

An architectural rendering of a modern school building with a brick and wood facade, large windows, and a covered walkway. In the foreground, there is a paved courtyard with a brick play area where several children are playing. A large tree stands in the center of the courtyard. The sky is blue with some clouds.

Upgrades to Chatswood Public School and Chatswood High School

Appendix 17 - Hydraulic Report

SSD 9483

Prepared by Wood & Grieve Engineers

For School Infrastructure NSW, Department of Education

Upgrades to Chatswood Public School & Chatswood High School

SSDA Hydraulic Infrastructure Management Plan

Prepared for: NSW Schools Infrastructure

Attention: JohnStaff Projects

Date: 20 Feb 2020

Prepared by: Matt Mee

Ref: 40623

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WOOD & GRIEVE ENGINEERS

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Revision

Revision	Date	Comment	Prepared By	Approved By
001	20/02/20	SDDA Hydraulic Infrastructure Management Plan	MHM	BJJ

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1. Introduction

This report has been prepared to accompany a detailed State Significant Development Application (SSDA) for two education facilities, Chatswood High School and Chatswood Public School, located at 5 Centennial and 24 Centennial Ave, Chatswood 2067. This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) Specifically, in response to the following SEARs:

SEARs Reference	SEARs Description	Report Section
14.1. Infrastructure	<ul style="list-style-type: none">Prepare an Infrastructure Management Plan in consultation with relevant agencies, detailing information on the existing capacity and any augmentation and easement requirements of the development for the provision of utilities including staging of infrastructure.	Section 2
	<ul style="list-style-type: none">Prepare an Integrated Water Management Plan detailing any proposed alternative water supplies, proposed end uses of potable and non- potable water.	Section 3

1.1 Description of Site and Locality

Address: 5 Centennial Ave, Chatswood, 2067

Chatswood Public school - Pacific Highway Site

Lot 1, DP812207

Lot C, DP346499

Address: 24 Centennial Ave, Chatswood, 2067

Chatswood High school - Centennial Avenue Site

Lot 1, DP725204

Lot 21-23, DP2273

Total Site Area: 7.31Ha

Centennial Avenue Site: 5.97Ha

Pacific Highway Site: 1.34Ha

The proposed development of the Centennial Avenue site will consist of two multistorey primary school buildings, one middle school building, a library/gym building, provision of two sports courts and various passive and active landscaped areas.

The proposed development of the Pacific Highway site will consist of two new multistorey high school building, provisions of various active and passive landscaped areas, as well as an 18 space carpark.

As can be seen in the site location aerial photo below (Figure 1), the Centennial Avenue site is bounded by Centennial Avenue to the North and Eddy Road to the South. The sites to the east and west are low density residential use. The Pacific Highway Site is bounded by Pacific Highway to the East, Centennial Avenue to the south and Jenkins Street to the West.

The Centennial Avenue site is currently a high school site and the Pacific Highway site is currently an elementary school site.



Figure 1: Site Location Plan



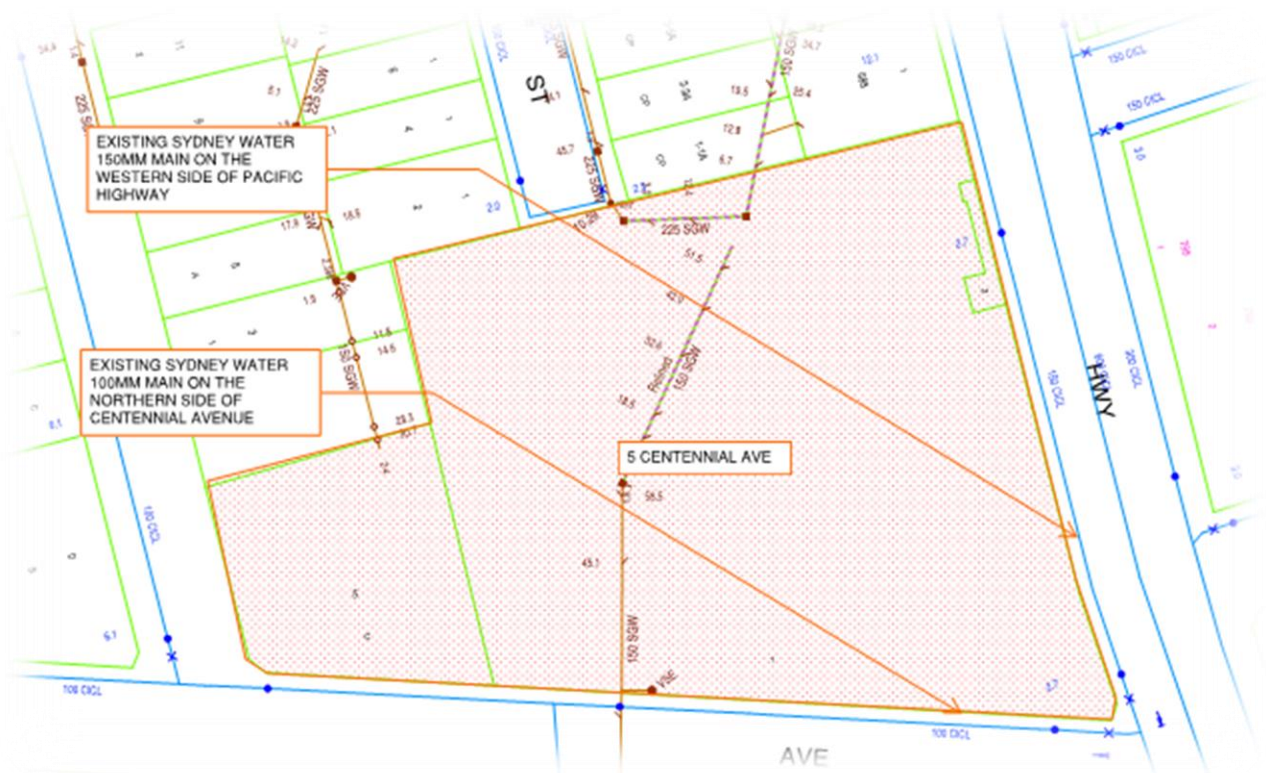
2. Hydraulic Services

2.1 Water Infrastructure

2.1.1 Pacific Highway - Chatswood Public School

Existing Infrastructure

The Water Supply Authority for the area is Sydney Water. The existing site is serviced by two existing potable water mains in both Pacific Highway and Centennial Avenue. The Sydney Water network in Pacific Highway consists of a 150mm diameter main on the western side of the street. The authority connection in Centennial Avenue is a 100mm diameter main on the northern side of the street. These two water mains are part of the wider Chatswood CBD network providing supply to the greater parts of the suburb with high levels of pressure, flow and reliability.



Chatswood Public School - Sydney Water Dial Before You Dig Water Infrastructure Map

Proposed Development Supply

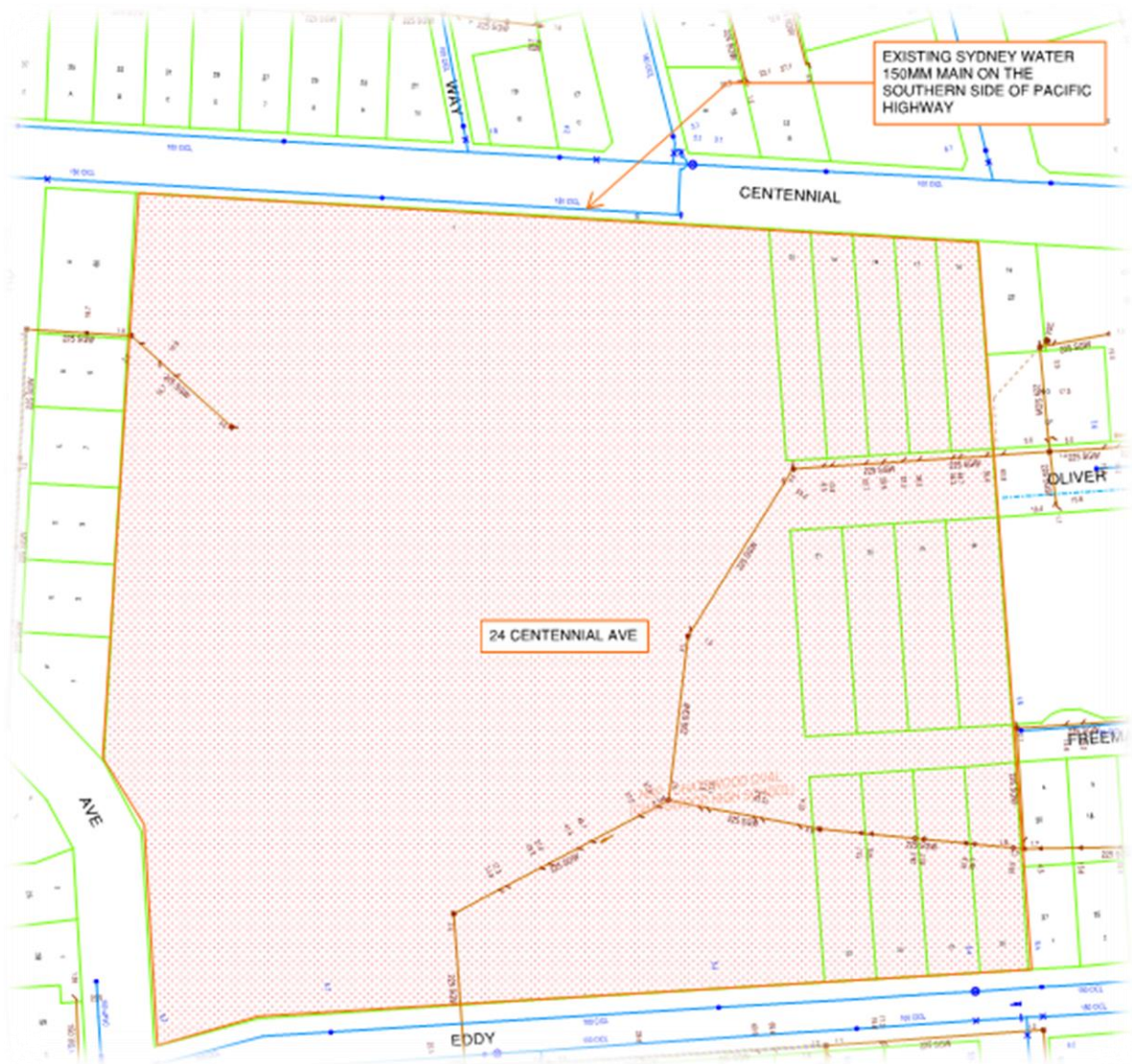
The proposed development at 5 Centennial Ave – Chatswood Public School, requires a potable water supply and fire water supply from the Sydney Water Network. The potable water supply is subject to detailed design and confirmation of client requirements. The estimated connection size is a single 100mm connection to the available 150mm main in Pacific Highway. The 100mm connection will support both the potable and fire water requirements of the site. The estimated potable supply is to be in the order of 2.5L/s as a probable simultaneous demand based off an estimated occupancy of 1400 students. This will require a 40mm diameter Sydney Water billable master meter connection being supportable by sub-meters at each new building for consumption purposes. The Section 73 Application process with Sydney Water will determine the final connection location within Pacific Highway. The fire water demand will be up to 20L/s based on the current building classification (9b), height of the largest building (under 25m effective) and largest fire compartment (>500 - <5000).



2.1.2 Centennial Ave - Chatswood High School

Existing Infrastructure

The existing site is serviced by a 150mm potable water main in the Southern side of Centennial Avenue. The authority connection in Centennial Avenue is a 100mm diameter main on the southern side of the street. This water main is a part of the wider Chatswood CBD network providing supply to the greater parts of the suburb with high levels of pressure, flow and reliability.



Chatswood High School - Sydney Water Dial Before You Dig Water Infrastructure Map

Proposed Development Supply

The proposed development at 24 Centennial Ave – Chatswood High School, requires a potable water supply and fire water supply from the Sydney Water Network. The potable water supply is subject to detailed design and confirmation of client requirements. The estimated connection size is a single 100mm connection to the available 150mm main in Pacific Highway. The 100mm connection will support both the potable and fire water requirements of the site. The estimated potable supply is to be in the order of 3.5L/s as a probable simultaneous demand based off a maximum estimated occupancy of 2000 students. This will require a 65mm diameter Sydney Water billable master meter connection being supportable by sub-meters, located at each new building for consumption purposes. The Section 73 Application process with Sydney Water will determine the

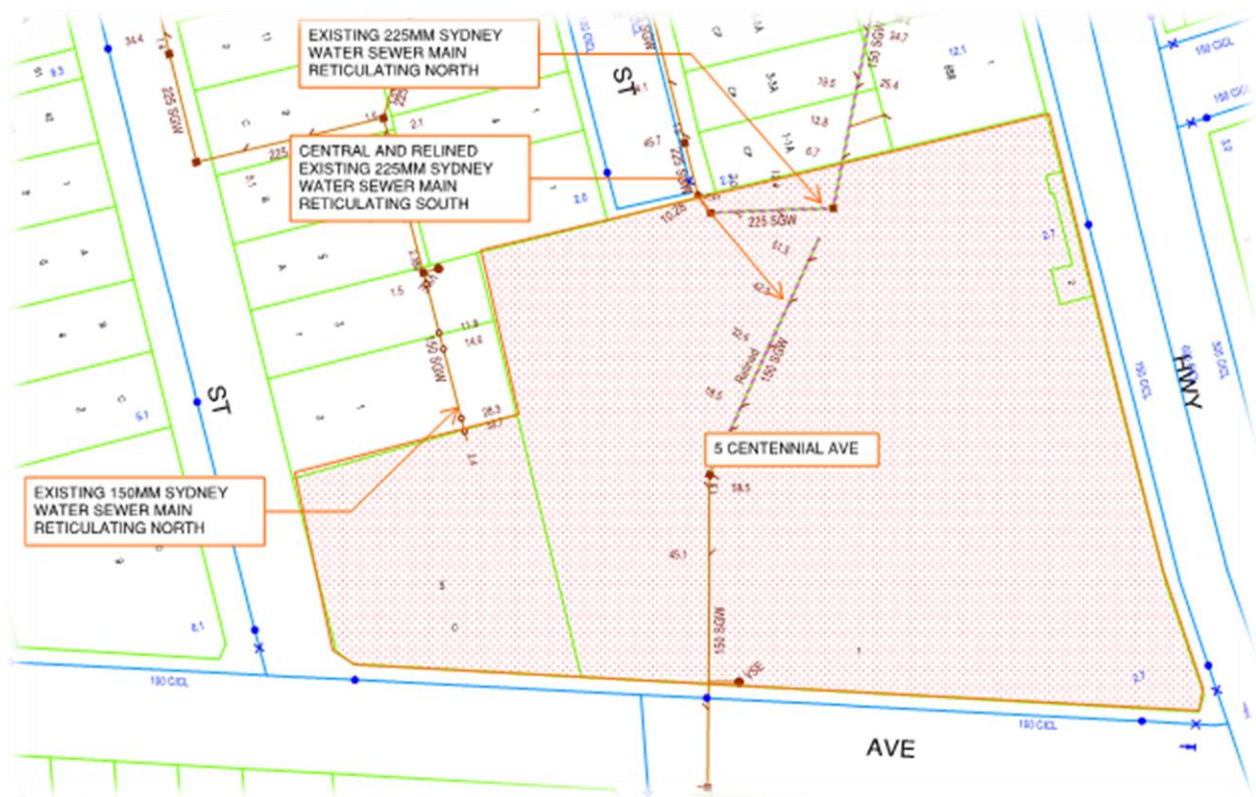


final connection location within Centennial Avenue. The fire water demand will be up to 20L/s based on the current building classification (9b), height of the largest building (under 25m effective) and largest fire compartment (>500 - <5000).

2.2 Sewer Infrastructure

2.2.1 Pacific Highway - Chatswood Public School

The Sewer Network Authority for the area is Sydney Water. The existing site is serviced by a 225dia sewer main at the northern end of the property that reticulates north, a relined 150mm sewer main central to the property that reticulates south and a 150mm sewer main to the west of the property that reticulates north. The three sewer mains available are all adequately sized to cater for the load from the new proposed development. The Section 73 process will determine if the mains have adequate capacity not to affect down-stream residents.

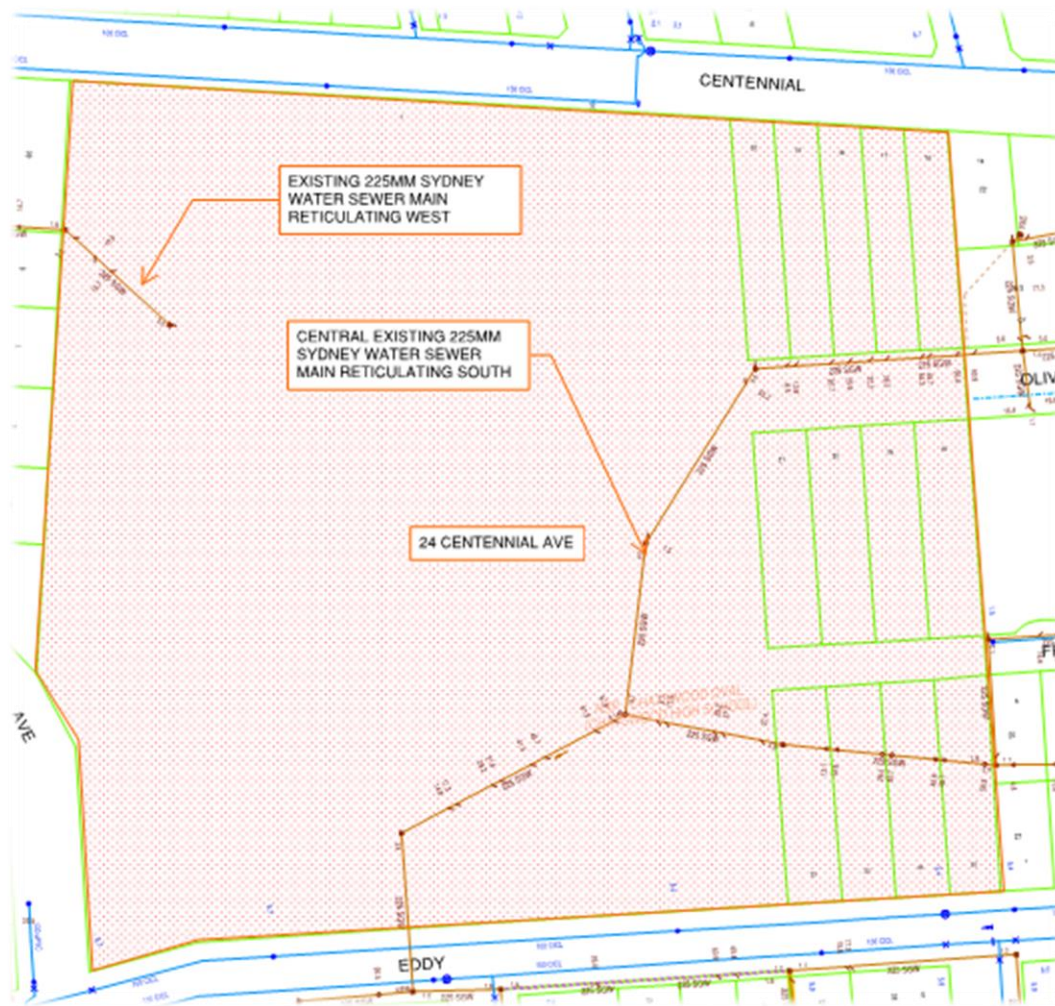


Chatswood Public School - Sydney Water Dial Before You Dig Sewer Infrastructure Map

2.2.2 Centennial Avenue - Chatswood High School

The existing site is serviced by a 225dia sewer main central to the property that reticulates south and a 225mm sewer main to the west of the property that reticulates west. The two sewer mains available are all adequately sized to cater for the load from the new proposed development. The Section 73 process will determine if the mains have adequate capacity not to affect down-stream residents.





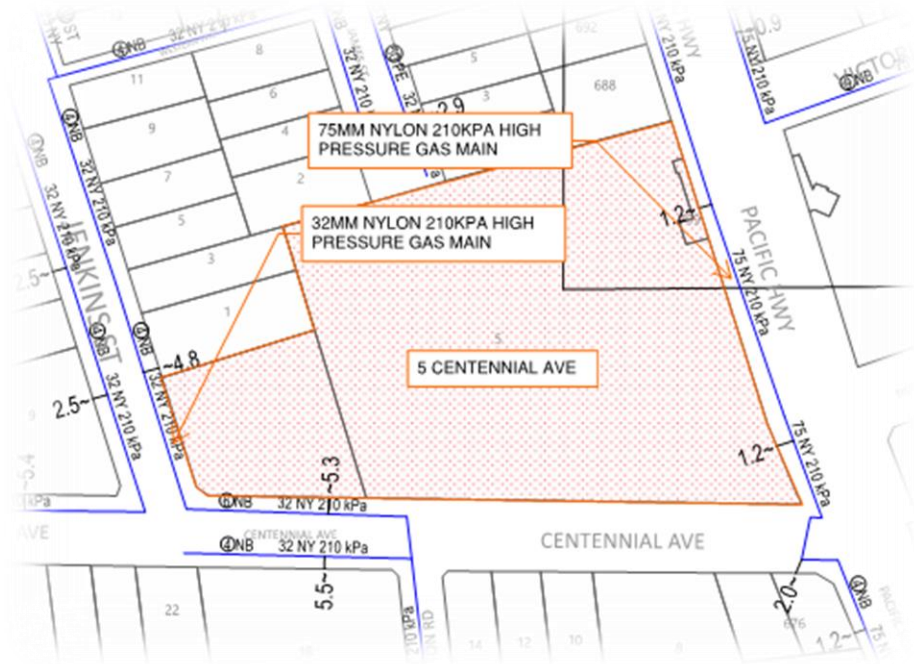
Chatswood High School - Sydney Water Dial Before You Dig Sewer Infrastructure Map

2.3 Gas Infrastructure

2.3.1 Pacific Highway - Chatswood Public School

The Gas Supply Authority for the area is Jemena. The existing site is surrounded by a high pressure (210kPa) network. The available supply has an adequate amount of energy to supply the site however, Jemena, the governing authority, will determine if the network has adequate capacity to service the requirements of site. It is highly likely the relatively low demands of the new development will not affect the surrounding properties. Refer to the network diagram below for further information.

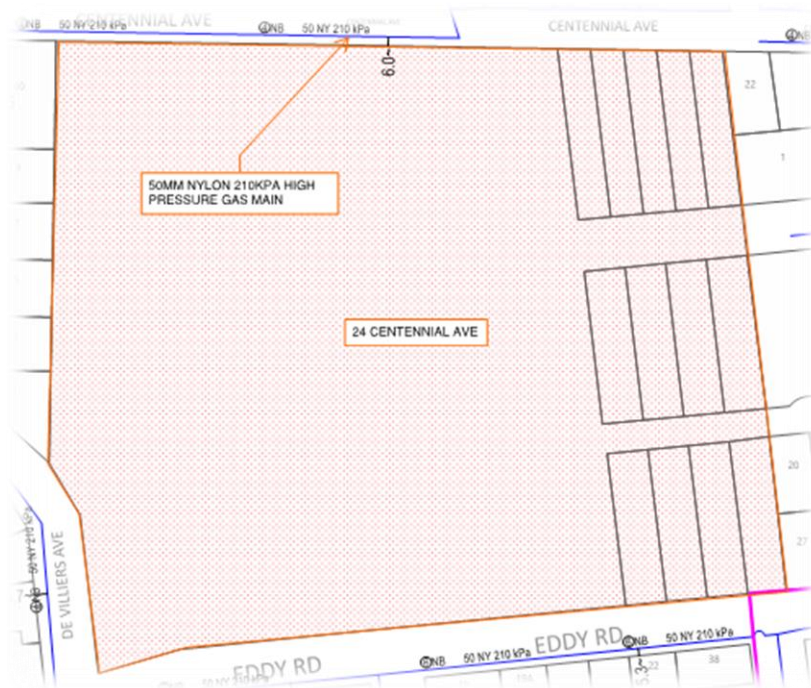




Chatswood Public School - Jemena Dial Before You Dig Gas Infrastructure Map

2.3.2 Centennial Avenue - Chatswood High School

The existing site has a high pressure 210kpa gas main available. The available supply has an adequate amount of energy to supply the site however, Jemena, the governing authority, will determine if the network has adequate capacity to service the requirements of site. It is highly likely the relatively low demands of the new development will not affect the surrounding properties. Refer to the network diagram below for further information.



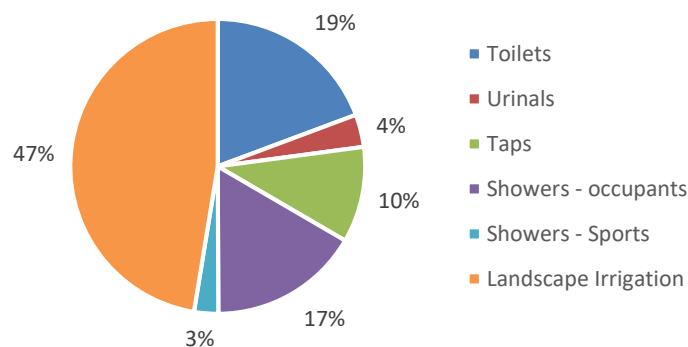
Chatswood High School - Jemena Dial Before You Dig Gas Infrastructure Map



3. Alternative Water Supplies

A variety of water efficiency measures are applicable to the proposed school and its individual buildings. These water efficiency suggestions are intended to influence the architecture in finalizing the design and operation of the spaces. The implementation of rainwater re-use will be decided by Green Star requirements and confirmed by the ESD consultant.

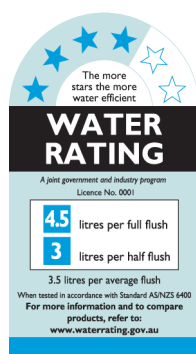
The following chart describes the typical water consumption of a school. It can be seen that the largest use can be landscaping due to grassed areas. There are a number of strategies that can be implemented to reduce the overall potable water consumption of the development



Typical school water consumption. (Source: Green Star Potable Water Calculator estimation)

Water efficiency measures which will be applied to reduce water consumption include:

- **Water efficient fixtures and fittings.** By implementing low-flow water fixtures, the consumption associated with amenities and shops can be reduced.
- **Water monitoring systems,** which can identify leaks and amend losses before greater loss occurs.
- **Rainwater collection and reuse,** which can offset irrigation and cooling tower water consumption
- **Methods to reduce water consumption in landscaped areas.** These could include drip-system irrigation for trees and larger plants. Consideration for the use of moisture sensors and the use of native plants in the landscaping plan. Natives are designed to thrive in the Australian environment and are typically more resilient than their exotic counterparts.
- **Water education plan** to provide information to users regarding their water consumption



4. Construction Impact on Infrastructure Service

The proposed development has been assessed for the hydraulic services infrastructure, as described in the specific section above. The construction of the proposed develop has minimal impact on the existing infrastructure network and is summarised below;

1. Water Supply: there are no Sydney Water, water supply assets within the site and therefore no impact on the infrastructure.
2. Sewer: The proposed developments, on both sites, have been designed with the locations of the existing sewer mains in mind. Building Plan Approvals have been lodged with Buildings G, P2, R and T requiring monitoring during construction by the WSC.
3. Natural Gas: there are no Jemena, gas network assets within the site and therefore no impact on the infrastructure.



5. Appendix

5.1 Sydney Water Pressure and Flow Enquires



Statement of Available Pressure and Flow

Matt Mee
207 Pacific highway
St Leonards, 2065

Attention: Matt Mee

Date: 01/03/2019

Pressure & Flow Application Number: 592260
Your Pressure Inquiry Dated: 2019-01-25
Property Address: Pacific Hwy, Chatswood 2067

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: Pacific Highway	Side of Street: West
Distance & Direction from Nearest Cross Street	100 metres North from Centennial Avenue
Approximate Ground Level (AHD):	109 metres
Nominal Size of Water Main (DN):	150 mm (Nominated Asset Number - 2547632)

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	64 metre head
Minimum Pressure	47 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	47
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5	53
	10	52
	15	52
	20	51
	26	50
	30	49
	40	47
	50	43
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	5	46
	10	46
	15	45
	20	44
	26	43
	30	42
	40	39
	50	36
Maximum Permissible Flow	67	29

(Please refer to reverse side for Notes)

For any further inquiries regarding this application please email :

swtapin@sydneywater.com.au

Statement of Available Pressure and Flow

Matt Mee
207 Pacific highway
St Leonards, 2065

Attention: Matt Mee

Date: 08/03/2019

Pressure & Flow Application Number: 592253
Your Pressure Inquiry Dated: 2019-01-24
Property Address: Centennial Avenue, Chatswood 2067

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: Centennial Avenue	Side of Street: South
Distance & Direction from Nearest Cross Street	10 metres West from Edgar Street
Approximate Ground Level (AHD):	93 metres
Nominal Size of Water Main (DN):	150 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	37 metre head
Minimum Pressure	26 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	26
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5	28
	10	27
	15	25
	20	22
	26	18
	30	16
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	5	24
	10	22
	15	20
	20	17
	26	13
	30	10
Maximum Permissible Flow	37	4

(Please refer to reverse side for Notes)

For any further inquiries regarding this application please email :

swtapin@sydneywater.com.au

Statement of Available Pressure and Flow

Matt Mee
207 Pacific Highway
St Leonards, 2065

Attention: Matt Mee

Date: 03/04/2019

Pressure & Flow Application Number: 619874
Your Pressure Inquiry Dated: 2019-03-13
Property Address: Centennial Ave, Chatswood 2067

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: Centennial Avenue	Side of Street: North
Distance & Direction from Nearest Cross Street	2 metres East from Edgar Street
Approximate Ground Level (AHD):	104 metres
Nominal Size of Water Main (DN):	100 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	69 metre head
Minimum Pressure	52 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	52
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5	58
	10	56
	15	54
	20	52
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	5	51
	10	49
	15	47
	20	44
Maximum Permissible Flow	26	40

(Please refer to reverse side for Notes)

For any further inquiries regarding this application please email :

swtapin@sydneywater.com.au

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