



Infrastructure Services Masterplan Report

Eileen O'Connor School: Tuggerah

84 Gavenlock Road Mardi NSW
2259

INFRASTRUCTURE SERVICES REPORT

PREPARED FOR:
Stanton Dahl Architects

Tel: 02 8876 5300

Ref: NL 231588

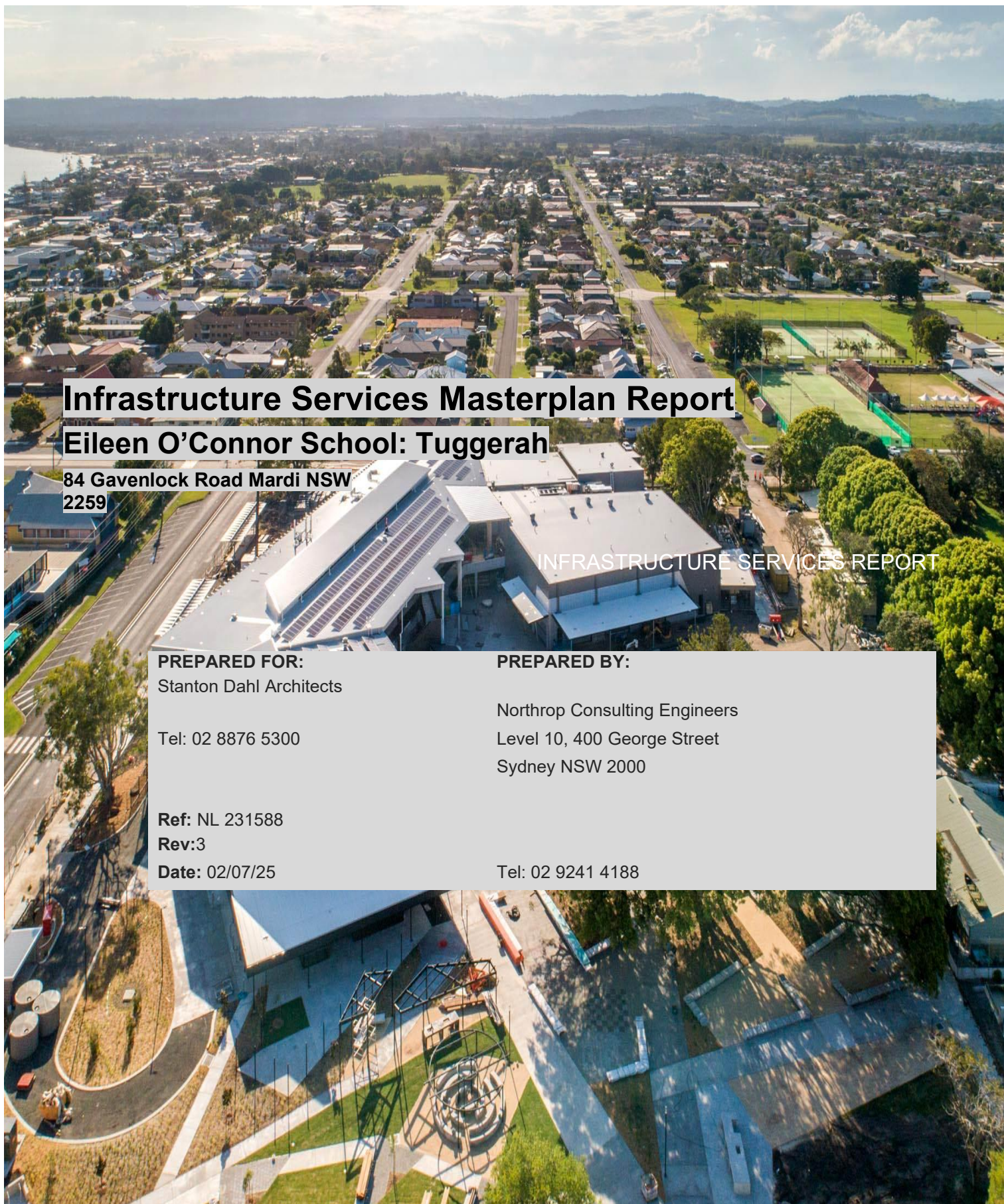
Rev:3

Date: 02/07/25

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INFRASTRUCTURE SERVICES MASTERPLAN REPORT

Amendment Schedule

Date	Revision	Issue	Prepared By	Approved By
16/04/25	1	For review	WJ/	MB
08/05/25	2	For Approval	WJ/KS	MB
02/07/25	3	Final	KS	MB

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EXECUTIVE SUMMARY

This Infrastructure Services Management Plan (ISMP) report outlines how the proposed works within The proposed Eileen O'Connor Catholic School at Mardi details the existing infrastructure, detailing information on the existing capacity and any augmentation required for the proposed development. The report also details record of consultation with relevant agencies.

This IMP outlines the existing infrastructure, detailing information on the existing capacity and any augmentation to the aforementioned services required for the proposed development. The report also details records of consultation with relevant agencies. The details within this report are preliminary and based on currently available information and correspondence undertaken at the time of writing.

This report is provided in response to the Secretary's Environmental Assessment Requirements (SEARs) issued for the project and has been prepared for lodgement to the State Significant Development (SSD) application for The proposed Eileen O'Connor Catholic School at Mardi. This IMP addresses the Infrastructure Management Plan requirements held within Item 21 of the SEARs. An extract of the SEARs requirement is below:

Item	Action to Address the Requirement	Report Location
<p>21. Infrastructure Requirements and Utilities In consultation with relevant service providers</p> <ul style="list-style-type: none"> • Assess the impacts of the development on existing utility infrastructure and service provider assets surrounding the site • Identify any infrastructure required on-site and off-site to facilitate the development and any arrangements to ensure that the upgrades will be implemented on time and be maintained. • Provide an infrastructure delivery and staging plan, including description of how infrastructure requirements would be coordinated, funded and delivered to the development 	<p>This IMP report details the existing hydraulic and electrical services infrastructure available to service the proposed Eileen O'Connor Catholic School at Mardi.</p>	<p>Section 4,5 & 6</p>

TABLE OF CONTENTS

Executive Summary	2
1. Development Description	4
2. SEARs Issues Addressed	8
3. Site Description	9
3.1 The Site	9
4. Existing Utility Services	10
4.1 Low Voltage Infrastructure	10
4.2 Telecommunications	10
4.3 Sewer Services	10
4.4 Water Services	11
4.5 Natural Gas Services	11
5. Proposed Infrastructure & Augmentation	12
5.1 Electricity Services	12
5.2 Telecommunications Services	12
5.3 Sewer Services	13
5.4 Water Services	15
5.5 Gas Services	15
5.6 Proposed Fire Protection Services	15
6. Conclusion	17
7. Appendices	18
7.1 Appendix A	18
7.2 Appendix B	19
7.3 Appendix C	20

1. DEVELOPMENT DESCRIPTION

Client: **Catholic Schools Office, Broken Bay Diocese**

Project Name: **Eileen O'Connor Catholic School**

Project Address: **84 Gavenlock Road, Mardi NSW 2259**

The Proposed Eileen O'Connor Catholic School project is a new school facility (Refer to Lower Ground, Ground and Level 1 plans in Figure 1,2 & 3). The proposed works are as follows:

1.1.1 Building, Playground and Parking

- Southern Carpark
- Eastern Carpark
- Lower and Upper playgrounds
- Equipment and Maintenance Stores
- 20 x General Learning Areas
- Kitchen/Canteen
- Administration
- Multi-Purpose Hall
- Gym
- Library/Staff Resource
- Amenity Areas
- Plant Areas

1.1.2 Site & Infrastructure Preparation Works

- Tree Removal
- Excavation and Earthworks;
- Remediation Works.

1.1.3 Infrastructure

- Extension of utilities as required.
- Installation of electrical and hydraulic infrastructure required for the development.

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All dimensions to be verified on site and any discrepancies reported immediately to the client. This drawing is to be used for construction purposes only. It is not to be used for any other purpose without the written consent of Stanton Dahl Architects.

Rev: Issue No: 01/07/25
 Issue No: 01/07/25
 Issue No: 01/07/25

Author: [Name]
 Designer: [Name]
 Checker: [Name]
 Date: 01/07/25



01 Floor Plan Lower Ground
 1:250

Legend

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- ag agricultural
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Figure 1-1: Lower Ground Plan

2. SEARS ISSUES ADDRESSED

This report addresses how the proposed project addresses Item 21 of the SEARs and outlines strategies relating to Utilities. These requirements are outlined below alongside where the response to each can be found within this report;

Item	Action to Address the Requirement	Report Location
<p>21. Infrastructure Requirements and Utilities</p> <p>In consultation with relevant service providers</p> <ul style="list-style-type: none"> • Assess the impacts of the development on existing utility infrastructure and service provider assets surrounding the site • Identify any infrastructure required on-site and off-site to facilitate the development and any arrangements to ensure that the upgrades will be implemented on time and be maintained. • Provide an infrastructure delivery and staging plan, including description of how infrastructure requirements would be coordinated, funded and delivered to the development 	<p>This IMP report details the existing hydraulic and electrical services infrastructure available to service the proposed Eileen O'Connor Catholic School at Mardi.</p>	<p>Section 4 & 5.</p>

3. SITE DESCRIPTION

3.1 The Site

The proposed site of works is located at 84 Gavenlock Road Mardi. It is defined by the green shaded area of the site shown in the Figure 4 below.



Figure 4: Proposed Site of Works

Northrop has performed desktop investigations in regard to the existing site conditions, considering the context of the proposed School development.

Our assessment has been based on information provided by the relevant electrical and telecommunications utility authorities, and information provided by the project representatives including but not limited to:

- Dial Before You Dig Plans
- Architectural Drawings produced by Stanton Dahl Architects

4. EXISTING UTILITY SERVICES

4.1 Low Voltage Infrastructure

The Energy Authority serving the site is Ausgrid.

There is an existing substation within the site that services St Peter's Catholic College.

This existing substation's location is not practical for upgrade or use due to its distance from the proposed Eileen O'Connor Catholic School, as the permissible voltage drop as per AS3000 could not be satisfied.

4.2 Telecommunications

Following the review of the Dial Before You Dig (DBYD) plans, Existing NBN services have been identified in the immediate vicinity of the proposed Eileen O'Connor Catholic School.

Utility telecommunications cabling is installed in underground conduits on street verges on Keefers Glen, with regular access points through pits along the northern western side of the site with underground services.



Figure 4-1 NBN infrastructure

4.3 Sewer Services

The existing sewer assets around the site are owned and operated by Central Coast Council as follows:

- DN 150mm Central Coast Council sewer main within the properties on the west side of Keefers Glen Road. The material the sewer is constructed of is not stated.

Refer Appendix A for details.

4.4 Water Services

The existing potable water assets around the site are owned and operated by Central Coast Council as follows:

- DN100mm uPVC Central Coast Council water main. Available Pressure and Flow Test Results

Flow Rate (L/sec)	Pressure Head (m)
0.66	724
5	697
10	657
20	553
30	416
35 (max flow)	337

Refer Appendix A for details of the infrastructure and Appendix B for mains pressure inquiry.

4.5 Natural Gas Services

The existing natural gas assets around the site are owned and operated by Jemena as follows:

- DN32mm NY 210kPa Natural Gas main within Keefers Glen Road

Refer to appendix C for details.

5. PROPOSED INFRASTRUCTURE & AUGMENTATION

5.1 Electricity Services

During the Concept Design phases of the project, Northrop completed preliminary maximum demand calculations based on the concept architectural plans to determine the required utility power services required to service the Eileen O'Connor Catholic School.

The site contains pad-mounted substation which services St Peter's Catholic College is not within the vicinity of the site. This is not suitable for upgrade or re-use due to its distance from the proposed Eileen O'Connor Catholic School.

The proposed Eileen O'Connor Catholic School will require the addition of a new substation on-site, including any augmentation required to the local HV network. This new substation will be dedicated to service the school site exclusively, with the existing substation to remain as it currently operates.

Northrop has undertaken a preliminary maximum demand calculation (AS 3000, Table C3) based upon architectural concept plans dated 19th December 2024, and is based on each building having air conditioning, along with provisions for EV charging for the carpark as per NCC2022 Section J9D4.

An application for connection will need to be lodged with Ausgrid, requesting for a new 3-phase supply for the site. Ausgrid will respond with indications of required substation, and modifications required to the local high voltage network to supply the requested capacity.

The electricity authority will provide a quotation for a contribution to facilitate the required changes for the client. The client will need to make allowance for these contributions.

Staging for the electrical works will need to be determined in accordance with the project program.

5.1.1 Options for Electricity Supply

Due to the significant impact of installing a substation on-site, all proposed and future expansion electrical requirements need to be considered. L-Type kiosk padmount substations (as proposed for this development) require a standard easement and enclosure size to supply the site. The overall available capacity is determined by the internal components installed inside the enclosure. For developments which may require additional capacity in the future, it is preferable that the substation is sized appropriately to have the capacity to supply both the proposed development and any additional expansion.

Additional consideration will be required for potential expansion of the school in the future. Based upon the concept plans received 19th December 2024, we have projected a maximum demand of **547.27 kVA or 790 Amps/Phase**. This would require a 750kVA substation to service the site.

5.2 Telecommunications Services

The school site presently has NBN infrastructure running along the street verge on Keefers Glen. It is proposed that the school is serviced by a single NBN fibre link for Department of Education wide-area network/data services and telephone access via VOIP. This will require augmentation/installation of infrastructure on Keefers Glen to bring telecommunications service into the site. The appropriate connection applications will need to be lodged to confirm the works required for connection.

NBN will provide a charge for network augmentation that the client will need to make allowance for.

Staging for the NBN works will need to be determined in accordance with the project program.

5.3 Sewer Services

The local area is serviced by a Central Coast Council 150mm gravity sewer in Keefers Glen Road which flows from south to north.

The Central Coast Council sewer is located on the west side of the road within property boundaries. An extension will be required to the east side of the road into the school boundary.

A DN150 gravity pipework system within the school shall connect all sanitary fixtures within the site making connection to the existing 150mm sewer in Keefers Glen Road. The fixture loading unit calculated to AS 3500.2 is 397.

5.3.1 Sewage Generation

Preliminary sewage generation rates have been estimated in accordance with the Sewerage Code of Australia - Sydney Water Edition, WSA-02-2002 (2009).

Table 1.1.1 Equivalent Populations for Synchronous Discharges			
Classification	Unit	EP per Unit	Remarks
Residential			
Single Occupancy Lots	Lot	3.5	To be used for single occupancy lots down to 300 m ² .
Single lot 1,000m ²	Gross Hectare	25	
Single lot 500m ²	Gross Hectare	50	Approx. 70% net which takes roads, parks etc. into consideration.
Single lot 300m ²	Gross Hectare	80	
Multiple Occupancy Lots			
Single Occupancy Medium Density Dwelling Units	Dwelling Unit	3.0	To be used for single occupancy lots down to 300 m ² .
Medium Density (Group housing)	Gross Hectare	120	Density of 40 dwelling units/ gross ha.
Medium Density e.g. 3 Storey Walk-up Flats	Gross Hectare	210	Density of 70 dwelling units/gross ha.
Single Occupancy High Density Dwelling Units	Dwelling Unit	2.5	
High Density Multi Storey Apartments	Gross Hectare	375-4,000	Depends on locality e.g. CBD in small capital city, CBD in Sydney, strip development along Gold Coast.
Commercial/ Special Cases			
High Density Commercial	Gross Hectare	300-800+	Typical for capital city CBD.
Local Commercial	Gross Hectare	75	

Education Institutions	Student	0.2	Includes teaching staff. Treat residential colleges and boarding houses as medium density dwelling units.
General Public Entertainment Facilities	Visitor	0.05	Shows, race crowds, etc.
Clubs	Occupant	0.25	Use the maximum number of occupants for which the club facilities were designed.
Hospitals and Nursing Homes	Available Beds	3.4	Includes staff quarters.
Caravan Parks	Camper	0.5	
Hostels	Resident	0.4	
Parks / Gardens / Reserves	Gross Hectare	20	
Golf Courses	Gross Hectare	10	Treat club houses as above.
Future Industrial Areas	Gross Hectare	150	To be used only when the future types of industry are unknown otherwise use Table A2.

Table 1.1.2 Sewage Generation Estimates for Study Area

Lot Yield	EP ¹	ADWF (kL/d) ²	ADWF (L/s) ³	PDWF 'd' Factor ⁴	PDWF (L/s) ⁵
42	147	26.46	0.308	2	0.617

Notes:

1. Based on 3.5 EP / ET.
2. Average Dry Weather Flow (ADWF) based on 180 L/EP/day.
3. Based on 0.0021 L/s / EP.
4. Peak Dry Weather Flow (PDWF) from Figure B.1 of SW ed. WSA 02-2002-2.2.
5. ADWF x d Factor.

5.3.2 EP Capacity Limitations for Reticulation Sewers

Pipe Size (DN)	Maximum Allowable EP
150	600
225	1,600
300	3,200

The existing 150mm Central Coast Sewer appears to have sufficient capacity to serve the proposed school however this will need to be confirmed by Central Coast Council with an application for Developer Services

5.4 Water Services

The cold water service will be designed in accordance with the NCC, AS3500.1, and Central Coast Council Water requirements.

The required flow rate for the fire hydrant service based on a fire compartment under 5000m² 20 litres per second.

The required probable simultaneous flow rate for the potable water service has been estimated at approximately 3 litres per second not accounting for any landscape watering flows.

Based on Sydney Water Guidelines for Schools, an allowance of 12 litres per student per day is allowed. The school has an anticipated population of 200. Allowing for 30 staff the daily flow rate would be 2,760 litres not accounting for landscape water flows.

The existing DN100mm uPVC Central Coast Council water main located within Keefers Glen Road appears to have sufficient capacity to service the proposed school. This has been determined by the pressure and flow statement provided by Central Coast Council. Refer to appendix C. However, this will need to be confirmed by Central Coast Council with an application for Developer Services

5.5 Gas Services

There is an existing DN32 PY 210kPa natural gas main within Keefers Glen Road, however we are not expecting the school to utilise natural gas for any energy requirements due to the move towards renewables.

All hot water generation will be by electric heat pump.

The commercial kitchen may require gas to cooktops.

The Science Lab will require gas.

5.6 Proposed Fire Protection Services

5.6.1 Fire Hydrants

A new dedicated fire hydrant system shall be designed for the proposed school in accordance with the requirements of the BCA and AS2419.1.

After reviewing the current architectural drawings it appears the each level is fire isolated. Therefore the required flow rate for the fire hydrant service based on a fire compartment under 5000m² is 20 litres per second.

However, Northrop's review was completed without a drawing showing fire compartments and a BCA report.

The new dedicated fire hydrant system will make connection into the 100mm uPVC water main available within Keefers Glen Road with a mains booster valve assembly at the Northwest boundary/vehicle entry.

From Northrop's preliminary review a fire hydrant pumpset will not be required, however this will be confirmed during detail design .

5.6.2 Fire Hose Reels

Fire hose reels may be required to the hall, admin/staff and library areas. All fire hose reels will be located in a readily accessible position within 4 metres of a required exit. Any requirements for fire hose reels will be noted in the BCA report.

The fire hose reel system shall make connection to the cold-water service.

6. CONCLUSION

This Infrastructure Services Master Plan (ISMP) outlining the proposed Utility Infrastructure servicing the proposed development will be suitable for addressing the requirements of the SSDA submission

The project, located at Keefers Glen Road NSW 2259, can be adequately serviced by power, telecommunications, natural gas, water and sewer services.

Ausgrid and NBN infrastructure: It has been identified that the local low-voltage electrical infrastructure is insufficient to support the proposed buildings, requiring a kiosk substation (subject to Ausgrid Requirements) to be installed to service the site. Augmentation of the local NBN communications infrastructure will also be required to service the site.

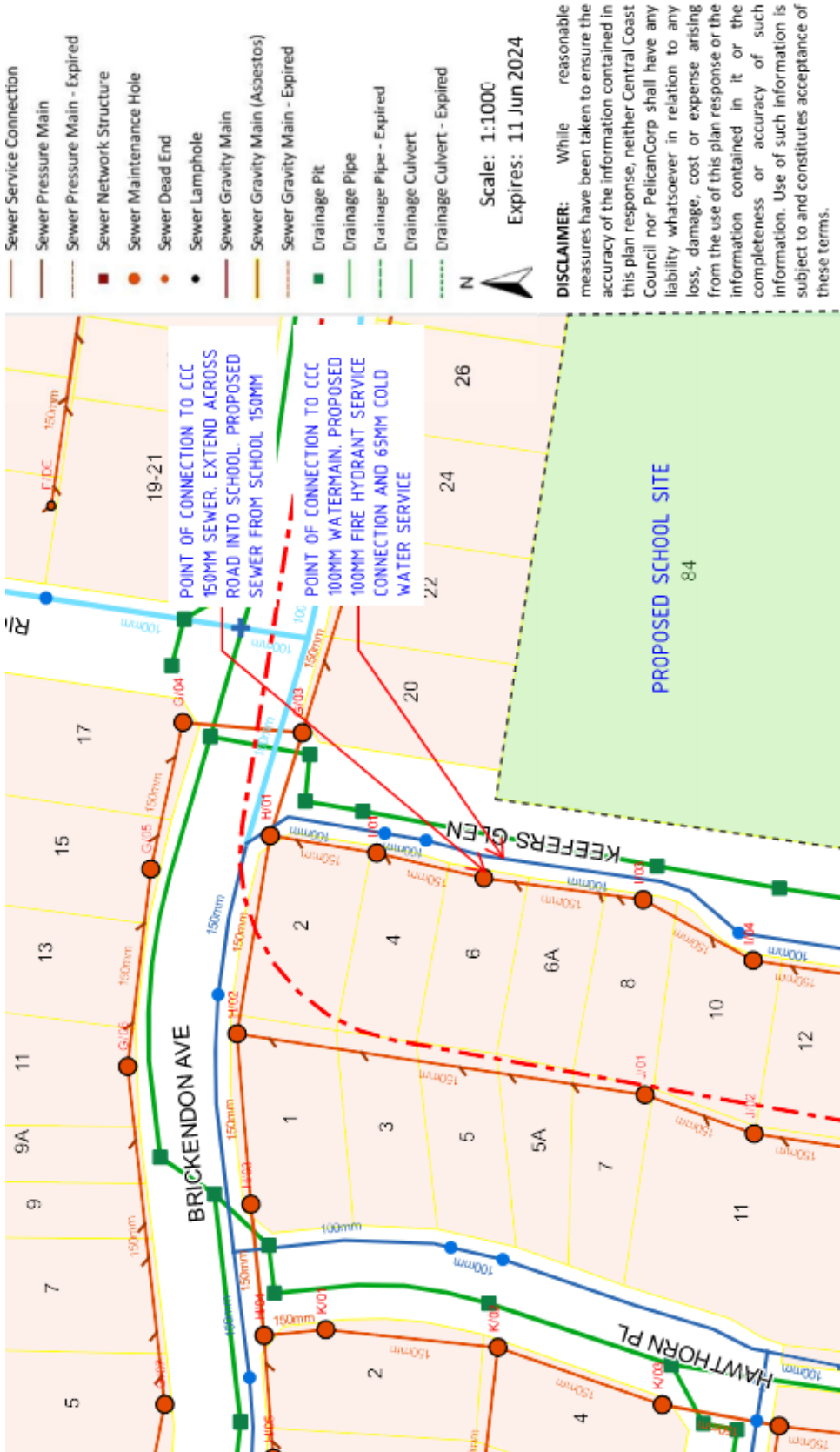
Central Coast Council Water and Sewer infrastructure: From Northrop's desktop review it appears that the Central Coast Council DN150mm sewer and DN100mm watermain have capacity for serving the proposed school and no amplification would be required. This will be confirmed once an application to Council's Developer Services to confirm the property is adequately serviced by sewer and water infrastructure.

Jemena Natural Gas main: Due to the limited use of natural gas to the proposed school the existing 32mm NY 210kPa Natural Gas main should have capacity to serve the school. This will be confirmed once a formal application is lodged to Jemena.

The IMP has addressed all aspects of the SEARs items identified in Section 2 of this report.

7. APPENDICIES

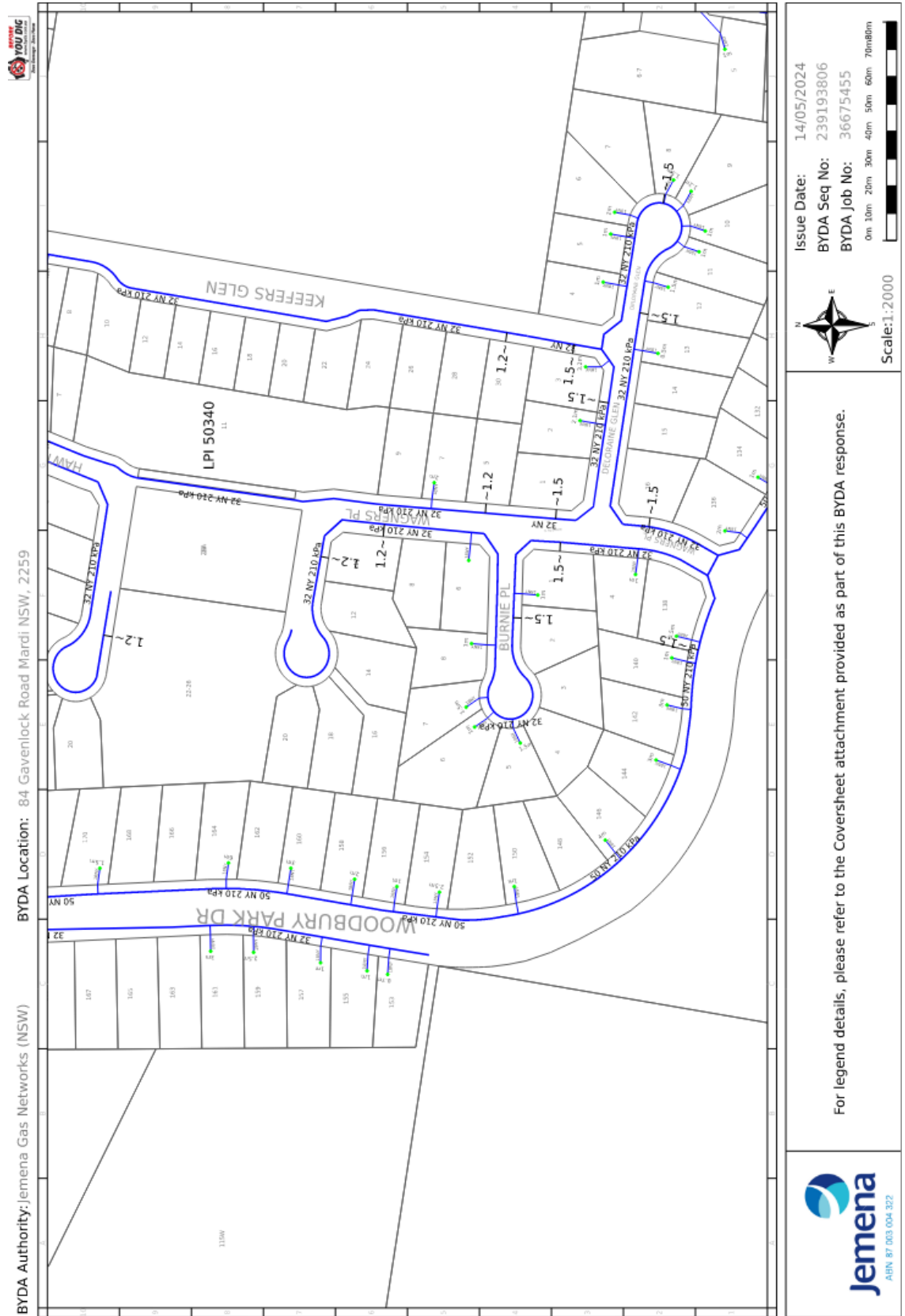
7.1 Appendix A



Central Coast C - MWTP Mains Plan.docx (22 Apr 2024)

etAccess Software | www.pelicancorp.com

7.2 Appendix B



7.3 Appendix C

Container: F2020/00495



Internal ref: D16256302
20 June 2024

Attention: Mitchell Blanton
mblanton@northrop.com.au

Dear Sir/Madam

Water Supply Pressures – 84 Gavenlock Road Mardi

In response to your mains pressure enquiry in relation to the above property, the following advice is provided based on a hydraulic model analysis of the water supply system under fire flow conditions:-

Physical Data		80mm Hydrant Flow Test Results	
Main and Hydrant Flow Test Location indicated on attached map	Y	Pressure at Main (Ground Level) with:	Pressure (kPa)
Node GIS ID	25434	* No Flow	728
Main Diameter (mm)	100mm	* 0.66L/s Flow	724
Ground Level (AHD) at Test Location (m)	7.61m	* 5.0 L/s Flow	697
		* 10.0 L/s Flow	657
		* 15.0 L/s Flow	609
		* 20.0 L/s Flow	553
		* 25.0 L/s Flow	488
		* 30.0 L/s Flow	416
		* 35.0 L/s Flow	337
		* 40.0 L/s Flow	N/A
		* 45.0 L/s Flow	N/A
		* 50.0 L/s Flow	N/A
		* Max. Flow (35 L/s)	337

NOTE: The above flow and pressure information is a calculated estimate from a hydraulic model of the water supply system, and should not be treated as a guarantee of supply in any way. These values are not representative of conditions at all times of the day or season and are subject to variables beyond Council's control, such as proposed system augmentations, variations in system demands or changes in hydraulic operation of the network. This information is valid for 12 months from the date of this letter.

Should you have enquiries regarding this matter, please contact Council Water Assessment Team via waterassess@centralcoast.nsw.gov.au

Yours faithfully

Water Assessment Team
Central Coast Council

PLAN OF TESTING POINT



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