



# ***St Aloysius' College – Project Magis***

## Infrastructure Management Plan



**Plan Magis**  
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## REPORT AUTHORISATION

**PROJECT: ST ALOYSIUS' COLLEGE – PROJECT MAGIS  
INFRASTRUCTURE MANAGEMENT PLAN**

**REPORT NO: SSAC0104-R006**

Date	Rev	Comment	Prepared by	Checked by	Authorised by
20/12/17	A	Draft	RH/RMcE/PJ	AA	PJ
19/01/18	B	Revised Draft	RH/RMcE/PJ	AA	PJ
13/02/18	C	For Client Review	RH/RMcE/PJ	AA	PJ
19/03/18	D	Standards of Limitation Statement updated	RH/RMcE/PJ	AA	PJ

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## EXECUTIVE SUMMARY

This Infrastructure Management Plan has been prepared by Umow Lai on behalf of St Aloysius' College (the 'Applicant'). It accompanies an Environmental Impact Statement (EIS) prepared in support of State Significant Development Application SSD-8669 for the redevelopment of 'St Aloysius' College' (the 'Site').

St Aloysius' College is proposing to undertake redevelopment works across three campuses located in Kirribilli, Lower North Shore, Sydney, NSW. These campuses are described as;

- Main Campus
- Wyalla Senior Campus
- Junior Campus

It is envisaged that works will be carried out over multiple stages.

Landscaping and pedestrian improvements throughout the site are also included, such as new outdoor learning and play areas located on the proposed roof terrace of the Main Campus on Upper Pitt Street.

The School will contain high quality classrooms, collaborative learning spaces, open play spaces and associated facilities including a sports facility, multi-purpose hall, as well as a library and canteen.

The purpose of this report is to make recommendations regarding available infrastructure and required upgrade works for the following services;

- Water Supply for Potable Use
- Water Supply for Fire Services
- Sewer Drainage
- Natural Gas Supply
- Electrical Supply
- Communications Services

The proposed development has been assessed against all relevant standards/guidelines, including the following:

- Sydney Water Regulations
- Jemena Natural Gas Regulations
- Ausgrid Regulations
- North Sydney City Council
- SEARs Application number SSD-8669, relevant clauses;

### *14. 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*



The Infrastructure Assessment has identified the following key findings/conclusions and recommendations for the **Main Campus**:

- The existing Water Main infrastructure and supply connection is adequately sized for potable water supply to the proposed development. A Sydney Water compliant backflow prevention device is to be installed directly downstream of the Sydney Water Meter.
- The existing hydrant system will be upgraded to be compliant with AS2419.1. This will include relocation of the Hydrant Booster to within sight of the Upper Pitt Street Entrance, and new Fire Water connection from the Upper Pitt St 150 mm dia water main
- The capacity of the existing sewer connection is adequate for the proposed development.
- The Natural Gas (NG) meter and regulator assembly will require upgrade to meet the increased NG demand.
- Ausgrid have provided preliminary advice that a new substation will be required to serve the site demand, based on the revised maximum demand summary. The proposed location is within the Wyalla Senior Campus, in the south eastern corner, adjacent to Upper Pitt Street. The low voltage feed would reticulate below Upper Pitt Street towards a new Site Main Switch Board (SMSB). The new SMSB is proposed to serve the new build area on the east of the site and to serve the existing main switchboard on LG3 off Jeffreys Street.

The Infrastructure Assessment has identified the following key findings/conclusions and recommendations for the **Wyalla Senior Campus**:

- The existing Water Main infrastructure and supply connection is adequately sized for potable water supply to the proposed development.
- The capacity of the existing fire water supply infrastructure is suitable for the proposed development works, however, a new substation is proposed to be installed within the Senior campus in the south east corner of the site. The proposed location of the substation is within 10m of the existing booster assemblies. It is therefore proposed to relocate the booster assemblies to maintain 10m clearance of the proposed substation.
- The capacity of the existing sewer connection is adequate for the proposed development.
- The capacity of the existing NG infrastructure is suitable as there is no additional gas equipment proposed, however, a new substation is proposed to be installed within the Wyalla Senior campus in the south east corner of the site. The proposed location of the substation is within 10m of the existing NG meter and regulator assembly. It is therefore proposed to relocate the NG meter and regulator assembly to maintain 10m clearance of the proposed substation.
- The capacity of the existing power supply is adequate for the proposed development. The proposed new substation for the Main Campus is planned to be located on the Wyalla Campus.

The Infrastructure Assessment has identified the following key findings/conclusions and recommendations for the **Junior Campus**:

- The existing Water Main infrastructure and supply connection is adequately sized for potable water supply to the proposed development.
- Fire hydrant coverage is to be provided by external hydrants if coverage can be achieved with the final architectural layout. Alternatively, an on site hydrant system will be provided, supplied from the Burton St water main.



- It is proposed to divert the existing 225 dia sewer that currently crosses through the site from Crescent Place to Humphrey Place. The proposed diversion would direct the sewer in a north west direction, to discharge to the Burton Street main.
- The capacity of the existing Natural Gas supply is adequate for the proposed development.
- The existing electrical supply to the Junior Campus is rated at 225A and is provided with a solar PV installation with a rating of approximately 12kW. Energy billing data from September 2017 indicates that the maximum demand is approximately 100A. This indicates that there is approximately 40-50% of rated capacity as spare.
- Historical billing data for this site is not available via the online Ausgrid portal, as such further monitoring is advised and energy usage should be considered during the design of the new build area.
- The new build area should employ low energy use, high efficiency elements and where possible, natural ventilation strategies should be employed during the design development period to remain within the estimated spare capacity.





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## 1.0 INTRODUCTION

### 1.1 SITE INFORMATION

St Aloysius' College features three campuses within the suburb of Kirribilli, NSW. These campuses are described as;

**Main Campus** – Located at 47 Upper Pitt St, accommodates the Secondary School and main administration, and comprises a multi-storey building constructed in stages in the 1960's and 70's. The buildings are built up to the street frontage boundaries on three sides and enclose a central courtyard.

**Wyalla Senior Campus** – Located on the opposite side of Upper Pitt St to the above noted Upper Pitt St Main Campus. Wyalla accommodates the Year 12 campus and Dalton Hall, which comprises an indoor pool and sports facility. "Wyalla" is a heritage item dating from the 1880's, whilst Dalton Hall was completed within the last 10 years.

**Junior Campus** – Located at 29 Burton St and accommodates the Year 3-6 students. The site contains the former Milsons Point Primary School, which is a heritage item, and newer buildings constructed in the 1990's and 2000's.



**Figure 1** Campus Location Site Image



## 1.2 POPULATION

The existing population (pre development) and proposed population (post development) for each campus is;

**Table 1** Pre and Post Development Population

<b>Campus</b>	<b>Pre Development Population</b>	<b>Post Development Population</b>
<i>Main Campus</i>	Students: 769 Staff: 114	Students: 769 Staff: 114
<i>Wyalla Senior Campus</i>	Students: 154 Staff: 23	Students: 154 Staff: 23
<i>Junior Campus Years 3 - 6</i>	Students: 321 Staff: 48	Students: 321 Staff: 48

The proposed redevelopment is not intended to increase the student population.





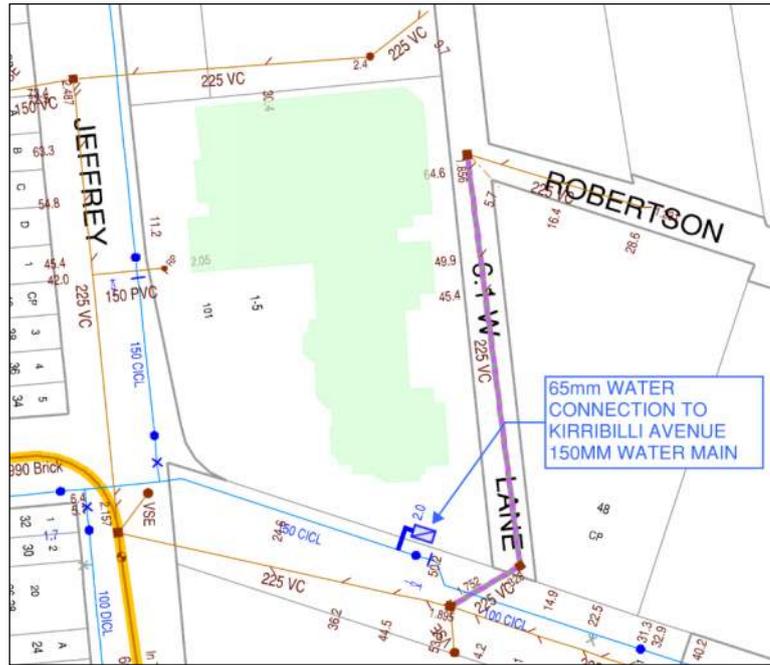


Figure 3 Senior Campus Potable Water Main Connection

### 2.1.3 Junior Campus

Potable Water is supplied to the Junior Campus from the 250mm dia Sydney Water main in Burton Street on the northern side of the site. A 50mm dia connection extends from the water main to the site. The site's water meter assembly is external to the building, perpendicular to the main connection and features a 50mm meter and backflow prevention device.

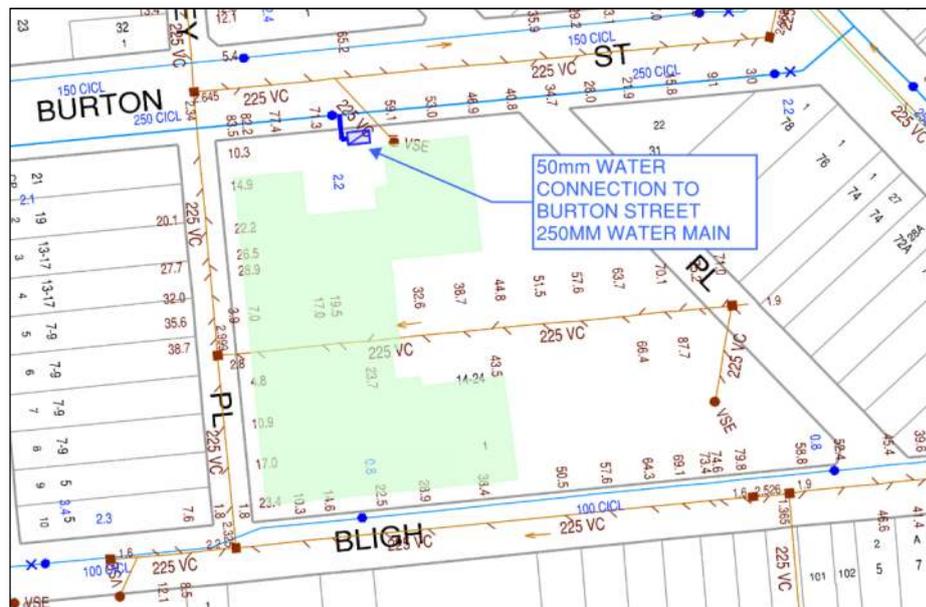


Figure 4 Junior Campus Potable Water Main Connection



## 2.2 EXISTING CAPACITY AND PROPOSED DEMANDS

Capacity of existing water mains flow and pressure have been provided by Sydney Water. Refer to Appendix B – Sydney Water Flow and Pressure Enquiry.

### 2.2.1 Main Campus

#### Existing Mains Connection Capacity

The existing 65mm supply from the 150mm water main in Kirribilli Avenue will supply a maximum peak flow of 8.5 l/s

#### Existing and Proposed Campus Demand

The capacity of water demand from Sydney Water infrastructure is assessed via an Equivalent Population (EP) calculation unit.

The modelled existing and proposed Main Campus potable water flow demands are summarised in the table below;

**Table 2** Main Campus Potable Water Demand

<i>Application</i>	<i>Existing (pre development)</i>	<i>Proposed (post development)</i>
Student Population	769	769
Staff Population	114	114
EP	88	88
Max KL / Day	17.6	17.6
Peak Probable Simultaneous Demand (PSD)	4.0 l/s	4.0 l/s

The population of the Upper Pitt St Campus is not intended to be increased following the proposed development, therefore there is no projected uplift in potable water demand.

### 2.2.2 Wyalla Senior Campus

#### Existing Mains Connection Capacity

The existing 50mm supply from the 150mm water main in Upper Pitt Street will supply a maximum peak flow of 5.5 l/s

#### Existing and Proposed Campus Demand

The capacity of water demand from Sydney Water infrastructure is assessed via an Equivalent Population (EP) calculation unit.

The modelled existing and proposed Main Campus potable water flow demands are summarised in the table overleaf;



**Table 3** Senior Campus Potable Water Demand

<b>Application</b>	<b>Existing (pre development)</b>	<b>Proposed (post development)</b>
Student Population	154	154
Staff Population	23	23
EP	18	18
KL / Day	3.5	3.5
Peak Probable Simultaneous Demand (PSD)	1.2 l/s	1.2 l/s

The population of the Senior Campus is not intended to be increased following the proposed development, therefore there is no projected uplift in potable water demand.

### 2.2.3 Junior Campus

#### Existing Mains Connection Capacity

The existing 50mm supply from the 250mm water main in Burton Street will supply a maximum peak flow of 5.5 l/s

#### Existing and Proposed Campus Demand

The capacity of water demand from Sydney Water infrastructure is assessed via an Equivalent Population (EP) calculation unit.

The modelled existing and proposed Junior Campus potable water flow demands are summarised in the table below;

**Table 4** Junior Campus Potable Water Demand

<b>Application</b>	<b>Existing (pre development)</b>	<b>Proposed (post development)</b>
Student Population	321	321
Staff Population	48	48
EP	37	37
KL / Day	7.3	7.3
Peak Probable Simultaneous Demand (PSD)	2.3 l/s	2.3 l/s

The population of the Junior Campus is not intended to be increased following the proposed development, therefore there is no projected uplift in potable water demand.

## 2.3 PROPOSED INFRASTRUCTURE WORKS

With consideration to the above assessment of existing and proposed demands, our recommendation for upgrade to infrastructure and / or supply from infrastructure per campus follows.

A Section 73 application will be made to Sydney Water following SSSA assessment to confirm acceptance of the below proposed recommendations.



### **2.3.1 Main Campus**

The existing Water Main infrastructure and supply connection is adequately sized for potable water supply to the proposed development.

A Sydney Water compliant backflow prevention device is to be installed directly downstream of the Sydney Water Meter.

### **2.3.2 Wyalla Senior Campus**

The existing Water Main infrastructure and supply connection is adequately sized for potable water supply to the proposed development.

### **2.3.3 Junior Campus**

The existing Water Main infrastructure and supply connection is adequately sized for potable water supply to the proposed development.



## 3.0 WATER SUPPLY FOR FIRE APPLICATIONS

### 3.1 EXISTING AUTHORITY INFRASTRUCTURE

Capacity of existing water mains flow and pressure have been provided by Sydney Water. Refer to Appendix B – Sydney Water Flow and Pressure Enquiry.

#### 3.1.1 Main Campus

The main campus features a fire hydrant system, and a number of external window wetting sprinklers. These systems are supplied from two separate water mains connections.

Hydrant water is supplied from the Jeffreys Street 100mm dia Sydney Water main. A 100mm dia H-Pattern booster assembly is located adjacent to the LGF03 Foyer entrance. The existing booster assembly features a number of non-compliances, including

- No backflow device is installed in the incoming water supply
- No block plan is present at the booster
- The booster assembly is not in sight of the main entrance (as determined by the location of the Fire Indicator Panel)

A number of openings on the eastern perimeter wall are protected by external wall / window wetting sprinklers due to the proximity of the openings to the boundary and neighbouring property.

The system is supplied via a connection to the 150mm dia water main in Kirribilli Avenue. A Sprinkler booster point is located in the south-east corner of the site, fronting Kirribilli Avenue.

Presently, the campus does not feature an internal fire sprinkler protection system.

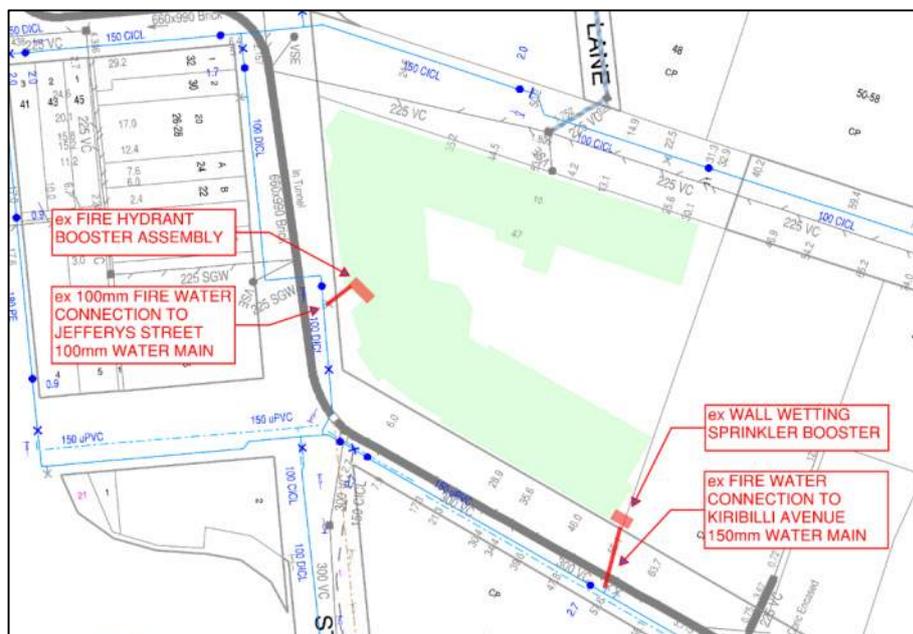


Figure 5 Main Campus Existing Fire Water Main Connections & Booster Positions

#### 3.1.2 Wyalla Senior Campus

The Wyalla Senior Campus features a fire hydrant system, and a number of external window wetting sprinklers. These systems are supplied from two separate and adjacent water mains connections from the Upper Pitt Street Water Main.



Each system features a 100mm dia booster assembly, located adjacent to the main connection on the Upper Pitt Street boundary.

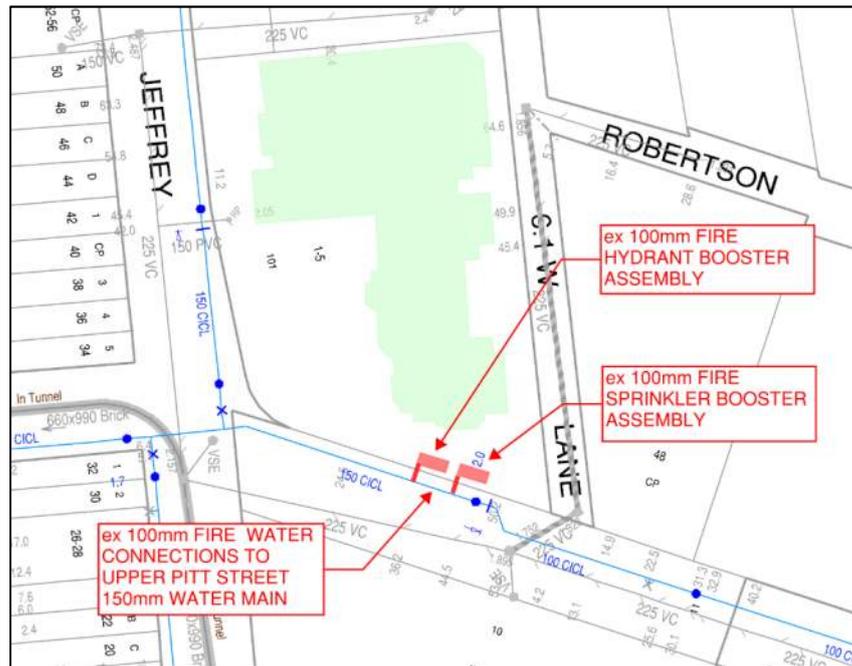


Figure 6 Senior Campus Existing Fire Water Infrastructure

**3.1.3 Junior Campus**

There are presently no on site fire hydrant or sprinkler protection systems. Hydrant protection to the Campus is achieved via street hydrants.

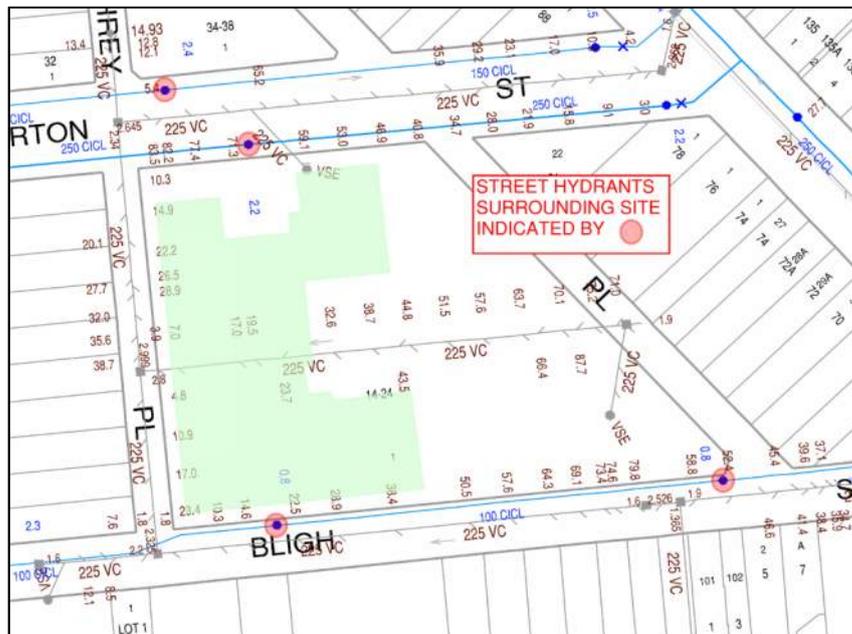


Figure 7 Junior Campus Existing Fire Water Infrastructure



## 3.2 PROPOSED INFRASTRUCTURE WORKS

### 3.2.1 Main Campus

An internal Sprinkler system is not proposed, as detailed in the Fire Safety Engineering Report.

The existing hydrant system will be upgraded to be compliant with AS2419.1. This will include;

- Relocate Hydrant Booster to within sight of the Upper Pitt Street Entrance
- New Fire Water connection from the Upper Pitt St 150 mm dia water main
- New backflow assembly to the new water connection
- Modification of pipework and landing valves to within fire stairwells
- Extension of system to serve new build areas.
- 25 kL water storage tank
- 2 x fire hydrant pump sets
- Pipework to be arranged in a ring main with monitored isolation valves

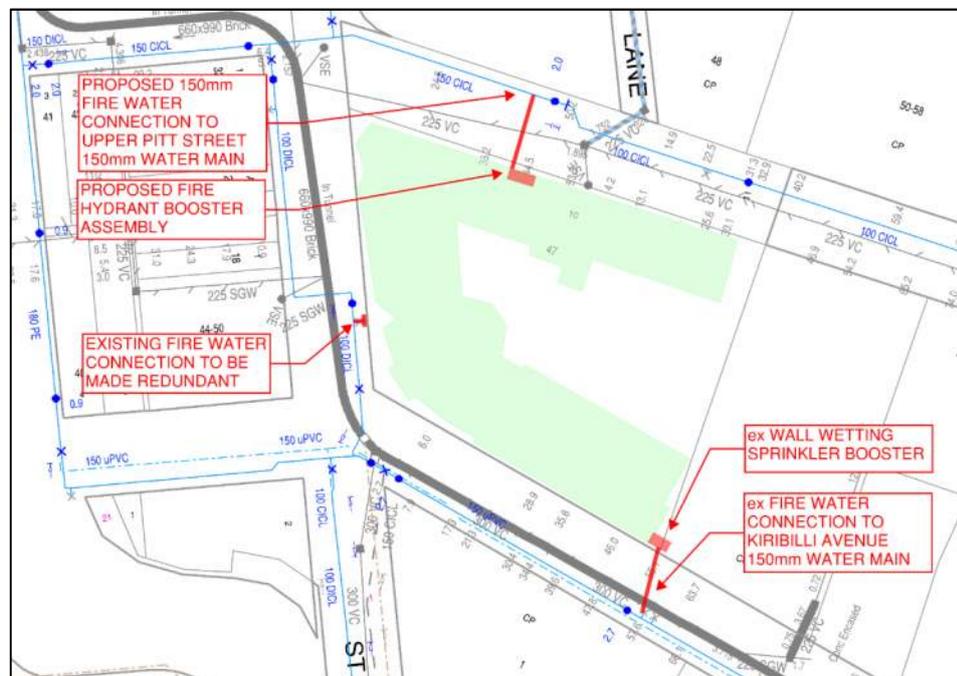
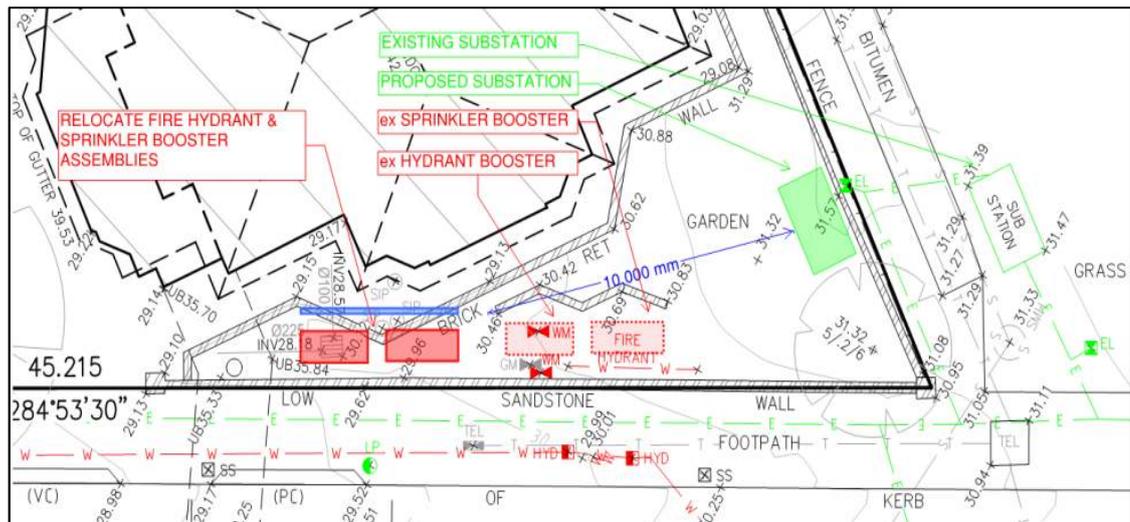


Figure 8 Main Campus Proposed Fire Water Main Connections & Booster Positions

### 3.2.2 Wyalla Senior Campus

The capacity of the existing fire water supply infrastructure is suitable for the proposed development works, however, a new substation is proposed to be installed within the Senior campus in the south east corner of the site. The proposed location of the substation is within 10m of the existing booster assemblies. It is therefore proposed to relocate the booster assemblies to maintain 10m clearance of the proposed substation.





**Figure 9** Wyalla Senior Campus Proposed Fire Booster Positions

### 3.2.3 Junior Campus

Fire hydrant coverage to the Junior campus can be provided by one of the following options. The relevant option will depend on hydrant coverage based on the final architectural layout.

#### Option 1 – Coverage from external street hydrants (present case)

This option relies on the final architectural layout featuring access to all parts of the building extension within 60m + 10m spray from the external hydrants.

#### Option 2 – Internal Hydrant system

This option requires a new on-site hydrant system to be installed, featuring a booster assembly supplied from the Burton Street water main, and internal hydrants positioned to achieve compliant coverage.

The capacity of the Burton Street water main is adequate for this proposed hydrant system.



## 4.0 SANITARY DRAINAGE

### 4.1 EXISTING AUTHORITY INFRASTRUCTURE

#### 4.1.1 Main Campus

The Main Campus sanitary drainage discharges to Sydney Water Corporation's sewer network via a single 150mm dia connection to the 300mm dia sewer main in Kirribilli Avenue.

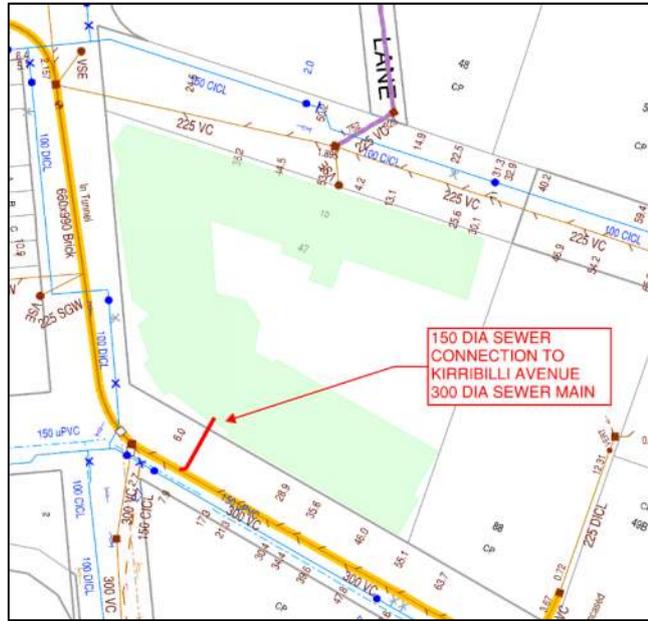


Figure 10 Main Campus Sewer Connection

#### 4.1.2 Wyalla Senior Campus

The Wyalla Senior Campus sanitary drainage discharges to Sydney Water Corporation's sewer network via two separate connections; a 150mm dia connection to the 225mm dia sewer main in Jefferey Street, and a 150mm dia connection to the 225mm dia sewer main in Upper Pitt Street.



Figure 11 Wyalla Senior Campus Sewer Connection



### 4.1.3 Junior Campus

The Junior Campus sanitary drainage discharges to Sydney Water Corporation's sewer network via two separate connections; a 150mm dia connection to the 225mm dia sewer main in Burton Street, and a 150mm dia connection to the 225mm dia sewer main in Humphrey Place.

An existing Sydney Water sewer main reticulates through the site. The proposed development works feature a below ground excavation that will clash with the sewer main. The sewer main appears to serve a number of properties on the eastern side of Crescent Place.

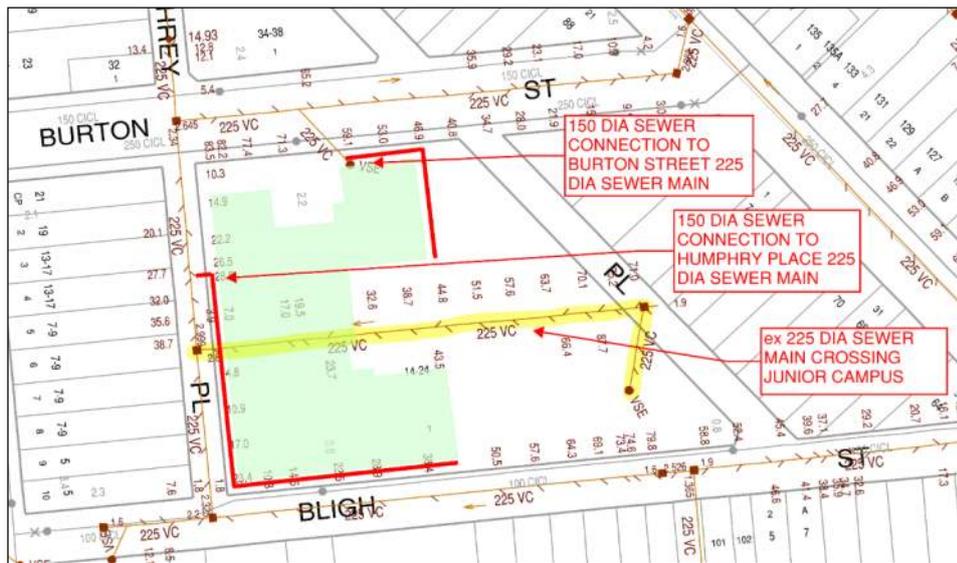


Figure 12 Junior Campus Sewer Connection

## 4.2 EXISTING CAPACITY AND PROPOSED DEMANDS

The capacity of connections to authority sewer drainage infrastructure is assessed by Sydney Water Corporation (SWC) via an Equivalent Population (EP) calculation unit.

### 4.2.1 Main Campus

#### Existing Sewer Main Capacity

The maximum capacity of a 225mm dia sewer is 1,600 EP (when laid at minimum grade), and the maximum capacity of the 150mm connection to the sewer main is 500 EP (when laid at minimum grade)

#### Existing and Proposed Campus Demand

The modelled existing and proposed Main Campus sewer flow demands are summarised in the table overleaf;



**Table 5** Main Campus Sewer Infrastructure Load

<b>Application</b>	<b>Existing (pre development)</b>	<b>Proposed (post development)</b>
Student Population	769	769
Staff Population	114	114
EP	88	88
KL / Day	15.9	15.9
Average Dry Weather Flow (ADWF)	0.6 l/s	0.6 l/s
Peak Dry Weather Flow (PDWF)	3.6 l/s	3.6 l/s

The population of the Main Campus is not intended to be increased following the proposed development, therefore there is no projected uplift in sewer infrastructure load.

#### 4.2.2 Wyalla Senior Campus

##### Existing Sewer Main Capacity

The maximum capacity of a 225mm dia sewer is 1,600 EP (when laid at minimum grade), and the maximum capacity of the 150mm connection to the sewer main is 500 EP (when laid at minimum grade)

##### Existing and Proposed Campus Demand

The modelled existing and proposed Wyalla Senior Campus sewer flow demands are summarised in the table below;

**Table 6** Wyalla Senior Campus Sewer Infrastructure Load

<b>Application</b>	<b>Existing (pre development)</b>	<b>Proposed (post development)</b>
Student Population	154	154
Staff Population	23	23
EP	18	18
KL / Day	3.2	3.2
Average Dry Weather Flow (ADWF)	0.1 l/s	0.1 l/s
Peak Dry Weather Flow (PDWF)	1.1 l/s	1.1 l/s

The population of the Wyalla Senior Campus is not intended to be increased following the proposed development, therefore there is no projected uplift in sewer infrastructure load.

#### 4.2.3 Junior Campus

##### Existing Sewer Main Capacity

The maximum capacity of a 225mm dia sewer is 1,600 EP (when laid at minimum grade), and the maximum capacity of the 150mm connection to the sewer main is 500 EP (when laid at minimum grade)



## Existing and Proposed Campus Demand

The modelled existing and proposed Junior Campus sewer flow demands are summarised in the table below;

**Table 7** Junior Campus Sewer Infrastructure Load

<b>Application</b>	<b>Existing (pre development)</b>	<b>Proposed (post development)</b>
Student Population	321	321
Staff Population	48	48
EP	37	37
KL / Day	6.6	6.6
Average Dry Weather Flow (ADWF)	0.2 l/s	0.2 l/s
Peak Dry Weather Flow (PDWF)	2.1 l/s	2.1 l/s

The population of the Junior Campus is not intended to be increased following the proposed development, therefore there is no projected uplift in sewer infrastructure load.

## 4.3 PROPOSED INFRASTRUCTURE WORKS

With consideration to the above assessment of existing and proposed demands, our recommendation for upgrade to infrastructure and / or supply from infrastructure per campus follows.

A Section 73 application will be made to Sydney Water following SSDA assessment to confirm acceptance of the proposed recommendations.

### 4.3.1 Main Campus

The assessment above indicates that capacity of the existing sewer connection is adequate for the proposed development.

### 4.3.2 Wyalla Senior Campus

The assessment above indicates that capacity of the existing sewer connection is adequate for the proposed development.

### 4.3.3 Junior Campus

The assessment above indicates that capacity of the existing sewer connection is adequate for the proposed development.

It is proposed to divert the existing 225 dia sewer that currently crosses through the site from Crescent Place to Humphrey Place. The proposed diversion would direct the sewer in a north west direction, to discharge to the Burton Street main. Refer Figure 13 overleaf.



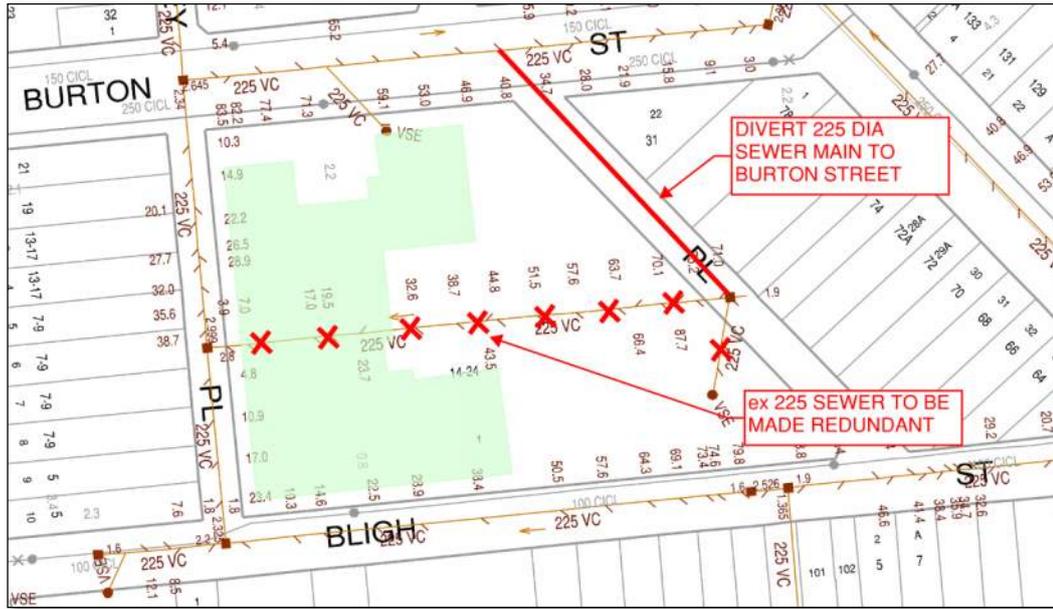


Figure 13 Junior Campus Proposed Sewer Diversion

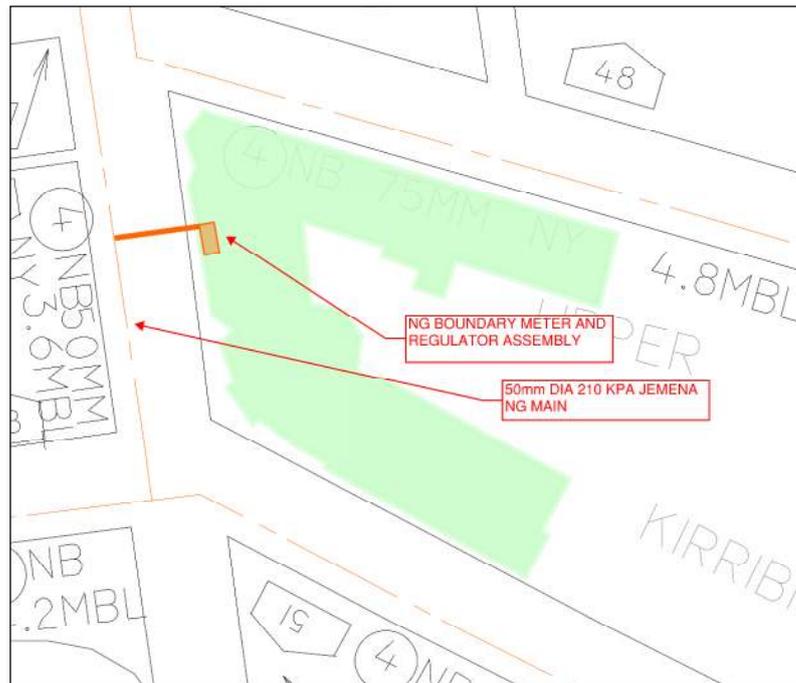


## 5.0 NATURAL GAS

### 5.1 EXISTING AUTHORITY INFRASTRUCTURE

#### 5.1.1 Main Campus

Natural Gas (NG) is supplied to the Main Campus from the 75mm dia Jemena medium pressure main (210 kPa) in Jeffreys Street. The regulator and meter assembly is located adjacent to the within a dedicated enclosure that opens onto Jeffreys street, adjacent to the main connection.



**Figure 14** Main Campus Existing Natural Gas Infrastructure

#### 5.1.2 Wyalla Senior Campus

Natural Gas is supplied to the Wyalla Senior Campus via two connections; one serving Dalton Hall, and the other serving the Wyalla Building. Each connection is supplied from the 75mm dia Jemena medium pressure main (210 kPa) in Jeffreys Street and Upper Pitt Street respectively.

The Dalton Hall regulator and meter assembly is located adjacent to the pool hall in a dedicated enclosure.

The Wyalla Building regulator and meter assembly is located in the landscaped area facing Upper Pitt Street, adjacent to the water meter and fire booster assemblies. Refer to Figure 15 overleaf for NG regulator and meter assembly locations.



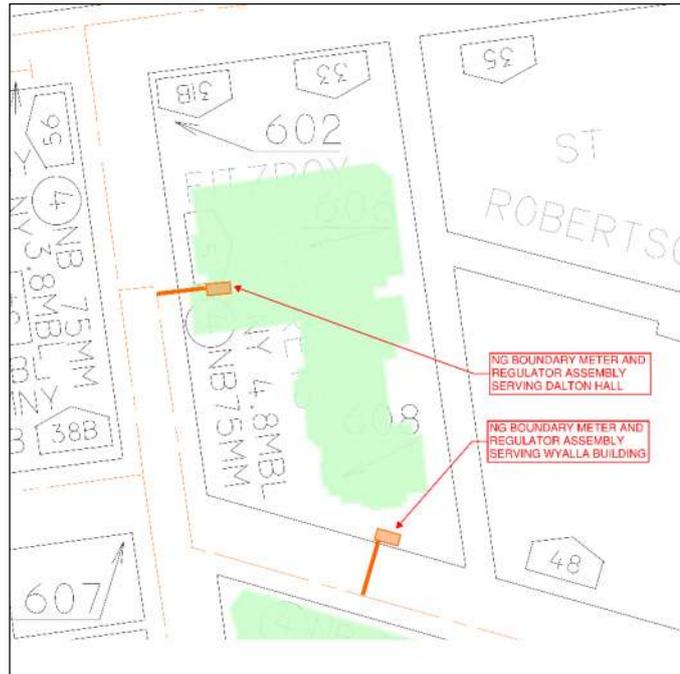


Figure 15 Wyalla Senior Campus Natural Gas Infrastructure

**5.1.3 Junior Campus**

Natural Gas (NG) is supplied to the Junior Campus from the 110mm dia Jemena medium pressure main (210 kPa) in Burton Street. The regulator and meter assembly is located externally to the building, behind the perimeter fence, adjacent to the main connection.



Figure 16 Junior Campus Natural Gas Infrastructure



## 5.2 EXISTING CAPACITY AND PROPOSED DEMANDS

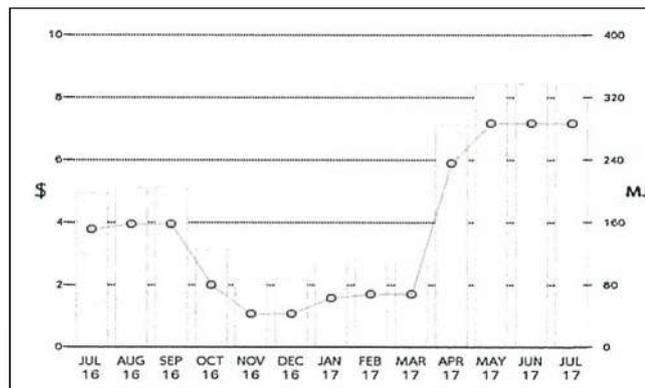
### 5.2.1 Main Campus

#### Existing Connection Capacity

The incoming connection from the main connection to the site is 65mm at 210 kPa. The NG meter & regulator assembly is a Jemena Model M60. This meter assembly has a maximum capacity of 21m<sup>3</sup>/hr or 819 MJ/hr

#### Existing and Proposed Campus Demand

The existing average daily gas consumption as noted on AGL bill dated July 2017 is 287 MJ. A graph indicating average daily gas consumption by month is below;



**Figure 17** Main Campus ex NG Consumption

The modelled existing and proposed Main Campus NG demands are summarised in the table below;

**Table 8** Main Campus NG Demand

Application	Existing (pre development)	Proposed (post development)
Peak Maximum Demand (PMD)	280 MJ/hr	3,700 MJ/hr
Maximum Hourly Quantity (MHQ)	63 MJ/hr	1,157 MJ/hr
Maximum Daily Quantity (MDQ)	296 MJ/hr	10,140 MJ/hr

### 5.2.2 Wyalla Senior Campus

No additional gas equipment is proposed for the Wyalla Senior campus.

### 5.2.3 Junior Campus

No additional gas equipment is proposed for the Junior campus.



## 5.3 PROPOSED INFRASTRUCTURE WORKS

### 5.3.1 Main Campus

The NG meter and regulator assembly will require upgrade to meet the increased NG demand. The new meter and regulator are to be installed in the same location as the existing meter and regulator assembly.

Jemena will confirm capacity availability for the increased demand via the on line portal application process, which is coordinated by the College's NG retailer; AGL.

### 5.3.2 Wyalla Senior Campus

The capacity of the existing NG infrastructure is suitable as there is no additional gas equipment is proposed, however, a new substation is proposed to be installed within the Wyalla Senior campus in the south east corner of the site. The proposed location of the substation is within 10m of the existing NG meter and regulator assembly. It is therefore proposed to relocate the NG meter and regulator assembly to maintain 10m clearance of the proposed substation.

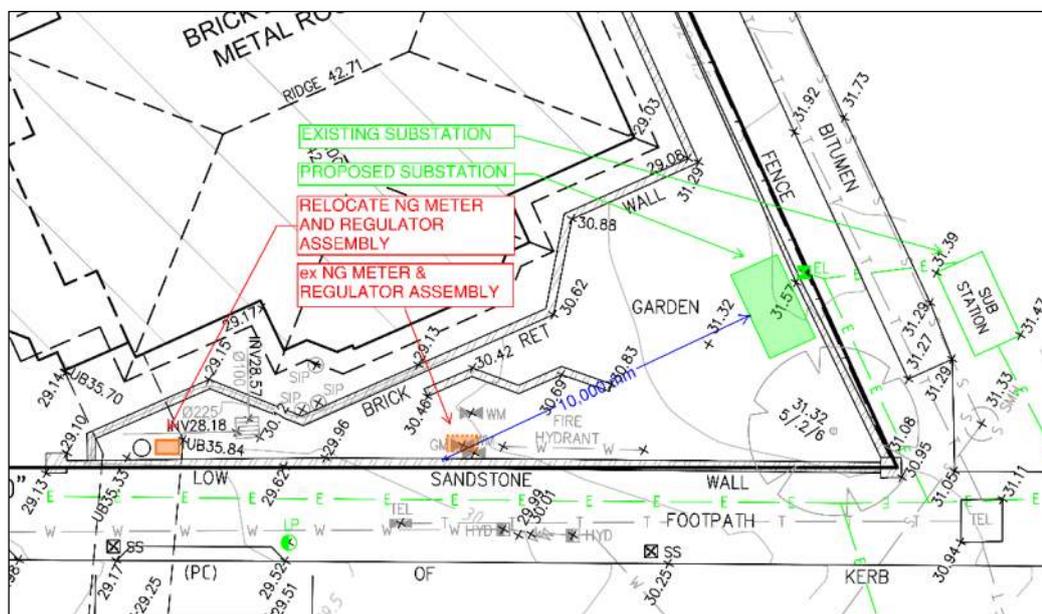


Figure 18 Wyalla Senior Campus NG Meter & Regulator Relocation

### 5.3.3 Junior Campus

The capacity of the existing NG infrastructure is suitable as there is no additional gas equipment is proposed.



## 6.0 POWER SUPPLY

### 6.1 EXISTING AUTHORITY INFRASTRUCTURE

#### 6.1.1 Main Campus

The original electrical installation appears to date from circa 1963 and has been subject to numerous modifications and extensions as the site has been developed.

In approximately 2005, a Form 2 main switchboard was installed on LG2 Level adjacent to the Gym and was served by a 400A 3 phase low voltage electrical supply from Upper Pitt Street (Ausgrid Sub 35843).

In 2010, a new 3 phase electrical supply was brought in from Jeffreys Street (Ausgrid Sub 36005) to replace the previous 400A supply. The new main switchboard located off Jeffreys Street is fitted with a 630A 3 phase service protective device. It has been concluded that the 630A service was brought in to replace the previous 400A service from Upper Pitt Street.

The new 630A 3-phase, low voltage electrical supply off Jeffreys Street enters via the garage on LG 3. The supply is terminated in a 800A 30kA rated Form 3B main switchboard installed in 2010, located in the garage on LG3. This switchboard was extended in 2012 to house the supply authority metering transformers and metering equipment, which was previously located in the original main switch room located on LG2.

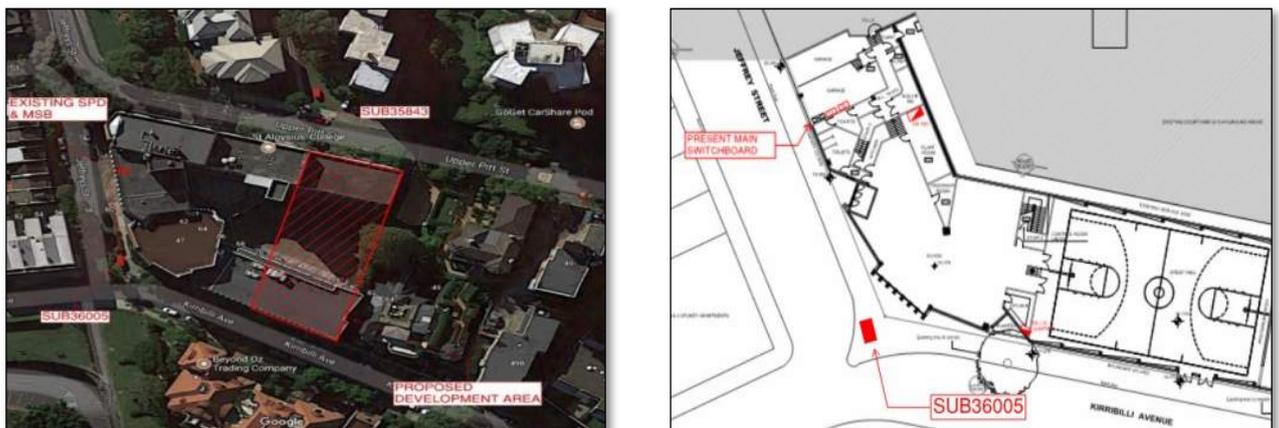


Figure 19 Main Campus Power Infrastructure

#### 6.1.2 Wyalla Senior Campus

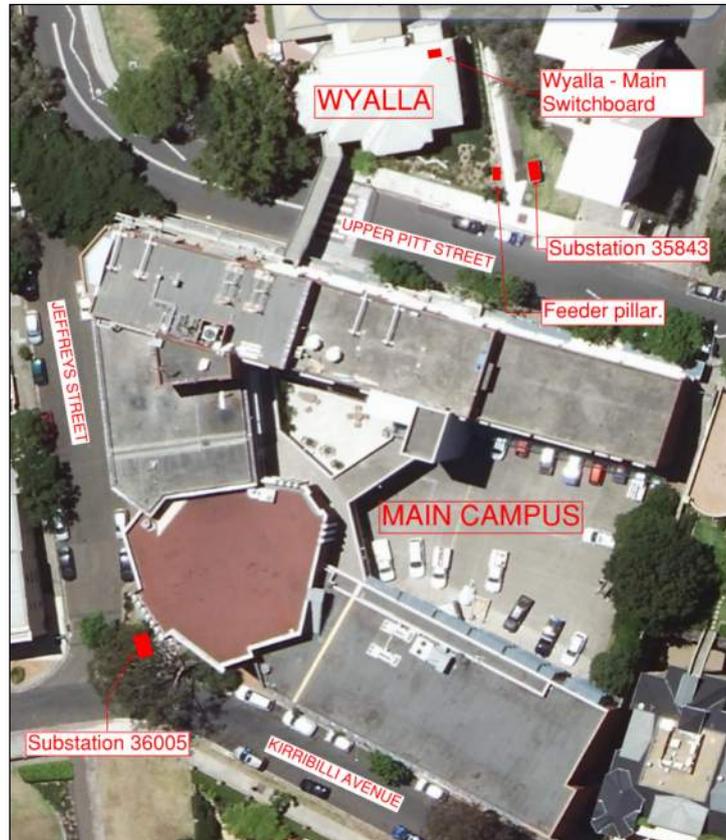
The Wyalla Senior Campus is served by a 300A 3-phase electrical supply, terminated in a main switchboard located on the ground floor in the south eastern corner of the Wyalla building. Dial Before You Dig record drawings indicate that the supply is from kiosk substation 35843, which is located on Upper Pitt Street.

The main switchboard is rated at 300A Form 1 with a fault rating of 18kA, appears to be 10-15 years old and is in good working order. The following items should be noted;

- No dedicated service protective device is installed. The main switch does not appear to comply with the NSW Services Rules requirements, to serve as a service protection device. Incoming supply rating increase or significant board modifications may trigger compliance related works to provide the device. However, the existing electrical supply is estimated to be sufficient and no significant board modifications are anticipated.



- There is no power factor correction equipment connected to the main switchboard. NSW Service Rules require a minimum power of 0.9 and the site's energy consumption data indicates that at certain times of the day, the power factor drops to 0.86.



**Figure 20** Wyalla Senior Campus Power Infrastructure

### 6.1.3 Junior Campus

The school is served by a 225A 3 phase, low voltage electrical supply via 4x150mm<sup>2</sup> PVC/RADOX fire rated cabling from the Ausgrid substation 35808, terminated in a main switchboard located in an electrical cupboard on Ground Level.

The service protective device is labelled as 225A/400A, implying that the maximum device capacity is 400A and that it has been set down to 225A to match the maximum demand calculated at the time of construction.

A solar PV installation is present and appears to be configured for grid export. The system rating could not be confirmed, but comprises circa 60 No. panels. Allowing 200W per panel would equate to approximately a 12kW system.



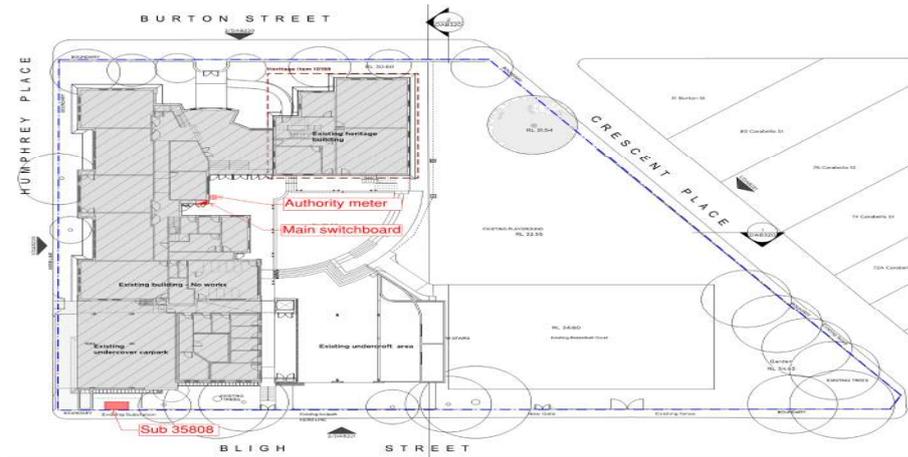


Figure 21 Junior School Campus Power Infrastructure

## 6.2 EXISTING CAPACITY AND PROPOSED DEMANDS

### 6.2.1 Main Campus

#### Supply Capacity

The Main Campus is served by a 630A 3-phase, low voltage electrical supply from the Jeffreys Street Ausgrid kiosk Sub 36005. The incoming service protective device is rated at 630A three phase, which translates to approximately 450kVA of electrical capacity in the incoming supply.

#### Existing Demand

Data obtained from the authority metering indicates that the recorded peak site load was 305kVA (425A) on the 6<sup>th</sup> February 2017. This represents 67% of the site’s electrical supply rating and indicates that the site has approximately 145kVA of power capacity available.

The figure below represents energy consumption data from the Ausgrid electrical meter on the main switchboard between November 2012 and November 2017. The data indicates that the site’s peak consumption typically occurs during February and March of the year and is likely the result of mechanical cooling loads present during the warmer months of the year. Load increases are also noted during the June to October periods, likely associated with heating loads. It should be noted that from 2016 onwards, the electrical loads during the non summer portions of the year have decreased compared to earlier years. This may be the result of more efficient heating systems, such as reverse cycle air conditioning replacing radiant heating.

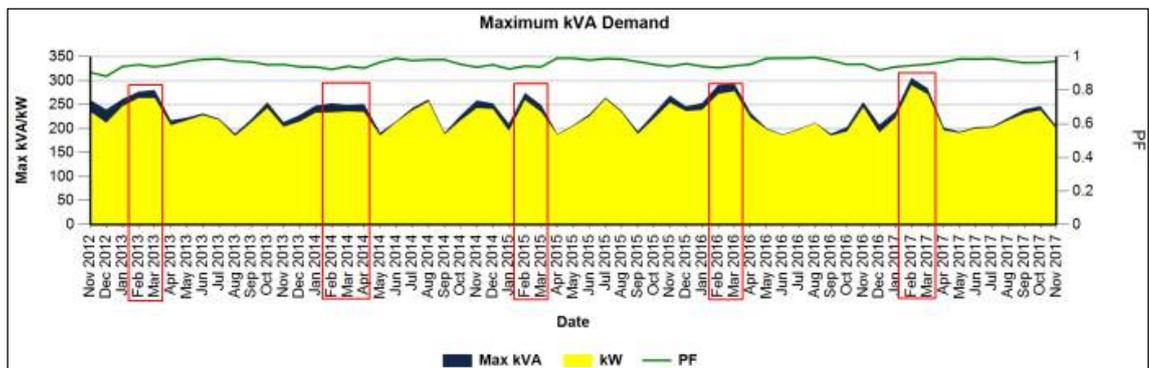


Figure 22 Main Campus Maximum Demand Load Profile



## Proposed Demand

The following considerations have been factored into the electrical demand summary;

- General lighting and power loads.
- Food Preparation loads.
- Multi Purpose Hall loads.
- Mechanical condensers for conditioned spaces.
- Mechanical extract fans and outside air tempering system for assisted naturally ventilated spaces.
- Mechanical cooling to the Great Hall.
- Refurbishment related load increases

**Table 9** Main Campus Maximum Demand Assessment

Area	Total Area (m <sup>2</sup> )	kVA	Amps
<b>Existing School Max Demand</b>		<b>305</b>	<b>425</b>
Less Replaced Build Area (28VA/m <sup>2</sup> )	3000	-90	-125
Allowance for general load increase in refurbished areas (5VA/m <sup>2</sup> )	8000	40	55
<b>Sub-total</b>		<b>255</b>	<b>355</b>
<b>New Build Area Max Demand</b>			
Ground	1467	75	105
Level 1	1741	50	70
Level 2	1722	50	70
Level 3	1611	50	70
Mechanical		210	300
<b>New Build Max Demand Sub-total</b>		<b>435</b>	<b>615</b>
Revised Site Max Demand (Estimated)		<b>690</b>	<b>970</b>
20% Spare Capacity		140	195
Revised Site Max Demand (incl. spare capacity)		<b>830</b>	<b>1165</b>
Existing Site Capacity		<b>(450)</b>	<b>(630)</b>

As can be seen in the maximum demand summary, the Main Campus's existing electrical capacity would be insufficient to serve the estimated peak electrical loads associated with the new build area, general refurbishment related load increases to the refurbished areas and the provision of cooling to the Great Hall.

Preliminary load estimates indicate that an electrical supply in the order of 1200A 3 phase would be required to serve the site's revised electrical maximum demand and provide some capacity for load increases in subsequent years.

## 6.2.2 Wyalla Senior Campus

### Supply Capacity

The Wyalla Senior Campus is served by a 300A 3-phase, low voltage electrical supply. Dial Before You Dig record drawings indicate that the supply emanates from the Upper Pitt Street Ausgrid kiosk Sub 35843.



Notes on the electrical site plan on the wall of the main switch room indicate that the supply emanates from Ausgrid Sub 36005 Feeder 1.

The service fuses are rated at 300A three phase and the main switch is also rated at 300A three phase, which translates to approximately 200kVA of electrical capacity in the incoming supply.

### Existing Demand

Data obtained from the authority metering indicates that the recorded peak site load was 80kVA on the 9th February 2017. This represents approximately 40% of the site's electrical supply rating and indicates that the site has approximately 120kVA of power capacity available.

The figure below represents energy consumption data from the Ausgrid electrical meter on the main switchboard between January 2016 and November 2017. The data indicates that the site's peak consumption typically occurs during February and March of the year and is likely the result of mechanical cooling loads present during the warmer months of the year.

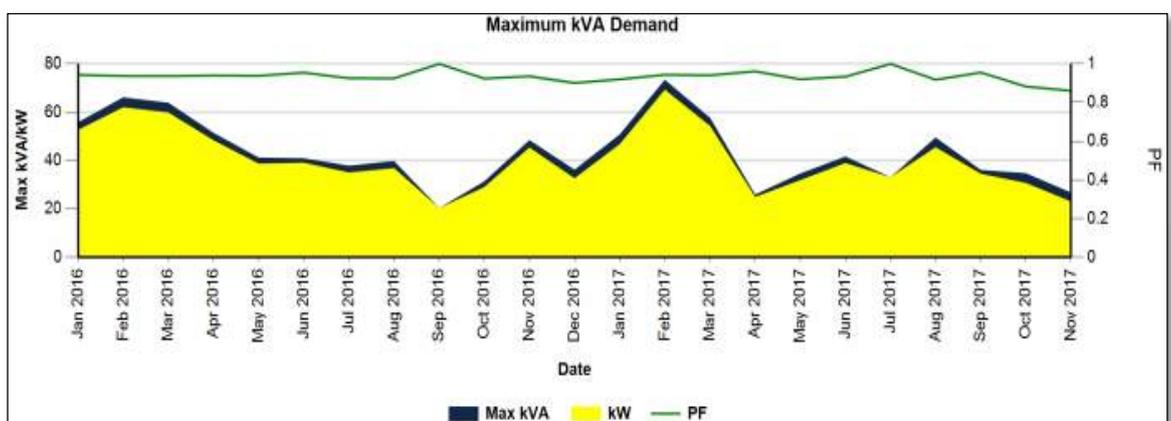


Figure 23 Main Campus Maximum Demand Load Profile

### Proposed Demand

It is anticipated that refurbished portions of the school shall benefit from general energy efficiency improvements in the new services installations, however it should be noted that some areas may be provided with a generally higher level of servicing than the pre refurbished spaces, e.g. more fixed equipment, audio visual, power points, etc.

The provision of air conditioning to areas which presently are not provided within this facility will increase electrical demand and this should be considered in the development of the refurbishment strategy.

Based on the consumption data obtained, it is anticipated that the existing 300A 3 phase supply will be sufficient for the proposed refurbishments to the Wyalla building.

## 6.2.3 Junior Campus

### Supply Capacity

The school is served by a 225A 3 phase, low voltage electrical supply via 4x150mm<sup>2</sup> PVC/RADOX fire rated cabling from the Ausgrid substation 35808, terminated in a main switchboard located in an electrical cupboard on Level 0 Ground.

### Existing Demand



An analysis of energy bill data from September 2017 indicates that the site's maximum demand charge was approximately 60kW or 100A 3 phase, which would include the solar PV load reduction. This indicates that the site is approximately at 50% of capacity. Further billing data shall be analysed to confirm the spare capacity.

### Proposed Demand

The addition of the multi-purpose hall, change rooms and canteen shall present additional electrical demand to the site. During design development, it is advised that high efficiency, low energy services solutions and equipment be selected to reduce the electrical energy demand, to remain within the available spare electrical capacity.

**Table 10 Junior Campus Maximum Demand Assessment**

Area	Total Area (m <sup>2</sup> )	kVA	Amps
<b>Existing School Max Demand – Estimated from billing data Sept 2017</b>		<b>60</b>	<b>85</b>
<b>New Build Area Max Demand</b>			
MP Hall (15W/m <sup>2</sup> lighting, 25w/m <sup>2</sup> mech, 5W/m <sup>2</sup> power)	1110	50	70
Change rooms		10	14
Canteen		10	14
External area lighting		5	7
<b>New Build Max Demand Sub-total</b>		<b>75</b>	<b>104</b>
Revised Site Max Demand (Estimated)		<b>135</b>	<b>187</b>
Existing Site Capacity		<b>(160)</b>	<b>(225)</b>

## 6.3 PROPOSED INFRASTRUCTURE WORKS

### 6.3.1 Main Campus

Ausgrid have confirmed that the kiosk substation 36005 located in Jeffreys Street is rated at 1000kVA. It presently provides an 800A fused supply to the Upper Pitt Street campus, in addition to 3 No. 400A feeds to other sites. There is insufficient spare capacity in this substation to meet the Main Campus' proposed maximum demand.

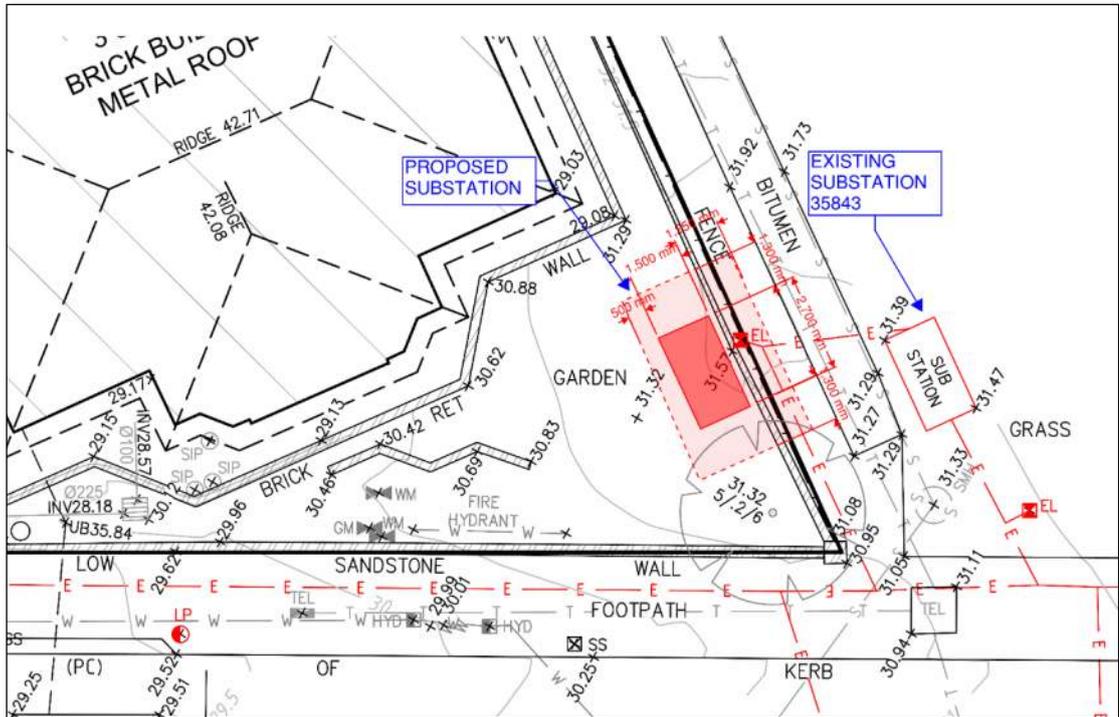
Ausgrid have provided preliminary advice that a new substation will be required to serve the site demand, based on the above maximum demand summary. Ausgrid will provide a formal supply offer at the time of a formal connection application, at which time they perform an analysis of their network capacity and advise how they can provide the requested supply. The offer is valid for 90 days, before re-assessment is required, as their network loading changes over time. Given the time frame for the proposed works, it should be noted that their offer will be based on the network status a number of years in the future.

As the build area extends to the site boundary in most areas of the Main Campus, the provision of a 5.3m L x 3.3m W easement for an external 1000 kVA kiosk substation within the site is not feasible.

The proposed location for a kiosk substation to supply power to the Main Campus is within the Wyalla Senior Campus, in the south eastern corner, adjacent to Upper Pitt Street. The substation location shall be finalised and co-ordinated with existing in ground services and equipment.



The low voltage feed would reticulate below Upper Pitt Street towards a new SMSB.



**Figure 24** Proposed new Kiosk Substation

A new 1200A SMSB is proposed for the new build area and shall be located on the northern side of Level 0. The new main switchboard is proposed to serve the new build area and serve the existing switchboard on level LG3 off Jeffreys Street.

**6.3.2 Wyalla Senior Campus**

The assessment above indicates that capacity of the existing power supply is adequate for the proposed development.

The proposed new substation for the Main Campus is planned to be located on the Wyalla Campus.

**6.3.3 Junior Campus**

The adequacy of the existing power supply is dependant on the design of the services to the new build area.

The available spare capacity is insufficient for air conditioning of the new build area, high power instantaneous electric heating, significant electric cooking equipment in the canteen area, etc.

It is advised that the building services design comprise low energy consumption, high efficiency equipment and that options such as natural ventilation be utilised wherever possible.

The consumer mains cabling to the main switchboard, the service protective device and the main switchboard appear to be rated for more than 225A 3 phase.



As such, should additional supply capacity be identified as a requirement during design development, an application could be made to the supply authority for an increase to the electrical supply to suit the electrical demands associated with the new build area, when more detailed load information is available.



## 7.0 COMMUNICATIONS

### 7.1 EXISTING AUTHORITY INFRASTRUCTURE

#### 7.1.1 Main Campus & Wyalla Senior Campus

The various incoming communications services, e.g. telephony services, Session Initiation Protocol (SIP), are reticulated to the existing main communications room located on Level 1 of the Main Campus.

The main communications room also provides communications services to the Wyalla site, via cabling reticulated on the underside of the link bridge.

It is proposed that the existing main communications room within the Main Campus shall remain the main communications node for the site, to avoid the works and disruption associated with relocating equipment and the services provided from this location.



Figure 25 Existing Main Comms Room and Riser Location

#### 7.1.2 Junior Campus

Accepting internal upgrades and system improvements associated with the refurbished areas, no infrastructure works to telecommunications services are anticipated.





## 8.0 CONCLUSION

The Infrastructure Assessment has identified the following key findings/conclusions and recommendations for the **Main Campus**:

- The existing Water Main infrastructure and supply connection is adequately sized for potable water supply to the proposed development. A Sydney Water compliant backflow prevention device is to be installed directly downstream of the Sydney Water Meter.
- The existing hydrant system will be upgraded to be compliant with AS2419.1. This will include relocation of the Hydrant Booster to within sight of the Upper Pitt Street Entrance, and new Fire Water connection from the Upper Pitt St 150 mm dia water main
- The capacity of the existing sewer connection is adequate for the proposed development.
- The NG meter and regulator assembly will require upgrade to meet the increased NG demand.
- Ausgrid have provided preliminary advice that a new substation will be required to serve the site demand, based on the revised maximum demand summary. The proposed location is within the Wyalla Senior Campus, in the south eastern corner, adjacent to Upper Pitt Street. The low voltage feed would reticulate below Upper Pitt Street towards a new Site Main Switch Board (SMSB). The new SMSB is proposed to serve the new build area on the east of the site and to serve the existing main switchboard on LG3 off Jeffreys Street.

The Infrastructure Assessment has identified the following key findings/conclusions and recommendations for the **Wyalla Senior Campus**:

- The existing Water Main infrastructure and supply connection is adequately sized for potable water supply to the proposed development.
- The capacity of the existing fire water supply infrastructure is suitable for the proposed development works, however, a new substation is proposed to be installed within the Senior campus in the south east corner of the site. The proposed location of the substation is within 10m of the existing booster assemblies. It is therefore proposed to relocate the booster assemblies to maintain 10m clearance of the proposed substation.
- The capacity of the existing sewer connection is adequate for the proposed development.
- The capacity of the existing NG infrastructure is suitable as there is no additional gas equipment proposed, however, a new substation is proposed to be installed within the Wyalla Senior campus in the south east corner of the site. The proposed location of the substation is within 10m of the existing NG meter and regulator assembly. It is therefore proposed to relocate the NG meter and regulator assembly to maintain 10m clearance of the proposed substation.
- The capacity of the existing power supply is adequate for the proposed development. The proposed new substation for the Main Campus is planned to be located on the Wyalla Campus.

The Infrastructure Assessment has identified the following key findings/conclusions and recommendations for the **Junior Campus**:

- The existing Water Main infrastructure and supply connection is adequately sized for potable water supply to the proposed development.
- Fire hydrant coverage is to be provided by external hydrants if coverage can be achieved with the final architectural layout. Alternatively an on site hydrant system will be provided, supplied from the Burton St water main.



- It is proposed to divert the existing 225 dia sewer that currently crosses through the site from Crescent Place to Humphrey Place. The proposed diversion would direct the sewer in a north west direction, to discharge to the Burton Street main.
- The capacity of the existing Natural Gas supply is adequate for the proposed development.
- The existing electrical supply to the Junior Campus is rated at 225A and is provided with a solar PV installation with a rating of approximately 12kW. Energy billing data from September 2017 indicates that the maximum demand is approximately 100A. This indicates that there is approximately 40-50% of rated capacity as spare.
- Historical billing data for this site is not available via the online Ausgrid portal, as such further monitoring is advised and energy usage should be considered during the design of the new build area.
- The new build area should employ low energy use, high efficiency elements and where possible, natural ventilation strategies should be employed during the design development period to remain within the estimated spare capacity.



## **APPENDIX A AUTHORITY COMMUNICATION REGISTER**



**Project** St Aloysius' College  
**Subject** Authority Communication Log  
**Project Number** S.SAC.0104  
**Date** 19/01/2018



Authority	Date	Communication addressees / Meeting or phone call Attendees	Communication Type	Subject	Summary
Ausgrid	4/10/2017	Ausgrid - mailbox Umow Lai - Reza Seyedi	Email	Preliminary Enquiry	Preliminary Enquiry supported with required documents was submitted to receive information about transformer ratings for the nearby kiosk substations.
Ausgrid	12/10/2017	Ausgrid - mailbox Umow Lai - Reza Seyedi	Email	Updated Preliminary Enquiry	An updated Preliminary Enquiry was sent to have more detailed and further information about existing nearby kiosk substations to assist us in having a better and clearer idea about the most suitable and cost-effective solution for the expansion project.
Ausgrid	23/10/2017	Ausgrid - Jan Bartosiak Umow Lai - Reza Seyedi	Email	Kiosk substations records	The requested information for the nearby kiosk substations was received as follows: <ul style="list-style-type: none"> <li>- Kiosk substations ratings.</li> <li>- LV distributor details.</li> <li>- The latest Maximum Demand Indicator (MDI) recorded information including Maximum Demands for 6 years in different seasons.</li> </ul>
Ausgrid	31/10/2017	Ausgrid - Jan Bartosiak Umow Lai - Reza Seyedi	Email Phone call	Possibility of having two dedicated feeders from two separate kiosk substations	Possibility of using a spare feeder of another nearby kiosk substation was proposed and discussed with Ausgrid in detail. <p>The proposed option was rejected by Ausgrid.</p>

**Project** St Aloysius' College  
**Subject** Authority Communication Log  
**Project Number** S.SAC.0104  
**Date** 19/01/2018



Authority	Date	Communication addressees / Meeting or phone call Attendees	Communication Type	Subject	Summary
Ausgrid	15/11/2017	Ausgrid - Jan Bartosiak Umow Lai - Reza Seyedi	Email Phone call	Possibility of having a new kiosk substation in the same land.	<p>Possibility of having a new kiosk substation in the same land across the road was investigated and discussed with Ausgrid.</p> <p>The abovementioned option will be acceptable by Ausgrid provided that the following requirements are met:</p> <ul style="list-style-type: none"> <li>- Two dedicated 800A distributors were allocated to achieve 1200A direct distributor supply.</li> <li>- The abovementioned two 800A direct distributors must not exceed 30m in length as per Ausgrid Standard.</li> </ul>
Ausgrid	8/12/2017	Ausgrid - Jan Bartosiak Umow Lai - Reza Seyedi	Email Phone call	Possibility of having a new kiosk substation in public land.	<p>Possibility of having a new kiosk substation in public land across the road was proposed and discussed with Ausgrid.</p> <p>The abovementioned option will be unacceptable by Ausgrid.</p>

**Project** St Aloysius' College  
**Subject** Authority Communication Log  
**Project Number** S.SAC.0104  
**Date** 19/01/2018



Authority	Date	Communication addressees / Meeting or phone call Attendees	Communication Type	Subject	Summary
Sydney Water	10/26/2017	Sydney Water Umow Lai	Letter (via Email)	Statement of Available Pressure and Flow	Statement of Available Pressure and Flow received from Sydney Water for Jeffery Street & Upper Pitt Street Water Mains
Sydney Water	10/26/2017	Sydney Water Umow Lai	Letter (via Email)	Sewer Service Diagrams	Sewer Service Diagram received from Sydney Water for Main Campus, Wyalla Campus & Junior Campus
Jemena / AGL	12/7/2017	Umow Lai - Paul Jacobsen AGL - Premium Connections	Email	AGL Commercial Gas Installation - Application	<p>Receipt of Commercial application form.</p> <p>Note all applications to Jemena are to be submitted via on line portal via the Gas retailer.</p> <p>Form to be populated and submitted to AGL following;</p> <ul style="list-style-type: none"> <li>- Final gas demand modelling is confirmed (i.e. heating system, kitchen and laboratory equipment confirmed)</li> <li>- Date of initial and staged occupancy is confirmed</li> </ul>
Telstra / NBN		Umow Lai NBN	On Line Portal	Initial Application	Online check to confirm NBN availability in area of main campus

## **APPENDIX B SYDNEY WATER FLOW AND PRESSURE ENQUIRY & SEWER SERVICE DIAGRAMS**



# Statement of Available Pressure and Flow

**Umow Lai**  
**657 Pacific Highway**  
**St Leonards, 2065**

**Attention: Umow Lai**

**Date: 18/12/2017**

**Pressure & Flow Application Number: 346649**  
**Your Pressure Inquiry Dated: 2017-11-07**  
**Property Address: Pitt Street, Kirri Billi 2061**

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: Upper Pitt Street	Side of Street: North
Distance & Direction from Nearest Cross Street	30 metres East from Jeffreys Street
Approximate Ground Level (AHD):	30 metres
Nominal Size of Water Main (DN):	150 mm

## EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	98 metre head
Minimum Pressure	39 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	39
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5	43
	10	43
	15	43
	20	42
	26	41
	30	40
	40	38
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	50	30
	5	39
	10	39
	15	38
	20	38
Maximum Permissible Flow	26	35
	30	31
	40	22
	50	11
	54	6

(Please refer to reverse side for Notes)

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

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

## General Notes

This report is provided on the understanding that (i) the applicant has fully and correctly supplied the information necessary to produce and deliver the report and (ii) the following information is to be read and understood in conjunction with the results provided.

1. Under its Act and Operating Licence, Sydney Water is not required to design the water supply specifically for fire fighting. The applicant is therefore required to ensure that the actual performance of a fire fighting system, drawing water from the supply, satisfies the fire fighting requirements.
2. Due to short-term unavoidable operational incidents, such as main breaks, the regular supply and pressure may not be available all of the time.
3. To improve supply and/or water quality in the water supply system, limited areas are occasionally removed from the primary water supply zone and put onto another zone for short periods or even indefinitely. This could affect the supply pressures and flows given in this letter. This ongoing possibility of supply zone changes etc, means that the validity of this report is limited to one (1) year from the date of issue. It is the property owner's responsibility to periodically reassess the capability of the hydraulic systems of the building to determine whether they continue to meet their original design requirements.
4. Sydney Water will provide a pressure report to applicants regardless of whether there is or will be an approved connection. Apparent suitable pressures are not in any way an indication that a connection would be approved without developer funded improvements to the water supply system. These improvements are implemented under the Sydney Water 'Urban Development Process'.
5. Pumps that are to be directly connected to the water supply require approval of both the pump and the connection. Applications are to be lodged online via Sydney Water Tap in™ system - Sydney Water Website – [www.sydneywater.com.au/tapin/index.htm](http://www.sydneywater.com.au/tapin/index.htm). Where possible, on-site recycling tanks are recommended for pump testing to reduce water waste and allow higher pump test rates.
6. Periodic testing of boosted fire fighting installations is a requirement of the Australian Standards. To avoid the risk of a possible 'breach' of the Operating Licence, flows generated during testing of fire fighting installations are to be limited so that the pressure in Sydney Water's System is not reduced below 15 metres. Pumps that can cause a breach of the Operating Licence anywhere in the supply zone during testing will not be approved. This requirement should be carefully considered for installed pumps that can be tested to 150% of rated flow.

## Notes on Models

1. Calibrated computer models are used to simulate maximum demand conditions experienced in each supply zone. Results have not been determined by customised field measurement and testing at the particular location of the application.
2. Regular updates of the models are conducted to account for issues such as urban consolidation, demand management or zone change.
3. Demand factors are selected to suit the type of fire-fighting installation. Factor 1 indicates pressures due to system demands as required under Australian Standards for fire hydrant installations. Factor 2 indicates pressures due to peak system demands.
4. When fire-fighting flows are included in the report, they are added to the applicable demand factor at the nominated location during a customised model run for a single fire. If adjacent properties become involved with a coincident fire, the pressures quoted may be substantially reduced.
5. Modelling of the requested fire fighting flows may indicate that local system capacity is exceeded and that negative pressures may occur in the supply system. Due to the risk of water contamination and the endangering of public health, Sydney Water reserves the right to refuse or limit the amount of flow requested in the report and, as a consequence, limit the size of connection and/or pump.
6. The pressures indicated by the modelling, at the specified location, are provided without consideration of pressure losses due to the connection method to Sydney Water's mains.

# Statement of Available Pressure and Flow

**Umow Lai**  
**657 Pacific Highway**  
**St Leonards, 2065**

**Attention: Umow Lai**

**Date: 26/10/2017**

**Pressure & Flow Application Number: 323548**  
**Your Pressure Inquiry Dated: 2017-09-29**  
**Property Address: 47 Upper Pitt Street, Kirribilli 2061**

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: Jeffrey Street	Side of Street: East
Distance & Direction from Nearest Cross Street	9 metres North from Kirribilli Avenue
Approximate Ground Level (AHD):	20 metres
Nominal Size of Water Main (DN):	100 mm

## EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	108 metre head
Minimum Pressure	49 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	49
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5	53
	10	52
	15	51
	20	50
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	5	49
	10	48
	15	48
	20	47
Maximum Permissible Flow	26	43

(Please refer to reverse side for Notes)

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

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

## General Notes

This report is provided on the understanding that (i) the applicant has fully and correctly supplied the information necessary to produce and deliver the report and (ii) the following information is to be read and understood in conjunction with the results provided.

1. Under its Act and Operating Licence, Sydney Water is not required to design the water supply specifically for fire fighting. The applicant is therefore required to ensure that the actual performance of a fire fighting system, drawing water from the supply, satisfies the fire fighting requirements.
2. Due to short-term unavoidable operational incidents, such as main breaks, the regular supply and pressure may not be available all of the time.
3. To improve supply and/or water quality in the water supply system, limited areas are occasionally removed from the primary water supply zone and put onto another zone for short periods or even indefinitely. This could affect the supply pressures and flows given in this letter. This ongoing possibility of supply zone changes etc, means that the validity of this report is limited to one (1) year from the date of issue. It is the property owner's responsibility to periodically reassess the capability of the hydraulic systems of the building to determine whether they continue to meet their original design requirements.
4. Sydney Water will provide a pressure report to applicants regardless of whether there is or will be an approved connection. Apparent suitable pressures are not in any way an indication that a connection would be approved without developer funded improvements to the water supply system. These improvements are implemented under the Sydney Water 'Urban Development Process'.
5. Pumps that are to be directly connected to the water supply require approval of both the pump and the connection. Applications are to be lodged online via Sydney Water Tap in™ system - Sydney Water Website – [www.sydneywater.com.au/tapin/index.htm](http://www.sydneywater.com.au/tapin/index.htm). Where possible, on-site recycling tanks are recommended for pump testing to reduce water waste and allow higher pump test rates.
6. Periodic testing of boosted fire fighting installations is a requirement of the Australian Standards. To avoid the risk of a possible 'breach' of the Operating Licence, flows generated during testing of fire fighting installations are to be limited so that the pressure in Sydney Water's System is not reduced below 15 metres. Pumps that can cause a breach of the Operating Licence anywhere in the supply zone during testing will not be approved. This requirement should be carefully considered for installed pumps that can be tested to 150% of rated flow.

## Notes on Models

1. Calibrated computer models are used to simulate maximum demand conditions experienced in each supply zone. Results have not been determined by customised field measurement and testing at the particular location of the application.
2. Regular updates of the models are conducted to account for issues such as urban consolidation, demand management or zone change.
3. Demand factors are selected to suit the type of fire-fighting installation. Factor 1 indicates pressures due to system demands as required under Australian Standards for fire hydrant installations. Factor 2 indicates pressures due to peak system demands.
4. When fire-fighting flows are included in the report, they are added to the applicable demand factor at the nominated location during a customised model run for a single fire. If adjacent properties become involved with a coincident fire, the pressures quoted may be substantially reduced.
5. Modelling of the requested fire fighting flows may indicate that local system capacity is exceeded and that negative pressures may occur in the supply system. Due to the risk of water contamination and the endangering of public health, Sydney Water reserves the right to refuse or limit the amount of flow requested in the report and, as a consequence, limit the size of connection and/or pump.
6. The pressures indicated by the modelling, at the specified location, are provided without consideration of pressure losses due to the connection method to Sydney Water's mains.

# Sewer Service Diagram

Application Number: 346658

## SEWERAGE SERVICE DIAGRAM

North Sydney No. 131084

Municipality of North Sydney  
Kirribilli

- SYMBOLS AND ABBREVIATIONS**
- Boundary Trap
  - P.H.
  - G.I. Grease Interceptor
  - P.T. P. Trap
  - R.S. Reflux Sink
  - R.V.
  - Vert.
  - V.P.
  - S.V.P.
  - D.C.C.
  - Reflux Valve
  - M.F. Mica Hep
  - T. Tubes
  - K.S. Kitchen Sink
  - W.C. Water Closet
  - B.W. Bath Waste
  - I.P. Induct Pipe
  - M.F. Mica Hep
  - T. Tubes
  - K.S. Kitchen Sink
  - W.C. Water Closet
  - B.W. Bath Waste
  - W.M. Washing Machine
  - B.S. Basin
  - S.S. Shower
  - W.I.P. Wrought Iron Pipe
  - C.I.P. Cast Iron Pipe
  - P.W. Floor Waste
  - W.M. Washing Machine

Scale: 40 Feet To An Inch

### SEWER AVAILABLE

Where the sewer is not available and a special inspection is involved the Board accepts no responsibility for the availability of the drainage in relation to the eventual position of the Board's Sewer

Detail Sheet No 43334

BTR

Broken Lines Denote Assumed Position of Drainage

MC	Cr	Date
31	12	23/8/66
47	22	1-2-67
62	25	11-5-71

A3 SIZE  
DIAGRAM

