

INFRASTRUCTURE MANAGEMENT PLAN for

Newcastle Grammar School
Park Campus Stage 1
127 Union Street Cooks Hill NSW 2300

Project No:
MN11507

Client:
APP Corporation Pty Ltd

Architect:
SHAC

Prepared By:
Marline Pty Ltd

Report Details

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EXECUTIVE SUMMARY

This Infrastructure Management Plan (IMP) for Hydraulic, Electrical and Mechanical services has been prepared by Marline Building Services Engineers on behalf of SHAC for the Newcastle Grammar School Park Campus Stage 1 redevelopment project.

This IMP outlines the existing infrastructure, detailing information on the existing capacity and any augmentation to the services required for the proposed development. The report also details records of consultation with relevant agencies. The details within this report are preliminary and based on currently available information and correspondence undertaken at the time of writing.

This report is provided in response to the Secretary's Environmental Assessment Requirements (SEARs) issued for the project and has been prepared for lodgement to the State Significant Development (SSD) application for NGS Park Campus Stage 1 Redevelopment. This IMP addresses the Infrastructure Management Plan requirements held within SEARs.

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1. INTRODUCTION

1.1. GENERAL

Marline Pty Ltd Consulting Engineers have been engaged as the electrical, mechanical and hydraulic consultants to provide professional advice on the proposed Stage 1 works associated with the Newcastle Grammar School Park Campus.

The intent of this report is to detail the investigations and findings associated with the existing building services (mechanical, electrical, and hydraulic) currently servicing the site, and advise what upgrade works are required (if any) for these services for future works planned.

- The investigations for this Infrastructure Management Plan primarily focuses on the following objectives:
- Identify potential opportunities and site constraints,
- Identify the location, size and capacity of all existing services within the vicinity of the proposed site,
- Identify utility confirmation for the subject site and,
- Identify options to service the site to support the proposed development.

It is important to note that the development will be subject to several regulatory authority approvals including but not limited to; Hunter Water Corporation, Newcastle City Council, Fire & Rescue NSW, electricity supply authority and NBN, that are likely to specify specific requirements for the development impacting on the spatial requirements nominated by Marline.

1.2. SITE LOCATION

The subject site is located at 127 Union Street Cooks Hill.

Existing Site Aerial View

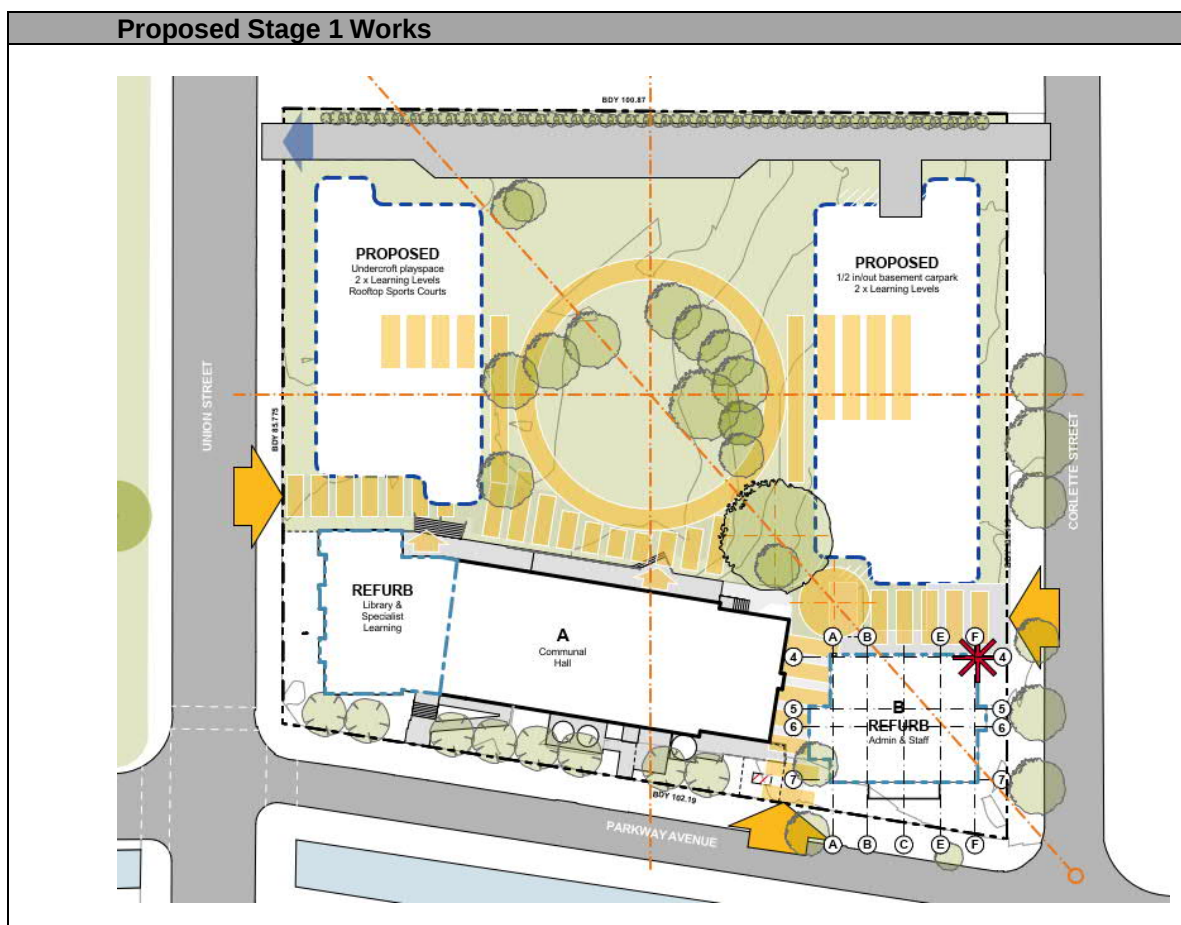


1.3. PROPOSED DEVELOPMENT

Newcastle Grammar School (NGS) has chosen to pursue a State Significant Development (SSD) for a stage masterplan of the Park Campus. Stage 1 of the redevelopment of NGS Park Campus involves:

- Demolition of Blocks F, C & D
- Stormwater upgrades across the school site
- Refurbishment of Block B to accommodate a new central Administration and the repositioning of other school functions impacted by stage 1 works (e.g. teaching spaces)
- Construction of a new 3-storey building which will feature:
 - o Ground floor open air space acting as a COLA and extension of adjacent active play area
 - o Levels 1 and 2 to house 16 learning spaces
 - o Roof top terrace/outdoor play area
 - o Lift access
 - o Associated landscaping, services, and school amenity.

The proposed Stage 1 works:



2. AUTHORITIES

2.1. GENERAL

The Hydraulic, Mechanical and Electrical Services installations covered by this IMP shall comply with the regulations and by-laws of all Federal, State, and Local Authorities holding jurisdiction over the works:

- The National Construction Code
- Standards Australia
- Newcastle City Council
- FRNSW
- NSW Department of Fair Trading
- Hunter Water Corporation
- NBN
- Electricity supply authority

3. HYDRAULIC AND FIRE SERVICES

3.1. GENERAL

Marline has performed non-invasive investigations with respect to the existing site services and additional loading from the proposed building into the existing utility infrastructure available for connection to the site.

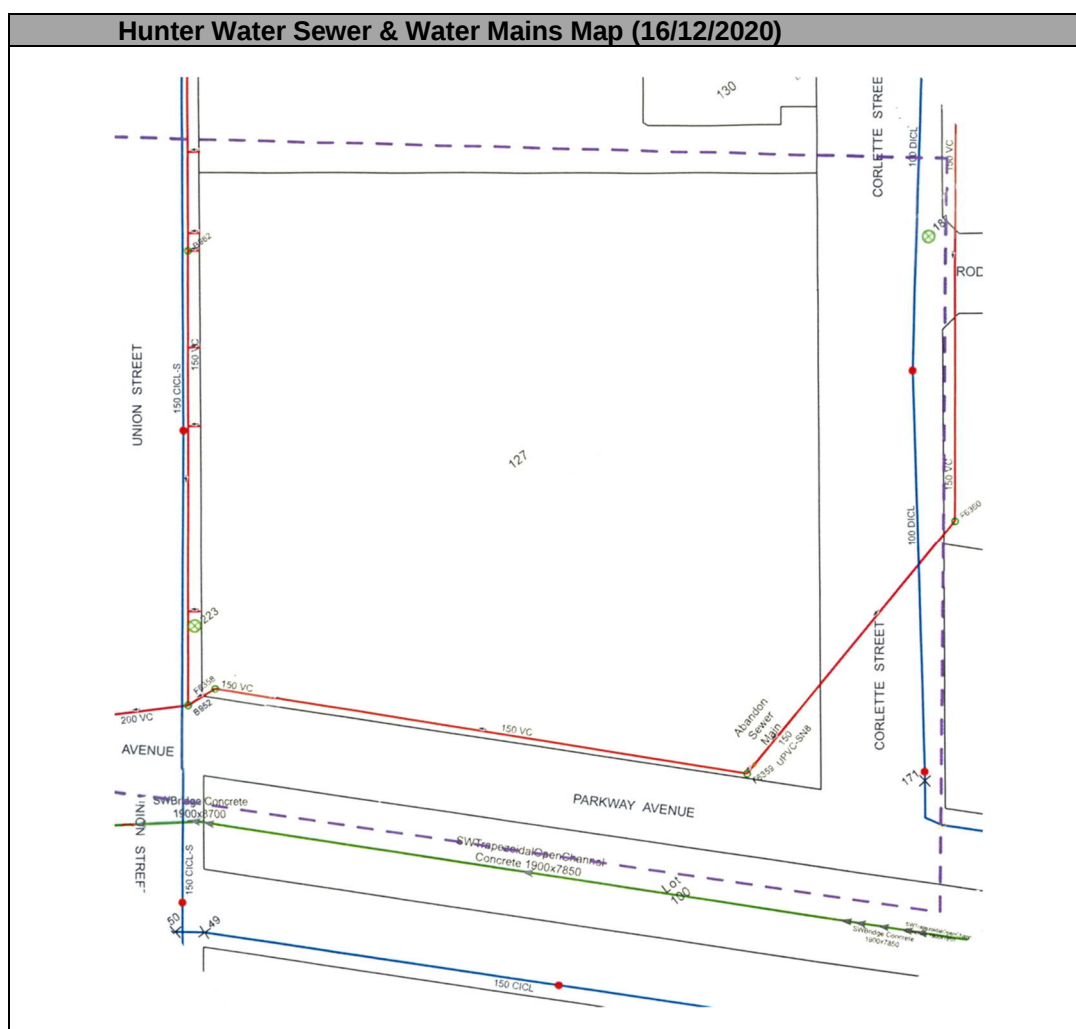
Our assessment has been based on site observations and discussions with, and information provided by, the relevant utility authorities.

3.2. EXISTING AUTHORITY INFRASTRUCTURE

All works will be subject to the appropriate documentation and requirements of council. Based on our recent assessment of authoritative documentation we anticipate that the following requirements will be applicable:

3.2.1. SEWER

There are several Hunter Water Corporation sewers available for the proposed site.



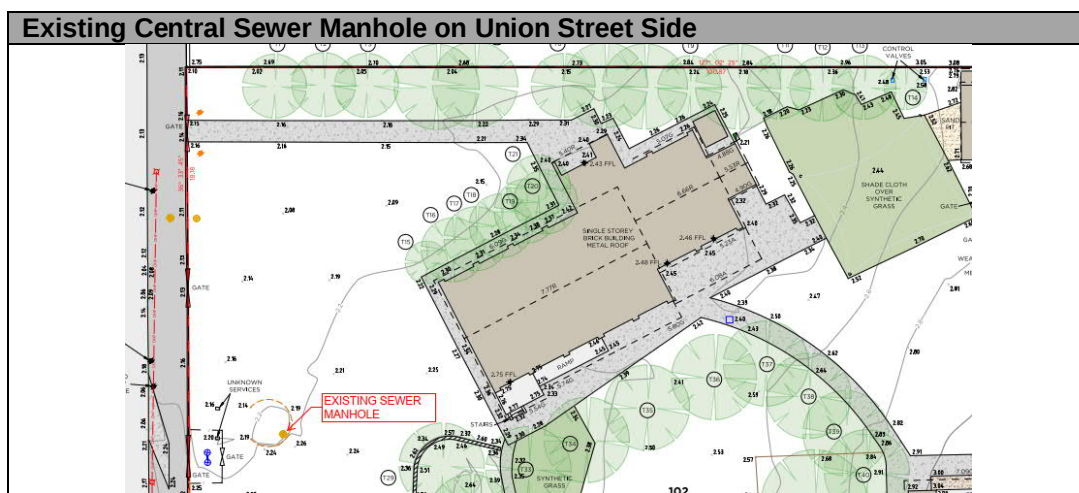
Three 150mm VC Hunter Water sewers are available; in Union Street (east side), Parkway Avenue (within the site) and partially within Corlette Street (southern side).

An internal sewer drainage plan was not found during investigations; however, it is thought, based on site observations, that at least two sewer connections are utilized on the Union Street sewer.



A sewer manhole currently exists in the area where the new Union Street building is to be constructed.

This manhole is presumed to drain to the northern Union Street sewer connection; however, this assumption will need to be confirmed by further invasive surveys.



Marline recommends that this existing central sewer manhole will need to be re-located to permit the construction of the new proposed building. It is recommended that a further invasive study is carried out to confirm the internal sewage layout of the lot.

3.2.2. WATER

The site has access to the following water mains:

- 150mm CICL water main on the eastern side of Union Street
- 100 DICL water main on the eastern side of Corlette Street

The existing buildings are currently connected via a single 50mm connection to the union Street water main towards the southern side of Building A.

Existing Water Meter and Backflow Prevention



Union Street Water Services Connections



Existing 50mm Water Meter Assembly and Backflow Valve

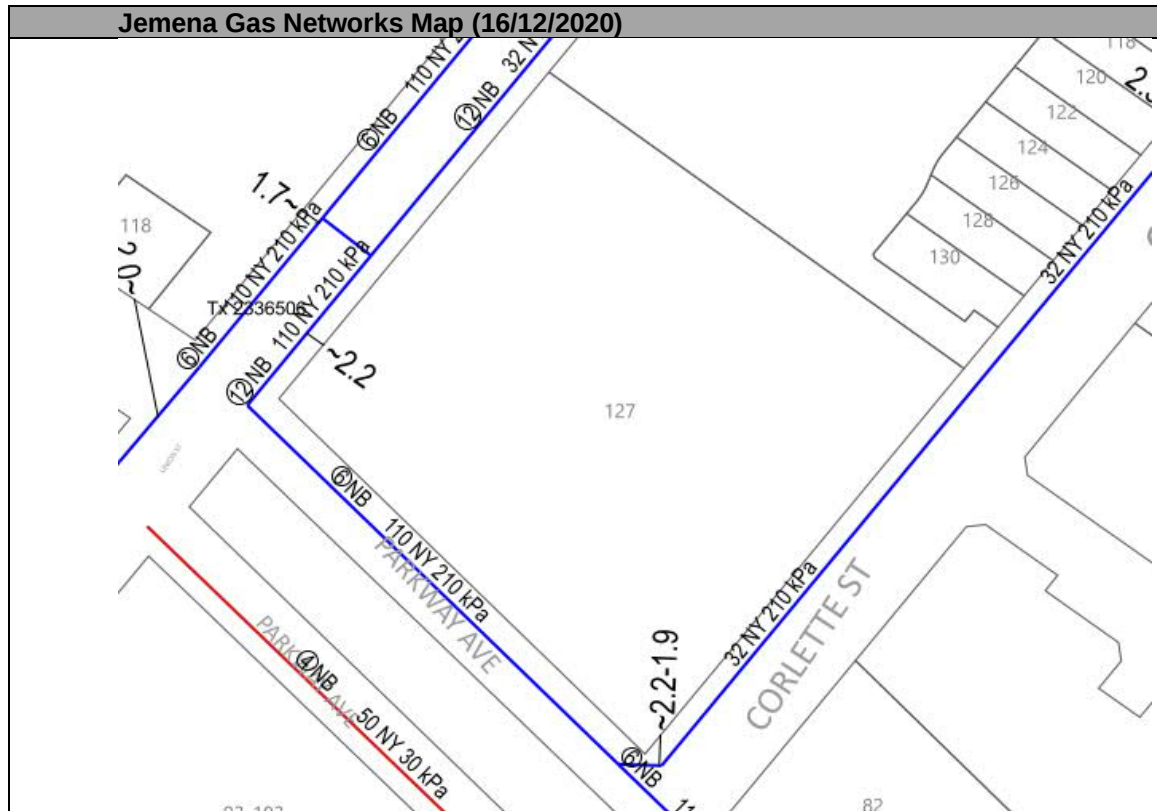


Existing 32mm Backflow Valve Presumed for Irrigation

3.2.3. GAS

The site has access to the following gas mains:

- 110mm gas main on the western side of Union Street
- 32mm natural gas main on the eastern side of Union Street
- 110mm natural gas main on the northern side of Parkway Avenue
- 32mm natural gas main on the western side of Corlette Street



It is not known at this stage, whether natural gas has been provided to the subject site.

3.2.4. FIRE HYDRANT SYSTEM

An existing fire hydrant system serves the site.

The existing system comprises a 100mm connection to the Union Street water main, 100mm double detector check valve backflow prevention, 100mm booster valve and suction points and a single external attack hydrant.

Existing Water Meter and Backflow Prevention



Fire Hydrant Backflow Prevention



Fire Hydrant Booster Valve and Suction Points



Solitary Double Hydrant Standpipe in Main Courtyard

The existing fire hydrant supply to the single attack hydrant standpipe is in a position which will conflict with the position of the proposed Union Street building. This system will be relocated / diverted and extended to new external and internal hydrants positioned to cover the proposed building and existing buildings.

Marline have assessed the Statement of Available Pressure and Flow provided by Hunter Water and preliminary findings indicate that the existing water mains performance is insufficient to provide for the subject building with the required fire hydrant performance required under AS2419-2005. Subsequently, modifications to the existing system configuration, including the introduction of a single diesel booster pump will be required.

The proposed Stage 1 building's position will result in the existing fire hydrant booster valve being within the 10-metre radiant protection zone required by the booster.

This will require the relocation of the booster valve to a position that provides radiant protection. This may be subject to any fire engineered solutions that may be adopted regarding the final booster valve location.

3.3. SPATIALS AND REQUIREMENTS

Note: Spatial planning for the project will be provided as separate documents.

4. MECHANICAL SERVICES

4.1. AIR-CONDITIONING

4.1.1. GENERAL

Marline have reviewed the mechanical systems throughout the existing site. The existing air-conditioning installed in the areas proposed to be refurbished have significant rusting are nearing the end of their reliable life. Marline recommend that all new and refurbished areas are provided with new air-conditioning systems selected to handle the high salt environment of the school.

The proposed new buildings will consist of new teaching spaces in either the Corlette or Union St Building and underground carpark and a refurbishment to Block B to create Offices and staff Areas. All spaces are proposed to be provided with air-conditioning systems to maintain an acceptable indoor air temperature.

The air-conditioning systems proposed are to be a combination of single split air cooled reverse cycle heat pump systems and Variable Refrigerant Flow (VRF) multi-split systems to provide heating and cooling to each space to suit the load demand. Each area or room will be zoned to suit the exterior and internal load influences to ensure an even temperature can be maintained throughout the various areas.

4.1.2. INDOOR UNITS

The indoor systems shall consist of a mixture of ducted, wall mounted or cassette indoor units to best suit the application and the configuration of the layout.

Ducted indoor units would consist of the unit being installed concealed above ceiling level within the roof space, having ductwork supplying air to the rooms via ceiling grilles and registers. A ceiling access panel will be required for access into the roof space for servicing and replacing filters at the unit.

Wall mounted indoor units would consist of the indoor unit being hung and mounted on the wall at high level below the ceiling level. Consideration of the positioning of the unit would be required to provide an optimal airflow pattern within the space and to avoid drafts or the air movement from the unit being directed onto occupants.

Cassette indoor units would consist of the unit being fully recessed into the ceiling with only the face plate and grille being visible. Units would be centrally located within the room and be configured to blow in 4 directions. Units would be complete with vertical oscillating grilles to allow adjustment of the airflow pattern and provide an even air distribution.

4.1.3. OUTDOOR UNITS

Each outdoor condensing unit would be proposed to be located on the roof at the South end of the building to reduce acoustic issues with neighbours. Units will be provided with safe access to provide ease of access for servicing. Areas located adjacent the units fan discharge and intake points will be required to be clear and free obstructions and vegetation to ensure adequate ventilation is achieved to the unit. A ventilated plant enclosure around the units could be provided as an option to enable units to be screened and secured from non-authorized access.

4.1.4. SYSTEM CONTROL

All systems will be controlled by a Central Controller located in the administration office area. This will enable systems to be programmed not to operate out of hours and in school holidays.

Each indoor unit will be controlled by a local wall mounted LCD controller which will provide the user with the ability to turn the system on or off and be able to adjust the indoor temperature set points. The controllers will also contain but not be limited to the following functions:

- Adjustment of fan speeds,
- Operational mode adjustment to enable manual switching between, Auto, heating, cooling, fan, and dry modes,
- Provide pre-programmed operational timer functions via weekly scheduled timers,
- Auto shut off set points to enable the system to be automatically shut down after a set time period after being switched on.
- Airflow direction and swing pattern adjustments (wall mounted and cassette units only),
- Error reporting messaging.

4.2. VENTILATION

4.2.1. GENERAL

Each room or space will be provided with either natural ventilation in accordance with the BCA Clause F4.6 & AS1668.4 – 2012 or mechanical ventilation in accordance with AS1668.2 - 2012 where natural ventilation isn't achievable or is not suitable for the intended use of the space.

4.2.2. NATURAL VENTILATION

Natural ventilation will be proposed for rooms and areas where indoor temperature control is not critical for equipment or personnel. Areas such as stores, equipment and plant rooms, vehicle depots and workshops would be considered for natural ventilation purposes.

4.2.3. MECHANICAL VENTILATION – EXHAUST SYSTEMS

Exhaust systems would be proposed to service all wet areas and rooms where local pollutants are generated that will contaminate and lead to a poor indoor air quality.

The systems shall consist of exhaust fans, controls, ductwork, fittings and grilles to an extraction point in the façade or through the roof.

Where the meals/staff room area is to be provided with a range or cooktop a local rangehood would be provided to locally capture and remove cooking odours from the space.

Makeup air for exhaust systems would be proposed to be achieved from utilising door grilles, door undercuts or ceiling transfer grilles.

Ventilation fans would be controlled by a mixture of methods to best suit the intended use for the space and shall include one of the following:

- Control via motion sensor for variable demand control,
- Manual control via local on/off control switches,
- Control via an interlock to the room lighting,
- Pre-programmed times via time clock,
- Control by a room thermostat where temperature management is required.

4.2.4. MECHANICAL VENTILATION – SUPPLY AIR SYSTEMS

Mechanical supply air systems will be provided to all habitable spaces where natural ventilation is not achievable or to habitable spaces where air conditioning is provided and relying on opening windows and doors would not be suitable under the normal use of the space.

Mechanical ventilation for air-conditioned areas would be interlocked and incorporated into the air conditioning system where possible.

The following areas are proposed to be provided with mechanical fresh air systems:

- Offices,
- Meeting & interview rooms,
- Meals/staff rooms,
- Reception and Corridor areas.

5. ELECTRICAL SERVICES

5.1. GENERAL

Electrical and Communication design features are proposed throughout this report. In many cases client feedback is required to confirm project specific preferences.

Marline has performed non-invasive investigations with respect to the existing site services and additional loading from the proposed building(s).

5.2. ELECTRICAL SERVICES SUMMARY

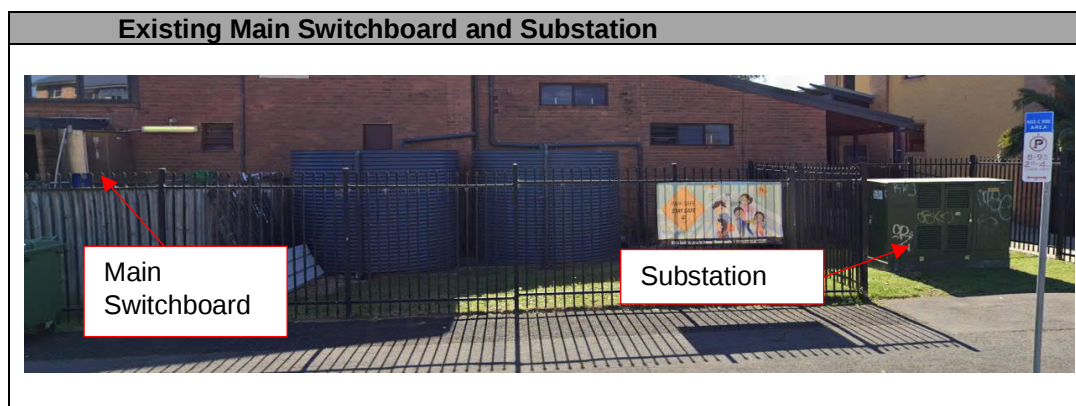
The electrical systems inspected included:

- Existing incoming power supply and maximum demand
- Main switchboard
- Distribution boards and cable reticulation
- Communication Systems
- Fire detection System
- Security System

5.3. EXISTING AUTHORITATIVE INFRASTRUCTURE

The electrical supply to the development falls within Ausgrid's distribution area. At present there is an onsite substation, tag no. 58292, located externally to the school on Parkway Avenue. This substation has a LV feeder to supply the main switchboard (MSB) that is located externally to Block A.

Based on the electricity monitored data received from Northmore Gordon the highest record usage was 91kVA on 26/11/2019 which equates to approximately 129A/ph.



5.4. EXISTING MAIN SWITCHBOARD

The existing MSB is located externally approximately 20m to the west of the substation and is rated for 800A. The main Service Protection Device (SPD) is 800Amps rated set at 600Amps 3 phase.

From the MSB is distributed throughout the school below ground in a series of underground pits and conduits to several sub distribution boards located throughout the facility. Based on the as-built documents within the MSB enclosure the MSB was installed in 2009 as part of upgrade works.

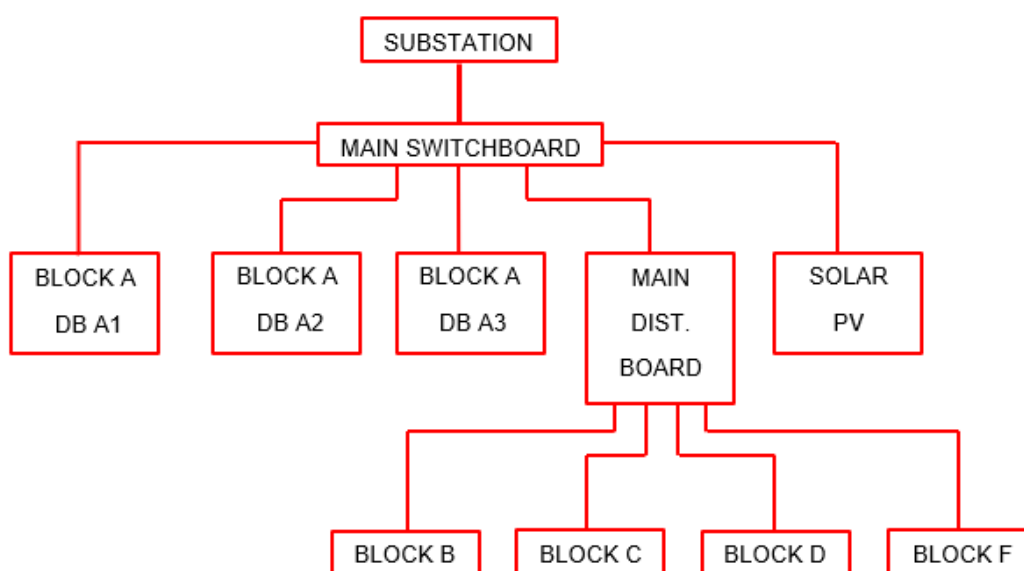
The MSB is in reasonable condition and at the time of the inspection had 5 no spare spaces for 3 phase circuit breakers.

The sub main section of the has 3 no. circuit breakers which supply Block A and 1 no. circuit breaker which supplies a main distribution board. The main distribution board was originally the main

switchboard for the school which was re-labelled and back fed from the new MSB as part of the upgrade works in the 2000s.

The main distribution board supplies distribution boards in all other buildings located throughout the facility including Block B, Block C, Block D and Block F.

There is also a further circuit breaker which supplies the solar PV system, which is located on the roof of Block A. The system is approximately 80kW made up from 227 panels.



Existing Electrical Services Block Diagram

Based on the concept plans received January 2021 the Union Street building has an approx. floor area of 2230m² with a covered outdoor play area and 2 floors of classrooms and facilities. The Corlette Street building has an approx. floor area of 3000m².

Using a standard VA/m² calculation the total additional load for the two proposed buildings would be in the region of 350A/ph. Based on the current power usage of the school and the additional load of the new buildings the existing substation, consumer mains and main switchboard will not require upgrading.

The main switch is currently set at 600A, the total estimated maximum demand of the existing and proposed buildings would be approx.450A/ph. With electrical load also removed with buildings being demolished this would provide additional capacity.

It would be intended to utilise the existing main switchboard to supply the proposed buildings and to re-supply Block B from the existing MSB which would allow for the removal of the main distribution board. There is also potential to install a reasonable size solar system on each roof of the proposed buildings to further reduce the electrical load. Subject to the final roof design a solar system of 20-30kW could be installed on each roof.

Note the above is for guidance and subject to the final proposed building design and services provided.

Existing Main Switchboard



5.5. DISTRIBUTION BOARDS AND SUB MAINS

Each Block throughout the facility has its own dedicated distribution board(s) with all local circuits terminated to supply general lighting, power and AC as required. The distribution boards condition varied in each block largely due to the different stages in which they have been constructed.

As part of the upgrade and refurbishment distribution boards in blocks C, D and F would all be disconnected and removed. It would also be recommended to replace the distribution boards in block B as the existing DBs have very little spare capacity and would be approx. 20 years old.

Existing Block B Distribution Board



It should also be noted that there were several circuits that were not RCD protected as per the current wiring rules AS/NZS 3000.

Dedicated electrical distribution boards supplied from new sub-mains will be distributed throughout the new buildings. Spacing of the distribution boards will be such that sub circuits will generally not

exceed 40m. All distribution boards will be fitted with Residual Current Device (RCD) protection to all general power and lighting sub-circuits as per AS/NZS 3000.

5.6. COMMUNICATIONS SYSTEMS

The main communications and server room is located on the upper floor of Block A, at the time of the inspection access was not available. From the main comms room fibre and copper tie cabling is reticulated underground to a dedicated comms rack in each building.

As part of the proposed works all redundant sub comms racks and cabling would be disconnected and removed.

As part of the proposed works cabling / reticulation architecture (internal and external) shall adopt a “star” approach. It is proposed that all horizontal / facility cabling shall be Cat 6a UTP and that all backbone cabling shall be Mutli mode optical fibre, subject to client requirements.

Equipment rooms, cable access ways from the equipment room to communication outlets via communication cable containment provisions, such as cable trays and/or conduits will be provided for the development. The client head-end equipment will be located in the Main Communication Room and serve the proposed new buildings.

All ICT works shall be in strict compliance with the client ICT Services Network Infrastructure specification / design guidelines (to be provided).

Existing Block B Comms Rack

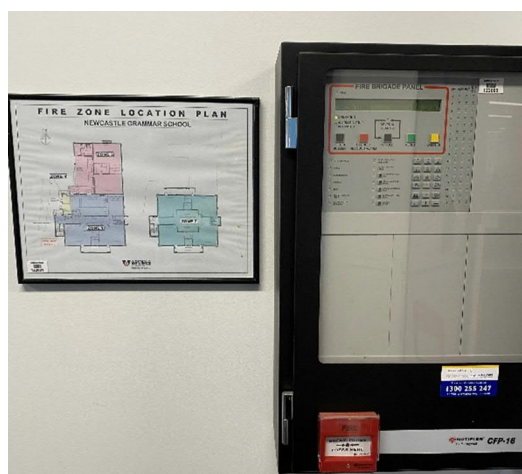


5.7. FIRE DETECTION SYSTEM

Fire detection systems are provided in Block's A and B with each building having its own dedicated panel. Block B has a conventional system which based on the block plan serves only that building with coverage provided with smoke/heat detectors located throughout the facility.

Block A has a fire detection and Emergency Warning and Intercom System (EWIS) which based on the block plan serves only that building with coverage provided with smoke/heat detectors located throughout the facility. The EWIS enables a dedicated evacuation/fire officer to provide further instruction in an evacuation scenario. This panel appeared relatively new and would have been installed as part of the upgrade works.

Existing Block B FIP



Existing Block A FIP



As part of the future works it would be proposed to retain both Block A and Block B FIPs. As the proposed buildings may be considered 3 storeys, an automatic smoke detection system will be required in accordance with BCA 2019 Clause E2.2a and AS1670.

The requirement for a fire detection system will also be determined by the type of air-conditioning system. A fire detection system for the automatic shutdown of air-handling systems for class 9B buildings will be required where ducted AC is proposed.

5.8. SECURITY SYSTEMS

Each building had a security expander panel supplied from the main security panel with motion sensor PIRs located throughout the facility with keypads to arm/disarm the system when departing and arriving. There are also various keypads located at each entry gate of the facility and card readers with swipe access on various doors.

It should be noted that the system was a Concept Inner Range which is now obsolete. Some parts are still available although consideration should be given to upgrading the entire system as part of the upgrade works.

It would be proposed to install a new security system in both new buildings with sufficient spare capacity to integrate future upgraded systems if required. The security system will be nominated to ensure card reader access is available at nominated doors of the new buildings – final requirements to be agreed with the school. CCTV cameras are to be installed to cover the main entry doors of the new buildings.

Existing Block B Security Expander Panel



APPENDIX A – DBYD HUNTER WATER



Dial Before You Dig (DBYD) Location Information

Hunter Water Corporation
36 Honeysuckle Drive
NEWCASTLE NSW 2300

To:
Marline - Mr Nazly Shammass
56 Clyde Street
Hamilton North NSW 2292

Enquiry Details	
Utility ID	80220
Job Number	20798863
Sequence Number	104973464
Enquiry Date	16/12/2020 15:59
Response	AFFECTED
Address	127 Union Street Cooks Hill
Location in Road	CarriageWay, Footpath, Nature Strip
Activity	Planning & Design

Enquirer Details			
Customer ID	1962974		
Contact	Mr Nazly Shammass		
Company	Marline		
Email	nshammass@marline.com.au		
Phone	02 4925 9314	Mobile	Not Supplied

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Enquirer Responsibilities

HWC's provision, and your access to and use, of the data, maps and other information contained in HWC's response to your Dial Before You Dig (DBYD) enquiry (Information) are subject to the following terms and conditions and any additional disclaimers contained in HWC's response.

1. Nature of HWC's assets

You acknowledge and accept that:

- (a) water in HWC mains is under pressure and may cause injury or damage if a main is damaged;
- (b) HWC sewer mains can be under pressure and may cause injury or damage if a main is damaged;
- (c) HWC recycled water mains can be under pressure and may cause injury or damage if a main is damaged;
- (d) HWC services are laid at varying depths;
- (e) the Information does not include data related to property services;
- (f) HWC will seek recovery of repair costs if an HWC asset is damaged; and
- (g) all electrical services are to be considered live.

Accordingly, all persons must exercise extreme care and only use hand excavation until the exact location of all assets within a work area is established.

2. Your use of Information

You acknowledge and accept that:

- (a) neither HWC nor DBYD make any representation or give any guarantee, warranty or undertaking (express or implied) as to the currency, accuracy, completeness, effectiveness or reliability of the Information;
- (b) all Information is:
 - i. generated by an automated system based on the information you submit to the DBYD website and it is your responsibility to ensure that the dig site is properly defined in your enquiry;
 - ii. approximate, intended to be of general application and may not be suitable for your specific requirements;
 - iii. unsuitable for scaling purposes; and
 - iv. based on information available to HWC and may not show all existing structures. For example, the location of Private Sewer/Water Mains is the initial indicative location supplied to HWC. This may not be the current location of such mains and not all private mains have been supplied to HWC;
- (c) you must not solely rely on the Information when undertaking underground works;
- (d) all Information is provided for the sole purpose of assisting you to locate HWC assets before excavation (Permitted Purpose) and you must not copy, translate, modify, distribute or make derivative works of the Information except as directly required to achieve the Permitted Purpose;
- (e) all Information must be used and kept together;
- (f) your access to and use of the Information does not grant you any ownership of or intellectually property rights in the Information;
- (g) in identifying in the Information the presence or potential presence of hazardous or potentially hazardous materials in HWC assets, HWC is not representing or warranting that other HWC assets not identified in the Information as containing or potentially containing hazardous materials do not also contain such materials; and
- (h) in excavating and conducting underground works, you must do so having regard to the fact that asbestos cement pipelines may form part of HWC's water and sewer reticulation systems.

3. Your other obligations

You are responsible for, amongst other things:

- (a) exposing underground structures, including HWC assets, by pot-holing using hand-held tools or vacuum techniques to determine the precise location and extent of structures before any mechanical means of excavation are used;
- (b) protecting underground structures, including HWC assets, from damage and interference;
- (c) maintaining acceptable clearances between HWC assets and structures belonging to others;
- (d) ensuring that backfilling in the vicinity of HWC assets complies with HWC's requirements (as set out on HWC's website or otherwise communicated to you by HWC);
- (e) notifying HWC immediately of any damage caused or threat of damage to any HWC asset; and
- (f) ensuring that plans are approved by HWC (usually by stamping) prior to landscaping or building over or in the vicinity of any HWC asset.

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Enquirer Responsibilities Continued

4. Disclaimer

While HWC takes reasonable care in providing details of its underground assets, due to changes in road and footway alignments and levels, the age and incompleteness of some records and the general nature of the Information, it is not possible to conclusively specify the location of all HWC underground assets, including pipes that contain or may contain hazardous materials.

ALL INFORMATION IS PROVIDED AS GENERAL GUIDANCE ONLY AND SHOULD NOT BE USED OR RELIED UPON IN SUBSTITUTION FOR SPECIALISED PROFESSIONAL INDEPENDENT ADVICE. YOU ACKNOWLEDGE AND AGREE THAT YOUR USE OF THE INFORMATION IS AT YOUR OWN RISK.

If you have any questions or concerns about the appropriateness, reliability or application of any Information you must seek advice from a relevantly qualified professional. Further, dealing with hazardous materials is potentially dangerous, and you must always seek advice where the Information provides that HWC's assets contain or may contain hazardous materials.

HWC makes no representation and gives no warranty or undertaking (express or implied) as to the currency, accuracy, completeness, effectiveness or reliability of the Information or that the Information can be used for any purpose in substitution for specialised, professional and independent advice.

5. Limitation of liability

To the fullest extent permitted by law:

- (a) all conditions and guarantees concerning the Information (whether as to quality, outcome, fitness, care, skill or otherwise) expressed or implied by statute, common law, equity, trade, custom, usage or otherwise are expressly excluded and to the extent such conditions and guarantees cannot be excluded, HWC's liability is limited to either of the following (as nominated by HWC):
 - i. HWC supplying the Information to you again; or
 - ii. HWC paying you the cost of having the Information supplied to you again.
- (b) HWC is not responsible for and you release HWC from any actions, liabilities, losses, damages, costs, claims, expenses, injuries or other claims whatsoever (including loss of revenue, use, production, goodwill, profit, business, contract, anticipated savings, financing costs, increased operating costs or other purely financial, economic, special or indirect loss or damage) arising out of:
 - i. your access to or use of the Information;
 - ii. any delay in HWC providing you with Information;
 - iii. your reliance on the Information or its inability to meet your needs;
 - iv. your failure to correctly or accurately:
 - (1) submit relevant or valid data to DBYD; or
 - (2) use or interpret Information provided to you by HWC; or
 - v. any failure, interruption or corruption of any Information;
- (c) you must indemnify HWC and its employees, agents and officers from and against all actions, liabilities, losses, damages, costs, claims, expenses, injuries and other claims arising out of or in connection with HWC providing you with incorrect or incomplete Information; and you assume all risk associated with your use of DBYD and HWC's websites and you release DBYD and HWC from and against all actions, liabilities, losses, damages, costs, claims, expenses, injuries or other claims which may arise in respect of such usage.

www.hunterwater.com.au

1300 657 000

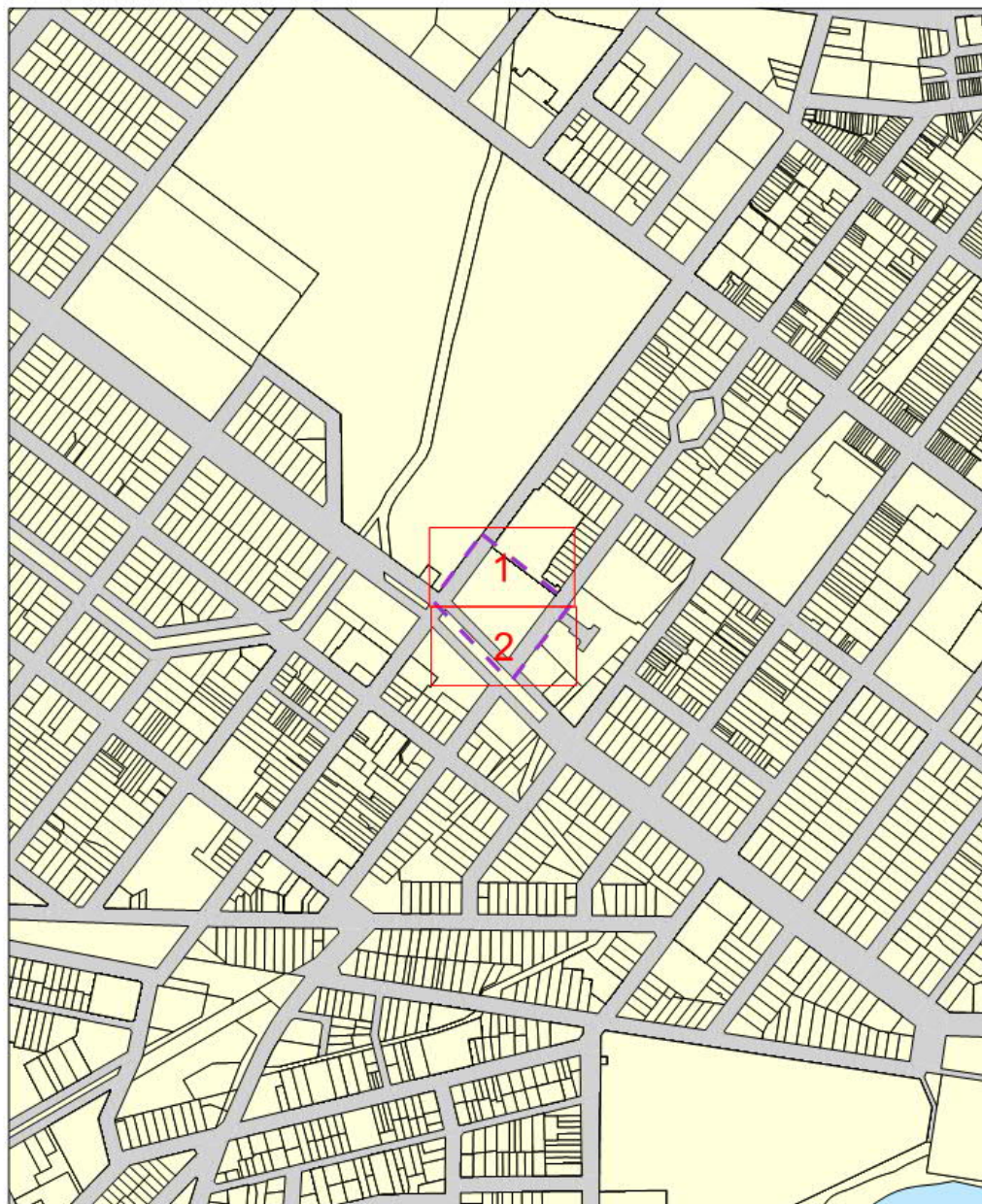
Powered by





Overview Map

Sequence No: 104973464
127 Union Street Cooks Hill



LEGEND:

- 1 Detail Map
- DBYD Work Area

Powered by

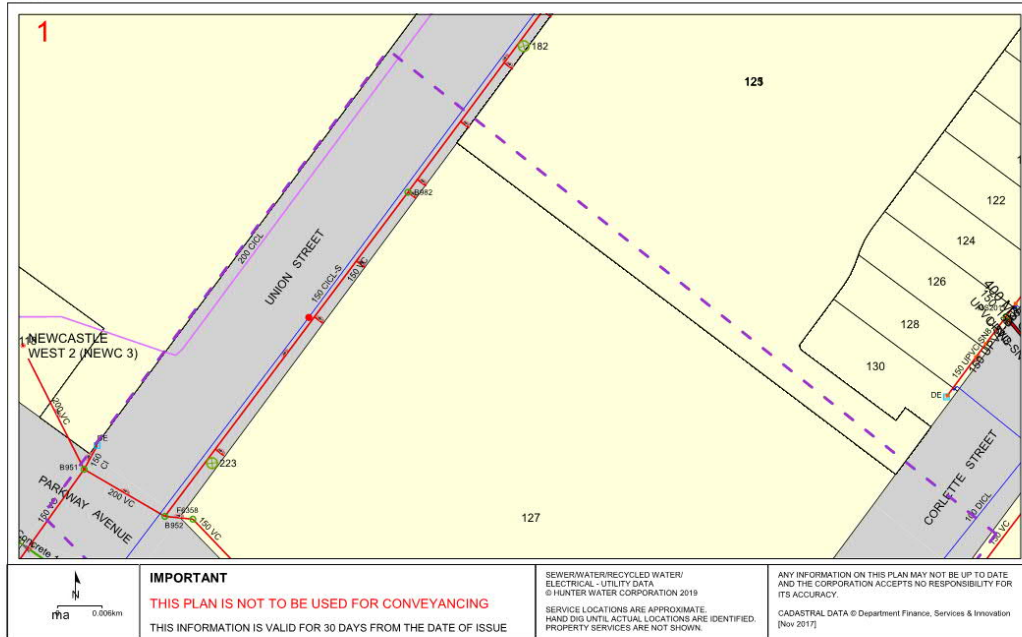


Date: 16/12/2020



Map 1

Sequence No: 104973464



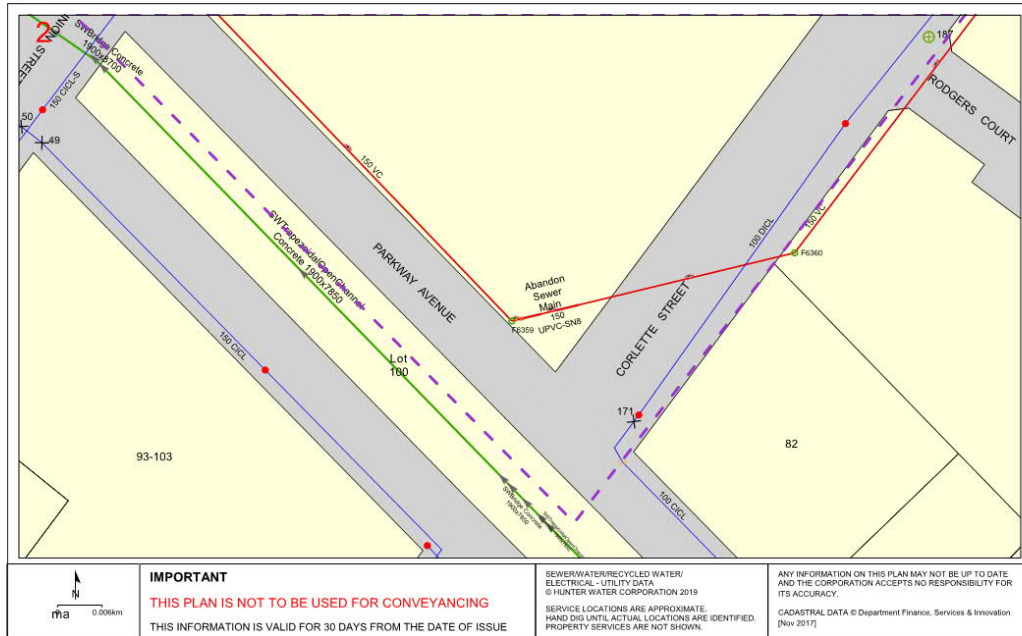
Powered by dbyd

Date: 16/12/2020



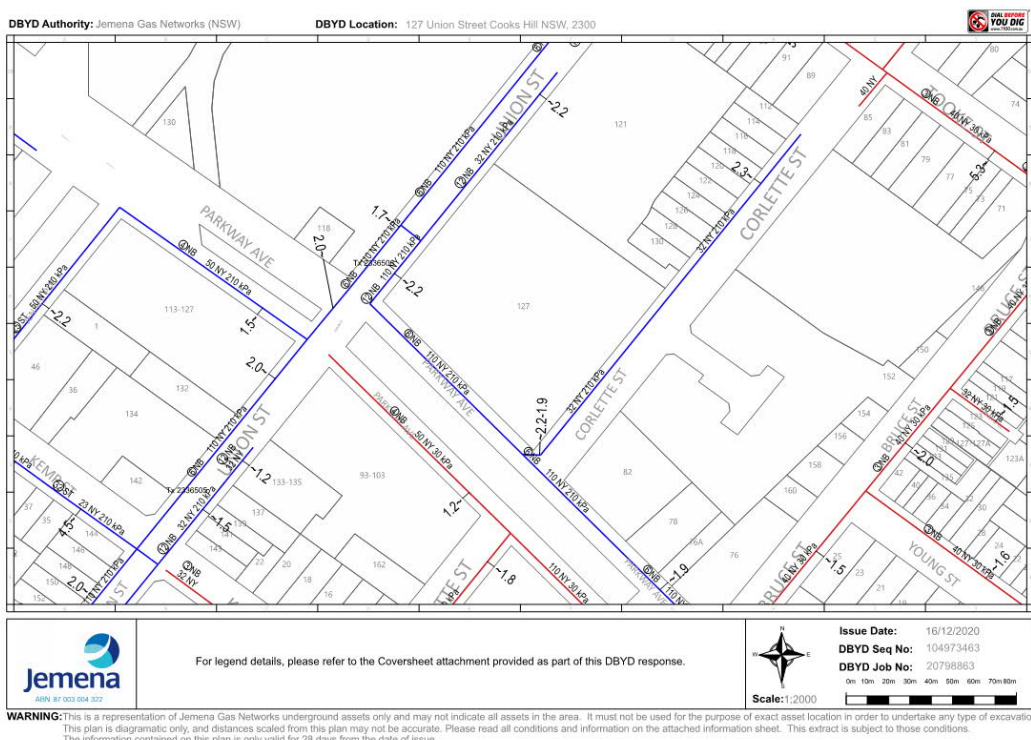
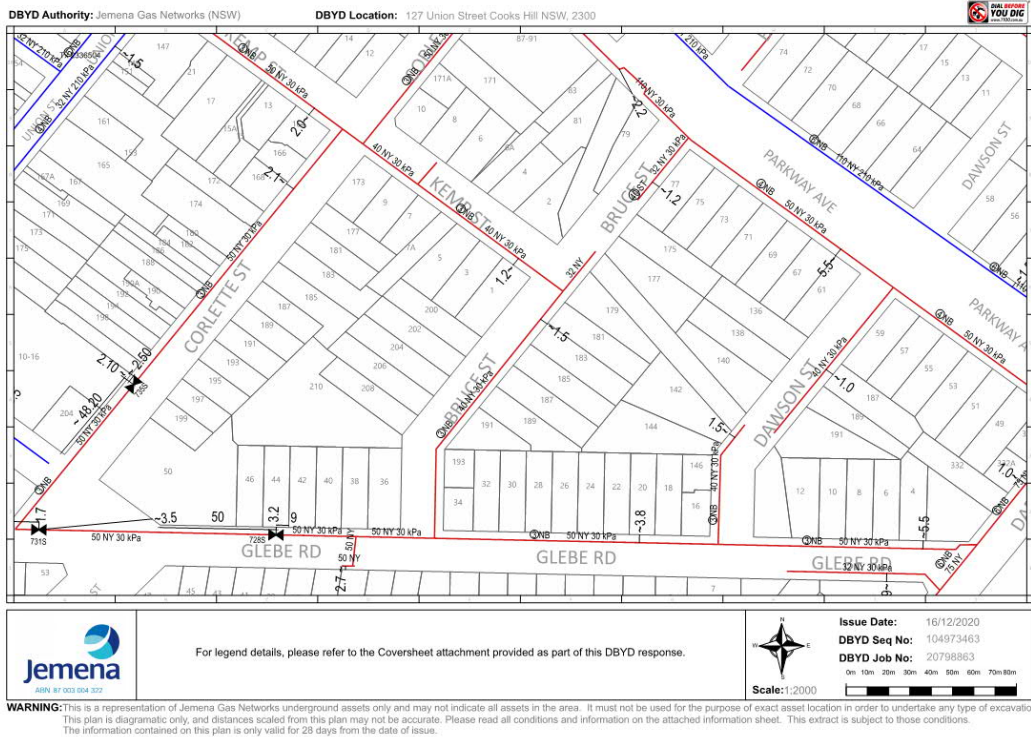
Map 2

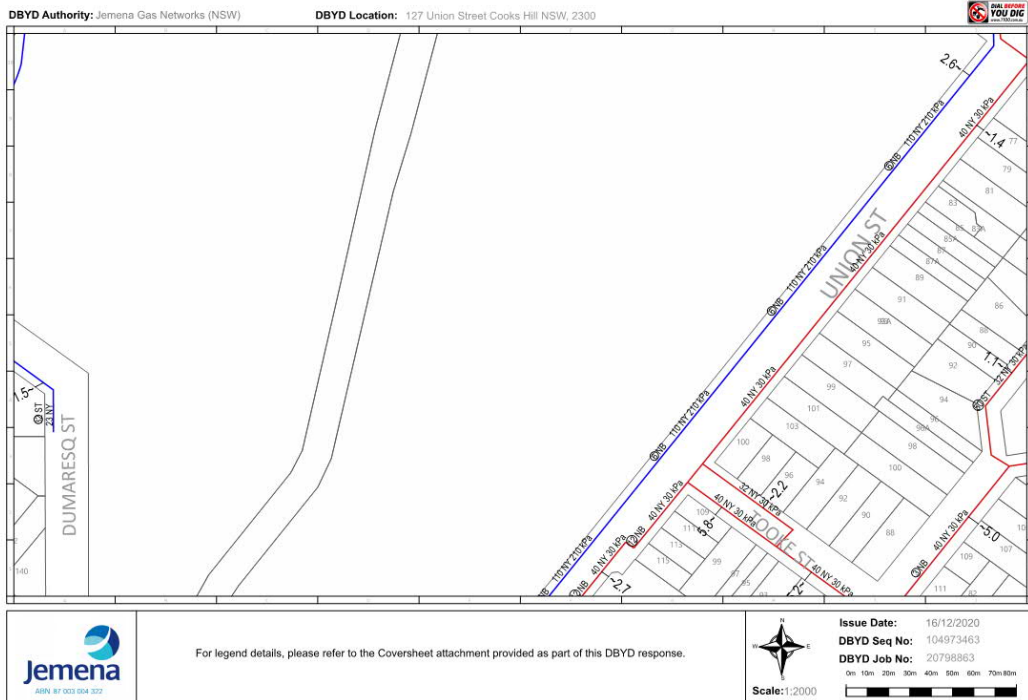
Sequence No: 104973464



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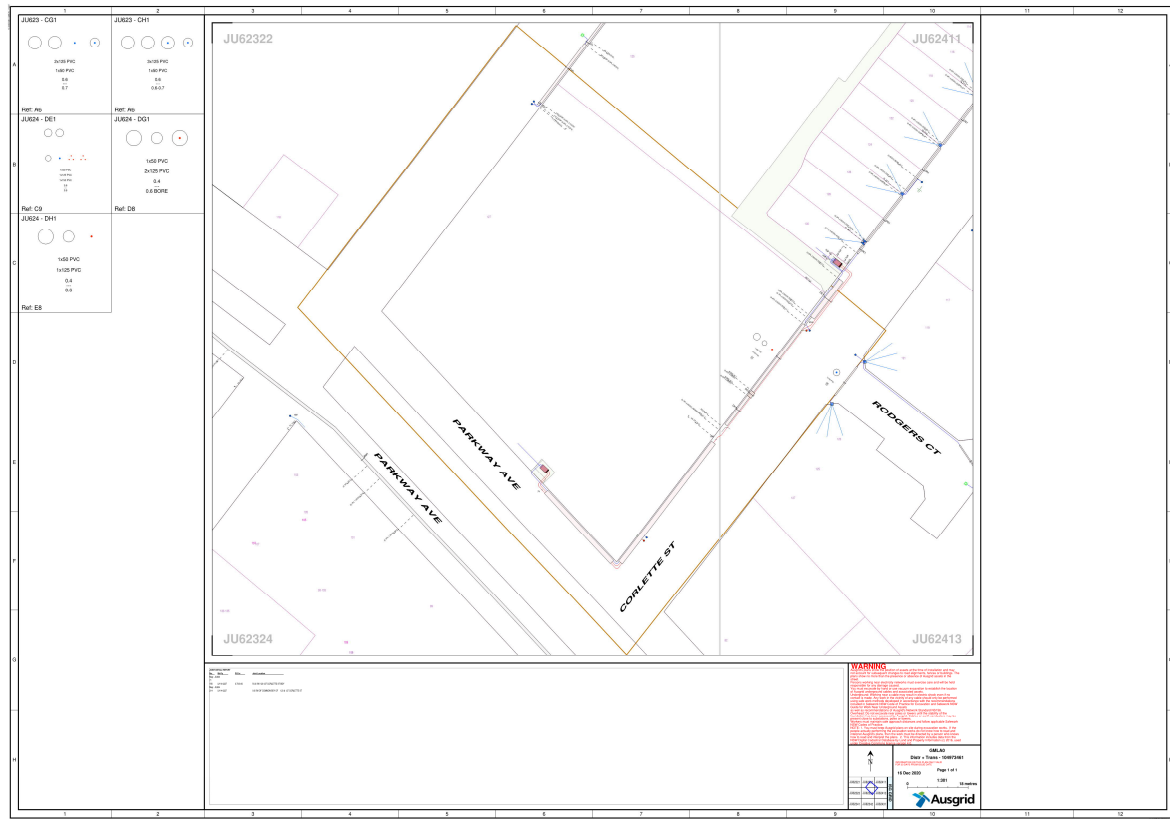
APPENDIX B – DBYD JEMENA





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 C – DBYD AUSGRID



APPENDIX D – HUNTER WATER STATEMENT OF AVAILABLE PRESSURE AND FLOW



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

Marline Newcastle PTY LTD
Unit F, 56 Clyde St
Hamilton North NSW 2292

6/07/2021

Dear James,

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: 2009-693
Property Address: Lot 102 DP 861562, 127 UNION ST COOKS HILL, NSW, 2300
Approximate Ground Level: 2.21 m AHD
Water Main Size and Location: DN150 mm CICL-S located in Union St
Hydrant No. 348733

Expected Pressure at Hydrant	Additional Fire Flow (L/s)	Pressure (kPa)
Maximum pressure (Average Day Demand)	0	600
Minimum pressure (Peak Day Demand)	0	465
Pressure expected under peak day demand conditions		
Fire hose reel (x2)	0.66	465
Pressure expected under 95%ile peak day demand conditions		
Fire hydrant /sprinkler installations	0.0 L/s	495
Fire hydrant /sprinkler installations	10.0 L/s	485
Fire hydrant /sprinkler installations	20.0 L/s	470
Fire hydrant /sprinkler installations	30.0 L/s	445

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



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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.