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APPROVALS

Rev #	Author	Status	Reviewer	Approver
01	J Chung	Superseded	J. Skubevski	S. Matthews
02	J Chung	Current	J. Skubevski	S. Matthews



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HYDRAULIC SERVICES
UTILITY SERVICES REPORT
NEW HIGH SCHOOL FOR LEPPINGTON AND
DENHAM COURT

17th January 2025

PREPARED BY:	PREPARED FOR:
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1 INTRODUCTION

This hydraulic services utility report has been prepared to support a Review of Environmental Factors (REF) for the Department of Education (DoE) for the new high school in Leppington and Denham Court (the activity). The purpose of the REF is to assess the potential environmental impacts of the activity prescribed by State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP) as “development permitted without consent” on land carried out by or on behalf of a public authority under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The activity is to be undertaken pursuant to Chapter 3, Part 3.4, Section 3.37A of the T&I SEPP.

The proposed activity is for the construction of a new high school located at 128-134 Rickard Road, Leppington, NSW, 2179 (the site).

The purpose of this report is to describe the existing utility mains that surround the site and proposed servicing strategies as well as preliminary load assessments based on the proposed project scope for the Review of Environmental Factors (REF) assessment for an activity that required approval under Part 5 of the EP&A act.

The Department of Education (DoE) is the proponent and determining authority pursuant to Section 5.1 of the Environmental Planning and Assessment Act 1979 (the Act).

The Minister for Education and Early Learning is the landowner.

1.1 SITE DESCRIPTION

The site is known as 128-134 Rickard Road, Leppington, NSW, 2179 and is legally described as Lots A and B in Deposited Plan 411211. The site is located on the eastern side of Rickard Road and is approximately 4.1ha in area. The site is located immediately south of the existing Leppington Public School at 144 Rickard Road and is approximately 700m south of Leppington Train Station. Figure 1 below provides an aerial image of the site.



Figure 1: Aerial Image of Site (Source: NearMap)

The northern portion of the site is currently used for residential purposes. The southern portion of the site is used for agricultural purposes, with multiple greenhouses and an existing pond on the property.

1.2 PROPOSED ACTIVITY

The proposed activity is for a new high school for Leppington and Denham Court. The new high school will accommodate up to 1,000 students across 3 new buildings that will comprise 48 permanent teaching spaces (PTS), 3 support teaching spaces (STS), 19 specialist labs/workshops/kitchens and a hall. Buildings 1, 2 and 3 will be clustered along the southern boundary and the hall will be located in south-east corner of the site. The activity also includes the construction of a sports field in the centre of the site and 3 x multipurpose courts along the northern boundary. The proposed scope of works is illustrated in Figure 2 below.



Figure 2: New High School for Leppington and Denham Court (Source: djrd architects)

2 DEMOLITION

There are existing buildings on the site that are required to be demolished.

3 HYDRAULIC SERVICES DEMAND CALCULATIONS

As the existing building are all to be demolished, the additional demands incurred on the network mains have been based on the school's design parameters for 1000 students.

3.1 WATER SUPPLY DEMAND CALCULATIONS

The assumption used in determining the average daily potable water demands for the proposed student population was sourced from the Sydney Water table, "Average Daily Water Use by Property Type" and is presented in Table 1 below. Please refer to APPENDIX A – for the Sydney Water table.

Where possible, potable water usage will be reduced by using low flow taps and sanitary fixtures (specified by the architect).

Table 1: Average Daily Water Demand

Classification	Metric Unit	Average Demand (L/Metric Unit/Day)
Special Use - School	Student	20

Please refer to Table 2 below for the average daily water demand calculation.

Table 2: Average Daily Water Demand Increase Calculation

Total Units	Average Demand (L/Metric Unit/Day)	Total Average Daily Water Demand (kL)
1000	20	20

The following flows for the entire site have also been calculated:

- Probable simultaneous demand – 2.32 L/sec
- Fire flow for hydrants – 20 L/sec
- Fire flow for hose reels – 0.66 L/sec
- Fire flow for sprinklers and drenchers – TBC – BCA Certifier and Fire Safety Engineer required to determine requirement

3.2 SEWER DISCHARGE CALCULATIONS

To determine the average daily sewer discharge for the proposed activity, an estimate of the daily sewer discharge in terms of Litres/Day has been made by adopting information derived by the NSW Water Directorate. Where the standard equivalent tenement figures suggest that a 60% water to sewer discharge factor is appropriate. Refer to Table 3 below for this calculation.

Table 3: Sewer Discharge Calculation

Classification	Unit	Average Demand (60% of Water Average Demand) L/Metric Unit/Day)
Special Use – School	Student	12

Please refer to Table 4 below for the Average Daily Sewer Discharge calculation.

Table 4: EP Calculation

Total Units	Average Demand (60% of Water Average Demand) (L/Metric Unit/Day)	Total Average Daily Sewer Discharge (kL)
1000	12	12

3.3 NATURAL GAS DEMAND CALCULATIONS

There are no requirements for natural gas for the site, noting the project's direction for electrification.

Where gas services have been noted as required, this has been provided via liquified petroleum gas (LPG) bottles, which is outside the scope of this report.

4 UTILITY SERVICE CONNECTIONS

4.1 WATER

The existing site has access to a 250mm diameter Sydney Water utility water main in Rickard Road as identified in Figure 3.

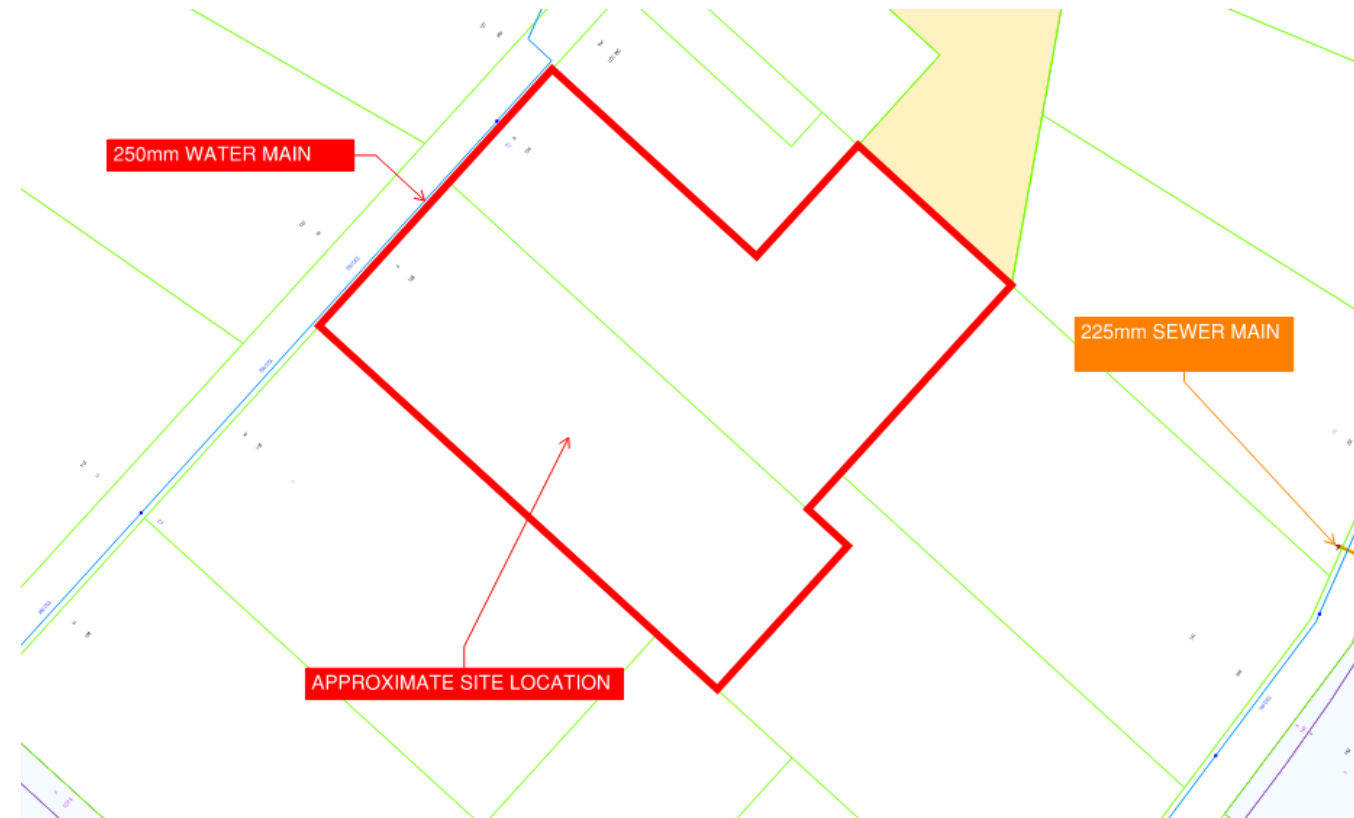


Figure 3: Existing utility sewer and water mains surrounding the site

It is proposed to connect to the 250mm diameter utility water main in Rickard Road to supply the site with drinking water services and also firefighting water services.

WSce is currently engaged as the accredited Water Services Coordinator (WSC) liaise with Sydney Water and carry out the Section 73 application requirements for the site. This Notice of Requirements (NoR) has not been provided at the time of writing this report.

4.2 SEWER

As identified in Figure 3 above, there are no local Sydney Water utility sewer assets that front the site i.e. within Rickard Road.

WSce is currently engaged as the accredited Water Services Coordinator (WSC) liaise with Sydney Water and carry out the Section 73 application requirements for the site. This Notice of Requirements (NoR) has not been provided at the time of writing this report. A Feasibility Application has been lodged, Case Number 219026,

However, as part of these discussions, four option proposals for sewer main extensions to supply the site have been discussed with Sydney Water and included in APPENDIX B – NETWORK UTILITY OPERATOR CORRESPONDENCE. After further discussions only Option 1 was deemed the only feasible option as shown in Figure 4. Hence, only Option 1 forms part of this REF Submission, while Options 2-4 will not be pursued and excluded from this submission.

It should be noted that the document: “Leppington High School – Section 73 Feasibility Application – Case No. 219026” appended in APPENDIX B – NETWORK UTILITY OPERATOR CORRESPONDENCE has been provided as reference to the Feasibility Application provided to Sydney Water prior to discussions, and shows all four options, however only Option 1 has been deemed feasible.

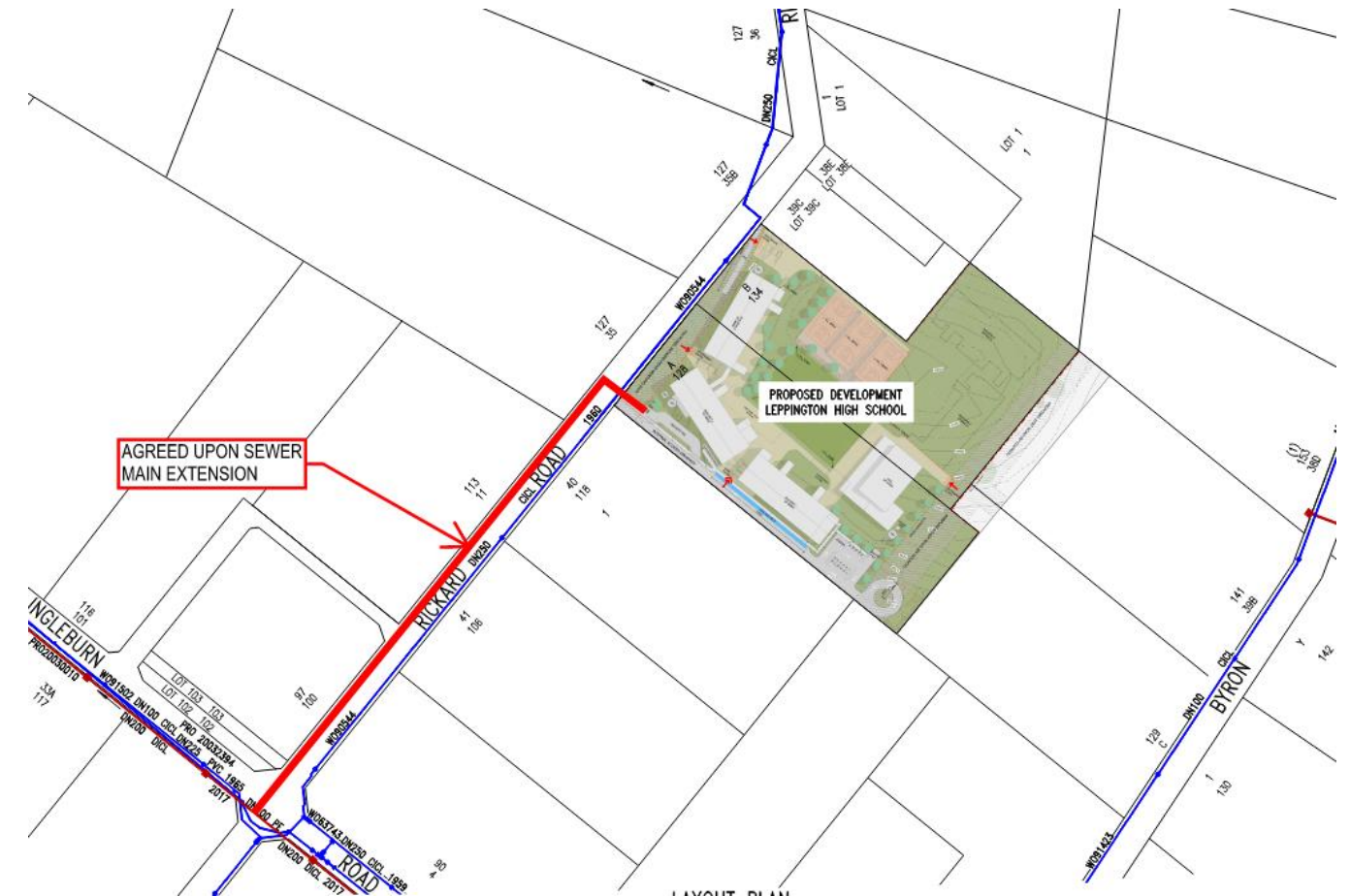


Figure 4: Option 1 Sewer Main Extension (only feasible option)

4.3 NATURAL GAS

The existing site has no access to any Jemena utility natural gas mains.

5 REVIEW OF ENVIRONMENTAL IMPACT ASSESSMENT

5.1 CUMULATIVE IMPACT ASSESSMENT

The South West Growth Area (SWGA), specifically Leppington, is undergoing rapid activity due to rezoning and new residential projects. This growth will lead to increased density, affecting infrastructure, traffic, and the environment. As part of this project, it's important to assess the cumulative impacts of the hydraulic works in connection with these changes, both during construction and after the building is operational.

The considerations of cumulative impact pertaining to the hydraulic scope have been outlined below:

- **Traffic and Parking:** Plumbing works could contribute to traffic congestion. Careful planning is needed to minimise disruptions during peak hours and secure proper access for plumbing activities.
- **Road Access:** Coordination with other projects is crucial to avoid road closures or disruptions. Proper planning of service connections and utility works is needed to ensure smooth access.
- **Noise and Vibration:** Construction activities, such as pipe installation and trenching, may cause noise and vibration. Measures should be taken to reduce disturbances, particularly near schools and residential areas.
- **Visual Impact:** Above-ground plumbing components, such as vents or tanks, should blend with the changing urban landscape

Noting the above, this will only impact the area during construction.

5.2 CONSULTATION WITH NETWORK UTILITY OPERATORS

The network utility operator (NUO) for both water and sewer for this activity is Sydney Water. WSce have been engaged as the accredited WSC to liaise with Sydney Water.

At the time of this report, no NoR had been received.

5.3 MITIGATION MEASURES

Mitigation measures are required to avoid, minimize, or rectify the potential adverse environmental impacts of the proposed hydraulic works. These measures aim to reduce the environmental risks associated with the project over time by promoting preservation, restoration, and ongoing maintenance.

A summary of the impacts of the activity and the proposed mitigation measures are surmised in the table below:

Table 5: Hydraulic Mitigation Measures

Mitigation Number/Name	Aspect / Section	Mitigation Measures	Reason for Mitigation Measure
Water Connection	During Construction	Coordinating the water services connection with Sydney Water via Section 73 Application to ensure it can be constructed in a risk free manner and also that the proposed activity does not negatively impact their system.	To ensure the site is sufficiently supplied with drinking water. To ensure the site demand does not disrupt water supply to the local area.
Sewer Connection	During Construction	Coordinating the sewer services connection with Sydney Water via a Section 73 Application to ensure it can be constructed in a risk free manner and also that the proposed activity does not negatively impact their system.	To ensure the site can sufficiently drain all wastewater to the utility network. To ensure the site demand does not disrupt sewer drainage of the local area.
Sewer Connection	During Construction	Should the proposed external sewer infrastructure not be available, if required, the interim measure of an on-site sanitation pump-out pit be adopted until the external sewer can be utilised.	To ensure the site's wastewater is sufficiently managed whilst the external

5.4 EVALUATION OF ENVIRONMENTAL IMPACTS

Based on an initial review of this project, the proposed activity will not have a significant impact on the environment. The potential impacts that have been identified can be adequately mitigated measures or is not considered to be significant.

6 APPENDICES

6.1 APPENDIX A – SYDNEY WATER AVERAGE DAILY WATER USE TABLE

“AVERAGE DAILY WATER USE BY PROPERTY TYPE”

Development Type	Development Sub-Type	Key Metric	Metric Unit	Average Demand (L/Metric Unit / Day)
Residential	Single Lot Torrens	Dwelling	Each dwelling	623.00
	Flats Torrens	Net Floor Area	Square Meter	2.36
	High Rise Units	Net Floor Area	Square Meter	3.34
	Single Lot Community	Dwelling	Each dwelling	623.00
Mixed	Residential / Commercial	Combined Floor Area	Each dwelling / Square Meter	Use separate rates for each component
	Commercial / Industrial	Combined Floor Area	Square Meter	Use separate rates for each component
Commercial	Aged Accom - Self Care	Net Floor Area	Square Meter	2.50
	Aged Accom - Hostel	Bed	Each bed	271.00
	Aged Accom - Full Care	Bed	Each bed	271.00
	Childcare	Net Floor Area	Square Meter	3.60
	Hotel / motel / serviced apartments	Room	Each room	359.94
	Office	Net Floor Area	Square Meter	2.27
	Shopping Centre	Net Floor Area	Square Meter	3.00
	Laundry / Dry Cleaner	Net Floor Area	Square Meter	10.50
	Café / Fast Food / Butcher / Deli	Net Floor Area	Square Meter	2.48
	Retail Units	Net Floor Area	Square Meter	2.48
	Medical / Veterinary	Net Floor Area	Square Meter	2.48
	Mechanical Repair	Net Floor Areas	Square Meter	2.48
	Car / Boat Sales	Net Floor Area	Square Meter	2.48
	Car Wash	Net Floor Area	Square Meter	9.40
	Club	Net Floor Area	Square Meter	3.77
Industrial	Heavy Process		As required	
	Chemical Manufacturing		As required	
	Printing Manufacturing		As required	
	Beverage Manufacturing		As required	
	Light Factory Unit	Developed floor area	Square Meter	2.82
	Warehousing	Developed floor area	Square Meter	2.82
	Transport / Bus Depot	Site area	Square Meter	0.91
Special Uses	University	Student	Each student	20.00
	School	Student	Each student	20.00
	Hospital	Bed	Each bed	271.00
	Religious assembles	Developed floor area	Square Meter	1.30
	Government Depot	Site area	Square Meter	0.91
	Community Centre / Library	Floor area	Square Meter	1.84
	Sport Fields with Amenities		As required	
	Park & Reserves		As required	
	Services - Police / Ambulance etc.	Floor area	Square Meter	1.40

6.2 APPENDIX B – NETWORK UTILITY OPERATOR CORRESPONDENCE

Statement of Available Pressure and Flow

Michael Cahalane
233 Castlereagh Street
Sydney, 2000

Attention: Michael Cahalane

Date: 17/07/2024

Pressure & Flow Application Number: 1926914
Your Pressure Inquiry Dated: 2024-07-09
Property Address: 128 Rickard Road, Leppington 2179

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: Rickard Road	Side of Street: East
Distance & Direction from Nearest Cross Street	373 metres North from Ingleburn Road
Approximate Ground Level (AHD):	94 metres
Nominal Size of Water Main (DN):	250mm (Target Point as per diagram provided)

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	94 metre head
Minimum Pressure	37 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	37
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	10	40
	15	39
	20	39
	25	38
	30	38
	40	37
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	10	35
	15	35
	20	34
	25	34
	30	33
	40	31
Maximum Permissible Flow	50	30

(Please refer to reverse side for Notes)

For any further inquiries regarding this application please email :

hydraulicassessment@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. 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.

LEPPINGTON HIGH SCHOOL

SECTION 73 FEASIBILITY APPLICATION

CASE No. 219026





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DOCUMENT CONTROL

01	18 th November 2024	Section 73 Report for Issue to Sydney Water	Current
Rev #	Date	Description of Change	Status

APPROVALS

01	Jane Ciabattoni - Liaison Manager - Civil and Water Engineering	Stuart Sullivan - Team Leader - Civil and Water Engineering
Rev #	Author	Approver

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Level 8, 8 Central Avenue
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School Infrastructure



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1. INTRODUCTION

WSCE Pty Ltd (WSCE) has been engaged by School Infrastructure NSW to prepare a Section 73 Feasibility Application for the proposed construction of a new High School at Leppington.

This report outlines the associated strategic plan with the proposed development and aims to address the following: -

- The existing site conditions.
- The proposed development and the associated demands.
- The potential impacts on existing Sydney Water assets.
- The proposed works to the Sydney Water assets including connections.

2. BACKGROUND

The proposed development site is located at 128-134 Rickard Road, Leppington. The site boundary is depicted in **Figure 1** below.



Figure 1 - Site Boundary

The purpose of this Section 73 application is to understand the impacts on the existing Sydney Water assets due to the proposed development. To do this the total water demand and sewerage discharges have been calculated along with a concept sketch of the proposed development's footprint to identify Sydney Water assets that may be impacted.

3. PROPOSED DEVELOPMENT

The proposed activity is for a new high school for Leppington and Denham Court. The new high school will accommodate up to 1,000 students across 3 new buildings that will comprise 48 permanent teaching spaces (PTS), 3 support teaching spaces (STS), 19 specialist labs/workshops/kitchens and a hall. Buildings 1, 2 and 3 will be clustered along the southern boundary and the hall will be located in the south-east corner of the site. The activity also includes the construction of a sports field in the centre of the site and 3 x multipurpose courts along the northern boundary. The proposed scope of works is illustrated in **Figure 2** below.

2.3.3 Floor Layouts - STAGE 01

2.3.3.2 Proposed Site Plan

PROPOSED SITE PLAN - LEGEND

- SITE BOUNDARY
- PROPOSED EXTERNAL FENCE LINE
- PROPOSED INTERNAL FENCE LINE
- PROPOSED GATE
- ➔ PROPOSED VISITOR ENTRY
- ➔ PROPOSED PEDESTRIAN ENTRY
- ➔ PROPOSED VEHICULAR ENTRY
- EXISTING TREES
- PROPOSED TREES
- PROPOSED TURF
- PROPOSED SOFTSCAPE
- SUPPORT PLAY AREA
- PROPOSED HARDSCAPE
- ASSEMBLY ZONE
- SPORTS COURTS
- SPORTS FIELD
- VEHICLE HARDSTAND
- KISS 'N' DROP
- SUPPORT DROP OFF
- PROPOSED WORKS BY OTHERS

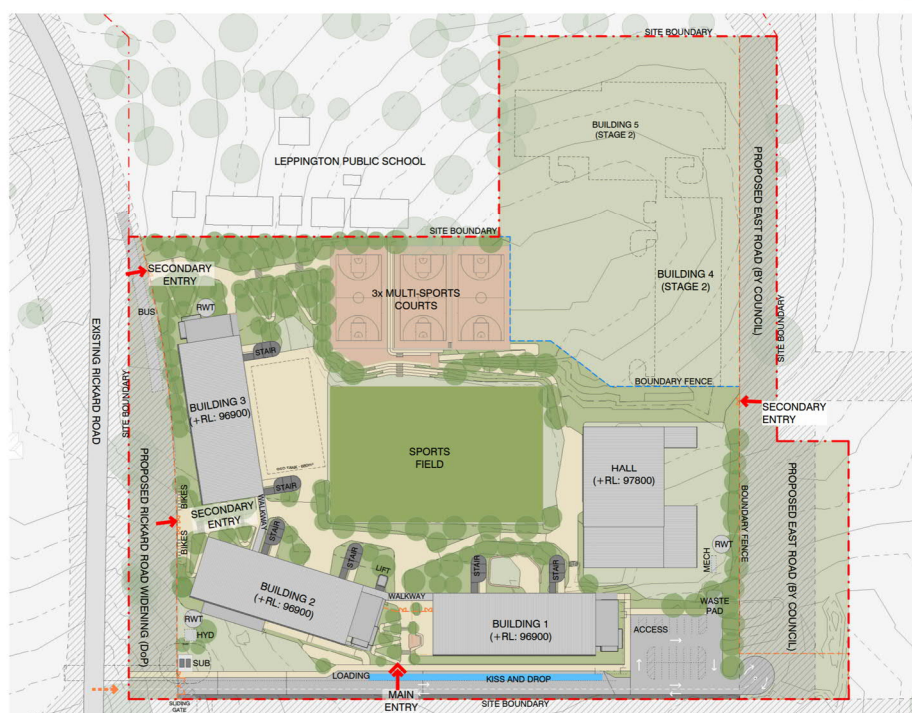


Figure 2 - Proposed Development

4. ABBREVIATIONS AND DEFINITIONS

AHD	Australian Height Datum
BPA	Building Plan Approval
CI	Cast Iron
CICL	Cast Iron Cement Lined
DA	Development Application
DICL	Ductile Iron Cement Lined
DN	Diameter Nominal (mm)
EPA	Environmental Protection Agency
IL	Invert Level
L/s	Litres per second
LGA	Local Government Area
m/s	Metres per second
MUF	Multi-User Facility
NSW	New South Wales
PVC	Polymerizing Vinyl Chloride
RCP	Reinforced Concrete Pipe
RL	Reduced Level
SWC	Sydney Water Corporation
WSC	Water Services Coordinator
WSCE	WSCE Pty Ltd

The Use of Must, Shall & Should:

In accordance with the International Organization for Standardisation (ISO) Directives, the word “shall” be used to state that a requirement is strictly to be followed to conform to a Performance Requirement. Consequently, there can be no deviation from that requirement, other than a specific tolerance.

It is noted that in legislation and specifications it is common to use the word “must” to express a requirement. The word “shall” in this document should be considered as equivalent to “must” in the legislation.

The word “should” introduce a suggestion or recommendation that is not a requirement. It is not necessary that such recommendations or suggestions be followed to comply with the Performance Requirement.

5. DEVELOPMENT APPLICATION

The Planning Pathway will be a Review of Environmental Factors (EF) which is currently in progress.

6. DEMAND CALCULATIONS

The calculations have been based on the following population numbers:-

- Stage 1 - 1,000 students and 75 staff.
- Stage 2 - 1,000 students.

6.1 WATER SUPPLY DEMAND CALCULATIONS

The maximum and average daily water demand has been calculated using data recorded from completed projects of comparable type, nature and scale, as presented in the Tables below.

Where possible, potable water usage will be reduced using low flow traps and sanitary fixtures, typically using the following WELLS ratings.

WCs will have a 4-star WELLS rating

Urinals will have a 5-star WELLS rating

Basins will have a 5-star WELLS rating

Showers will have a 3-star WELLS rating

The following table indicates the maximum and average daily water demands for the development.

Figure 6.1 – Maximum and Average Daily Water Demands

	Maximum Day Demand (Peak Demand)	Average Demand	Maximum Day Demand (Peak Demand)
	kL/day	kL/day	l/s
School	40	20	2.32
Total	40	20	2.32

6.2 SEWER DISCHARGE CALCULATIONS

To express the results in a total daily sewer discharge, an estimate of the average daily sewer discharge in terms of L/Day has been made by adopting information derived by the NSW Water Directorate. Where the standard equivalent tenement figures suggest that a 60% water to sewer discharge factor is appropriate. Refer to table below for this calculation.

The following table indicates the maximum and average daily sewer demands for the proposed school buildings at Leppington high school.

Figure 6.2 – Maximum and Average Daily Sewer Discharge

	Maximum Discharge kL/day	Average Discharge kL/day	Average Dry Weather Flow l/s
School	24	12	1.92
Total	24	12	1.92

7. PROPOSED CONNECTIONS

The existing Sydney Water assets are shown in **Figure 3**.

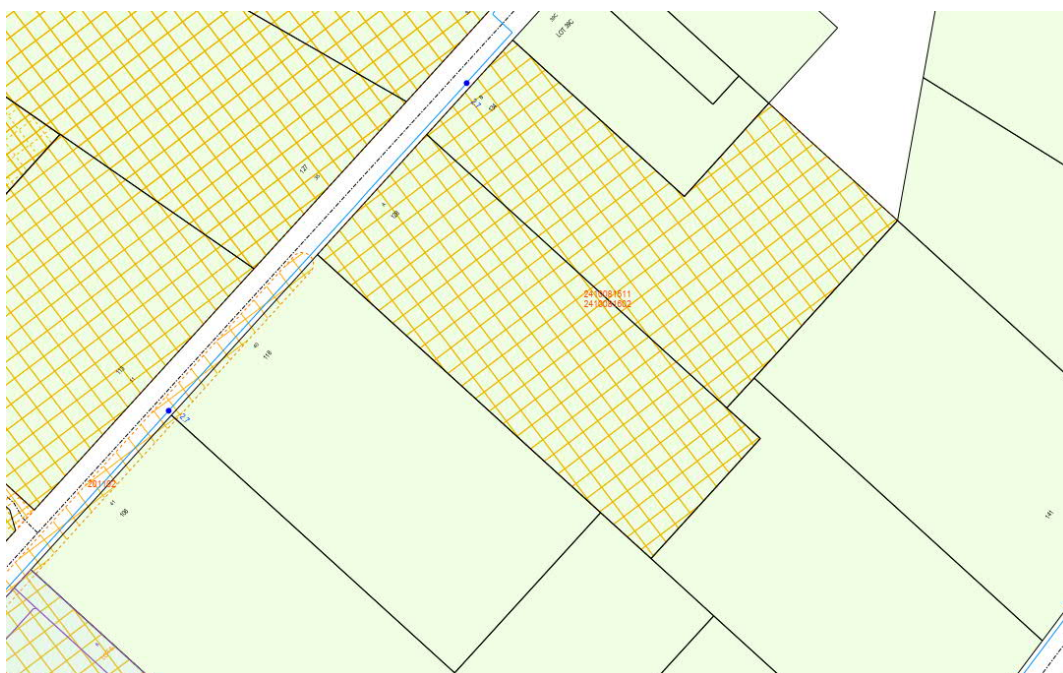


Figure 3 - Existing Sydney Water Infrastructure

7.1 WATER

The proposed development has frontage to an existing DN250 watermain in Rickard Road and it is proposed to connect to this watermain.

7.2 SEWER

To provide the proposed school with a sewer connection we have investigated four options as follows:-

- Option 1: It is proposed to construct a sewer extension from the existing DN225 sewer main in Ingleburn Road.
- Option 2: It is proposed to construct a sewer extension from the existing DN225 sewer main located in Property Number 56 on Byron Road.
- Option 3: It is proposed to construct a sewer extension from the existing DN225 sewer main in Byron Road, to the north of the development site.
- Option 4: It is proposed to construct a sewer extension from an existing DN225 sewer main to the west of the development site along a proposed future road.

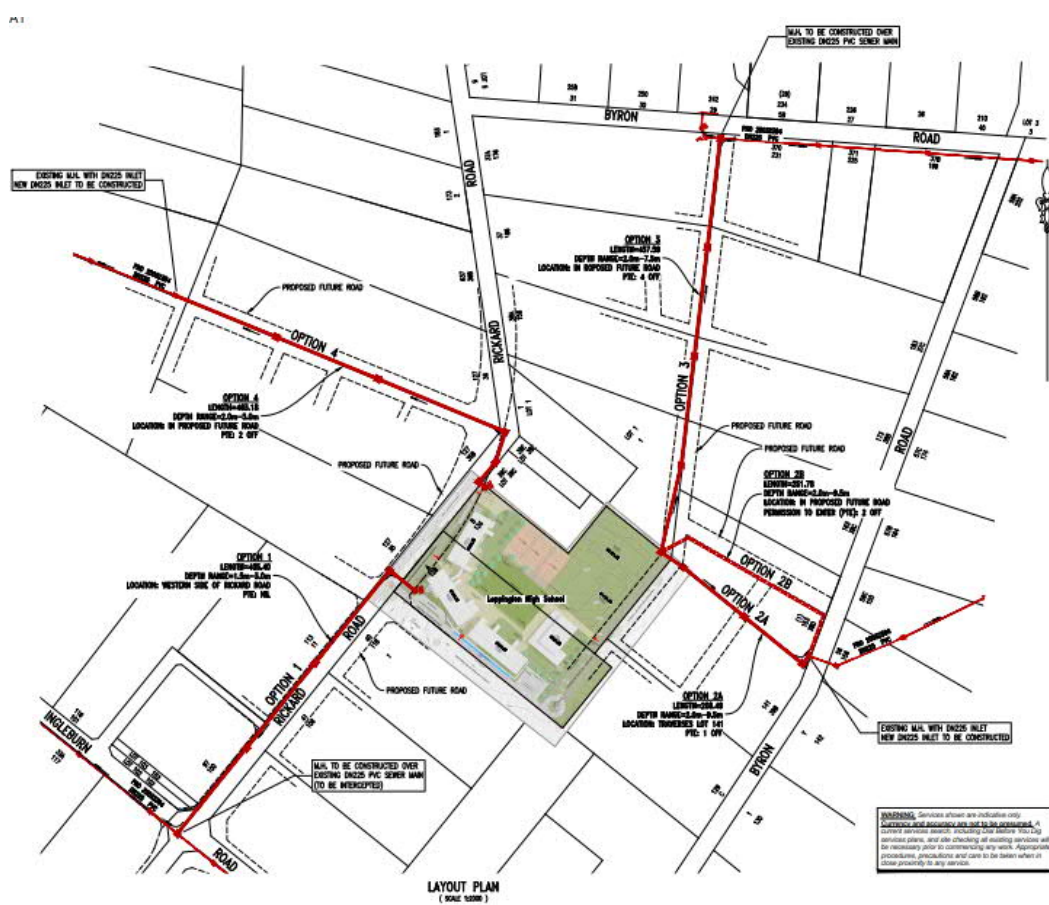


Figure 4 - Sewer Options

Our preferred option is Option 1.