SSD DA REPORT

New Ultimo Pyrmont Public School Quarry Street Ultimo

SERVICES INFRASTRUCTURE & WATER MANAGEMENT PLAN

JHA

CONSULTING ENGINEERS

DOCUMENT CONTROL SHEET

Title	**Services Infrastructure & Water Management Plan**
Project	New Ultimo Pyrmont Public School
Description	SSD DA REPORT
Key Contact	Con Serban

Prepared By

Company	JHA
Address	Level 23, 101 Miller Street, North Sydney NSW 2060
Phone	61-2-9437 1000
Email	@jhaengineers.com.au
Website	www.jhaservices.com
Author	Kosma Tzannes, Alex Bartley
Checked	Brenton Burrows, Diego Montelvere
Authorised	Con Serban

Revision History

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Belinda Dawes	**REV**	A	B	C	D	E	F		
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1. EXECUTIVE SUMMARY

This report has been prepared by JHA to identify and summarise the proposed Utility and relationship with the major infrastructure and integrated water management requirements which will be incorporated into the design of the proposed New Ultimo Pyrmont Public School project.

This report demonstrates compliance with the Secretary's Environmental Assessment Requirements (SEARS) which apply to the project and has been prepared to accompany a State Significant Development Application to the NSW Department of Planning and Environment. This report should be read in conjunction with the Architectural design drawings and other consultant design reports submitted as part of the application.

The report identifies how the principles of infrastructure management and integrated water management plans will be incorporated in the design and during the phases of the development.

2. INTRODUCTION

2.1 Project Description

The proposed new Ultimo Pyrmont Public School site is bounded by Jones St, Quarry St and Wattle St, Ultimo.

JHA understand that a key component of this project will be consultation and liaison of the following Utility agencies:

- Ausgrid
- Telstra
- Sydney Water
- Jemena

In obtaining information and advising of the existing infrastructure and have initiated enquiries to further understand the project specific requirements required for the proposed development with the augmentation of infrastructure where required, incoming lead-in services capacity, proposed point of entry locations of services from the boundary.

Furthermore an integrated water proposal will be outlined in section 6.

2.2 Secretary's Environmental Assessment Requirements (SEARS)

This report acknowledges the SEARS prepared by the Secretary which notes the following in Section 11 of the document:

11. Utilities

- Prepare an Infrastructure Management Plan in consultation with relevant agencies, detailing information on the existing capacity and any augmentation requirements of the development for the provision of utilities including staging of infrastructure.
- Prepare an Integrated Water Management Plan detailing any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design.

The above Utility items of the SEARS requirements are addressed in sections 3, 4, 5 and 6 of this report respectively.

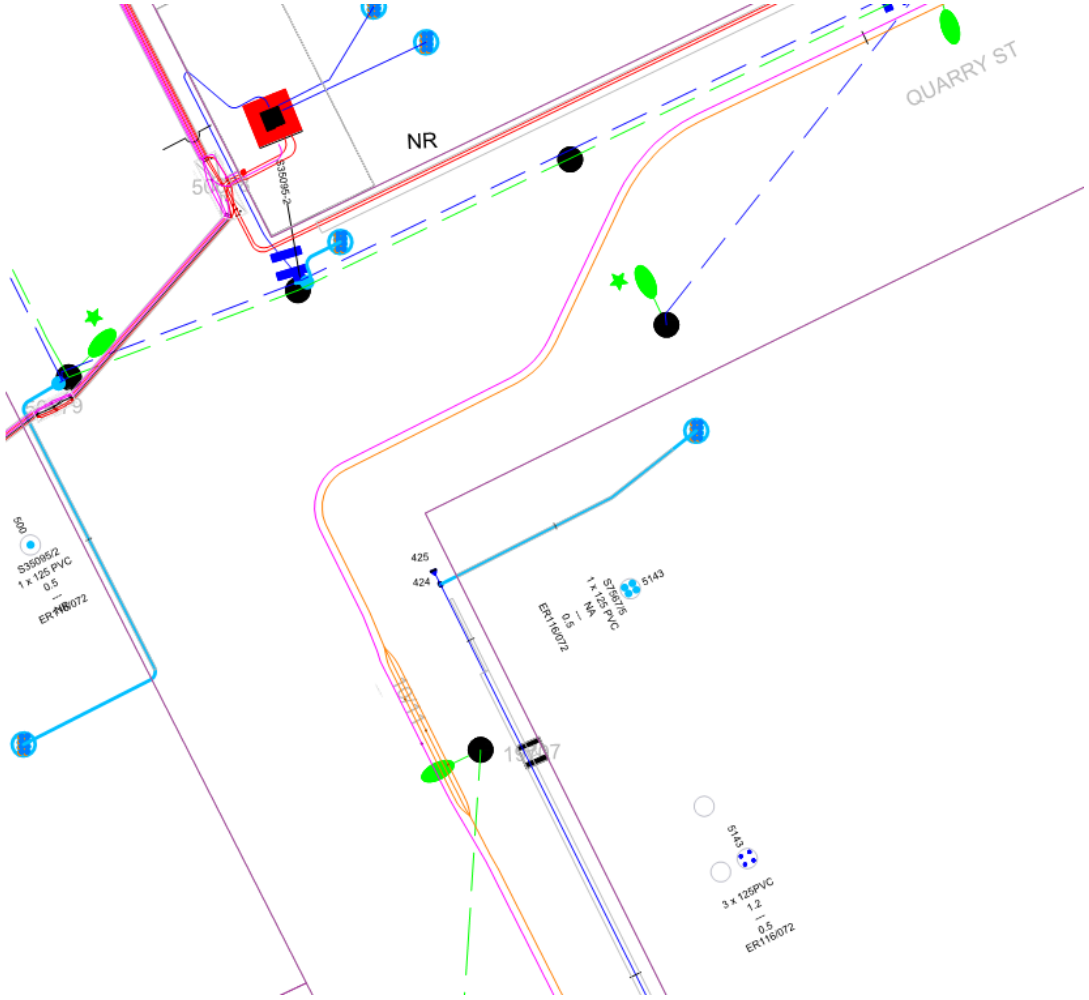
3. ELECTRICAL SERVICES

The electrical supply infrastructure will be incorporated into the design and construction phases of the development as follows:

3.1 Existing Infrastructure Capacity

The existing school site is currently supplied by an electrical services infrastructure lead-in arrangement originating from Wattle Street. This electrical supply is currently provided by a single set of underground service main cables connected to the Ausgrid low voltage network. The existing Ausgrid low voltage distributor to which the site is connected originates from existing chamber substation S.7567 “Jones Quarry” located within the lot boundary of 12 William Henry Street, Ultimo.

It has been determined that, although, the existing lead-in cable installation from the Ausgrid network seems sufficiently sized to supply the site with 400 Amps, 3 phase, it is more likely the current electrical capacity permitted from the network is in the order of 200 Amps, 3 phase. This is to be confirmed by the Supply Authority.



Ausgrid GIS Extract – Existing Low Voltage Electrical Infrastructure

3.2 Proposed Maximum Demand

Electrical calculations for the final school development arrangement were undertaken and have yielded an electrical load requirement of approximately 860 Amps, 3 phase. The existing electrical infrastructure to the site has been deemed insufficient to provide the required calculated electrical demand to the public school or for any future upgrade works.

To provide the new school with the required electrical capacity needed for final functioning and any future upgrade considerations, a new chamber substation will be required for installation on site.

3.3 Ausgrid Application

3.3.1 Construction Stage

The proposed on-site chamber substation will require co-ordination with overall site building works, including an electrical supply for construction equipment such as cranes, lifts and on-site amenities.

Review of the current Ausgrid GIS network indicates the existing chamber substation S.7567 “Jones Quarry” within the adjacent lot boundary provides supply to the low voltage distributor network cable along Wattle Street. This distributor network cable is a connection (documents indicate to be 400 Amps, 3 phase) direct from the substation and does not provide electrical supply to any service connections or lots other than the existing public school.

An Ausgrid application has already been undertaken to provide the site with suitable power for temporary construction use. Ausgrid has confirmed a 400 Amp, 3 phase basic connection can be undertaken on the existing low voltage street network cable in Wattle Street to increase the electrical supply to the site for use as construction power. Refer to Appendix A for Ausgrid connection approval.

A 400 Amps, 3 phase is the maximum supply that can be obtained from the existing Ausgrid low voltage network in the area. Should more than 400 Amps, 3 phase be required for construction power, alternative options should be sought and may include a new temporary kiosk substation on site, or generators to supplement the 400 Amps, 3 phase supply.

3.3.2 Permanent

A calculated electrical maximum demand of 860 Amps, 3 phase has been determined as the required electrical demand for the new school development as a permanent supply. This demand is above the capacity currently available from the existing Ausgrid low voltage network in the area.
To provide the required electrical supply for the final school arrangement, a new substation is proposed to be installed within the school’s site boundary. Consideration has been given to the use of space, limitations and impacts to proposed buildings to determine the most suitable substation installation.
A single transformer, surface chamber substation has been deemed the most suitable installation for the site. This form of chamber substation has been chosen for its minimalistic footprint, its ability to be constructed within a building envelope enabling buildings to be constructed directly adjacent (unlike a kiosk substation), and ease of connection and access.

Refer to Appendix A for a copy of the Ausgrid Design Information Package for the new chamber substation.

3.4 Staging

The following provides an indicative staging arrangement for the augmentation of the electrical services infrastructure to the site up to permanent final electrical supply.

1. Construction Stage:- The electrical services infrastructure will require augmentation at this stage of the works. The existing electrical supply is to be disconnected from the current Ausgrid

low voltage network within Wattle Street, and the new temporary builders supply of 400 Amp, 3 phase is to be installed. Construction works for the new chamber substation can begin for permanent power.

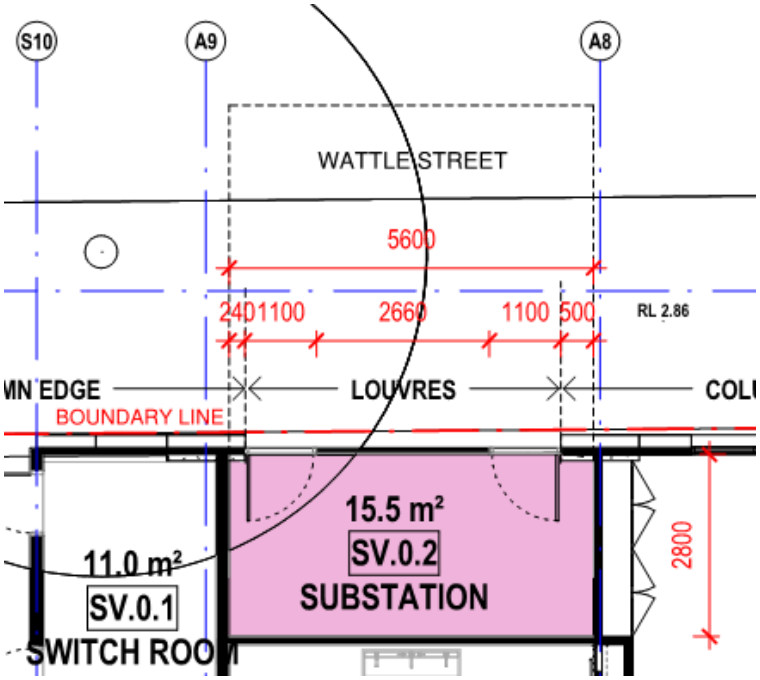
2. Completion Stage:- Upon completion and energisation of the new chamber substation, the temporary construction supply of 400 Amps is to be disconnected with the overall site to now be supplied completely from the new chamber substation.

3.5 Surface Chamber Substation

The new on-site surface chamber substation is to be a single transformer, surface chamber constructed into the new building envelope of the school as shown below.

The proposed location for the new chamber substation has been carefully determined with the following considerations:

- Direct access to the chamber substation from public areas for Ausgrid required vehicle and personnel without the need to enter the site.
- Direct access to the existing Ausgrid high voltage and low voltage networks located within the Wattle Street footpath.
- Minimisation of site ground impact for Ausgrid easement zones.



Substation Location & Spatial

The overall internal dimensional footprint of the single surface chamber substation is 5.6m (length) x 2.8m (depth) x 3.2m (height), with access directly to the Wattle Street footpath.

The complete 5.6m x 3.2m frontage of the substation shall comprise of a removable louvered panel and louvered personnel doors at either end providing necessary ventilation for the substation.

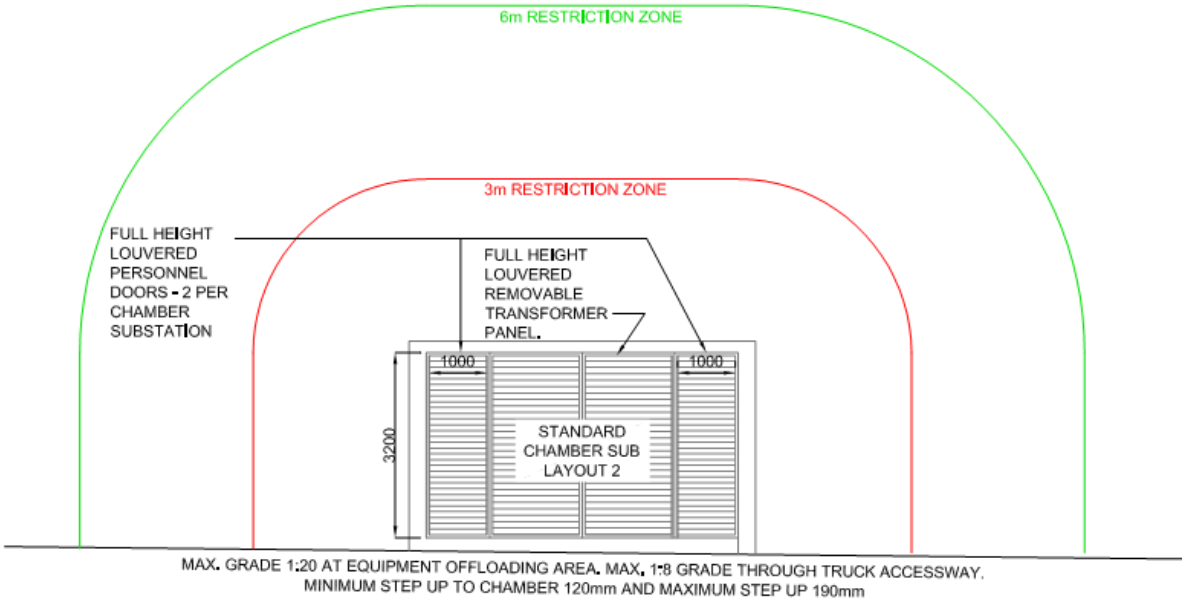
The substation will contain an oil filled high voltage transformer and, as such, in association with the open façade louvers imposes restrictions to the surrounding building elements in direct vicinity.

The chamber substation structural elements shall be constructed to a FRL of not less than 180/180/180 and a minimum blast resistance of 2kPa.

With regard to building fire rating and protection in association with the chamber substation, Ausgrid imposes additional requirements to those currently in the BCA and Australian Standards including AS1668.2. These additional requirements are included as below:

- All exterior parts of buildings (including adjacent lots) within 3 meters in any direction from the substation louver openings that are not sheltered by a non-ignitable blast resisting barrier must have an FRL of not less than 180/180/180, and a minimum blast resistance of 2kPa;
- All building air intake and exhaust openings, natural ventilation openings including those on buildings on adjacent lots must be separated by no less than 6 meters in any direction from the substation louver openings. Note, Ausgrid does not regard openable windows, which provide natural ventilation to a sole occupancy unit only, as a building ventilation system opening.

The above exclusion zones are to be measured in a direct string line fashion from the substation louver openings as shown below.



Substation Elevation & Restriction Zones

3.6 Main Switchroom

The new main switchroom is proposed to be located adjacent to the on-site substation serving the school campus. The main switchroom will accommodate the main switchboard serving safety services equipment, supply authority meter panels, power factor correction equipment and local distribution boards.

The main switchroom shall be constructed to comply with NCC/BCA clause 2.13 including the following elements:

- Structural elements shall be constructed to a FRL of not less than 120/120/120 and a minimum
- Two egress exit self-closing door with a FRL of not less than -/120/30 spaced well apart in accordance with AS/NZS3000.

3.7 Distribution Boards

The new main switchroom will serve all distribution boards located throughout the campus. The distribution boards will be accommodate within a lockable distribution board cupboards located within 40m in accordance with EFSG requirements.

The cupboard doors shall be provided with non-combustible coverings and opening suitably smoke sealed when located within egress paths of travel in accordance with NCC/BCA D2.7.

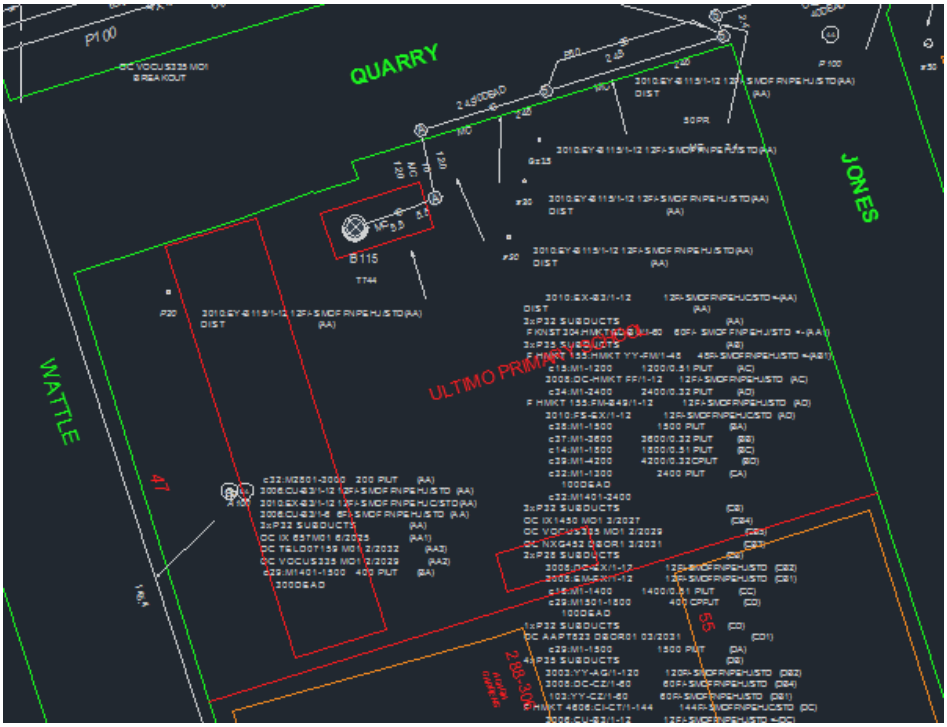
4. COMMUNICATION SERVICES

The communication lead-in infrastructure will be incorporated into the design and construction phases of the development as follows:

4.1 Existing Infrastructure Capacity

The existing school site is currently served with the following communication infrastructure lead-in arrangement originating from both Wattle Street and Quarry Street.

- Multiple conduits containing fibre optic SMOF services originating from Quarry St
- Multiple conduits containing fibre optic SMOF and cooper cabling originating from Wattle St.



4.2 Proposed Lead-in Conduits

Communication services infrastructure lead-in conduits shall be provided to pits located along the footpath.

Three (3) x 50mm underground conduits will be provided to each pit located on Quarry St to allow provision for up to three carriers to the main Communication Room serving the entire School.

Provision of three (3) x 50mm underground conduits will be provided to each pit located on Jones St to allow provision for up to three carriers to the OOSH tenancy.

4.3 Application

4.3.1 Construction Stage

The builder will make an application for a temporary Telstra service.

We note a 400 pair dead leg is noted on the Telstra DBYD drawings illustrated above from Wattle St made redundant with the FTTP service.

4.3.2 Permanent

School Infrastructure NSW ITC section will make all communication applications to Telstra and other FTTP providers.

4.4 Staging

The following provides an indicative staging arrangement for the augmentation of the communication infrastructure to the site up to permanent final connectivity of carrier services.

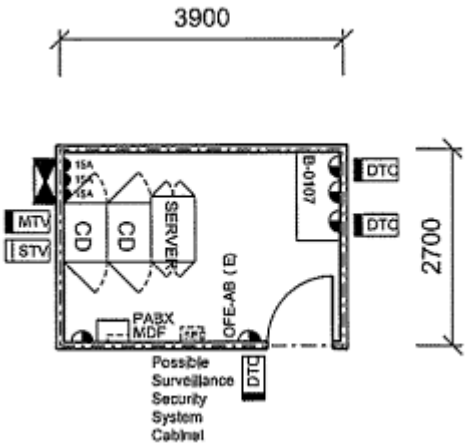
1. Construction Stage:- At this stage of the works additional pairs may be retrieved to accommodate the site requirements from the Wattle St copper dead leg.

2. Completion Stage:- Upon completion when the communication room is commissioned, then final connectivity of the new carrier.

4.5 Communication Room

The communication room is proposed to be located within close proximity to the office administration areas to serve the entire school campus.

The proposed communication room will be sized in accordance with the EFSG requirements and will comprise of three full height school campus distributor, server and IT network equipment communication racks, PABX/VOIP, wall mounted carrier MDF, fibre to the premises network hubs, MATV hubs and security cubicles.



The communication equipment UPS will exceed the 10Ah capacity threshold limit serving the communication room equipment thereby requiring the communication room shall be constructed to comply with NCC/BCA clause 2.13 including the following elements:

- Structural elements shall be constructed to a FRL of not less than 120/120/120 and a minimum
- Self-closing door with a FRL of not less than -/120/30

4.6 Communication Cupboards

The communication cupboards are proposed to be centrally located within close within each building serving network and security equipment serving all data outlets within a 90m cable route length.

It is expected the UPS if required will not exceed the 10Ah capacity the communication cupboards to eliminate the above NCC/BCA clause 2.13 requirements.

The cupboard doors shall be provided with non-combustible coverings and opening suitably smoke sealed when located within egress paths of travel in accordance with NCC/BCA D2.7.

5. HYDRAULIC SERVICES

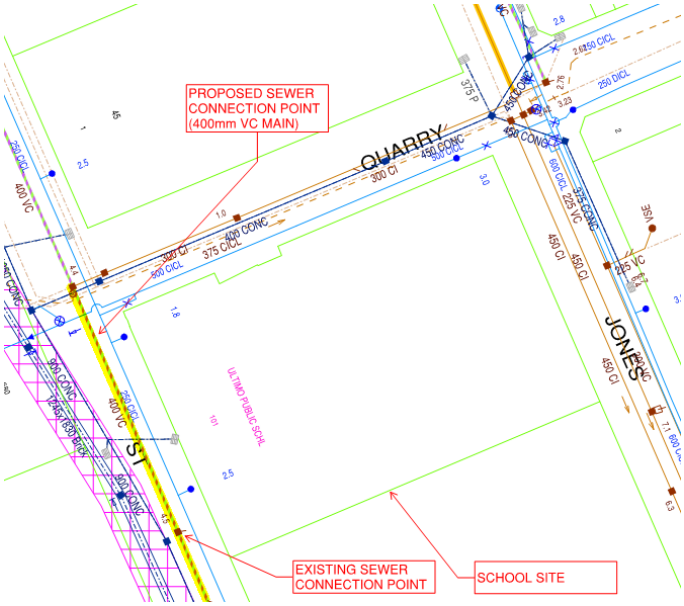
The hydraulic services infrastructure will be incorporated into the design and construction phases of the development as follows:

5.1 Existing Infrastructure

5.1.1 Sewer Drainage

The Dial Before You Dig (DBYD) and as-built information obtained indicate that the site is served by a 400mm VC sewer main in Wattle Street. Site inspections and Sewer Service Diagrams (SSD) corroborated that the existing site connection point is in Wattle Street. It is envisaged that the redeveloped site will drain to the same sewer main at a downstream location of the existing connection.

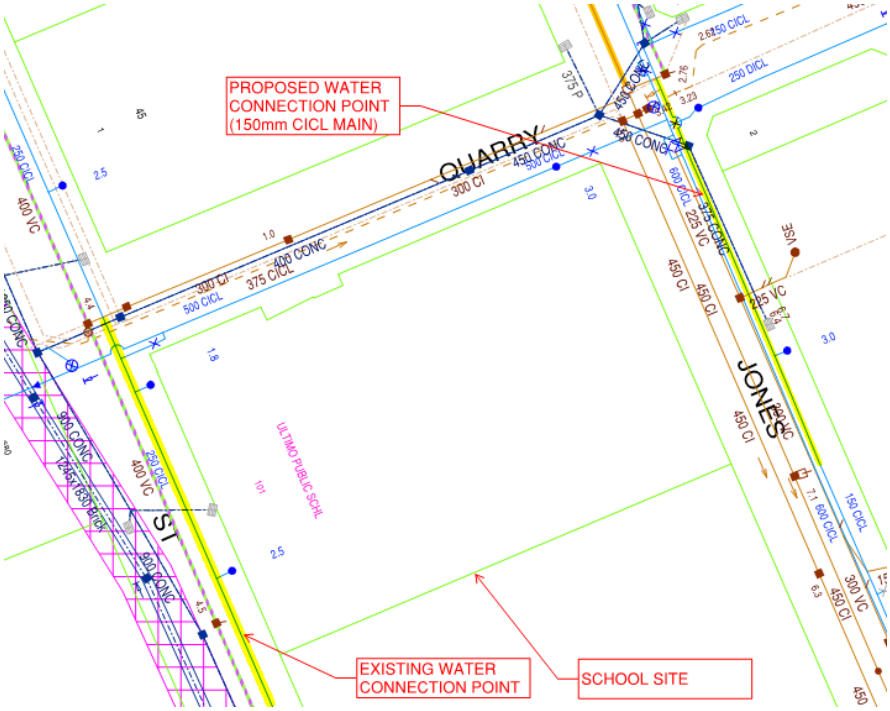
It is envisaged that the sewer main will have the capacity to service the planned development.



5.1.2 Potable Water Supply

The DBYD and as-built information obtained indicate that the site is served by a 250mm Cast Iron Cement Lined (CICL) water main in Wattle Street. Site inspections corroborated that the existing site connection point is in Wattle Street. The existing water meter and backflow prevention device is located in the southern boundary of the site. It is envisaged that the redeveloped site will connect to the 150mm CICL water main in Jones St.

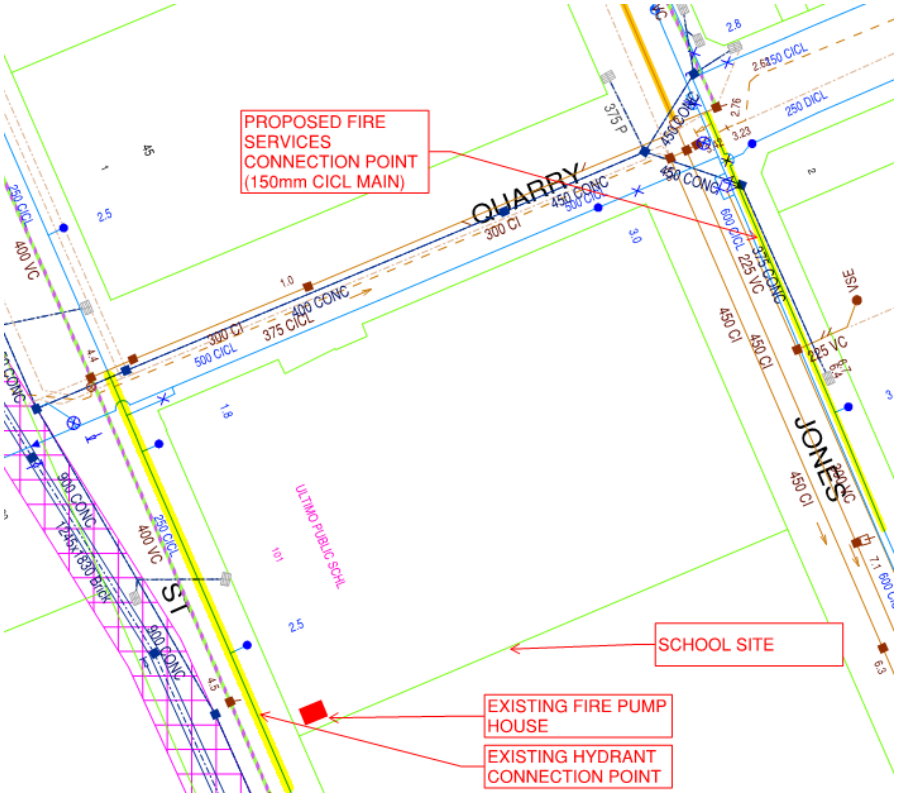
It is envisaged that the water main will have the capacity to service the planned development.



5.1.3 Fire Services

The DBYD and as-built information obtained indicate that the site is served by a 250mm Cast Iron Cement Lined (CICL) water main in Wattle Street. Site inspections corroborated that the existing site connection point is in Wattle Street. The existing fire hydrant booster assemble and fire pump house is located in the southern boundary of the site. It is envisaged that the redeveloped site will connect to the 150mm CICL water main in Jones St.

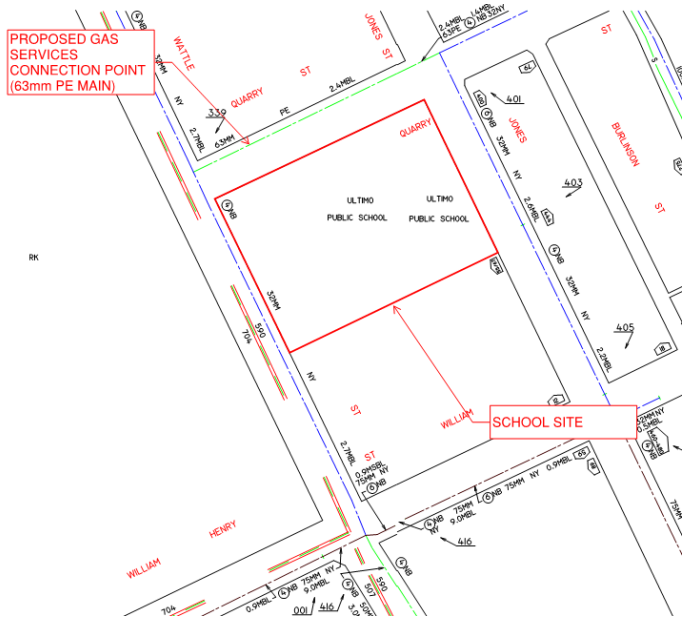
It is envisaged that the water main will have the capacity to service the planned development.



5.1.4 Natural Gas Service

The DBYD and as-built information obtained indicate that the site is served by a 32mm 210kPa Nylon gas main in Wattle Street, and 63mm 210kPa PE gas main in Quarry Street and a 32mm 210kPa Nylon gas main in Jones St. Site inspections corroborated information provided by the school that there is currently no gas service to the site. It is envisaged that the redeveloped site will connect to the 63mm 210kPa PE gas main in Quarry Street.

It is envisaged that the gas main will have the capacity to service the planned development.



5.2 Authorities' Applications

5.2.1 Section 73/Feasibility Study

With the development at its current stage a Section 73 is not applicable. The development is required to be a DA stage for this application.

In preliminary/planning stages a Feasibility Study is the Sydney Water requirement. JHA lodged this application with a Water Servicing Coordinator (WSC), Greg Houston Plumbing, and have received the Feasibility Letter from Sydney Water.

Please see Section **8 Appendix B - Sydney Water Correspondence**

The letter indicates that currently there are no augmentation requirements for this development and that our proposed connection points are satisfactory.

Once the development progresses, a Section 73 will need to be submitted to confirm the results of the Feasibility Study.

5.2.2 Jemena

JHA have lodged the gas connection with Jemena which is currently under assessment. Contact was made with a Jemena customer representative on the 13th September 2017 who indicated that there was

an internal fault and we could anticipate an Offer of Connection by late September 2017. Please see Appendix C – Jemena Correspondence.

We do not envisage any concerns or augmentation requirements for this development.

5.3 Construction Stage

5.3.1 Potable Water Supply

As the existing water supply is a 50mm service fronting Wattle Street and the new service is proposed to be connected in Jones Street we anticipate the existing water service will be used for the temporary supply. We envisage the 50mm service being adequate for construction activities.

5.3.1 Fire Services

As the existing fire service is connected in Wattle Street and the new service is proposed to be connected in Jones Street we anticipate the existing water service will be used for the temporary supply.

5.3.1 Sewer Drainage

As the existing sewer connection is in Wattle Street and the new service is proposed to be connected downstream of the existing connection we anticipate the existing sewer service will be used for the temporary supply. The 150mm sewer service will be adequate for construction facilities

5.4 Staging

As all authority connections are to be relocated for the new services we envisage that the new connections will be made as required. Once the new connections are completed and we envisage the temporary services from the existing supplies being altered to be connected to the new services. Upon transfer of connections we envisage the existing connections serving the construction facilities to be disconnected and capped as per authority requirements. This will allow a seamless changeover.

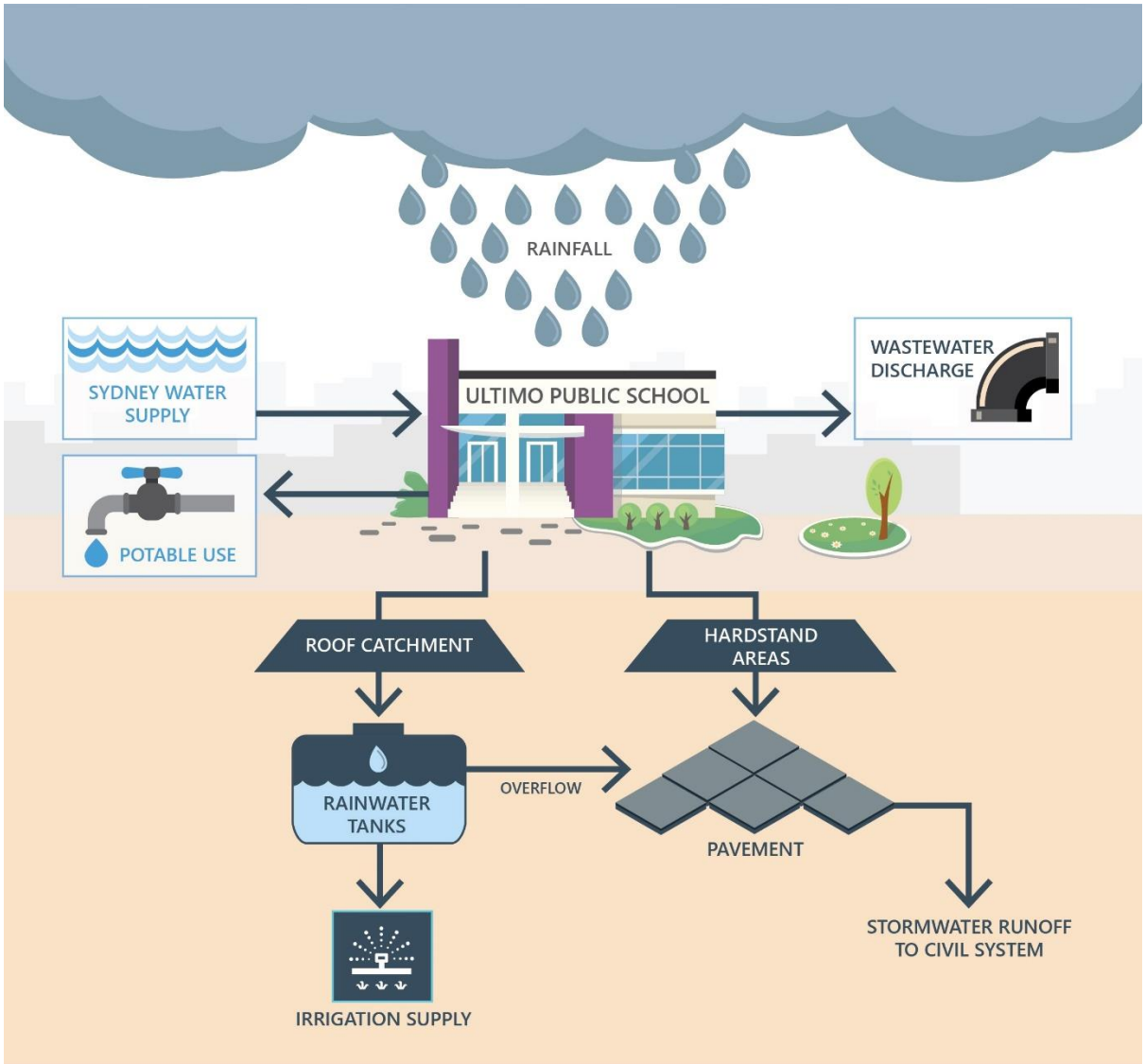
6. INTEGRATED WATER MANAGEMENT PLAN

6.1 Water Management

Traditionally, water planning has based on importing potable water for consumption, then discharging it via the sewerage system and viewing stormwater as a flooding risk that should be conveyed offsite as quickly as possible via the stormwater system.

By treating stormwater as a resource rather than a problem, the conventional planning method shifts to a sustainable management system. Sustainable urban water management means to simultaneously plan for the following:

- Reducing the amount of wastewater leaving a catchment that may cause pollution in other locations (e.g. ocean out falls).
- Reducing the reliance on drinking quality water (i.e. potable water) supplied by Sydney Water.
- Using water more appropriately i.e. using potable water for consumption only – not for watering the garden.
- Reducing the impact of stormwater on waterways.



6.2 Potable Water supply demand

The potable water demand for the buildings has been estimated at an average of 15.1kL per day based on preliminary calculations. This will be supplied entirely from the 150mm CICIL water main in Jones Street.

6.3 Alternative Water Supplies

A feasibility study was performed by JHA into the potential use of rainwater harvesting to provide an alternative water source on site for landscape irrigation services. Rainwater storage tanks will be incorporated into the development and connected to the roof water downpipes.

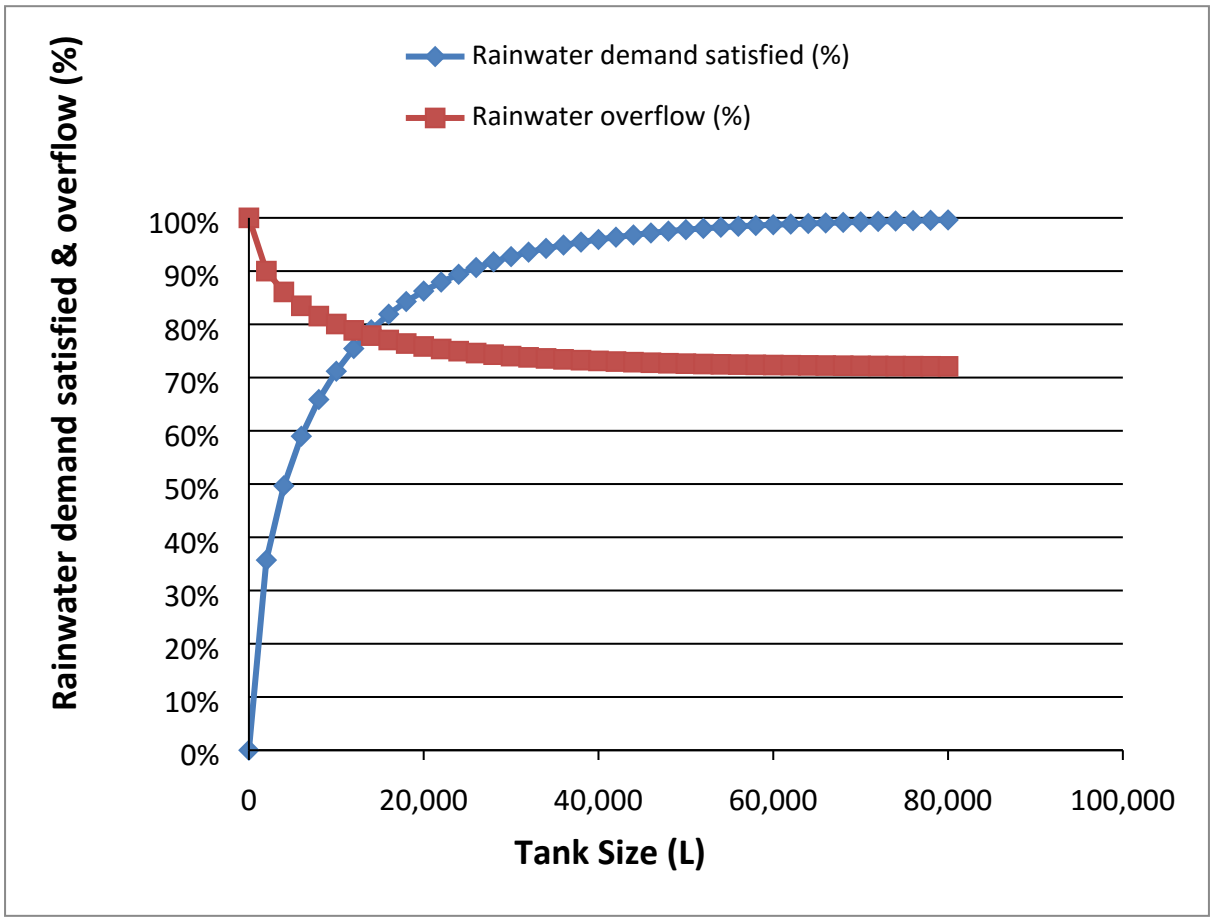
6.4 Rainwater Collection

It is envisaged that downpipes from the roof will discharge to a 20 kilolitre rainwater harvesting tank. The approximate roof catchment area is 1450m².

Preliminary calculations indicate that the proposed 20 kilolitre rainwater harvesting tank is the optimum size for providing the estimated landscape watering demands (in the order of 1.37 kilolitres per day).

Based on a preliminary water balancing assessment the proposed 20 kilolitre rainwater harvesting tank achieves the following:

- Meets an average of 86% of the estimated annual landscaping demands. I.e. only 14% of the landscaping water demands are estimated to be provided from the potable water supply
- Provides an average run-off reduction of 24% from the collected roof area



6.5 Water use reduction initiatives

6.5.1 High Efficiency Fixtures

Water consumption shall be reduced by incorporating water efficient fixtures and fittings (WELS rated), time flow taps for student use in accordance with Educational Facilities Standards and Guidelines.

6.5.2 Hot Water

Individual hot water units are proposed to be installed at individual or groups of fixtures. Due to the minimal consumption of hot water in primary education facilities this will reduce energy consumption as usage will be limited to on demand.

To further reduce the energy consumption associated with hot water, hot water will be not be provided to student restroom wash basins as per Educational Facilities Standards and Guidelines.

6.5.3 Water Sensitive Urban Design (WSUD)

The landscaping of the site has been designed with best practice WSUD principles in mind. The following initiatives have been included to ensure the development has a minimal requirement for irrigation of the landscaping from potable water sources:

Paved areas have been sloped to facilitate surface water recharge to mass planting beds to provide improved irrigation efficacy during low rainfall events.

Appropriate shade planting has been selected to improve air quality and reduce the urban heat island effect, further minimising localised evaporation of water held in the soil.

Where possible the landscaping is comprised of hardy, low water use, indigenous plant species suited to the harsh urban environment which will thrive without the need for irrigation other than natural rainfall. Where necessary water-efficient subsoil drip irrigation systems are proposed to ensure that the landscape is maintained to the high standard required. These will be supplied by the rainwater harvesting system to minimise potable water consumption.

7. APPENDIX A - AUSGRID CORRESPONDENCE

7.1 400 Amp, 3 Phase Temporary Builders Supply Approval

Kosma Tzannes

From: Vivienne Jackson <vjackson@ausgrid.com.au> on behalf of DataNorth <datanorth@ausgrid.com.au>
Sent: Thursday, 11 May 2017 8:14 AM
To: Bien Ebonia
Subject: ULTIMO PUBLIC SCHOOL TEMPORARY BUILDERS SERVICE 189 JONES ST ULTIMO
Attachments: ES1 Form C Application for CT Metering July 2011.xls; Schedule of Labelling.xlsx

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Connection Applicant

Connection Premises Address:	ULTIMO PUBLIC SCHOOL TEMPORARY BUILDERS SERVICE 189 JONES ST ULTIMO
NMI:	4103964787

MAXIMIMUM CAPACITY FOR CONNECTION-400A (RESTRICTED TO 400A VIA SPD)
SPD REQUIRED TO BE SET AND SEALED AT MAX CAP OF CONNECTION-YES- SPD SET 400A
POINT OF COMMON COUPLING-S.7567 LV BOARD PANEL 5
CONNECTION POINT-MAIN SWITCHBOARD TBS
REMARKS-OK TO CONNECT, ENSURE SPD IS RESTRICTED TO 400A
SUBSTATION NUMBER- S.7567
DISTRIBUTOR NUMBER- #5

Ausgrid is pleased to inform you that it has approved your application for connection services received in respect of the premises referred to above.

Please note that before a new connection is electrified, the retail customer who will be using electricity at the premises will be required to enter into a supply contract with an electricity retailer. The NMI at the top of this letter should be provided to the retailer by the customer.

Ausgrid will not issue a job number until the chosen retailer notifies Ausgrid that a supply contract has been entered into. We will then contact you again to issue the job number. The job number can be used to pick up a meter from Ausgrid.

If this installation requires CT metering for an installation greater than 100amps:-

- The attached "Request for Inspection of sites requiring CT metering" form must be submitted to Ausgrid's National Electricity Market Support group (NEMS) 2 weeks prior to contacting the Customer Operations Regional Office to make an appointment to inspect / energise the installation.

NEMS Fax: (02) 9277-3560
NEMS Inquiry: (02) 9277-3535
Information regarding the CT Form: Refer to Ausgrid's ES1 document (Clause 3.12).
Appointments: Refer to Ausgrid's ES 1 document (Clause 2.1)

Please note:

This connection may be delayed and you will be unable to make an appointment with the Customer Operations Regional Office if:

1

- A Negiotiated Retail Contract, if required, (with an Energy Retailer of the customer's choice) has not been arranged and signed.
- There is incorrect or missing information on the CT form, or
- You have not submitted the CT form with at least 10 days notice, or
- The CT form is not signed by the electricity customer.

Also:
For sites that will supply multiple installations, such as units, job numbers will not be issued unless a schedule of premise labelling (as example floor #, unit #) is submitted to Ausgrid. See attached spreadsheet for completion.

Thank You

Installation Data - Central Coast
Phone: 02-43998000
Fax: 1300 662 089
Email: datanorth@ausgrid.com.au

7.2 Permanent Chamber Substation – Ausgrid Design Information Package

Ausgrid

Project Number: SC09935

New Chamber S.78320 "Wattle Quarry No.3"

Ultimo Public School – Corner of Wattle and Quarry St, Ultimo

Design Information

Site Specific Requirements - Complex

Date: 17th May 2017

SC09935 - 20170517 - Design Information Site Specific.docm

CONTENTS

SITE SPECIFIC DESIGN INFORMATION REQUIREMENTS

The Design Information Site Specific Requirements Complex is complementary to, and must be read in conjunction with, the Design Information General Requirements, which can be found on the Ausgrid web site.

1. *Ausgrid Project References*

SAP Project Number	SC09935
Prjtrak Number	XCZ020279

2. *Ausgrid Contact Details*

Note that this information is not to be placed on the design.

Ausgrid Contact	Keiran Jackson
Telephone No	02 85 69 67 32
Email Address	keiranjackson@ausgrid.com.au

3. *Details of proposed Ausgrid Projects in the vicinity of Development*

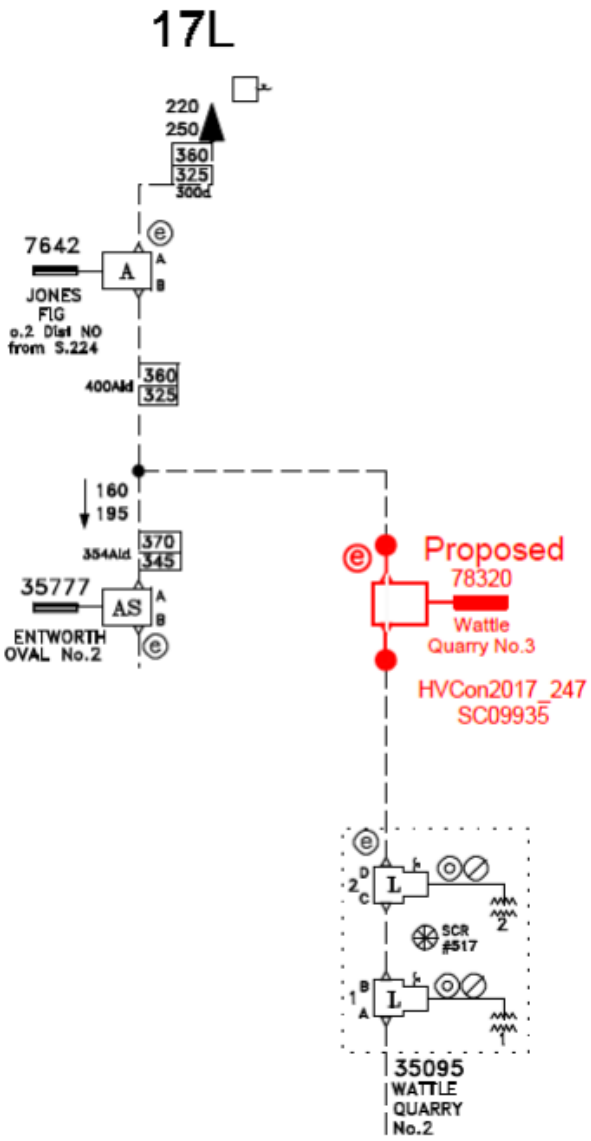
- N/A

4. *Network Extension Connection Point*

4.1. High Voltage Connection Point

Zone substation – Darling Harbour - 11kV feeder: Panel 17L

- Between tee to S.7642 and S.35777 and S.35095



4.2. Low Voltage Connection Point

N/A

5. *Details of Ausgrid Network in Vicinity of the Development*

Recorded details of the Ausgrid network, including cable codes, soil codes, etc, are shown in Ausgrid's WebGIS. The ASP/3 designer must login to the WebGIS to obtain relevant information. The ASP/3 designer should contact Ausgrid for any further clarification or if information appears to be missing. Note: Ausgrid's WebGIS information has not been verified against actual site assets. The ASP/3 designer is responsible for the accuracy of information on designs and it is strongly advised that the ASP/3 designer verifies WebGIS asset details on site prior to undertaking the design.

6. *Proposed Works*

Alter the existing high voltage and/or low voltage network systems, in accordance with the schematic and/or graphical representation, for the required electrical works as shown on the attached and/or following drawing(s).

6.1. Extension Works

Fit out a 1000kVA transformer surface chamber substation that is to be constructed on the development property either within the proposed building or as a freestanding structure.

Install low voltage interconnection(s) from the proposed substation(s) to the existing low voltage Network reticulation.

6.2. Relocation Works
N/A

6.3. Network Augmentation Works
Network augmentation work is work required to be constructed on the upstream side of the network extension to enable the connection of the development.

- N/A

7. URD Subdivision - After Diversity Maximum Demand (ADMD) Value
N/A

8. Customer Point of Supply (Connection Point)
Provide a 1000 amp three phase low voltage point of supply at the low voltage switchgear terminals within the chamber substation enclosure.

9. Fault Level
11kV node: Proposed Sub S.78320

- Existing maximum three phase 11kV fault level is **3.58kA**.

10. Cable/Conductor Route and Type

10.1. Route Information
It is generally the responsibility of the ASP/3 designer to select an appropriate route. However, Ausgrid reserves the right to require variation(s) of any proposed cable route.

Ausgrid makes no warranty expressed or otherwise that any proposed route depicted in the design information by Ausgrid is suitable for the intended purpose.

10.2. Overhead Mains
N/A

10.3. Underground

11kV	11kV 400 AL3 TRXQ 35 CU(WS) ZYQ - refer to NS177 for details on cable termination requirements (ie the cable size for the transistion to single core cables). 11KV 300CU1 EPR 70 CU(WS) Z YQ / Triplex.
Low Voltage	LV 240AL4XQZ/SAC LV direct distributor: select appropriate cable as per NS112
Street Lighting	Newcastle & Upper Hunter Area (Refer to NS112 & NS119) Single street light standard supplied from pillar: 2.5sqmm copper 2 core + earth. Grouped streetlight standards on streetlight circuit: 6sqmm or 16sqmm copper 4 core double insulated. Sydney & Central Coast Area (Refer to NS112 & NS119) 16CU2 XQZ or 16CU4 XQZ
SCADA / Telecontrol	UGFO - 60 Fibre Nylon Jacketed Dry Core Cable

10.4. Conduits

Spare Conduits available for use	NIL
Spare conduits to be laid as part of this project	One spare HV conduit to be installed for each 11kV cable. Sydney CBD area use 125mm conduit all other areas 150mm conduit. Other: 4 spare 125mm LV conduits from S.78320 to Street.

10.5. Protection

Protection	NIL

11. EQUIPMENT

11.1. Standard Single Transformer Surface Chamber Substation

Substation Number	**78320**	Substation Name	**Wattle Quarry No.3**		
Type	**Single 1000kVA transformer surface chamber to Ausgrid Drawing 224407 or 224408**				
Load Cycle	A: Commercial / Industrial	Vector Group	Dyn 1	Voltage Ratio	11000/433

Description		Stock Code	Quantity
Power Transformer	1000kVA Oil Filled	180358	1
HV Switchgear	ABB Safelink RMI	179642	1
LV Board Arrangement	400/400/1600 (181835)	181835	1

11.1.1. Standard Single Transformer Surface Chamber Substation Equipment Fuse Element Schedule

HV Fuse	1000kVA Transformer (ABB Safelink): 100amp SIBA 30.020.93.100
LV Fuses	LV fuse elements: 400amp 92mm centres Bell / MEM "J" LV fuse elements: 1000amp 160mm centres Alstom

12. Asset Number Allocation

During the design stage the ASP/3 designer will need to request from Ausgrid any additional asset numbers.

13. Redundant Equipment

Redundant equipment to be removed from service and returned to Ausgrid.

The redundant equipment is expected to be:

N/A

14. Apportionment of Costs

The information this section contains is based on assumptions of the likely design solution. Certification of a design that does not conform to such assumptions may require Ausgrid to reassess the apportionment of costs and funding of the project, including re-assessment of any quotations issued prior to Design Certification.

14.1. Funding

At this stage Ausgrid will fund the following works for the development and anything not listed is funded by the customer. Where applicable, the amount(s) to be paid by Ausgrid will detailed on the Schedule to the Certified Design.

- Low voltage mains components within dedicated public roadways and/or the substation property rights area(s) used for supplying Network loads and are beyond the development property as follows.
  - ~ Low voltage interconnection from S.78320 to street.

15. Design Information Attachments

The following documentation is readily available and can be found on our website www.ausgrid.com.au

- Design Information – General Terms and Conditions document.
- Ausgrid's external CAD design template.
- Design Certification Check Sheet.
- Asset Number Request Spreadsheet.
- Asset Valuation Spreadsheet (AVS).
- Street Lighting Acceptance Form(s).

- Network Earthing Information Sheet.

The following can only be obtained from the Ausgrid WebGIS portal.

- A translated GIS extract of the proposed work area in DWG format (includes soil codes).
- Relevant additional asset information including cable codes.
- Relevant system diagram(s). **NOTE – Loads and ratings shown on system diagrams is for internal Ausgrid use only.**
- Environmental Analysis report.

The ASP/3 designer intending to undertake the design must obtain and use the electronic format of the relevant design information attachments (refer to NS104).

16. Notations to be placed on Design

In addition to the standard notations on the attached CAD design template add the following notations.

- The ASP/1 is required to comply with the correct procedure(s) for working with and/or near asbestos material (refer to Ausgrid NUS 211 – Working with Asbestos Products). The following Ausgrid assets are registered as containing asbestos.
- N/A

17. Remarks / Other Comments

The ASP/3 designer needs to contact Ausgrid early in the design phase should any of the proposed works require an alteration and/or extension to the Ausgrid fibre optic network. Ausgrid will then advise the ASP/3 designer of the scope of fibre optic network works that needs to be undertaken by Ausgrid and the works that will need to be done by the ASP/1. Generally Ausgrid only undertakes the final terminations and commissioning of the fibre optic network installation, however, the fibre optic network design and funding review is undertaken on a case by case basis.

The following table specifies LV link usage and link asset numbering requirements.

LV1-61 K & N switch pillar: usage	Link numbers required on Design	Link numbers required in Field
Not Permitted	No	Yes: but only normally open LV links within single and double link switch pillars are allocated an additional asset number for the link(s).

Any LV underground to overhead transition points that connect directly to a kiosk substation (ie the first LV network connection on the LV distributor cable) requires the installation of pole mounted LV links.

Any LV underground to overhead transition points that connect directly to a chamber substation (ie the first LV network connection on the LV distributor cable) requires the installation of pole mounted LV links.

Low voltage pillars (new or altered) within Commercial areas must comply with NS224 unless a written variation is agreed with Ausgrid.

Please consult your Contestable Project Coordinator for approval prior to the use of 11kV high voltage stub tee joints (HV3-43) on this project.

18. Design Information Revision History

17th May 2017	Initial issue using template version v161027

8. APPENDIX B - SYDNEY WATER CORRESPONDENCE

Case Number: 163184

27 June 2017

Department Of Education And Training
c/- Greg Houston Plumbing Pty Ltd

FEASIBILITY LETTER

Developer:	**Department of Education And Training**
Your reference:	**GHP2418**
Development:	**Lot 101 DP 1105527 (No 189) Jones Street, Ultimo**
Development Description:	**demolition of the existing Ultimo Primary School facilities and the construction of a new school up to 5 storeys incorporating a day care centre. The proposed population is 800 students, 40 OOSH students and 60 staff**
Your application date:	**2 May 2017**

Dear Applicant

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 eg 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.

You have made an application for specific information. Sydney Water's possible requirements are:

What You Must Do To Get A Section 73 Certificate In The Future.

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**

   It would appear that 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 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 that:

   - The DN150 drinking water main located on the north side of Jones Street can provide for the domestic needs of the development. Please refer to additional advise on Large Water Service Connections, Firefighting & Disused Water Service Sealing all located below.

   - At time of the Section 73 application, your Water Servicing Coordinator can assess your proposal to advise you of any amplification requirements based on the proposed building heights, connection points and corresponding discharge. More information about the Section 73 application process is available on our web page in the Land Development *Manual*.

4.2 **Sewer**

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

Sydney Water has assessed your application and found that:

- The development can utilise the connection on the manhole over the DN400 VC sewer in Wattle Street.

- The point of connection to the Sydney Water sewer should, as a rule, be provided within the property boundaries. Where this is not able to be provided (e.g.; due to the nature of the proposed building, or, to physical constraints of the site), the point of connection should be as close as possible, Sydney Water will allow this, but, cannot approve the point of connection.

- Where the point of connection cannot be provided within the site boundaries, you should consult with the Department of Fair Trading before carrying out any work, to ensure you will be able to meet their connection requirements.

4.3 Stormwater

- Sydney Water has noted your advice regarding stormwater discharge from the development to Wattle Street.

- In this instance, there are no specific Sydney Water's stormwater requirements for the proposed development at this location.

5. Ancillary Matters

5.1 **Asset adjustments**

After Sydney Water issues this Notice (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, you will need to do this work as well as the extension we have detailed above at your cost. The work must meet the conditions of this Notice and you will need to complete it **before we can issue the Certificate**. Sydney Water will need to see the completed designs for the work and we will require you to lodge a security. The security will be refunded once the work is completed.

5.2 **Entry onto neighbouring property**

If you need to enter a neighbouring property, you must have the written permission of the relevant property owners and tenants. You must use Sydney Water's **Permission to Enter** form(s) for this. You can get copies of these forms from your Coordinator or the Sydney Water website. Your Coordinator can also negotiate on your behalf. Please make sure that you address all the items on the form(s) including payment of compensation and whether

there are other ways of designing and constructing that could avoid or reduce their impacts. You will be responsible for all costs of mediation involved in resolving any disputes. Please allow enough time for entry issues to be resolved.

6. **Approval of your Building Plans**

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

Your Coordinator can tell you about the approval process including:

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

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

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

Notes:

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

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.

Fire Fighting

Definition of fire fighting 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 fire fighting 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 fire fighting 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 fire fighting purposes, the mains shall be arranged through the water main extension process and not the Section 73 process.

Large Water Service Connection

The DN150 water main in Jones Street is available to provide your development with a domestic supply. The size of your development means that you will need a connection larger than the standard domestic 20 mm size.

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

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

You will have to pay an application fee.

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

Disused Water Service Sealing

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

Other fees and requirements

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

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

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

END

9. APPENDIX C – JEMENA CORRESPONDENCE