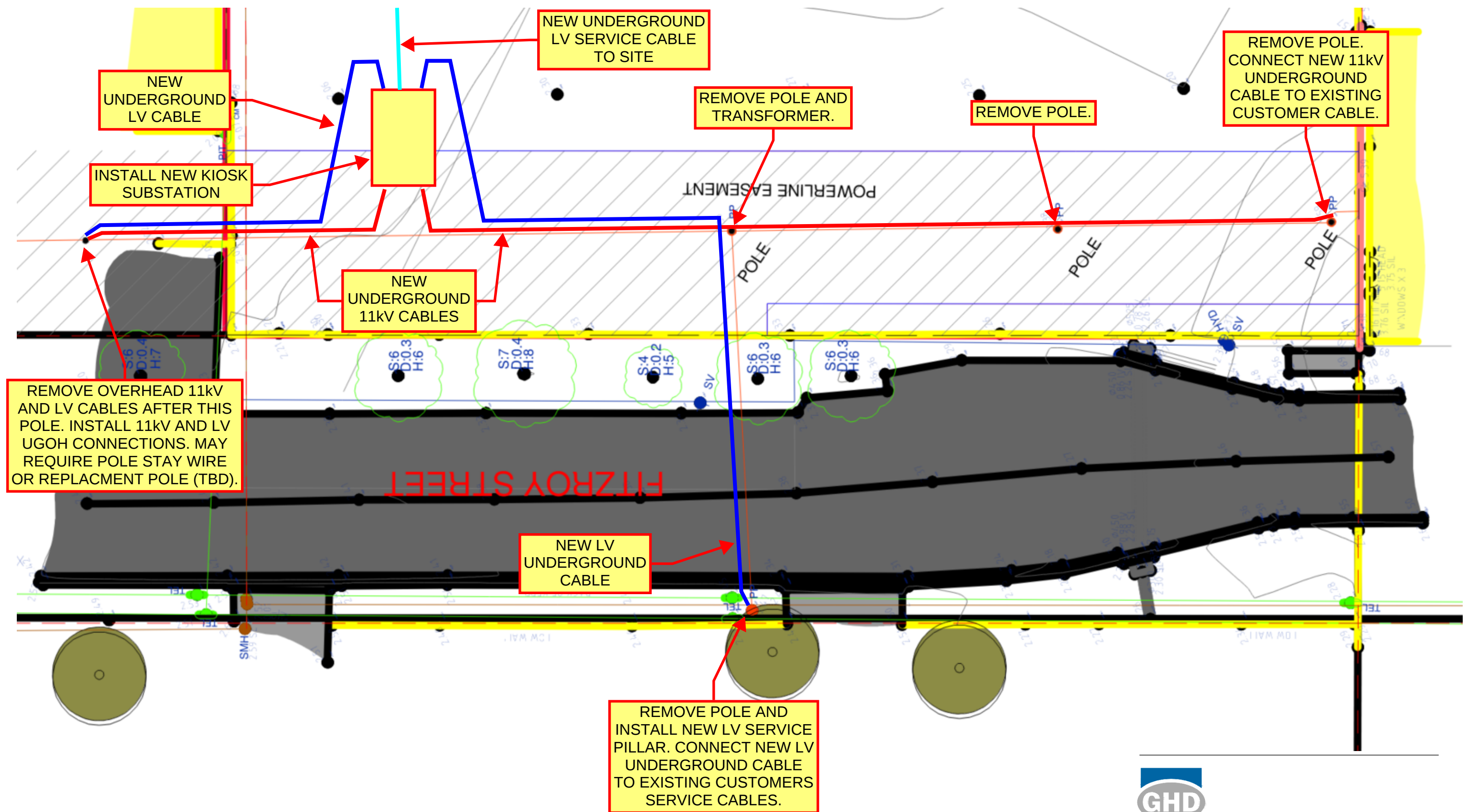
DBYD Seq No: 106875967

DBYD Job No: 21130902

0m 10m 20m 30m 40m 50m 60m 70m 80m

WARNING: This is a representation of Jemena Gas Networks underground assets only and may not indicate all assets in the area. It must not be used for the purpose of exact asset location in order to undertake any type of excavation. This plan is diagrammatic only, and distances scaled from this plan may not be accurate. Please read all conditions and information on the attached information sheet. This extract is subject to those conditions. The information contained on this plan is only valid for 28 days from the date of issue.

Appendix H – Electrical Supply/Connections Concept Design



NOTES:

- ALL NEW AND EXISTING SERVICE LOCATIONS ARE INDICATIVE ONLY.
- NEW KIOSK SUBSTATION NOT SHOWN TO SCALE. LOCATION OF KIOSK SUBSTATION TO BE CHOSEN DURING ASP3 DESIGN.
- KIOSK SUBSTATION SIZING AND SWITCHGEAR CONFIGURATION TO BE DETERMINED DURING ASP3 DESIGN.



GHD Tower, Level 3
24 Honeysuckle Drive, Newcastle NSW 2300 Australia
PO Box 5403 Hunter Rgn Mail Cent. NSW 2310
T 61 2 4979 9999 F 61 2 4979 9988
E ntlmail@ghd.com W www.ghd.com

Conditions of Use: This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose.

scale | NTS for A1 job no. | 12547196
date | 24/03/2021 rev no. | 01

approved | EMP..... SKE001

GHD

Level 3, GHD Tower
24 Honeysuckle Drive
NEWCASTLE NSW 2300
T: 61 2 4979 9999 F: 61 2 9475 0725 E: ntlmail@ghd.com

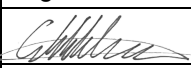
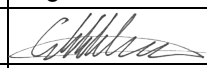
© GHD 2021

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

12547196-16611-

11/[https://projectsportal.ghd.com/sites/pp01_04/65denisonstdevelopme/ProjectDocs/12547196-REP_65 Denison St - Services Assessment.docx](https://projectsportal.ghd.com/sites/pp01_04/65denisonstdevelopme/ProjectDocs/12547196-REP_65%20Denison%20St%20-%20Services%20Assessment.docx)

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	S. Sun E. Penn	G. Wilton		G. Wilton		25/03/2021

www.ghd.com

