



# Infrastructure Management Plan Picton High School Redevelopment

480 Argyle Street, Picton NSW 2571

REPORT

## PREPARED FOR

Department of Education NSW  
35 Bridge Street  
Sydney NSW 2000

Tel: 1300 679 332

Ref: SY167053-MDR02

Rev: 2

Date: 04.04.2018

## PREPARED BY

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# INFRASTRUCTURE MANAGEMENT PLAN

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## Activity Schedule

Date	Revision	Issue	Prepared By	Approved By
08.02.2018	1	Issued for Review	A.Muralidharan	
04.04.2018	2	Final Issue	A.Muralidharan	G.Lukic

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## EXECUTIVE SUMMARY

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This Infrastructure Management Plan (IMP) report outlines how the proposed redevelopment for Picton High School details the existing infrastructure, detailing information on the existing capacity and any augmentation required for the proposed development. The report also details record of consultation with relevant agencies.

This report is provided in response to the Secretary's Environmental Assessment Requirements (SEARs) item 13.

# TABLE OF CONTENTS

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Executive Summary .....	2
1. Introduction .....	4
1.1 Proposed Redevelopment.....	4
2. SEARs Issues Addressed .....	5
3. Site Description .....	6
4. Existing Utility Services .....	7
4.1 Incoming Electrical Supply .....	7
4.2 Telecommunications .....	7
4.3 Hydraulic Services.....	8
5. Proposed Infrastructure & Augmentation.....	10
5.1 Electricity Supply .....	10
5.2 Telecommunications .....	10
5.3 Hydraulic Services.....	11
6. Conclusion .....	14
7. Integrated Water Management Plan .....	15
Appendices.....	16
Correspondence – Dial Before You Dig Summary .....	16
Correspondence – Electricity Supply .....	17
Correspondence – Telecommunications .....	19
Correspondence – Hydraulic Services – Water & Sewer .....	20
Correspondence – Hydraulic Services - Natural Gas .....	22

# 1. INTRODUCTION

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## 1.1 Proposed Redevelopment

Picton HS will provide permanent teaching spaces (classroom space) for 1500 students and core facilities (common amenities – library, hall, recreational facilities etc) are proposed for 2000 students. Accordingly, the school would accommodate for a maximum 1500 students at commencement of operation. The preliminary masterplan concept suggests a progressive layout of the school to be organised in specific disciplinary and resource hubs. This is to be achieved through the development of new buildings, refurbishment of retained buildings and transforming aspects of the landscape and accessibility.

The capital works upgrade to Picton High School is to facilitate increased student numbers.

- The upgrade project is planned to provide an additional 1500 student capacity with core facilities incorporated to accommodate 2000 students (COLA, administration, halls, optional facilities, student/staff and support facilities).
- The work may be included, but is not limited to the below which will be developed throughout the design phases;
  - Demolition of various existing buildings
  - Construction of new administration facility;
  - Expansion of existing core facilities
  - Construction of new core facilities
  - New special education facility
  - Upgrade to existing bus pickup and drop-off
  - Establish temporary school for decanting of students and staff during construction

## 2. SEARS ISSUES ADDRESSED

This report addresses how the proposed project addresses Item 13 of the SEARs and outlines strategies relating to Utilities. These requirements are outlined below alongside where the response to each can be found within this report;

Item	Action to Address The Requirement	Report Location
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.	This IMP report details the existing hydraulic and electrical services infrastructure available to service the proposed Picton High School Redevelopment. This report also includes details regarding any augmentation / amplifications required to service the proposed high school development	Section 4 & 5.
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.	Section 6 of this report describes the various alternative water supplies proposed to be used within the proposed high school to offset the use of potable water services.	Section 6

Note: All items relating to stormwater and drainage including Water Sensitive Urban design Report shall be within the report prepared by the Civil Engineer (Bonacci Group).

### 3. SITE DESCRIPTION

Picton High School is an educational facility located at 480 Argyle St (Old Hume Highway), Picton NSW 2571 within the Wollondilly Shire Council area. The school in its current stage is made up of separate buildings, demountables, sporting fields and agricultural land. The school has been gradually expanded at different stages since 1958 to accommodate the growing student cohort. There are approximately 1,000 students presently enrolled in between years 7-12.

The site is amidst a range of land uses, with residential housing to its North, commercial buildings to the South and rural land to the West.



**Figure 1: Site Location**



## 4. EXISTING UTILITY SERVICES

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### 4.1 Incoming Electrical Supply

The site is served by a direct distributor from a local kiosk substation No S28744 located outside the school fence along Argyle Street.

The kiosk substation seemed to be recently constructed and it appears to serve the school's existing main switchboard located in the workshop. This substation also feed a number of nearby residential properties.

The substation has a 500kVA transformer which has a maximum capacity of 800Amp per phase.

The existing consumers main cable is 800Amp rated and runs underground to the main switchboard.



### 4.2 Telecommunications

Based on Northrop's interpretation of the supplied DBYD information and further site investigations, we have identified existing utility telecommunications services in the immediate vicinity of the Picton High School development. Utility telecommunications cabling is generally installed in underground conduits on street verges, with regular access points through pits along Argyle Street.

These services include:

- NBN – Existing NBN ducts reticulate on both parallels of Argyle Street. NBN trenches/ducts and cables are shared with Telstra services due to NBN taking ownership of the existing Telstra copper network in Picton. The ducts contain NBN backbone fibre optic cable and NBN customer copper cabling (shared with Telstra for premises not yet converted to NBN). NBN does not currently service the 480 Picton Road (Picton High School) site, as it exists on the edge of the rollout map.
- Telstra – As per the above point regarding existing NBN services, Telstra services coexist with NBN services running along both parallels of Argyle Street. NBN/Telstra customer copper cabling runs parallel to the Picton



High School site. The School is served by a Telstra lead-in conduit which contains copper services and private fibre services (carrying Department of Education WAN traffic) through the School's existing pit and conduit network, terminating in the main communications room (in the library).

- Other Services – According to the information given on DBYD, no other communications services (private fibre, dark fibre or otherwise) are known to traverse the vicinity of the Picton High School site. This does not resolve the Contractor of their responsibility to conduct a thorough survey of all areas of excavation and ensure that no existing services shall be disrupted.

## 4.3 Hydraulic Services

### 4.3.1 Sewer Services

The site is currently served by a 150 mm diameter Sydney Water sewer main that traverses north-south through the central portion of the site. Two Sydney Water sewer manholes are located near the north and south boundaries of the site respectively.

The existing buildings are served by an internal site sewer drainage system. The sewer currently incorporates no sewer pump out stations and the sewer is of a gravity design.

The existing sewer will be modified to accommodate the temporary structures on an ad hoc basis. Connections will be from the existing system to building connection points. Temporary buildings will be served by a gravity sewer system.

### 4.3.2 Water Services

The site is currently served by a 200 mm diameter Sydney Water water main within Argyle Street. The existing water meter is located on the western boundary of the site.

The current buildings are served by a single water meter which subsequently feeds multiple building feeds. The existing meter size is 50 mm. The existing water system consists of a distributed pipe network underground to feed the various buildings.



*Existing Water Meter*

The existing water system will be modified to accommodate the temporary structures on an ad hoc basis. Connections be from the existing system to temporary building connections points. Northrop have received the pressure and flow information from Sydney Water for the 200mm water main within Argyle Street. Refer appendix

#### 4.3.3 Gas Services

Natural gas is supplied from a 160 mm 300 kPa nylon Jemena natural gas main within Argyle Street. The complex has a single gas meter and regulator located on the western boundary.

The existing system runs throughout the site with an operating pressure of 35 kPa. Each building is currently served with a 1.38 kPa step-down regulator for supplying hot water plants and space heaters.



*Existing Gas Meter*

The temporary buildings gas requirements should be fed from the existing system. Each temporary building serviced should have a step-down regulator and own dedicated connection point. The gas supply should reticulate through the temporary school area for this service.

## 5. PROPOSED INFRASTRUCTURE & AUGMENTATION

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### 5.1 Electricity Supply

We estimated the new school's power demand based on AS3000 Table C1.

Our calculation was carried out using VA/m<sup>2</sup> in Table C1 allowing the following:

- General lighting: 10W/m<sup>2</sup>
- General power: 40W/m<sup>2</sup>
- General power for workshops, hospitality and kitchens type areas as well as canteen: 300W/m<sup>2</sup>
- Air conditioning to administration and special education areas only: 45W/m<sup>2</sup>.
- Ventilation: 5W/m<sup>2</sup>
- External lighting 3W/m<sup>2</sup>

Our calculations indicate that the new school will require 1780Amp/phase supply plus another 200Amp/phase for the existing Multipurpose Hall and Workshop. Total power requirement for the site is 1980 Amp/phase.

The existing substation has only 800Amp/phase capacity, thus a new substation with 1500kVA transformer and 2000Amp/phase capacity is recommended. The new substation has to be located close to the new building where the majority of loads are.

We do not recommend to upgrade the existing 500kVA substation's transformer for the following reasons:

- a) Endeavour Energy regulations is that the maximum distance from a substation to a main switchboard shall not be more than 50m. The existing substation will be more than 50m away from the new building.
- b) It is best practice to install a new power supply close to major loads i.e. near the new building.
- c) The temporary school will require the entire electrical capacity of the existing substation.
- d) The existing substation, if upgraded, would be too far away from the new building. The new 2000Amp/phase consumers main cable would be over 100m long requiring multiple, parallel and very large cables due to voltage drop. The cost of installing 3 sets of 500mm<sup>2</sup> copper cables per phase and neutral (16 cables in total) would be extremely costly.

The temporary school will be served by the 500kVA existing substation. The existing substation does not have sufficient capacity to feed the entire temporary school. This due to the large amount of air conditioning units in the demountable buildings. (The existing school has partial air-conditioning).

The construction of the new 1500kVA substation therefore has been accelerated in order to have power ready to supplement the temporary school's power need as well as having construction power ready for the new school ready.

Once the temporary school moves into the new school, the existing consumers main cable will be disconnected and removed.

### 5.2 Telecommunications

Required alterations to suit the Picton High School redevelopment shall be considered throughout the design development stage. In coordination with the Department of Education ICT Directorate, the project will be registered with Telstra to achieve the desired connection requirements for the site.

The existing site is sufficiently served by Telstra private fibre infrastructure, however, new construction works and relocation of the Campus Distributor to the front-facing (Argyle Street) side of the building warrant the connection of new Telstra private fibre. Preliminary assessment indicates that the new lead-in connection will come from the

existing Telstra pits on the site's north, on Argyle Street. New lead-in conduits will be designed to upturn at the location of the new Campus Distributor/Main Communications Room.

It is imperative that the existing telecommunications services are not disrupted by the demolition and excavation works required to construct the New School phase of works. The project team is operating a 'Temporary School' with communications facilities using the existing library as an entry node. Demolition works on the Argyle Street side of the development may warrant the relocation of on-site Telstra pits and/or infrastructure, which must remain active throughout the life of the project. New cable connections from Telstra will reticulate underground from existing street pits to the new building in wholly new infrastructure.

Northrop does not envisage any direct impact on street telecommunications services with respect to the new works.

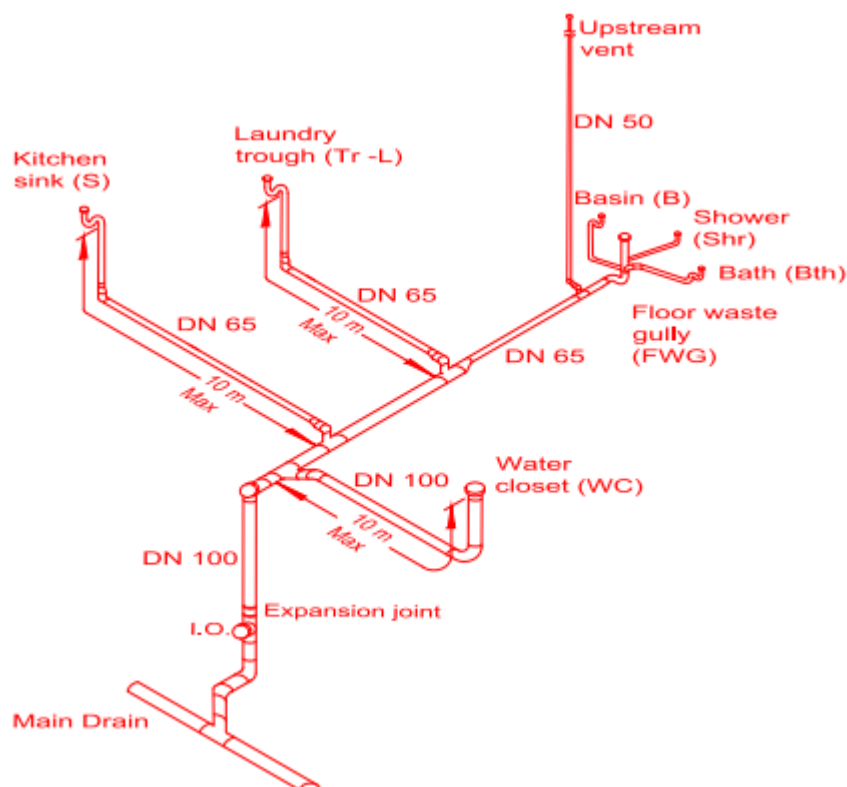
## 5.3 Hydraulic Services

### 5.3.1 Sewer Services

The proposed sewer system will incorporate the existing where feasible. The existing buildings sewer connections will be maintained throughout construction. New buildings that are projected to be constructed in close proximity to the Sydney Water sewer main will have to be evaluated by Sydney Water. An out of scope building plan will need to be lodged with Sydney Water and a corresponding Services Protection Report shall be prepared to satisfy Sydney Water's requirements for building over / adjacent to the existing sewer main.

Determination of the Sydney Water sewer main capacity will be confirmed after lodgement of the section 73. For initial assessment. There is a potential for need to upgrade the Sydney Water sewer main depending upon sewer main capacity. This will be confirmed by Sydney Water within the Notice of Requirements further to the Section 73 application to be made to Sydney Water upon receipt of DA.

New buildings within the site will gravitate to the existing sewer main utilizing internal stack and in-ground drainage.





### *Typical Elevated Drainage*

This type of system comprises of an upstream vent, first floor fixtures connected by drainage principals and subsequently connecting to the main drain. This style of plumbing system is acceptable for buildings with a rise of no more than 4 stories.

A gravity pipework system shall connect all upstream elevated drainage pipework stacks and sanitary fixtures within the building making connection to Sydney Water sewer infrastructure.

Sewer pump stations will be used to collect waste flows not able to be drained to the in ground system via gravity. A vent pipe shall extend from the sewer pump station through the building to discharge above roof level.

### 5.3.2 Water Services

The proposed water system will entail upgrading the meter to feed the redeveloped site. The water system will be reutilized where feasible. The existing building connections will be maintained throughout construction. Due to the pressure within the mains, a triplex cold water pumpset will be required to boost pressures throughout the complex. Due to the Sydney water main being 200 mm, there should be significant capacity and no upgrades are foreseen for the supply line. The evaluation of water main capacity will be determined by Sydney Water upon the section 73 application to be lodged with Sydney Water upon receipt of DA.



*Typical Building Services Cold Water Pump Set*

### 5.3.3 Gas Services

The proposed development will entail upgrading the meter and regulator to accommodate the increased demand. Jemena have verbally confirmed that the existing main has sufficient supply for the proposed development but this is subject to final gas loads. Gas service will be provided throughout by a reticulated supply which will feed new hot water plants, laboratories, mechanical plants, and internal gas heaters. Gas supply will also have point of connections within laboratories for use by the classroom. Each laboratory and the main supply will be supplied with a System 3 safety measure for automatic gas shut-off.



*Existing Emergency Shut Off*



## 6. CONCLUSION

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The Services Infrastructure Management Plan for Electrical, Telecommunications and Hydraulic services for the proposed development for Picton High School, located at 480 Argyle Street, Picton NSW 2571, addresses the Secretary's Environmental Assessment Requirements (SEARs) issued for the project.

The site can be adequately serviced by the power supply authority, Endeavour Energy; the telecommunications authority, Telstra (and NBN if required), Sydney Water and Jemena.

## 7. INTEGRATED WATER MANAGEMENT PLAN

This section details the proposed alternative water supply proposed to be used within Picton High School.

The existing high school currently has rainwater reuse in the form of downpipe collection.

### 7.1.1 Existing Rainwater Reuse

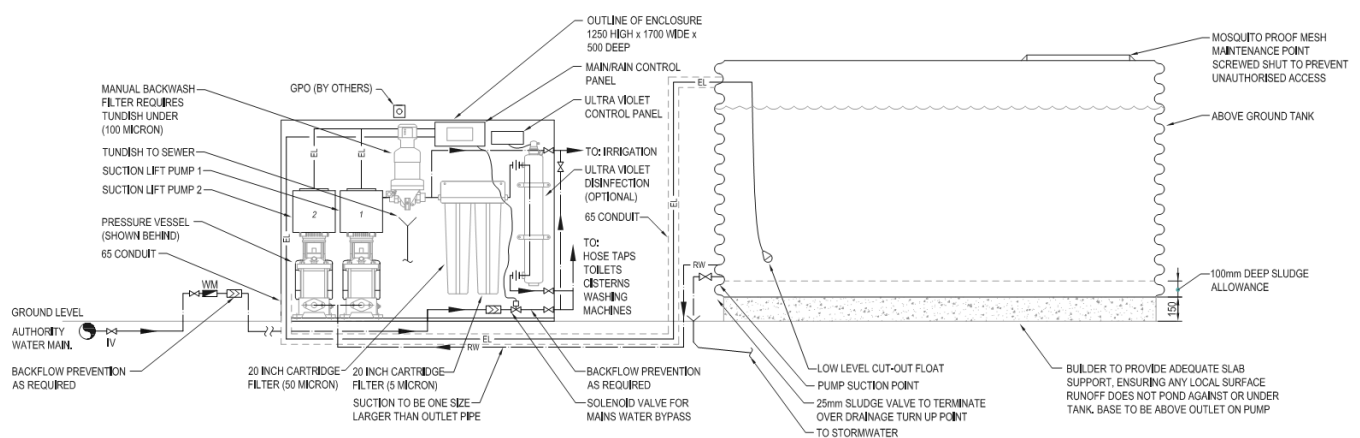
The existing site and temporary school area are implementing rainwater reuse in the form of spot rainwater reuse tanks which service various grey water uses though out the facility.



*Existing Rainwater Reuse Tank*

### 7.1.2 Proposed Rainwater Reuse

If rainwater reuse is implemented, a rainwater tank will be installed aboveground in close proximity to the OSD system. The intent is to collect majority of the roof areas. Other components are the pumpset and filtration system. The above ground tank will be in a position to provide visually stimulating reminder of sustainability efforts undertaken by the school. Collection of water will be through the roof stormwater system. Rainwater pumpset will be provided adjacent to the rainwater tank to supply water from the tank to irrigation and other rainwater reuse points. Final sizing and system configuration is pending DA.



*Typical Rainwater Reuse System*

## APPENDICES

### Correspondence – Dial Before You Dig Summary



**Job No 11759299**

Phone: 1100  
www.1100.com.au

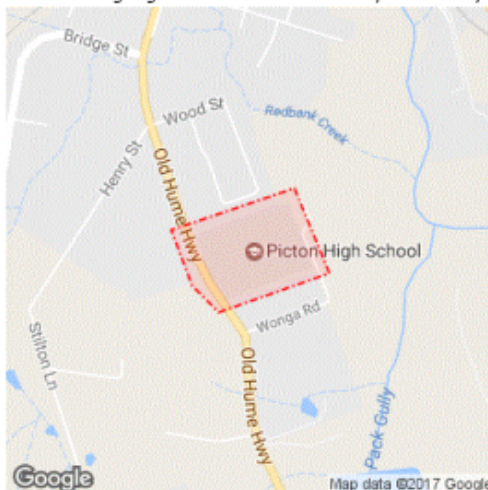
#### Caller Details

**Contact:** Mr Scott Murray  
**Company:** Northrop Engineers  
**Address:** Northrop Engineers 60 Hickson  
Sydney NSW 2000

**Caller Id:** 1171688  
**Mobile:** Not Supplied  
**Email:** scottm@northrop.com.au  
**Phone:** 0292414188  
**Fax:** Not Supplied

#### Dig Site and Enquiry Details

**WARNING:** The map below only displays the location of the proposed dig site and does not display any asset owners' pipe or cables. The area highlighted has been used only to identify the participating asset owners, who will send information to you directly.



**User Reference:** Picton High School  
**Working on Behalf of:** Private  
**Enquiry Date:** 19/01/2017  
**Start Date:** 24/01/2017  
**End Date:** 24/01/2017  
**Address:** 480 Argyle Street  
Picton NSW 2571  
**Job Purpose:** Design  
**Onsite Activity:** Tendering  
**Location of Workplace:** Private Property  
**Location in Road:** Not Supplied

- Check that the location of the dig site is correct. If not you must submit a new enquiry.
- Should the scope of works change, or plan validity dates expire, you must submit a new enquiry.
- Do NOT dig without plans. Safe excavation is your responsibility. If you do not understand the plans or how to proceed safely, please contact the relevant asset owners.

**Notes/Description of Works:**  
Not Supplied

#### Your Responsibilities and Duty of Care

- If plans are not received within 2 working days, contact the asset owners directly & quote their Sequence No.
- ALWAYS perform an onsite inspection for the presence of assets. Should you require an onsite location, contact the asset owners directly. Please remember, plans do not detail the exact location of assets.
- Pothole to establish the exact location of all underground assets using a hand shovel, before using heavy machinery.
- Ensure you adhere to any State legislative requirements regarding Duty of Care and safe digging requirements.
- If you damage an underground asset you MUST advise the asset owner immediately.
- By using this service, you agree to Privacy Policy and the terms and disclaimers set out at [www.1100.com.au](http://www.1100.com.au)
- For more information on safe excavation practices, visit [www.1100.com.au](http://www.1100.com.au)

#### Asset Owner Details

The assets owners listed below have been requested to contact you with information about their asset locations within 2 working days. Additional time should be allowed for information issued by post. It is **your responsibility** to identify the presence of any underground assets in and around your proposed dig site. Please be aware, that not all asset owners are registered with the Dial Before You Dig service, so it is **your responsibility** to identify and contact any asset owners not listed here directly.

\*\* Asset owners highlighted by asterisks \*\* require that you visit their offices to collect plans.

# Asset owners highlighted with a hash require that you call them to discuss your enquiry or to obtain plans.

Seq. No.	Authority Name	Phone	Status
58314569	Endeavour Energy	0298534161	NOTIFIED
58314571	Jemena Gas Country	1300880906	NOTIFIED
58314573	NBN Co, NswAct	1800626762	NOTIFIED
58314572	Sydney Water	132092	NOTIFIED
58314570	Telstra NSW, Central	1800653935	NOTIFIED

END OF UTILITIES LIST

## Correspondence – Electricity Supply

If further clarification is required, please contact:  
 Endeavour Energy  
 Phone: (02) 9853 4161 (8:00am-4:30pm Mon-Fri)  
**Emergency Phone Number: 131 003**



### DBYD Underground Search Report

Date: 19/01/2017

DBYD Sequence No: 58314569

DBYD Job No: 11759299

### ENDEAVOUR ENERGY ASSETS AFFECTED

To:	Mr Scott Murray	Company:	Northrop Engineers
Address:	Northrop Engineers 60 Hickson, Sydney, NSW 2000		
Cust. ID:	1171688	Email:	scottm@northrop.com.au
Phone:	0292414188	Mobile:	Not Supplied
		Fax:	Not Supplied
Enquiry Location:	480 Argyle Street, Picton, NSW 2571		

Our Search has shown that **UNDERGROUND ASSETS ARE PRESENT** on our plans within the nominated enquiry location. This search is based on the graphical position of the excavation site as denoted in the DBYD customer confirmation sheet.

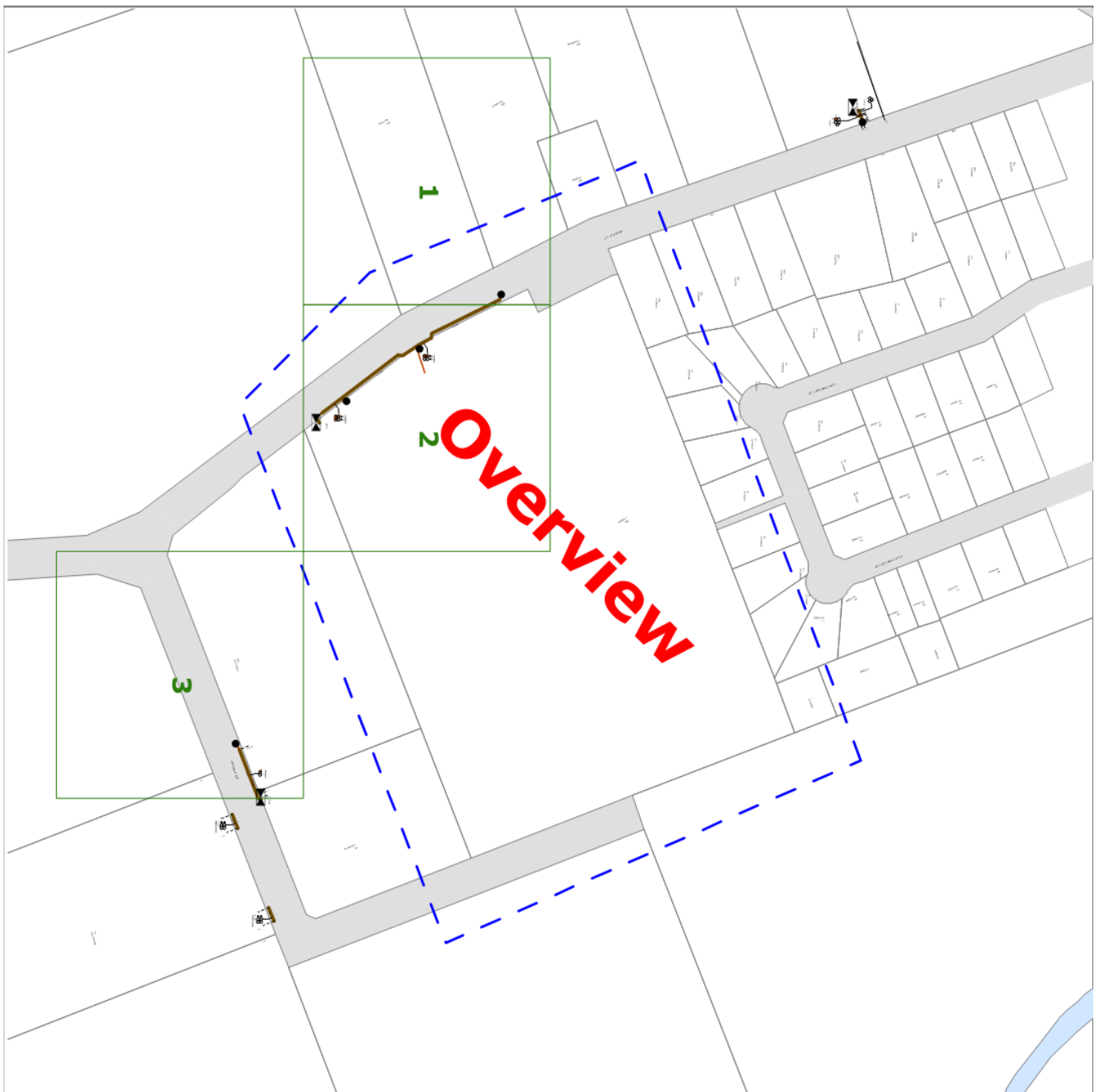
### WARNING

- **All electrical apparatus shall be regarded as live until proved de-energised.** Contact with live electrical apparatus will cause severe injury or death.
- In accordance with the *Electricity Supply Act 1995*, you are obliged to report any damage to Endeavour Energy Assets immediately by calling **131 003**.
- The customer must obtain a new set of plans from Endeavour Energy if work has not been started or completed within twenty (20) working days of the original plan issue date.
- The customer must contact Endeavour Energy if any of the plans provided have blank pages, as some underground asset information may be incomplete.
- Endeavour Energy underground earth grids may exist and their location **may not** be shown on plans. Persons excavating are expected to exercise all due care, especially in the vicinity of padmount substations, pole mounted substations, pole mounted switches, transmission poles and towers.
- Endeavour Energy plans **do not** show any underground customer service mains or information relating to service mains within private property.
- Asbestos or asbestos-containing material may be present on or near Endeavour Energy's underground assets.
- Organo-Chloride Pesticides (OCP) may be present in some sub-transmission trenches.
- All plans must be printed and made available at the worksite where excavation is to be undertaken. Plans must be reviewed and understood by the crew on site prior to commencing excavation.

### SUPPLEMENTARY MATERIAL

Material	Purpose	Location
DBYD Cover Letter	Endeavour Energy DBYD response Cover Letter	Attached
DBYD Important Information & Disclaimer	Endeavour Energy disclaimer, responsibilities and information on understanding plans	Attached
DBYD Response Plans	Endeavour Energy DBYD plans	Attached
Work Cover NSW "Work near underground assets: Guide"	Guideline for anyone involved in construction work near underground assets	Contact Work Cover NSW for a copy
Work Cover NSW "Excavation work: Code of practice"	Practical guidance on managing health and safety risks associated with excavation	<a href="#">URL [Click Here]</a>
Safe Work Australia "Working in the vicinity of overhead and underground electric lines guidance material"	Provides information on how to manage risks when working in the vicinity of overhead and underground electric lines at a workplace	<a href="#">URL [Click Here]</a>
Endeavour Energy Safety Brochures & Guides	To raise awareness of dangers of working on or near Endeavour Energy's assets	<a href="#">URL [Click Here]</a>





#### WARNING

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- Contact with live electrical apparatus will cause severe injury or death.
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- Organo-Chloride Pesticides (OCP) may be present in some sub-transmission trenches.
- All plans must be printed and made available at the worksite where excavation is to be undertaken. Plans must be reviewed and understood by the crew on site prior to commencing excavation.









#### INFORMATION PROVIDED BY ENDEAVOUR ENERGY

- Any plans provided pursuant to this service are intended to show the approximate location of underground assets relative to road boundaries, property fences and other structures at the time of installation.
- Depth of underground assets may vary significantly from information provided on plans as a result of changes to road, footpath or surface levels subsequent to installation.
- Such plans have been prepared solely for use by Endeavour Energy staff for design, construction and maintenance purposes.
- All enquiry details and results are kept in a register.

#### DISCLAIMER

Whilst Endeavour Energy has taken all reasonable steps to ensure that the information contained in the plans is as accurate as possible it will accept no liability for inaccuracies in the information shown on such plans.

#### LEGEND

-  Street light column
-  Padmount substation
-  Overground pillar (O.G. Box)
-  Underground pit
-  Duct run
-  Cable run
-  Typical duct section
-  Asbestos warning

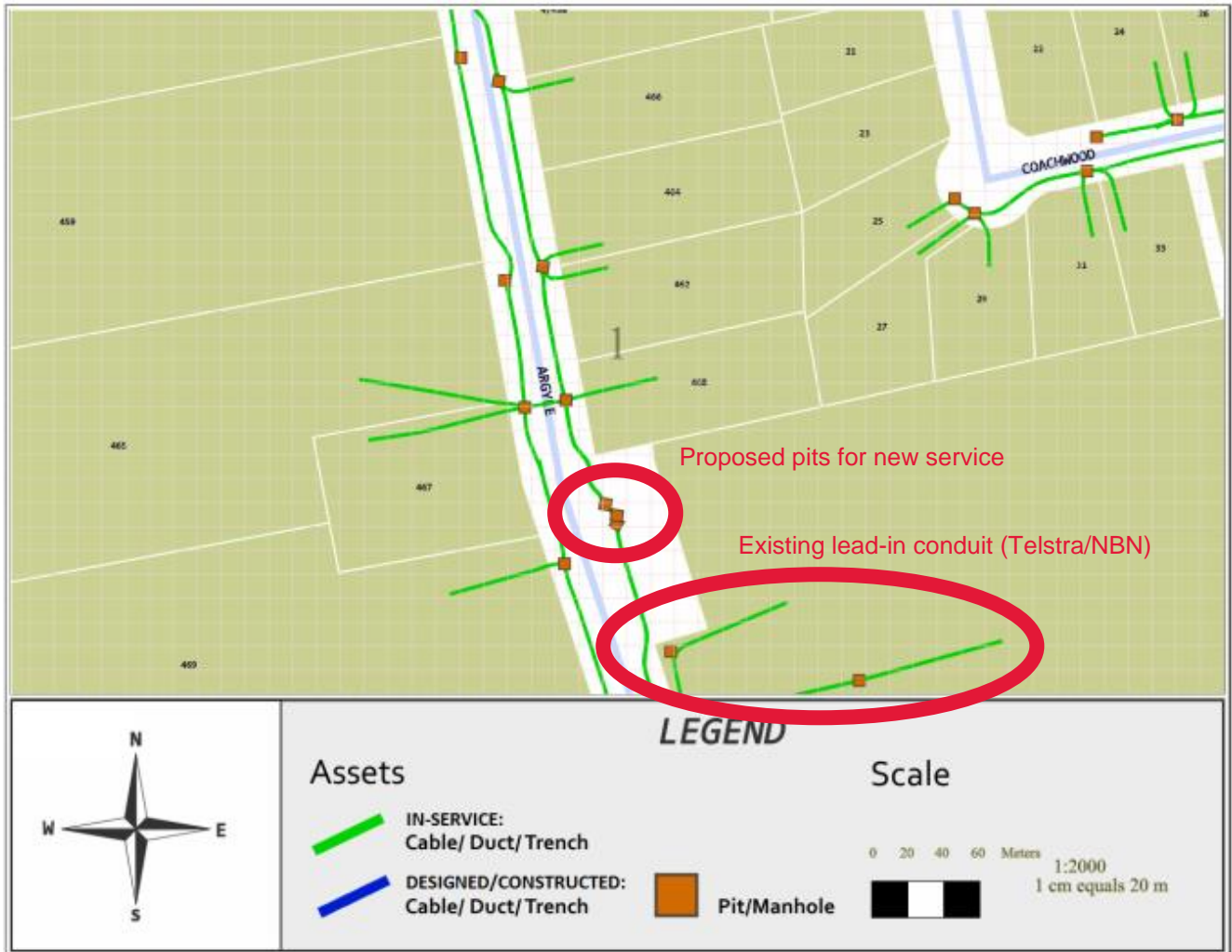
#### NOT TO SCALE



DBYD Sequence No.:	58314569
Issued Date:	19/01/2017

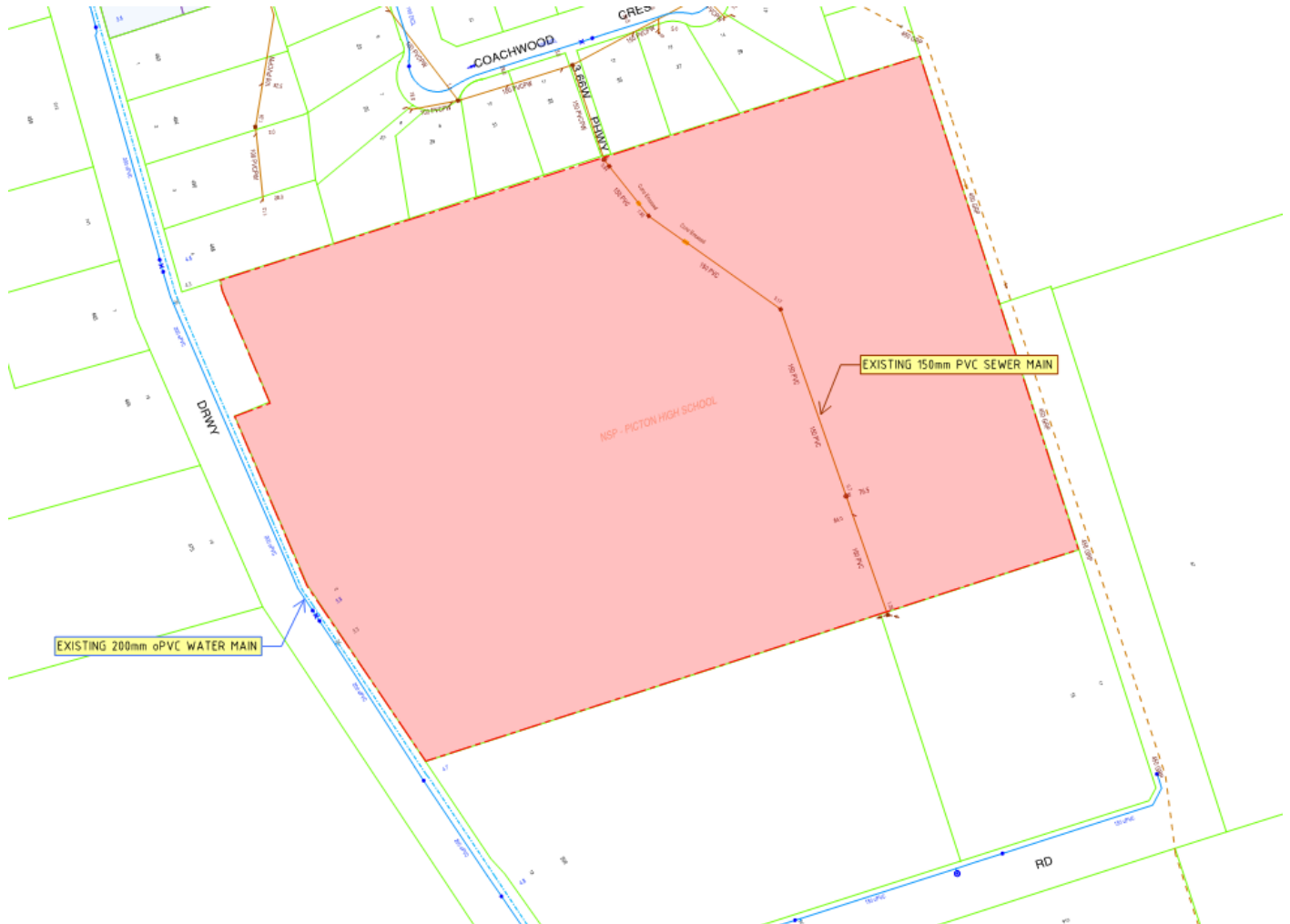
Cadastral: © Land and Property Information 2015, 2016

Correspondence – Telecommunications





Correspondence – Hydraulic Services – Water & Sewer



## Statement of Available Pressure and Flow

**Juan Ruiz**  
**345 George St**  
**Sydney, 2000**

**Attention: Juan Ruiz**

**Date: 21/02/2017**

**Pressure & Flow Application Number: 182648**

**Your Pressure Inquiry Dated: 2017-01-24**

**Property Address: Argyle St, Picton 2571**

The expected maximum and minimum pressures available in the water main given below relate to modelled existing demand conditions, either with or without extra flows for emergency fire fighting, and are not to be construed as availability for normal domestic supply for any proposed development.

### ASSUMED CONNECTION DETAILS

Street Name: Remembrance Driveway	Side of Street: East
Distance & Direction from Nearest Cross Street	180 metres North from Wonga Road
Approximate Ground Level (AHD):	220 metres
Nominal Size of Water Main (DN):	200 mm

### EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	128 metre head
Minimum Pressure	29 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	28
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5	29
	10	25
	11	24
Fire Installations based on peak demand (Pressure expected to be maintained with flows)	5	25
	10	22
Maximum Permissible Flow	11	21

(Please refer to reverse side for Notes)

**For any further inquiries regarding this application please email :**

[connections@sydneywater.com.au](mailto:connections@sydneywater.com.au)

## Correspondence – Hydraulic Services - Natural Gas

