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HYDRAULIC SERVICES
UTILITY SERVICES REPORT
GLEDSWOOD HILLS HIGH SCHOOL

22nd November 2024

DOCUMENT CONTROL

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APPROVALS

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01	A. Palmer	Superseded	J. Skubevski	S. Matthews
02	J. Chung	Current	J. Skubevski	S. Matthews

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Contents

1 INTRODUCTION AND DECLARATION

1.1 INTRODUCTION

This hydraulic services utility report has been prepared by WSce on behalf of the NSW Department of Education (DoE) to assess the potential environmental impacts that could arise from the activity of the new Gledswood Hills High School (the Proposal) at 9 Gregory Hills Drive, Gledswood Hills (the site). The works are proposed by the DoE to meet the growth in educational demand in Gregory Hills and Gledswood Hills, and the broader South West Growth Area.

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.

1.2 SUMMARY OF THE ACTIVITY

The proposed activity involves the construction and operation of a new high school at the site accommodating 1000 students, including:

- A series of school buildings along the northern, eastern and southern site boundaries.
- A school hall.
- An assembly area, sports field and multi sports courts.
- Car parking and a Kiss and Drop zone.

Associated on and off-site infrastructure to support the school, including a new pedestrian crossing and relocation of the existing bus stop on Gregory Hills Drive to the site frontage.

The Review of Environmental Factors prepared by Ethos Urban provides a full description of the proposed works.

Figure 2 is illustrative of the proposed buildings that will reside across the site upon the project's completion.

1.3 SITE DESCRIPTION

The site is located at 9 Gregory Hills Drive, Gledswood Hills, within the Camden Local Government Area (LGA), approximately 60km southwest of the Sydney CBD and approximately 3.5km from Narellan Town Centre. It comprises one lot, legally described as Lot 2 in DP 1262720, that measures approximately 4.15ha in area. The site is bound by Digitaria Drive to the north and Gregory Hills Drive to the south. To the east lies two vacant lots, a childcare centre and a fast food outlet. To the west lies another childcare centre and a vacant lot (which also has approval for a childcare centre).

An aerial image of the site is shown at Figure 1

Figure 1: Site Aerial of Property Boundary (Source: Ethos Urban)

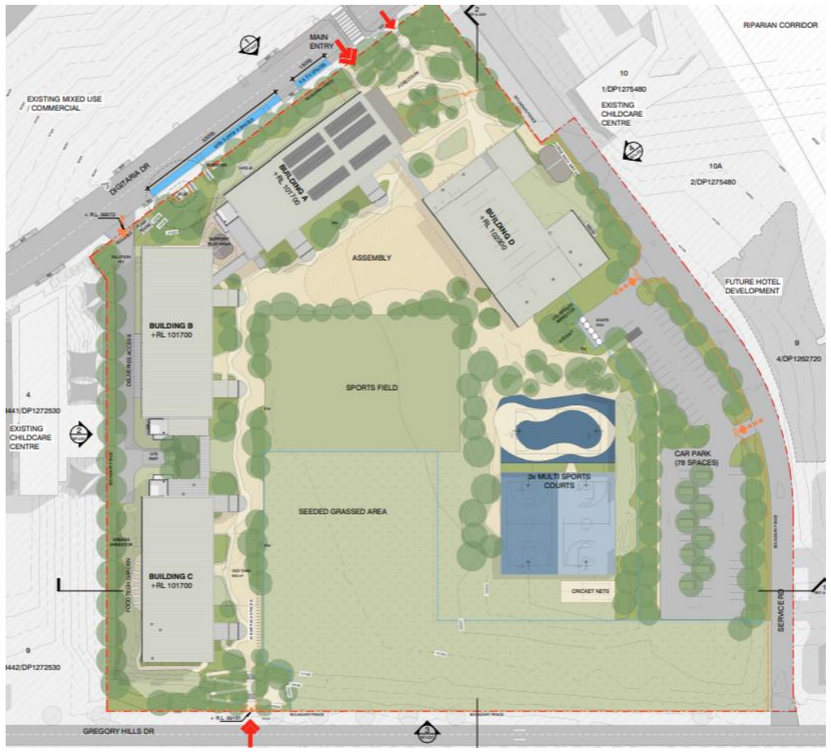

Figure 2: Site Plan – Proposed Site Massing

1.4 CONCEPT APPROVAL

This report has considered the concept approval (DA/2017/45/1) for a mixed-use activity comprising bulky goods premises, business premises, food and drink premises, indoor recreation facilities, two hotels and a cinema. It has been determined that the concept approval is not applicable to the subject of this report, and implications for assessment have not been identified.

1.5 SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

Based on the identification of potential issues, and an assessment of the nature and extent of the impacts of the proposed activity, it is determined that:

- the extent and nature of the potential impacts is low and won't have a significant impact on the locality and/ or the environment.
- Potential impacts can be appropriately mitigated or managed to ensure that there is minimal impact on the locality, community and/or the environment.

2 DEMOLITION

There are no existing buildings on the site that are required to be demolished.

3 HYDRAULIC SERVCES DEMAND CALCULATIONS

There is currently no existing demand on the Sydney Water and/or Jemena network utility mains as there are no existing buildings on the site. Therefore, 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 additional 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 – 2.46 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 multiple Sydney Water utility water mains as identified below and in Figure 3:

- 150mm diameter water main in Digitaria Drive,
- 375mm diameter water main in Gregory Hills Drive,
- 375mm diameter water main along the western boundary.

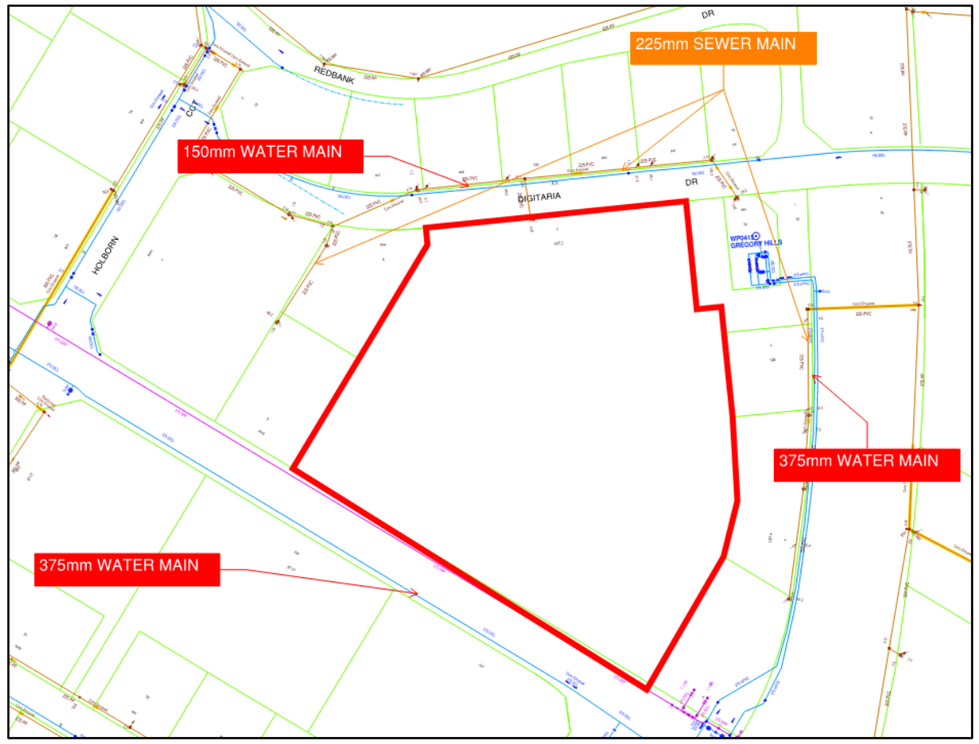

Figure 3: Existing utility sewer and water mains surrounding the site

There has been no formal correspondence with Sydney Water regarding the capacity of their water assets as of yet and there is no assumed requirement for any water main diversions as there are no mains that reticulate within the site boundary. This is to be confirmed through the Section 73 Notice of Requirements by the D & C contractor.

It is assumed that there is no requirement for any water main diversions as there are no mains that reticulate within the site boundary.

It is proposed to connect to the 150mm diameter water main asset in Digitaria Drive. A Pressure and flow application of this water main was previously lodged and has been referenced in APPENDIX B – NETWORK UTILITY OPERATOR CORRESPONDENCE. It was identified that this main is sufficient to supply the proposed activity from a hydraulic and fire services perspective, although is to be confirmed via the Sydney Water Section 73 process.

4.2 SEWER

The existing site has access to multiple Sydney Water utility sewer mains as identified below and in Figure 3:

- 225mm diameter sewer main in Digitaria Drive,

There has been no formal correspondence with Sydney Water regarding the capacity of their sewer assets as of yet and there is no assumed requirement for any sewer main diversions as there are no mains that reticulate within the site boundary. This is to be confirmed through the Section 73 Notice of Requirements.

It is proposed to connect to the 225mm diameter sewer main asset in Digitaria Drive.

4.3 NATURAL GAS MAINS

The existing site has access to multiple Jemena utility natural gas mains as identified below and in Figure 4:

- 110mm diameter 210kPa natural gas main in Gregory Hills Drive,

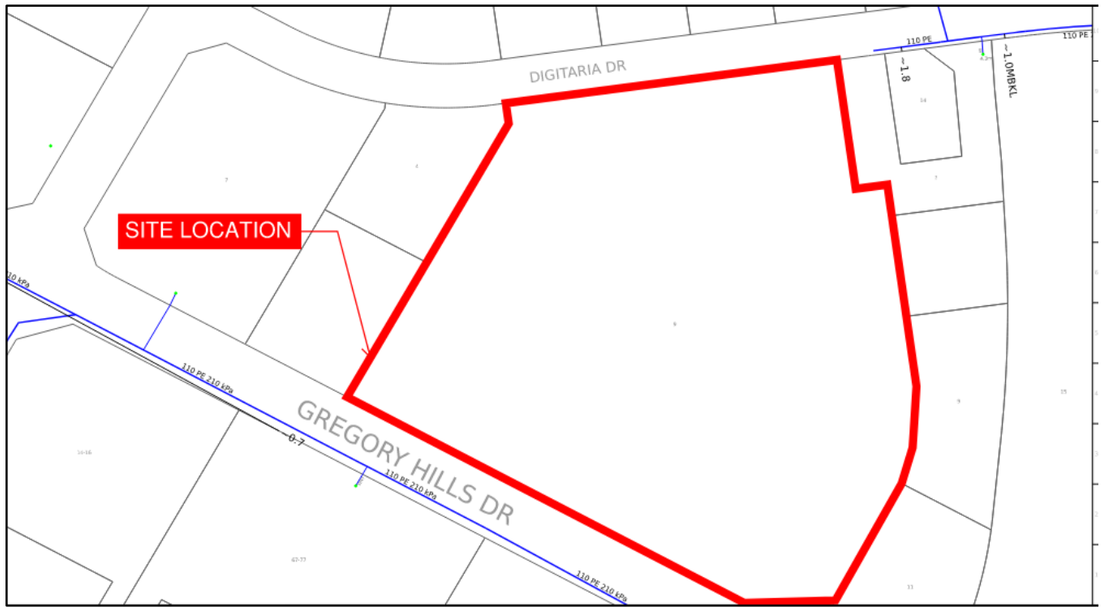

Figure 4: Existing utility natural gas mains surrounding the site

There is no proposed new natural gas connections or diversions required due to the project's electrification strategy.

5 REVIEW OF ENVIRONMENTAL IMPACT ASSESSMENT

5.1 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 Notice of Requirements had been received.

5.2 CONCLUSION

Based on the identification of potential issues, and an assessment of the nature and extent of the impacts of the proposed activity, it is determined that:

- the extent and nature of the potential impacts is low and won't have a significant impact on the locality and/ or the environment.
- Potential impacts can be appropriately mitigated or managed to ensure that there is minimal impact on the locality, community and/or the environment.

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: Mitigation Measures

Project Stage Design (D) Construction (C) Operation (O)	Mitigation measure	Reason for mitigation measure	Relevant section of report
D/C	Water services connection outlined in Sydney Water Notice of Requirements	Coordinating the water services connection with Sydney Water to ensure it can be constructed in a risk-free manner and also that the proposed activity does not negatively impact their system.	Clase 4.1
D/C	Sewer services connection outlined in Sydney Water Notice of Requirements	Coordinating the sewer services connection with Sydney Water to ensure it can be constructed in a risk-free manner and also that the proposed activity does not negatively impact their system.	Clause 4.2

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: 31/07/2024

Pressure & Flow Application Number: 1935891
Your Pressure Inquiry Dated: 2024-07-22
Property Address: Lot 2 Digitaria Drive, Gregory Hills NSW 2557

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: Digitaria Drive	Side of Street: North
Distance & Direction from Nearest Cross Street	90 metres West from Redbank Drive
Approximate Ground Level (AHD):	97 metres
Nominal Size of Water Main (DN):	150 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	65 metre head
Minimum Pressure	42 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	41
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	10 15 20 25 30 40 50	48 47 46 44 42 37 30
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	10 15 20 25 30 40 50	40 39 37 35 33 28 21
Maximum Permissible Flow	60	13

(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 a 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.