Building Services Infrastructure Report

NORTHERN RIVERS FLOOD RECOVERY – RICHMOND RIVER HIGH CAMPUS REDEVELOPMENT

Client:
NSW DoE

Revision:
D

Date:
11/07/2025

REPORT INFORMATION

Project	Northern Rivers Flood Recovery – Richmond River High Campus Redevelopment
Title	Building Services Infrastructure Report
Client	NSW DoE
Revision	D
Revision Date	11/07/2025
Prepared By	LCI Consultants Sydney Office Level 5, 73 Miller Street North Sydney, NSW 2060
ABN / ACN	92 124 107 973 / 124 107 973
Author	LCI

REVISION SCHEDULE

Revision	Date	Issue Name	Author	Authorised
A	10/12/2024	Issued for Information	MM, GL, LBH	CF
B	10/01/2025	Issued for Information	MM, GL, LBH	CF
C	27/06/2025	Issued for Information	MM, FM, NF, SFH	CF
D	11/07/2025	Issued for Information	MM, FM, NF, SFH	CF

CONTENTS

1 Introduction 4

1.1 Purpose 4

1.2 Sources of Information 4

1.3 Site Description 4

1.4 Proposed Activity Description 5

1.5 Design Guidelines and Standards 7

2 Electrical Utility Services 8

2.1 Existing Supply Authority Infrastructure 8

2.2 Proposed Electrical Infrastructure 11

2.3 Status of Authority Applications 11

3 Telecommunications Carrier Services 13

3.1 Existing Telecommunication Infrastructure 13

3.2 Proposed Telecommunication Infrastructure 17

3.3 Status of Authority Applications 17

4 Water Utility Services 18

4.1 Potable Cold Water 18

4.2 Sewer Service 21

4.3 Gas Service 21

4.4 Status of Authority Applications 21

5 Mitigation Measures 22

6 Summary and Conclusion 23

6.1 Summary of Electrical & Communications Infrastructure 23

*6.2 Summary of Water & Sewer Infrastructure ..... **Error! Bookmark not defined.***

6.3 Evaluation of Environmental Impacts 23

Appendix A 23

1 Introduction

1.1 Purpose

This building services infrastructure report has been prepared to support a Review of Environmental Factors (REF) for the rebuild of Richmond River High Campus (the activity) (RRHC). The REF has been prepared to support an approval for the RRHC development under Section 68 of the NSW Reconstruction Authority Act 2022 (RA Act).

The purpose of this report is to summarise the existing building services infrastructure including electrical utility, telecommunications, water, gas, and sewer, to the site, and identify the required upgrade works to accommodate Richmond River High Campus on this site.

1.2 Sources of Information

The information in report is based on the following information:

- DBYD information.
- Site visit by LCI conducted on 29 February 2024. Note this site inspection was visual only and no intrusive investigations were undertaken.
- Desktop assessment of Essential Energy database (in absence of any correspondence or negotiations).
- Surveys provided to LCI for the Showground site on 23 February 2023.

1.3 Site Description

The site is located at Dunoon Road, North Lismore, also known as 163 and 170 Alexandra Parade, North Lismore. The site comprises of three separate lots, located to the north of Alexandra Parade, with Dunoon Road running parallel to the eastern boundary of the site.

The site is legally described as:

- Lot 1 DP 539012
- Lot 2 DP 539012
- Lot 1 DP 376007

The site area is approximately 33.53 hectares. The proposed activity will be undertaken mainly within the southeastern portion of the site. The site is outlined in Figure 1.

Figure 1 Aerial image of site (Source: Nearmap)

1.4 Proposed Activity Description

The proposed activity comprises the relocation and rebuild of the Richmond River High Campus from its existing temporary location alongside The Rivers Secondary College Lismore High Campus at East Lismore to the site at 163 and 170 Alexandra Parade, North Lismore.

The school will be delivered in one stage. A detailed description of the proposal is as follows:

1. Demolition of existing features including existing buildings, cattle drinking well, cattle sheds, and wire fencing, and removal of trees to accommodate school development.
2. Construction of new 3 storey buildings on the southeastern portion of the site for the proposed public secondary school including:
    a. General and Specialist Learning Spaces, and Workshops.
    b. Administration, and Staff facilities.
    c. Library, Hall, and Movement Studio.
    d. Construction, Hospitality, and Agricultural Learning Facilities.
    e. Amenity, Plant, Circulation, and Storage areas.
    f. Outdoor Learning Spaces and play spaces.
3. Landscaping including tree planting.
4. Public domain works comprising:
    - Access road off Dunoon Road, comprising a separate shared bicycle/pedestrian pathway, and internal access roundabout.

- Kiss and ride drop-off and pick up zones.
- Bus transport arrangements with a separate bus zone.

5. Outdoor spaces including assembly zones, agricultural spaces, sports fields, games courts, dancing circles, yarning and dancing circles, seating and shade structures.
6. On-site carparking, including accessible spaces and provision for EV charging spaces.

Figures 2 below show the scope of works.

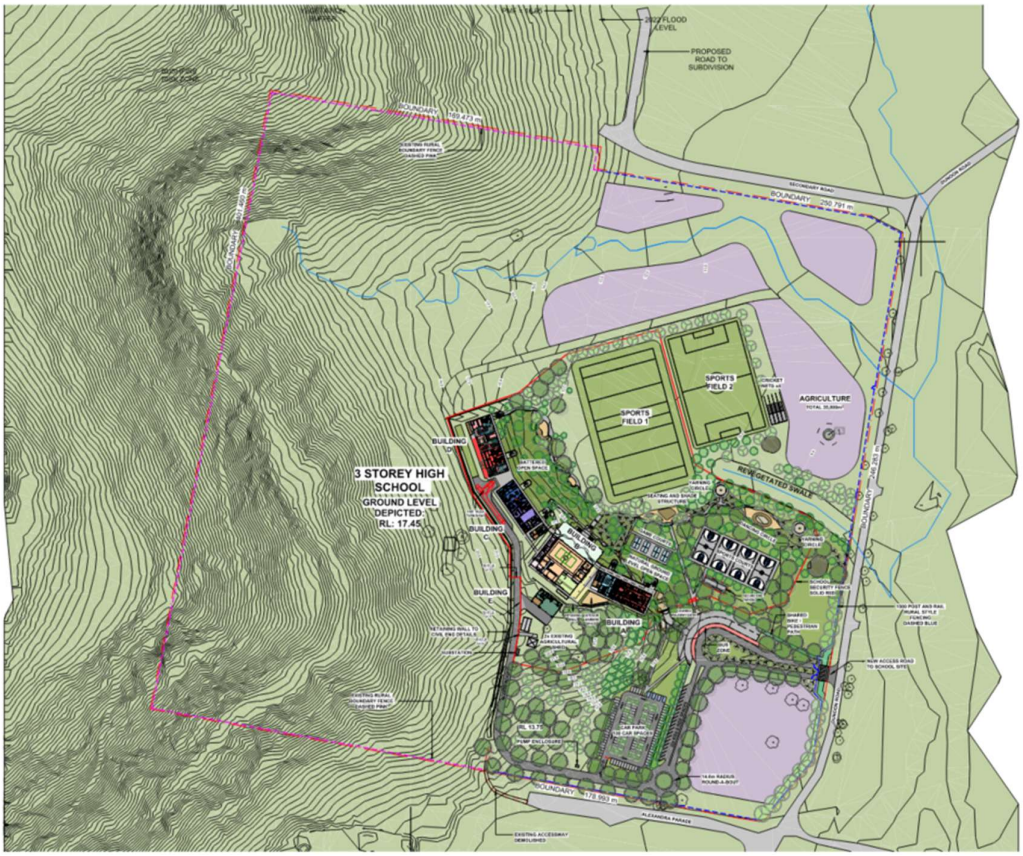

Figure 2 Overall Site Context Plan (Source: EJE Architecture)

1.5 Design Guidelines and Standards

Any design and future works completed for the project build, must comply with the following technical specifications, procedures, practices, and standards:

Electrical & Communications Services:

- NSW Service and Installation Rules
- Essential Energy Network Standards and Electricity Supply Policies and Standards
- NBN Requirements

Water and Gas Services:

- Lismore City Council Records and Guidelines

All Services:

- Relevant Australian Standards

2 Electrical Utility Services

2.1 Existing Supply Authority Infrastructure

The local supply authority within the area is owned and maintained by Essential Energy. The existing Essential Energy network near this location is an overhead system, and this distributes to the existing pole substations, and reticulates to customers in the area via overhead low voltage mains.

At this site location, there is an overhead network located approximately 330m south of the proposed site location. There is existing 11kV (3-phase) Essential Energy network, and this is located within the road reserve at the intersection of Dunoon Road and Alexandra Parade. The existing 11kV network extends toward north-west from the intersection into property that has a pole mounted substation 6527 installed, and this supports two connections. Importantly, there is no authority electrical network between the intersection at Alexandra Parade and the site.

The other nearest 11kV network is found approximately 180m north of the proposed site location on Dunoon Road. Note this is limiting given that this section of 11kV network does not support 3-phase power and a school of this magnitude, will require a 3-phase supply. To connect and provide a 3-phase supply to the school, the network augmentation and extension would be necessary for approximately 640m from the north of the site, which has been identified as a considerable constraint as the customer is responsible for any network extensions and upgrades.

It is proposed the existing network south of the site is extended to the site. Based on electrical demand calculations submitted in the Connection Application and Design Information Application thereafter, Essential Energy has determined that a new padmount substation would be required to be installed on site. Essential Energy's project reference is ECN-103136. The DIP specified that a 1500kVA padmount substation be installed on site via HV underground extension from the available HV overheads with new easements created and accessibility provided to Essential Energy.

Note that existing LV network and service connections within the site will no longer be required as a result of the new campus activity. These LV decommissioning works are included in the overall Accredited Service Provider [Level 3] (ASP3) design. This activity is conducted via the Essential Energy contestable connections process and requires coordination and consultation between Essential Energy, an ASP3 designer and the Accredited Service Provider [Level 1] (ASP1) designer authorised network contractors during the network design and construction phases.

LCI have also undertaken a high-level review of the impact on infrastructure during the 2022 floods. LCI were advised during our site visit that during the 2022 floods, customers in the dwellings north of Alexandra Parade, were without power five (5) days straight.

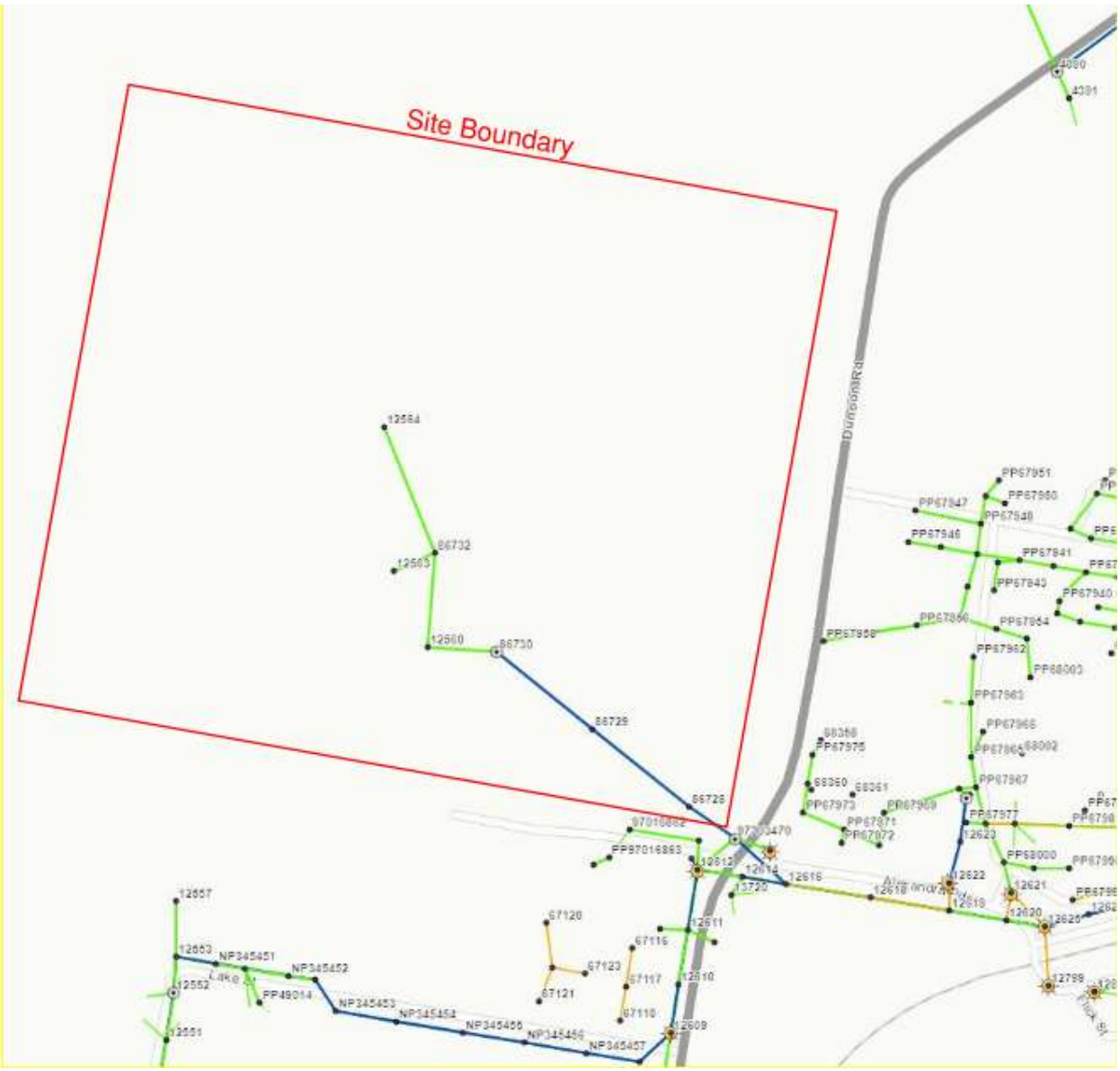

Figure 3: Essential Energy Network (Source WebGIS Extract)

Figure 4: Overhead 11kV network and pole substation, north of Alexandra Parade

Figure 5: Extent of the overhead 11kV network and pole substation, north of the site (not 3-phase)

Figure 6: View south along Dunoon Road, section void of authority network.

2.2 Proposed Electrical Infrastructure

The proposed electrical infrastructure includes connection to existing overhead mains cable, installation of a new 12.5m pole, underground consumer mains and 1500kVA pad mount sub-station. The revised padmount substation location is proposed off the Access Road near the existing agricultural sheds.

Pit and Pipe are provided from the sub-station and temporary generator to Building C main switchroom. The main switchroom houses the main switchboard and temporary generator connection panel / link box. The temporary generator connections and hard stand are provided in the event of extended power outage as described in section 2.1, during the 2022 floods. If the school needs to be operated during an extended power outage, a generator can be brought in to provide power.

2.3 Status of Authority Applications

Currently, the Level 3 works are at Detailed Design stage as per the below Essential Energy process flowchart.

Essential Energy provided a response to the connection enquiry stating that it is feasible to install underground cables from the existing pole and overhead line to the pad mount sub-station. A concept design based on the enquiry assessment has been completed, showing a 1500 kVA padmount substation to be installed on the site adjacent building C. The substation location has since been revised to be placed off the Access Road near the existing agricultural sheds. Further connection details will be provided in the design information package to be issued by Essential Energy.

The design information application was submitted to Essential and subsequently Essential Energy issued the Design Information Package in March 2025 that is required to complete during the detailed design phase.

The Essential Energy period from start of design to certification of design is typically 10-12 weeks, the design is then valid for installation for 6 months. To meet the proposed construction program, the start of the design period should start mid-January 2025 with Notification to local residents and council. Notifications need to be issued to residents (21-day notice) and the council (40-day notice), these are issued by the Designer (LCI). The design submission is targeted for early August 2025, after the notification periods expire and before the design information expiry deadlines (early March 2026). Essential Energy will then review the submission and provide feedback within approximately two weeks.

Certification fees should be paid along with the design and documentation submission. Essential Energy will review the submission and provide comments, which need to be promptly addressed by LCI. If required, prepare for resubmission after addressing the comments. The final certification is expected by mid to late Sept 2025 and will be valid for six months, allowing for the commencement of construction. Please note that these timeframes are indicative and is subject to Essential Energy internal review processes.

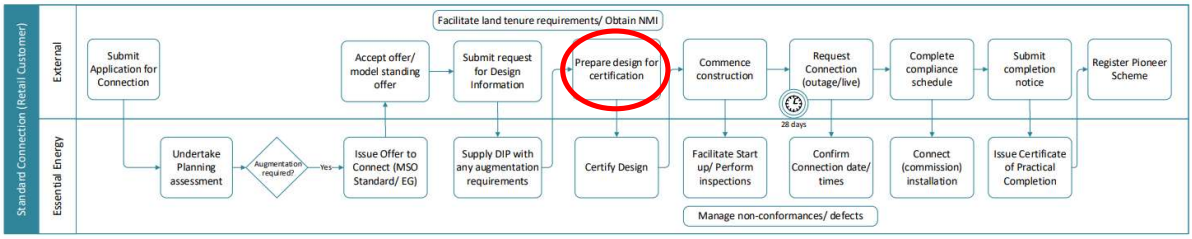

Figure 7: Status of Essential Energy Level 3 works.

3 Telecommunications Carrier Services

3.1 Existing Telecommunication Infrastructure

The site currently has an existing underground communications network in Dunoon Road, Alexandra Parade and Lake Street. From the Dial Before You Dig enquiry, the providers supplying the area are Telstra, NBN and Optus. The diagrams from the Dial Before You Dig enquiries are shown below. A survey was also completed that indicates above ground joining posts for communications networks. It is assumed that as these locations roughly match those indicated in the Telstra DBYD, that these are Telstra infrastructure. Note that conduit runs are not detailed in the survey only pit/termination infrastructure.

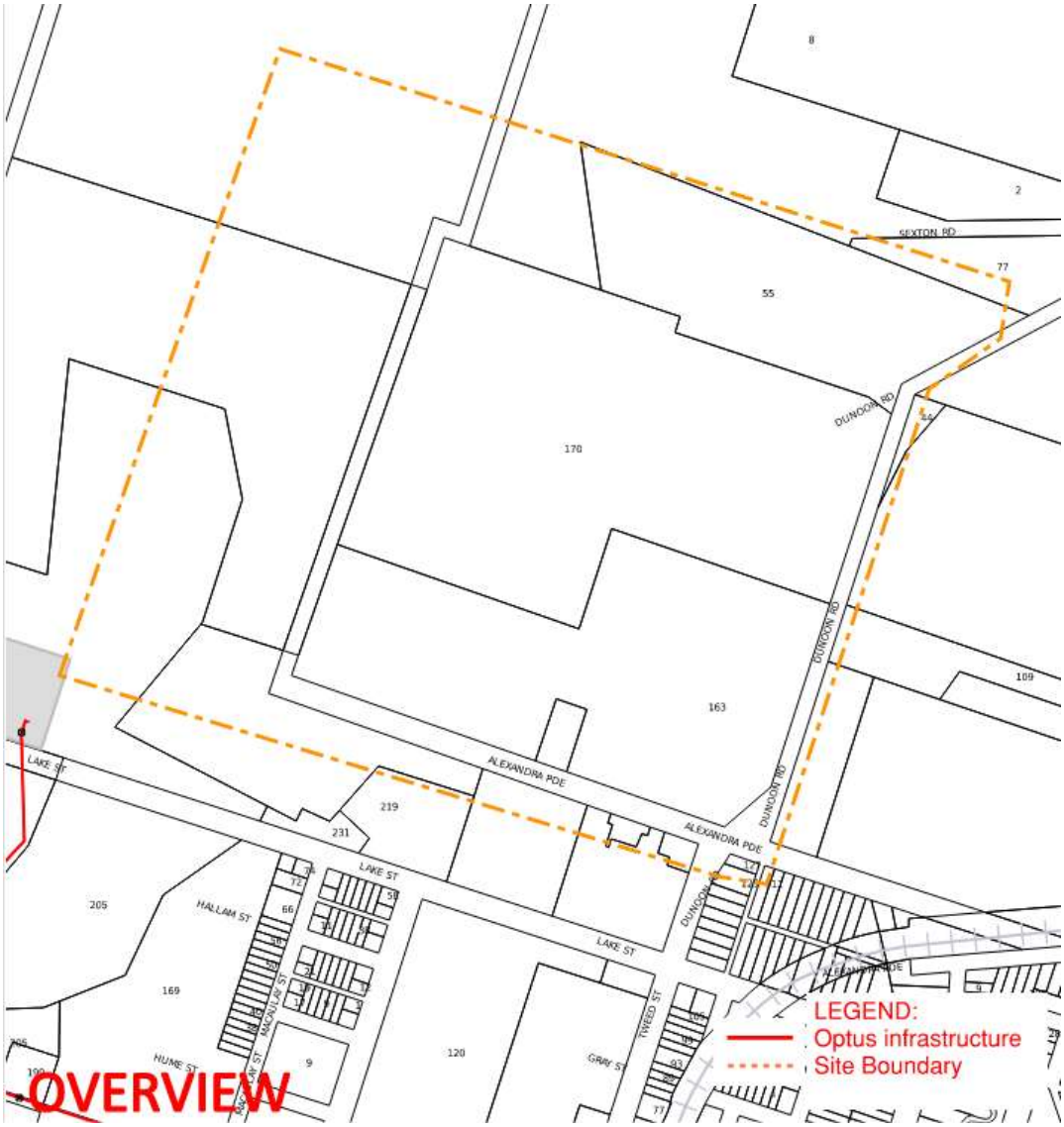

Figure 8: Optus Network - Lake Street Services

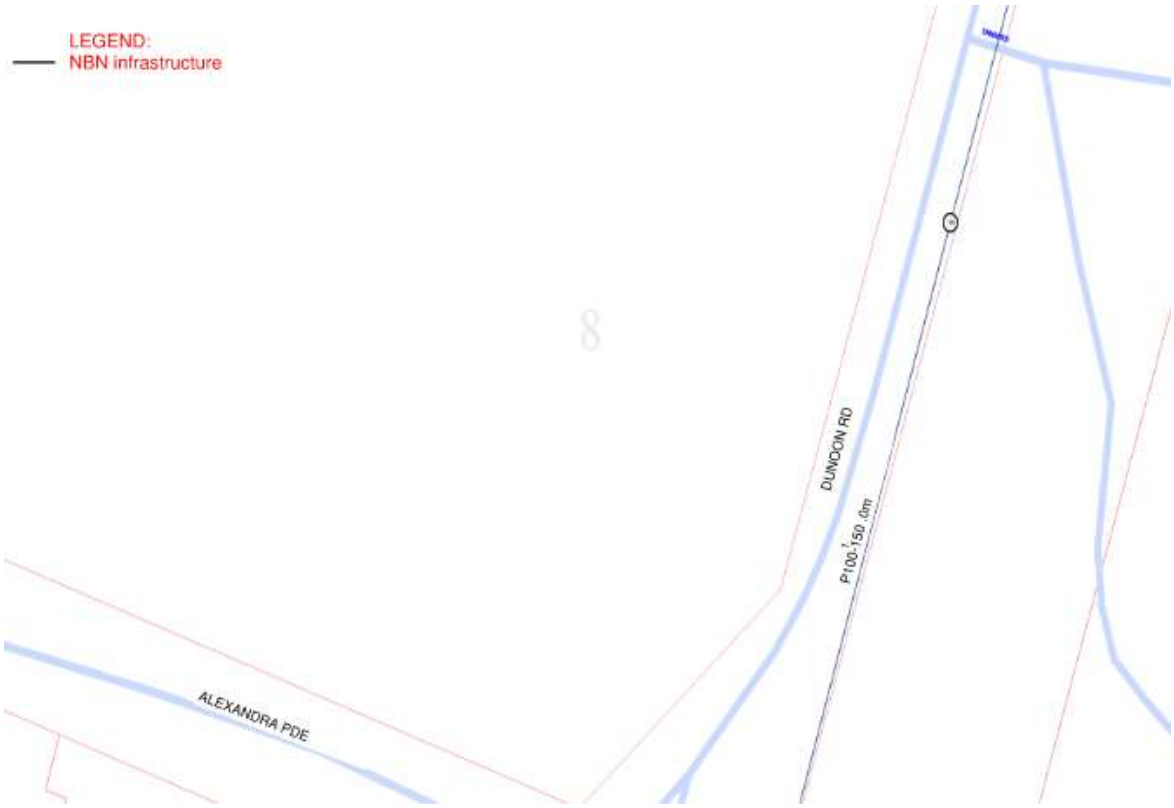

Figure 9: NBN Network - Alexandra Parade and Dunoon Road

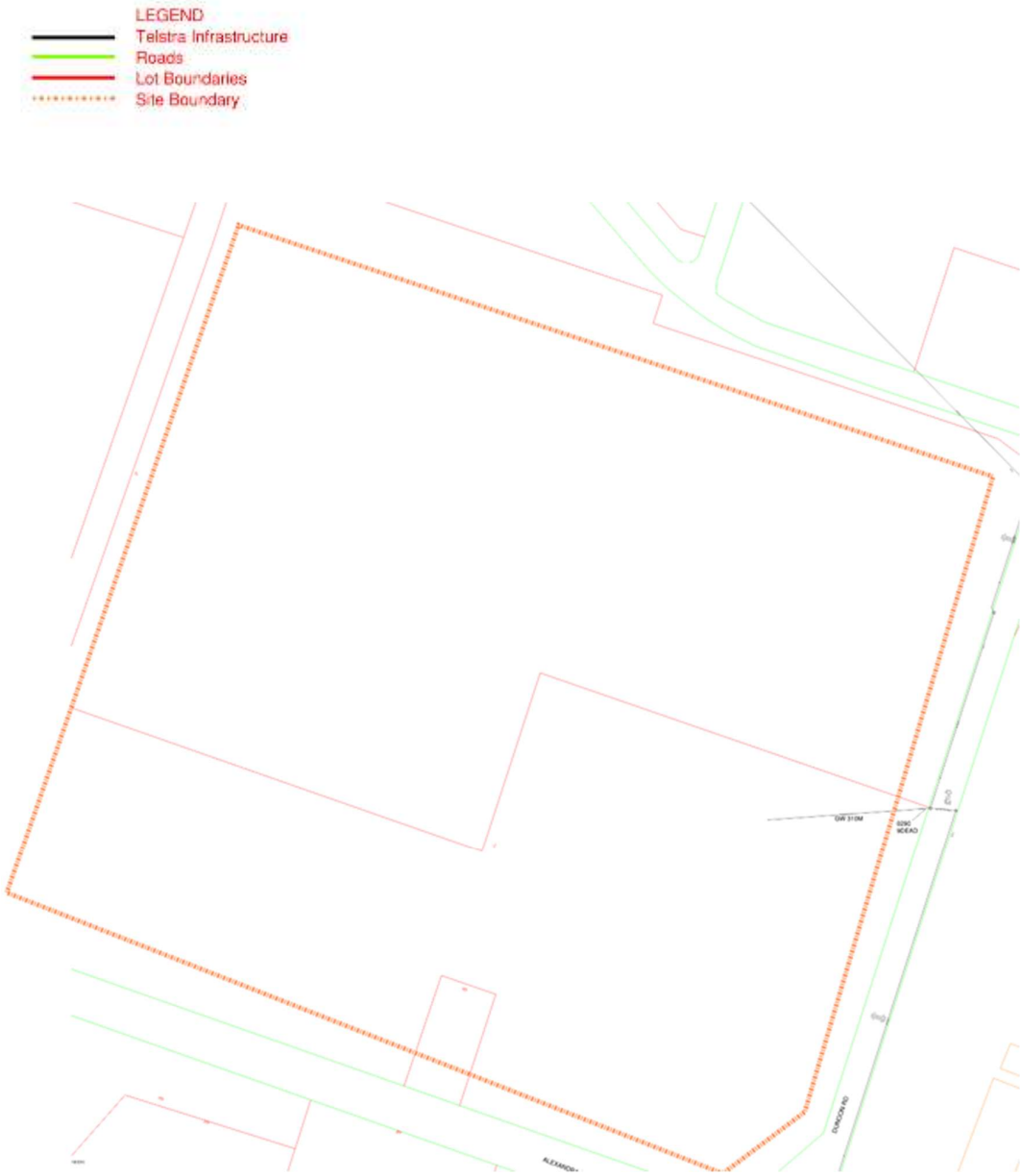

Figure 10: Telstra Network – Site

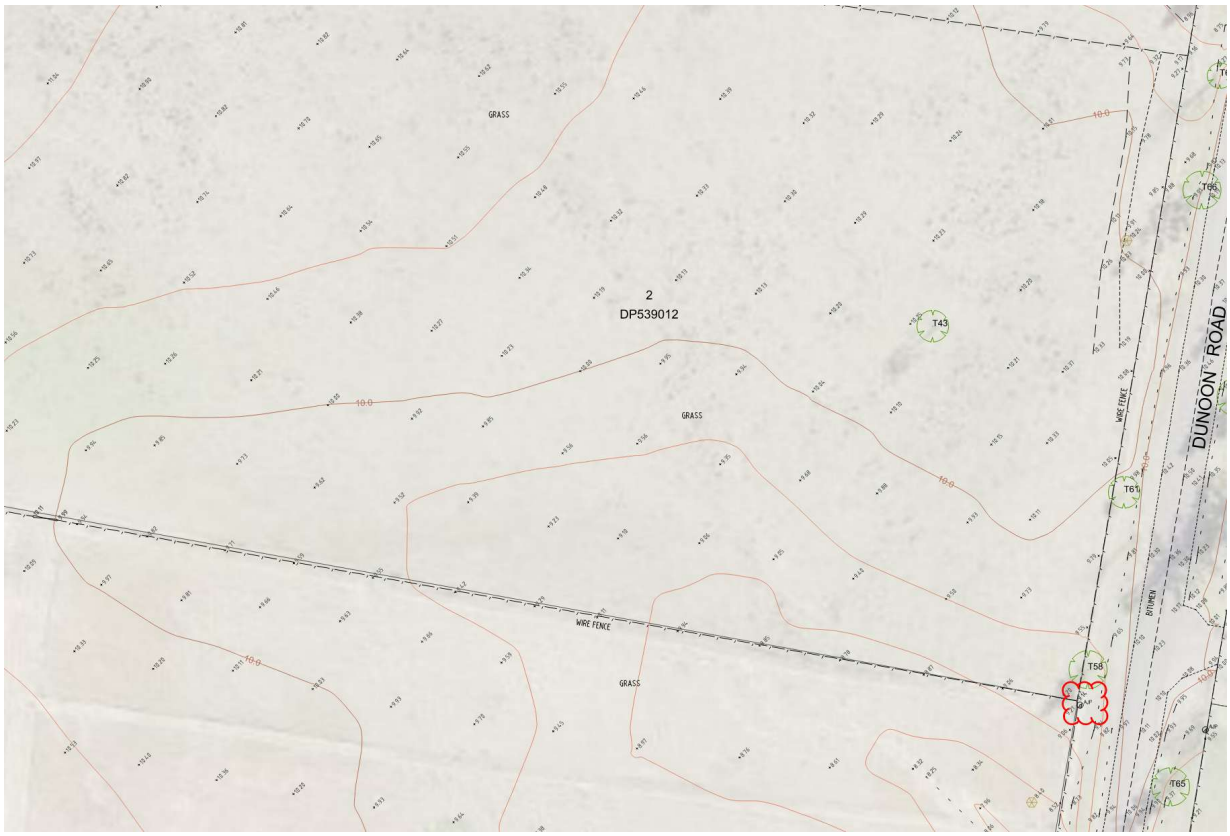

Figure 11: Survey Above Ground Joining Post – Appears to match location of Telstra Services

3.2 Proposed Telecommunication Infrastructure

Adjustments will be required to the existing telecommunication infrastructure where located within the site boundary. The works shall be carried out by each utilities approved contractors at the request of the Design and Construct "D&C" building contractor. The site is serviced by Optus, NBN and Telstra networks. The works required within the proposed property boundary are as follows:

- **Optus** network exists on Lake Street. DBYD records do not show any network reticulation within the site boundary.
- **NBN** network exists on Dunoon Road. DBYD records do not show any network reticulation within the site boundary.
- **Telstra** network exists on Dunoon Road. Removal of the existing underground Telstra cabling within the site boundary is required.

The school shall utilise existing communication providers infrastructure. Subject to further detailed design. Pit and pipe shall be designed to the providers standards to facilitate connection of the school to the service providers in the public domain. These communication leadin cables shall terminate into the Main Comms Room of the school and will be developed as part of the detailed design progress.

3.3 Status of Authority Applications

No telecommunications service provider authority applications have been submitted. These applications for the telecommunications network connections to the school shall be submitted during the detailed design process. The application shall be based on the schools chosen telecommunications service provider and include all application forms, reports and detailed design service drawings to the approval of the services provider.

4 Water Utility Services

4.1 Potable Cold Water

The site is currently serviced for potable water from a 50mm water main located in Dunoon Street and a 150mm water main located in Alexandra Parade both water mains are owned and operated by Lismore City Council. The proposed connection is to the 150mm water main in Alexandra Parade.

A test for pressure and flow was carried out on 1st April 2025 on the Alexandra Parade water main by council on three street fire hydrants. The process for testing is to turn on Hydrants 1+2 and equalise the flow rates then test the residual pressure at the third hydrant. This process was carried out in 2L/s increments until max. We can see in figure 12 below that the main maximum output is at 16L/s x 2. LCI have used a conservative approach and used the 12L/s x 2 flow rate to keep residual pressure in the main of 400kpa. This will provide the fire system a flow rate of 24L/s.

The results of these test are shown below:

Hydrant 1		Hydrant 2		Hydrant 3
Flow Rate (L/s)	**Pressure (kPa)**	**Flow Rate (L/s)**	**Pressure (kPa)**	**Pressure (kPa)**
0	600	0	600	600
2	550	2	550	550
4	500	4	500	525
6	425	6	425	500
8	375	8	375	450
10	300	10	300	425
12	200	12	200	400
14	100	14	100	375
16	0	16	0	350

Figure 12: Lismore Council Water main flow and pressure test – Alexandra Parade, North Lismore

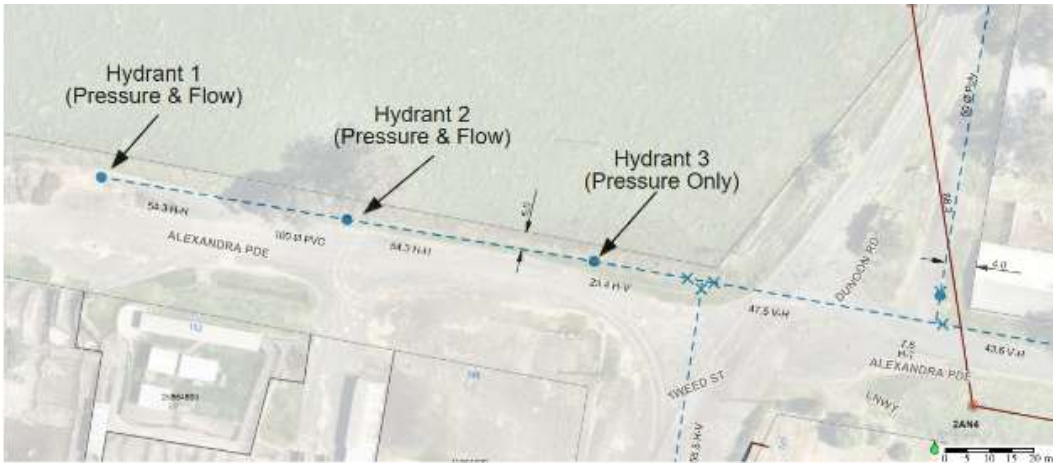

Figure 13: Lismore Council Flow and Pressure Test map of the hydrants used for this test.

The test for pressure and flow was also carried out on the Dunnon road water supply. The flow rate is only 3.2L/s at a pressure of 60kPa. This is inadequate for the proposed works.

The locations of the current water mains are further illustrated in the image below.

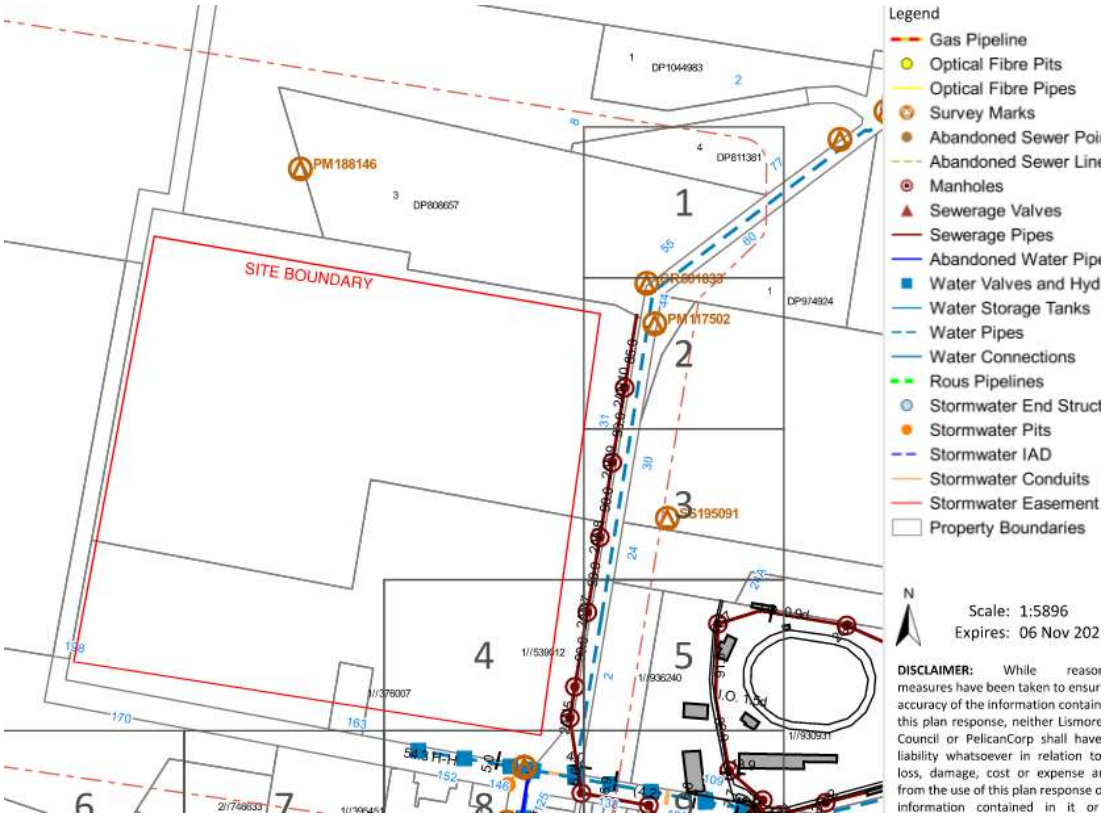

Figure 14: Existing Authority Water Main Diagram

PROPOSED CONNECTION:

The proposed water connection for RRHC is to the main on Alexandra Parade. A new 150mm tee with isolation valve proposed to supply fire water services. The potable water supply will include a 65mm connection including water meter, backflow prevention and pressure boosting pump.

The locations of the existing and proposed mains are depicted in the diagram below.

Designs are feasible and can be supplied from the water mains, further development and detailed pricing in detailed design.

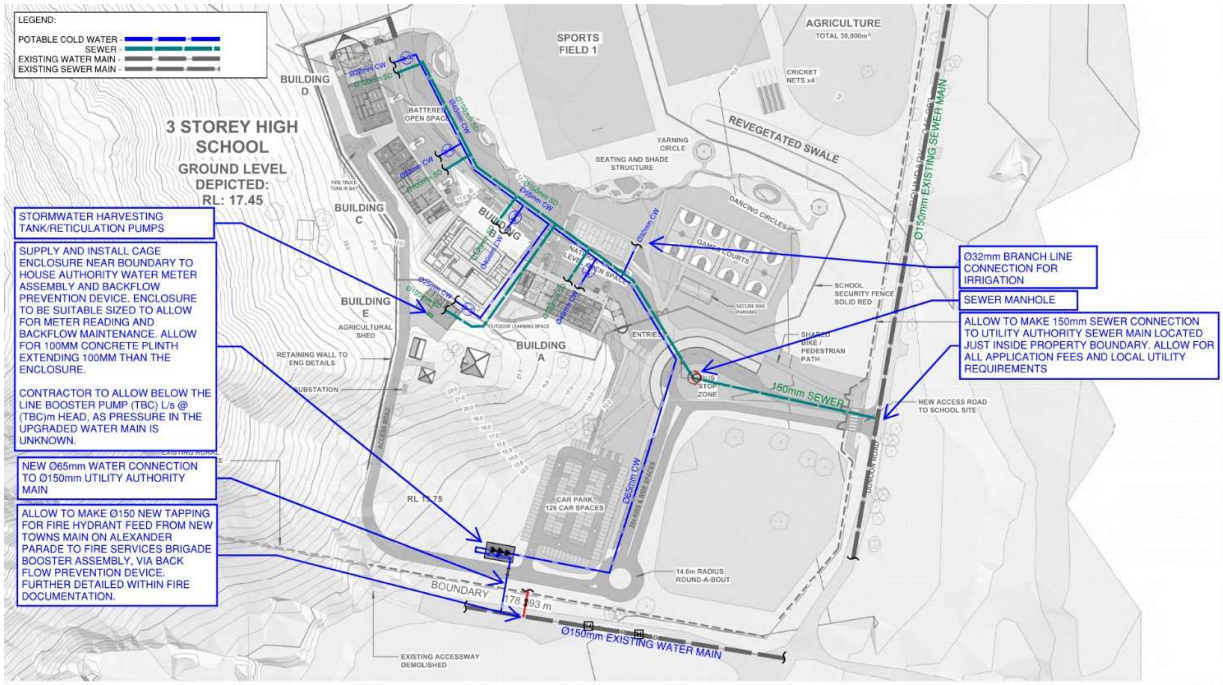

Figure 15: Authority Water Main Connection Diagram

4.2 Sewer Service

The site is serviced for sewer by an existing Gravity Sewer Main on the eastern side of the site located inside the property boundary. The sewer main is owned and operated by Lismore City Council. The existing sewer main is understood to have been recently installed. A new connection to an existing manhole will be made within the site boundary to serve proposed site drainage requirements. See below snapshot for location.

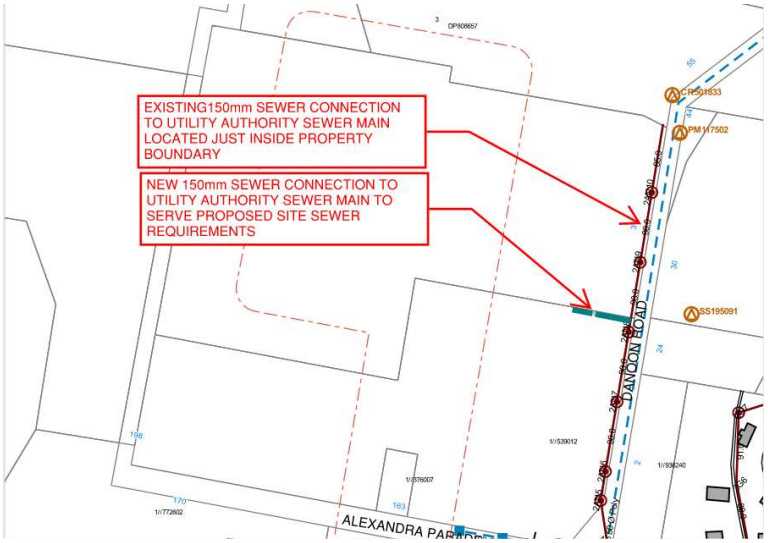

Figure 16: Lismore City Council Sewer Connection

No upgrade to the sewer infrastructure is required outside of the new Ø150mm connection.

4.3 Gas Service

No gas is proposed for the site.

4.4 Status of Authority Applications

The plumbing contractor will be responsible for coordinating the necessary actions following the outcomes of the preliminary consultation with service providers in relation to the new utility connections. This includes managing the application and approval process with Lismore City Council for both the new sewer and water connections.

Specifically, a new sewer connection is required to the Lismore City Council utility sewer main, located east of the site on Dunoon Road within the property boundary. A new water connection is required to the Lismore City Council utility water main located on Alexandra Parade. Lismore City Council has confirmed that the water main provides adequate flow capacity for the site further highlighted within Section 4.1 Potable Cold Water.

This water connection must include an accessible water meter and backflow prevention device, to be situated near the property boundary. The plumbing contractor and coordination from SINSW will be responsible for handling all the necessary paperwork, permits, and associated costs involved in obtaining the required approvals from Lismore City Council.

5 Mitigation Measures

The services mitigation measures are summarised in the table below.

Mitigation Number/Name	Aspect/Section	Mitigation Measure	Reason for Mitigation Measure
Progression of Level 3 works	During design phase	A separate REF is prepared by the ASP/Level 3 for the electrical infrastructure works which is then determined by Essential Energy under Part 3 of the EP&A Act in the design certification phase prior to commencement of construction. Risks and mitigation measures are assessed under the Essential Energy process and documented in the REF mentioned above.	To minimize/eliminate the possibility of accidents and risk of environmental/social impacts during and after construction.
Connection application to Lismore Council hydraulic infrastructure	Prior to commencement of any construction work	The plumbing contractor will coordinate the necessary actions for new utility connections. This is done under Section 68 of the Local Government Act 1993 and covers: • Water Supply (B1) • Sewerage (B4) The contractor will manage the application and approval process with Lismore City Council for both sewer and water connections. • Sewer Connection: A new connection to the Lismore City Council sewer main on Dunoon Road is required. • Water Connection: A new connection to the Lismore City Council water main on Alexander Parade must be established. The existing Ø50mm main will need to be upgraded to Ø150mm. Once raised by the Plumbing contractor through coordination with NSW DoE the necessary paperwork, permits, and associated costs for obtaining the required approvals from Lismore City Council will be handled.	To obtain the necessary approvals from Lismore City Council for sewer and water connections prior to construction under the Local Government Act 1993.

6 Summary and Conclusion

6.1 Summary of Electrical & Communications Infrastructure

- Based on LCIs assessment, the nearest electrical network is located approximately 330m to the south of the proposed school buildings. To connect and provide a 3-phase power supply to the school, the network would need to be extended, and a new substation to be located off the Access Road adjacent to the agricultural sheds.
- The school shall make new connections to the existing Optus, NBN and Telstra communication infrastructure.
  - Optus network exists on Lake Street. DBYD records do not show any network reticulation within the site boundary.
  - NBN network exists on Dunoon Road. DBYD records do not show any network reticulation within the site boundary.
  - Telstra network exists on Dunoon Road. Removal of the existing underground Telstra cabling within the site boundary is required.

6.2 Summary of Water & Sewer Infrastructure

Below is a summary of the key considerations around the required Water & Sewer infrastructure to this site:

- Lismore City Council utility Sewer Main is located approximately 2m within the site boundary. Application needed to determine if an easement is required. A new sewer connection to the Lismore City Council sewer main on Dunoon Road is proposed as part of the design.
- Upgrade of the Lismore City Council Water main along Dunoon Road and Secondary Road to 150mm.
- New water connection to Lismore City Council utility water main on Dunoon Road. Connection will require an accessible water meter and backflow prevention device near the property boundary.
- New utility connections require applications and approvals from Lismore City Council. Plumbing contractor in coordination with Lismore City Council is typically responsible for handling the application process and associated costs.
- Gas: No gas planned for the site.

6.3 Evaluation of Environmental Impacts

LCI confirm that the required infrastructure modifications proposed to service the site will not have a significant effect on the environment and are not considered to be of significant impact.