

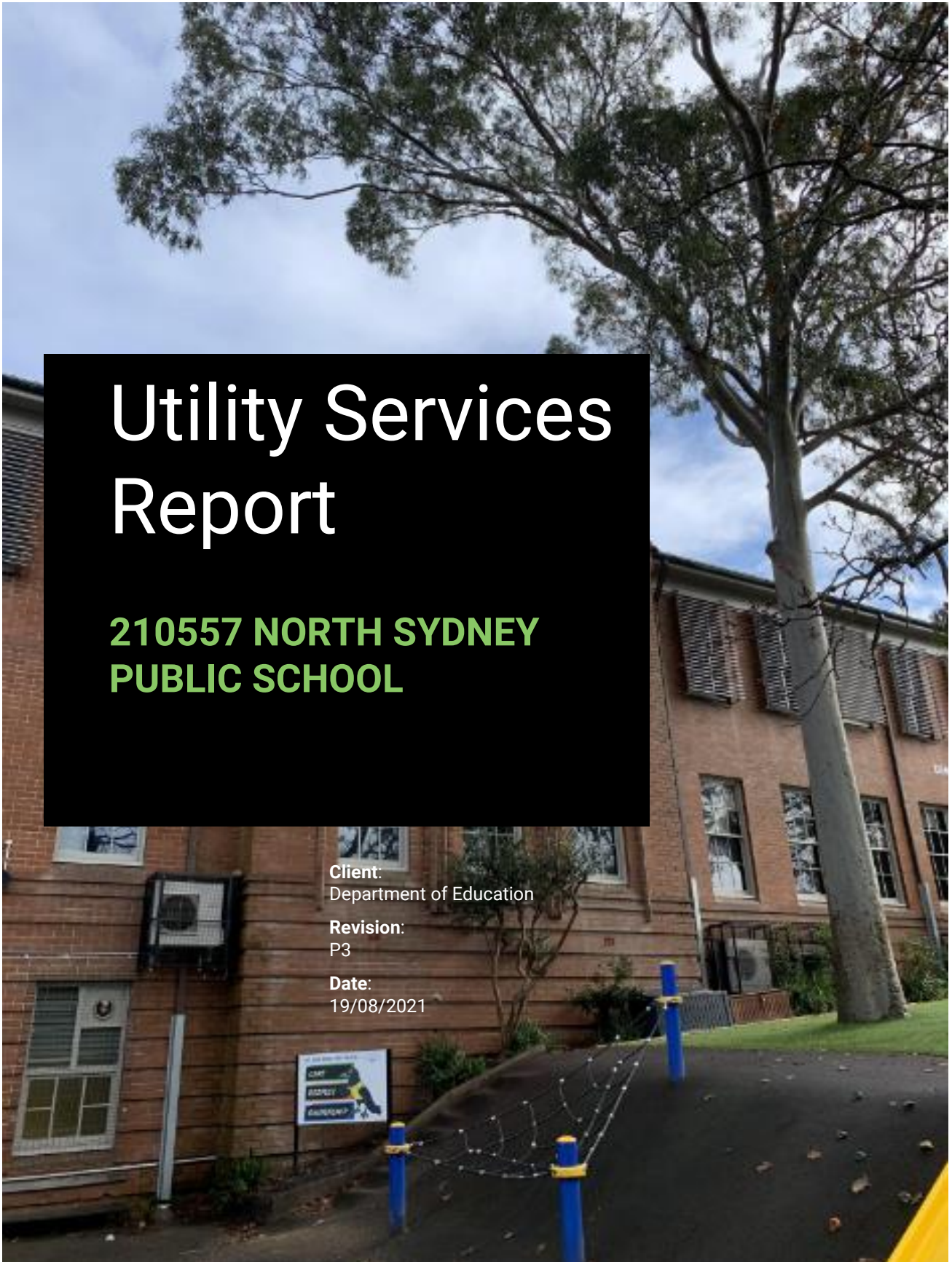
Utility Services Report

**210557 NORTH SYDNEY
PUBLIC SCHOOL**

Client:
Department of Education

Revision:
P3

Date:
19/08/2021



REPORT INFORMATION

Project	North Sydney Public School
Title	Utility Services Report
Client	Department of Education
Revision	P3
Revision Date	19/08/2021
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REVISION SCHEDULE

Revision	Date	Issue Name	Author	Authorised
P1	16/08/21	SSDA Submission	FY/RN/MB	DDC
P2	17/08/21	SSDA Submission	FY/RN/MB	DDC
P3	19/08/21	SSDA Submission	FY/RN/MB	DDC

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1 Introduction

LCI has been engaged by Department of Education to prepare the Electrical, Telecommunications, Water and Sewer Utility Infrastructure Management Plan for the proposed upgrades to North Sydney Public School.

This report addresses the requirements outlined in the Planning Secretary's Environmental Assessment Requirements (SEARs) dated 24 December 2020 for State Significant Development Application 11869481 SEAR 14.

1.1 Project Description

This SSDA seeks consent for alterations and additions to the existing North Sydney Public School. The proposal entails:

- Demolition of the existing hall (building B), Haven building (building C) and 6 temporary buildings;
- Construction of a three storey building comprising:
 - staff administration rooms;
 - 16 homebases
 - a new library;
 - hall;
 - out of school hours care facilities;
 - covered outdoor learning area;
 - bicycle parking and end of trip facilities for staff; and
 - services, amenities and access.
- New entry gate and forecourt from Bay Road;
- Internal refurbishment of building G ground floor from the existing library to 3 homebases;
- Capacity for an increase in student numbers from 869 to 1,012; and
- Associated tree removal, landscaping and excavation.

The proposal maintains:

- The gates and fence of former Crows Nest House including the entrance from Pacific Highway and Bay Road;
- Existing gate along McHatton Street;
- The outdoor play area to the east of Building A;
- Existing covered outdoor learning area adjacent to Building A;
- The basketball courts and staff carpark in the western portion of the site;
- The significant tree planting on all school boundaries;
- Buildings A, D and F noting minor internal refurbishments are being undertaken outside of the SSDA scope of work (exempt development) to improve student amenities and canteen; and
- Building G noting ground floor internal refurbishment is proposed in the SSDA.

1.2 Design Guidelines and Standards

The Electrical services to this building will be designed in accordance with the following Guidelines and Australian Standards:

- NSW Department of Education - Education Facilities Standards and Guidelines
- NSW Service and Installation Rules
- Ausgrid Network Standards and Electricity Supply Policies and Standards
- Sydney Water Design Standards
- Jemena Design Standards (AS/NZS 4645.1 – Gas Distribution Networks)
- Relevant Australian Standards

2 Electrical Utility Services

2.1 Existing Supply Authority Infrastructure

The Supply Authority to North Sydney Public School is Ausgrid. The existing Ausgrid HV network supplies the school from a substation (S.79467) located near the junction between McHatton Street and Pacific Highway as shown in figure 1 below.

Substation S.79467 is a 600kVA Kiosk type substation with a non-firm rating of 920amps. It currently provides supply to the following low voltage distributors:

- Distributor No.1 is a spare panel (fuse-way rated to 400amps with no fuses installed)
- Distributor No.2 supplies McHatton St overhead network (fuse-way rated to 400amps with no fuses installed) – normally open at substation
- Distributor No.3 supplies North Sydney Public School (fuse-way rated at 800amps with a 800amp fuse installed) – an MDI reading on this distributor indicates a load of 292amps.

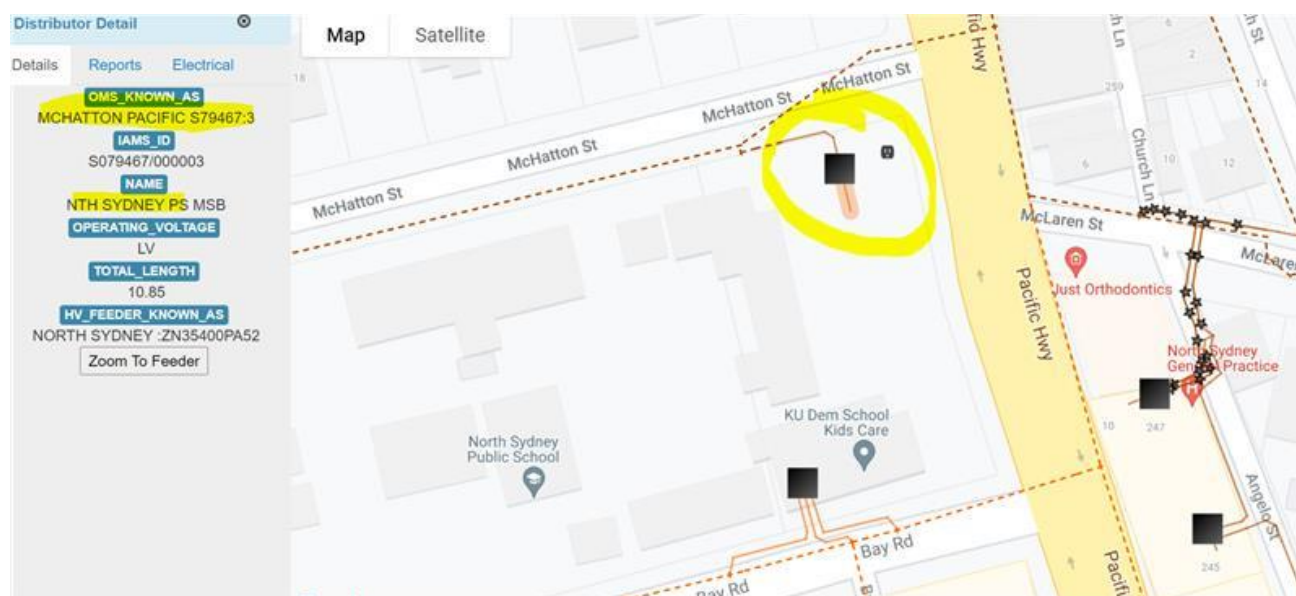


Figure 1 Ausgrid WebGIS Extract

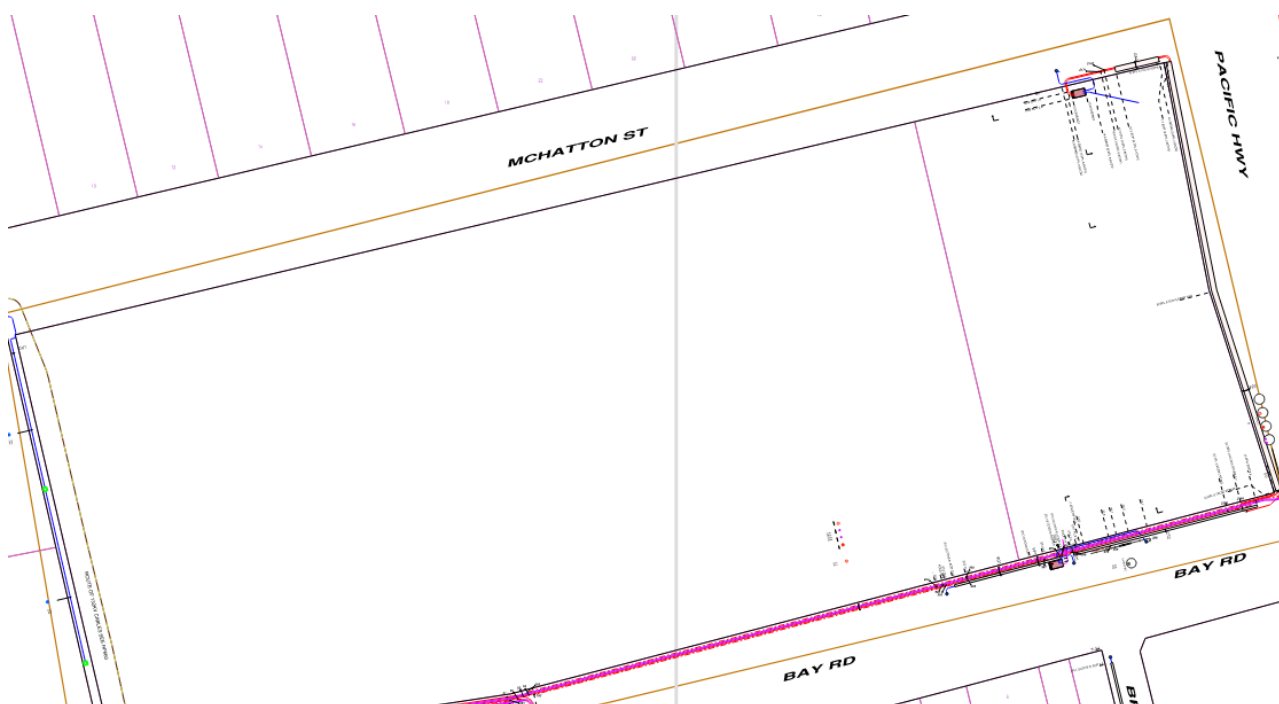


Figure 2 Ausgrid Network Plan

As substation S.79467 supplies no other customers, the full 800amp supply is available to be utilised for the NSPS upgrade.

A SSDA maximum demand calculation carried out to ESFG requirements and AS/NZS 3000 guidelines indicate the load estimate for the new and existing buildings to be approximately 660Amps/Phase. This means an upgrade to the existing HV infrastructure is not anticipated to be required.

North Sydney Public School Preliminary Maximum Demand

Building/Area	kVA	Amps per phase
Existing school maximum demand reading from Ausgrid	202	292
<i>Buildings B, C, H, 5 x Temporary Demountables - to be demolished</i>	63.88	-92.2
New Buildings I & J	271	392
New AC units installed 2020 (20 x total)	47	68
Subtotal	585	660
Total + Spare Capacity (20%)	702	792

Table 1 SSDA Maximum Demand calculation

2.2 Proposed Electrical Infrastructure

A new main distribution board (MDB) rated to 400amps is proposed to supply the two new Buildings I and J. The location of the new MDB is currently planned to be within a dedicated electrical cupboard on level 1 of building I in the corridor of the admin area. The MDB in building I will supply electrical distribution boards (EDB) for general power and lighting final sub-circuits located on each floor, typically within a 25m radius in compliance with EFSG

requirements. It will also supply the new hall building J and any mechanical services switchboards and dedicated hydraulic or fire services equipment.

Subject to further surveys of the electrical pits and inground conduits on site, the existing 400amp submain (4 x 1C 240mm² XLPE/PVC + E) supplying the existing MDB in building B is proposed to be re-used for the new buildings I & J. This will require a cable joint and extension of the submain to the new MDB location. This proposal is a departure to the EFSG requirements as cable joints are not permitted, however due to the new condition of the submain (installed 2019) and the proximity of the existing route we recommend to re-use this submain as a cost-effective strategy.

Noting only 1 x 400amp circuit breaker space is available at the MSB and it is currently connected to the MDB in building B, re-using the submain will also avoid costly modification works.

2.3 Construction Period Services Continuity

The existing MDB in building B currently supplies all other buildings on site (excluding building A):

- Building F: River Building
- Building G (DB-L)
- Link box 2 (Temporary Buildings D14580 and D13763)
- Building C: Haven Building
- Building B: Hall
- Building D: McHatton Building

Prior to demolition of building B, the existing outgoing supplies from the MDB will need to be relocated to another source to maintain continuity of electrical supply to the school. The proposed works involves:

- Re-supply building G from existing DB-2 in building A or a spare circuit breaker space in the MSB as a permanent solution
- Re-supply buildings D and F from spare circuit breaker spaces in the existing MSB as a permanent solution
- Re-supplying temporary buildings D14187 and D10493 subject to further survey confirming the existing cable routes, as a temporary solution

Minimal disruption is expected during construction period. As such a detailed construction staging plan must be coordinated with the key stakeholders to arrange any electrical shut-downs during school holidays if possible. The relocation of electricity supplies as part of exempt development/early works package, not as part of this SSDA.

3 Telecommunications Carrier Services

3.1 Existing Telecommunication Infrastructure

The site has three existing comms lead-ins: two coming from McHatton Street and one from Bay Road. From the Dial Before You Dig enquiry it is not clear who the provider from McHatton Street is, however from Bay Road the provider is Ucomm. The diagram from the Dial Before You Dig enquiry is shown in Figure 3 below.

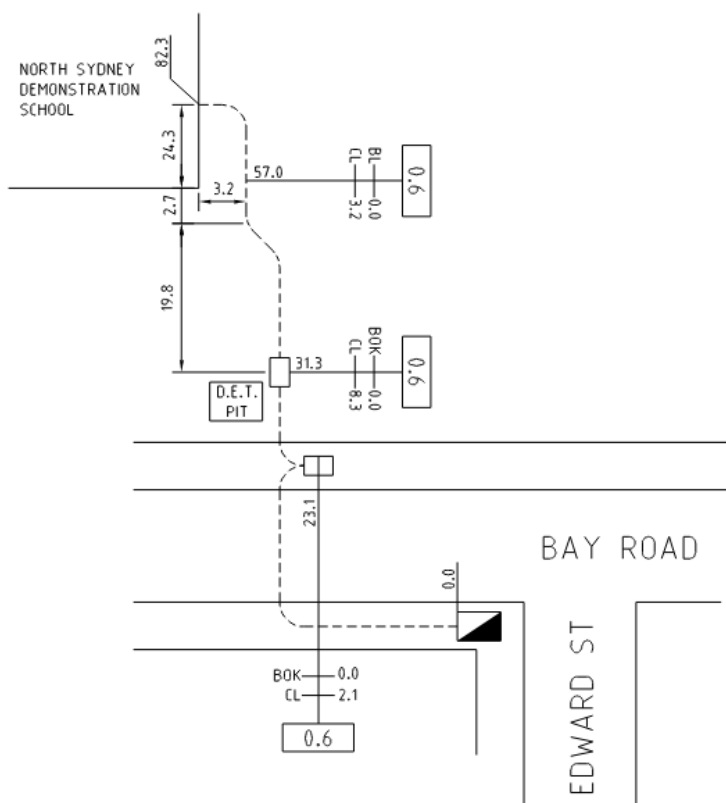


Figure 3: Existing Incoming Comms

3.2 Proposed Telecommunication Infrastructure

The intention is to retain the existing incoming comms route from Bay Road and one from McHatton Street. The pits will be upgraded to meet the current NBN requirements and new conduits and pit provided to connect to Building J, where the new Main Comms Room will be located. The proposed new comms lead-in route is identified in Figure 4 below.

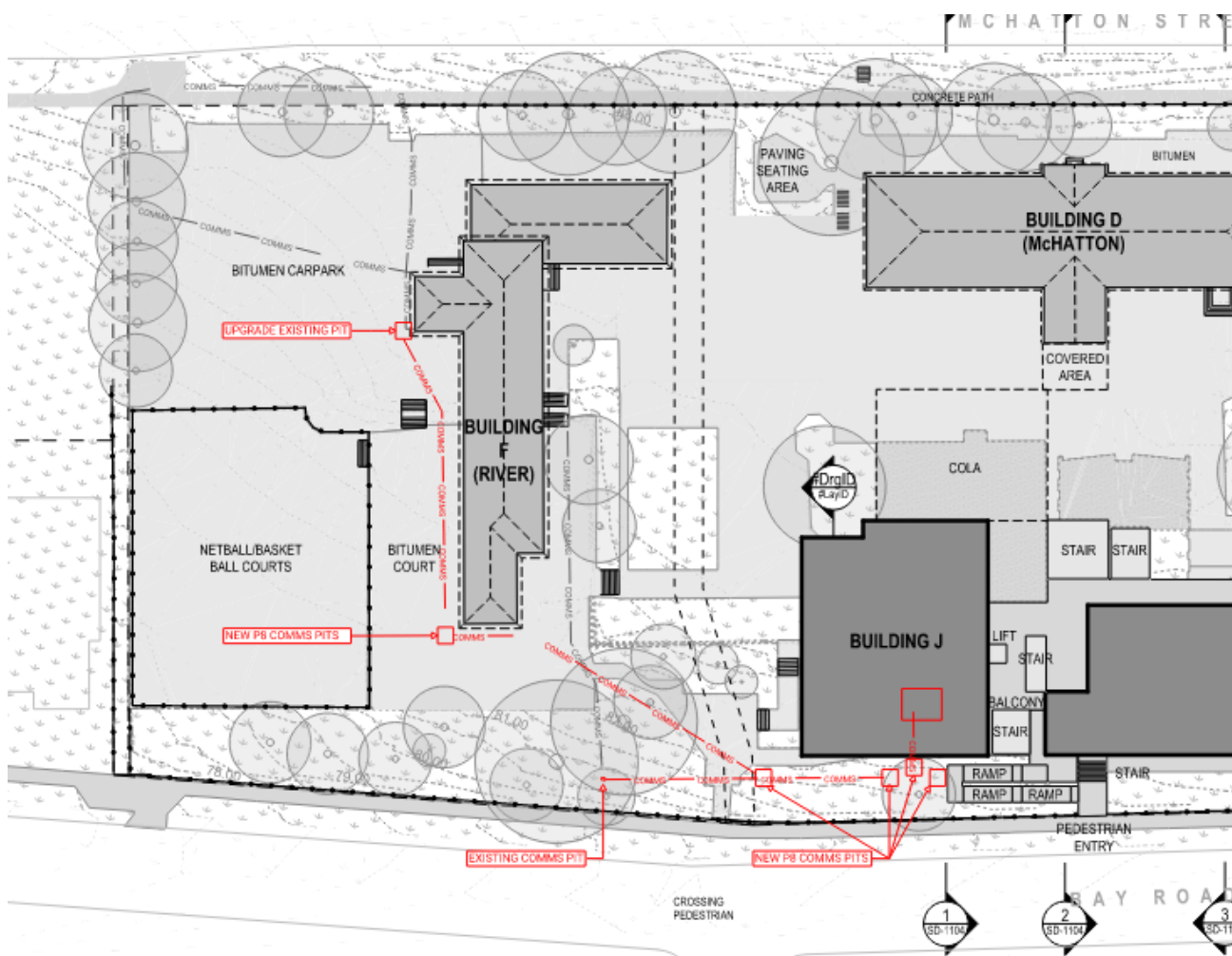


Figure 4: Proposed Comms Infrastructure

3.3 Construction Period Services Continuity

No disruption to telecommunication carrier services to other parts of the North Sydney Public School is expected during construction. It is not proposed to construct new buildings over the existing telecommunications carrier plant. Diversion of existing telecommunications services is not anticipated for the new building until towards the end of construction, when the changeover can be managed outside of school operating hours.

Staging of communications services will be determined in accordance with the approved construction methodology. The proposed SSDA design allows for early enabling works prior to commencement of the first stage of construction works.

Prior to initiating any site work or shutdowns, communications contractors shall conduct a detailed site audit to inspect the existing site infrastructure, equipment conditions, validate the existing services and associated cable reticulation nominated in the existing as-built and project documentation where applicable, to ensure all communications services are maintained and operational throughout the construction phase.

4 Water, Gas and Sewer Utility Services

4.1 Existing Sydney Water and Jemena Infrastructure

4.1.1 Potable Cold Water

There are three existing potable cold water connections to North Sydney Public School from the DN200 CICL water main located on Bay Road. All three connections are sized at 50mm and reticulate through Authority Cold Water meters to serve sanitary fixtures throughout the school.

There is no water main connection to the site to serve fire services (i.e. fire hydrant and fire sprinklers).

There is an existing easement in the middle of the school for the Authority Water Main sized at DN500 CICL.

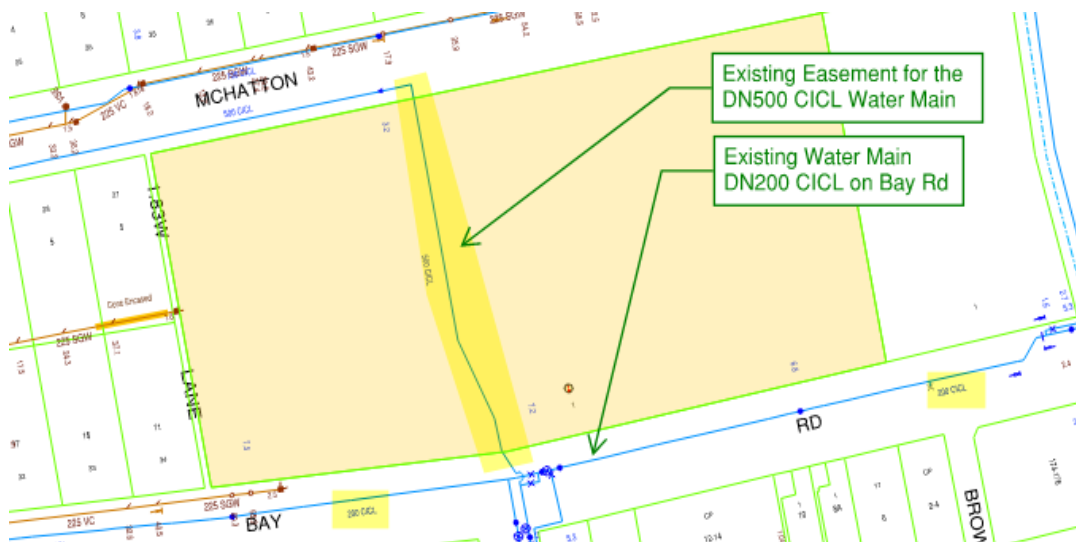


Figure 5: Sydney Water DBYD Plan

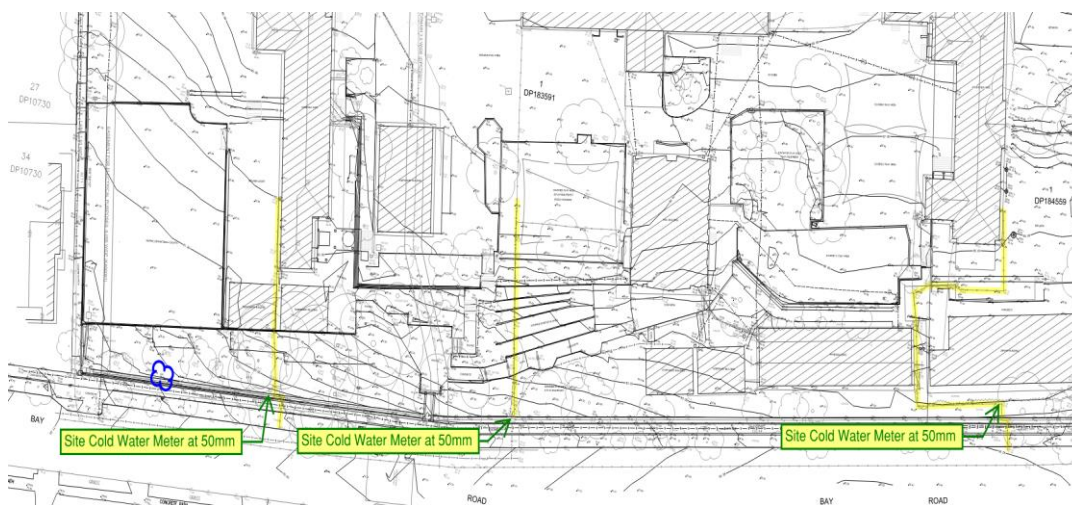


Figure 6: Site Survey Plan

4.1.2 Gas Service

There is one existing gas connection to North Sydney Public School from the DN32 Nylon @ 210kPa gas main located on Bay Road. The gas service reticulates throughout the school to serve the old gas space heaters (LB90 Gas Heaters) and hot plates in the canteen.

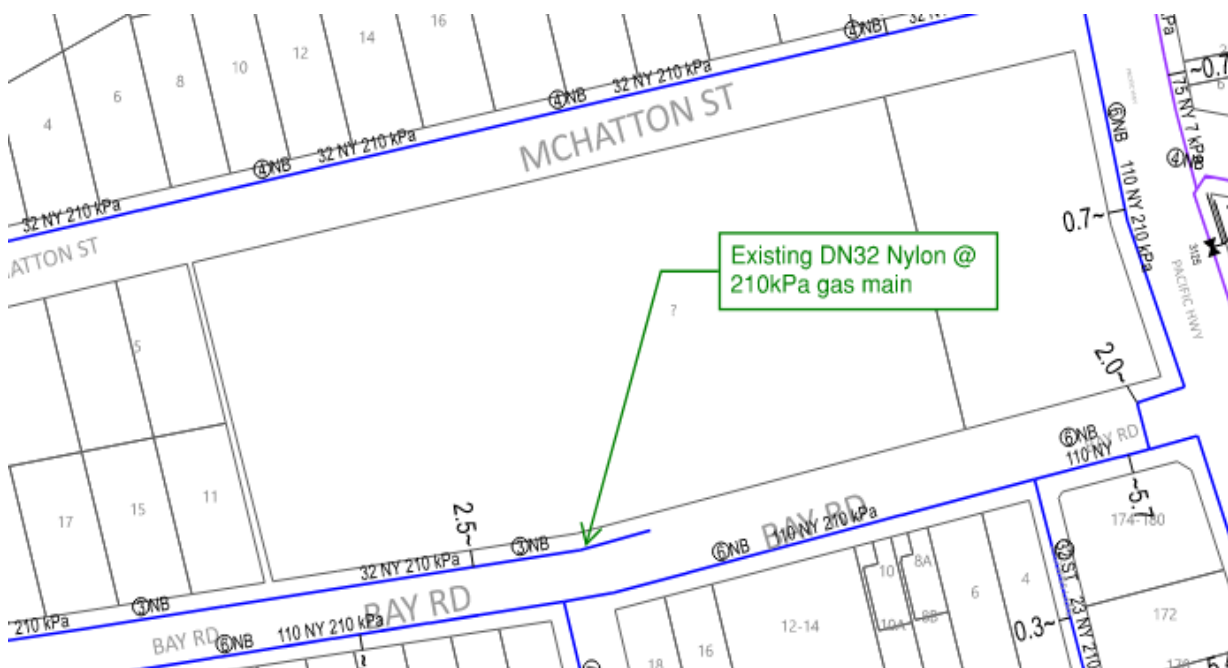


Figure 7: Jemena DBYD Plan

4.1.3 Sanitary Drainage Service

There are two existing sanitary drainage connections to North Sydney Public School. The first connection is located on the DN225 VC pipe located on the corner of Bay Road and Pacific Highway (southeast corner of the school). The second connection is located on the DN225 SGW pipe located on Bay Road (southwest corner of the school).

Both sanitary drainage connections reticulate throughout the school to serve sanitary fixtures.

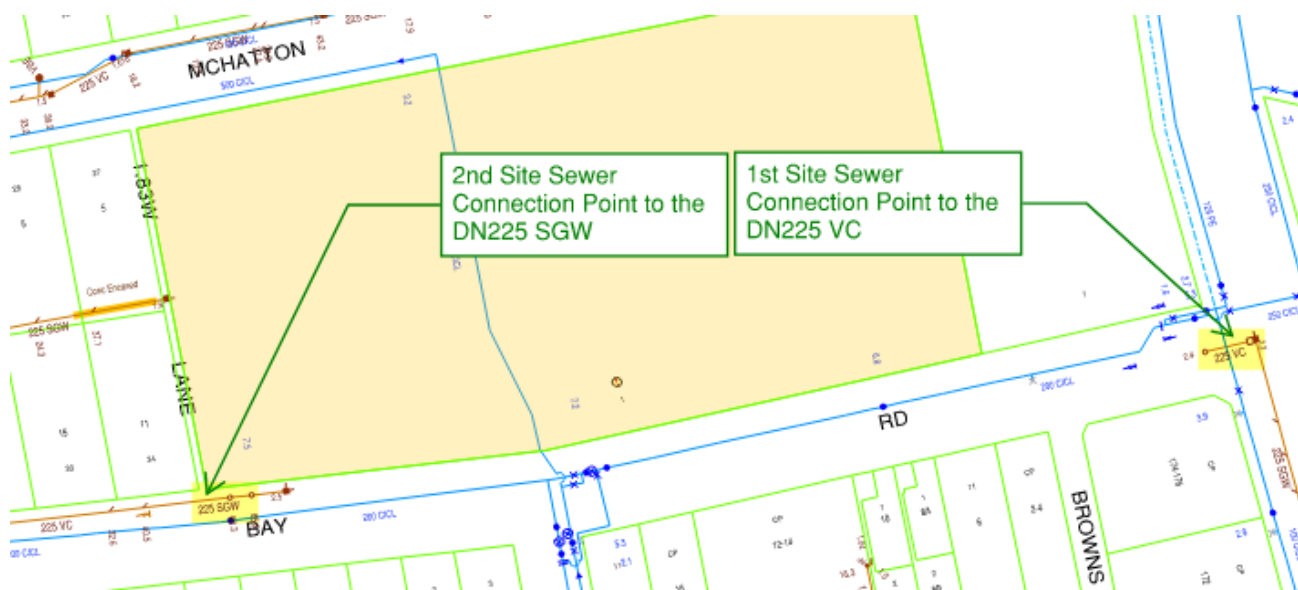


Figure 8: Sydney Water Sewer DBYD Plan

4.2 Proposed Sydney Water and Jemena Infrastructure

4.2.1 Potable Cold Water

To comply with the Water Service Code of Australia (WSA-Part 03), the proposed development will require frontage to a minimum DN150 water main. This is achieved by the existing DN200mm C1CL water main located on Bay Road.

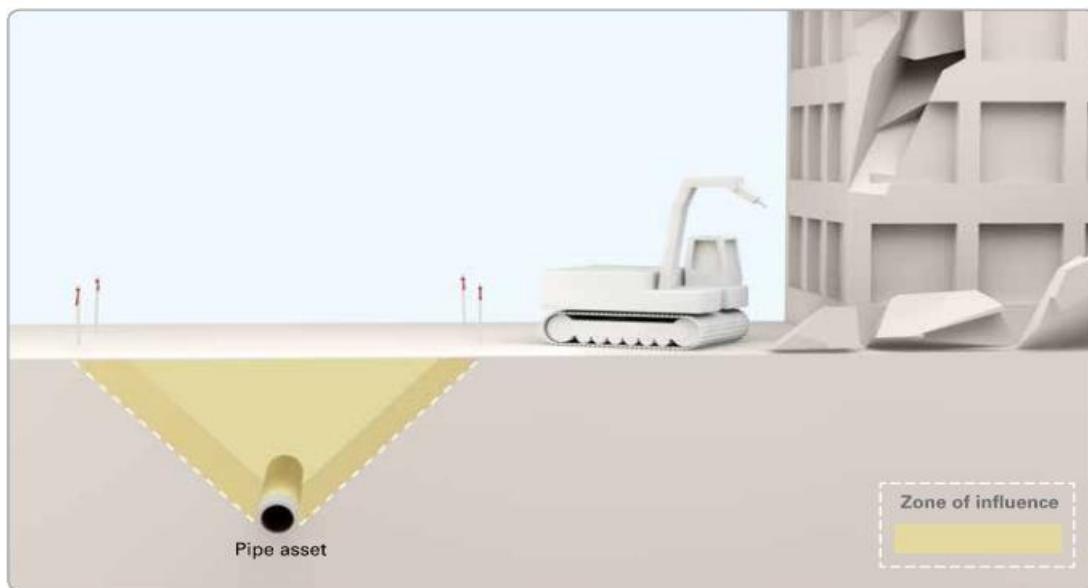
Based on initial investigations and site inspection of North Sydney Public School, three Authority water meters serve the whole site. Further investigations will be required to detail (survey) each water service and what fixtures they serve throughout the school.

SSDA design calculation on the proposed new buildings and existing buildings, we envisage a new water main connection to serve potable cold water might not be required (subject to final survey results).

We have submitted a pressure and flow application to Sydney Water to investigate the hydraulic demands for the water main. We are awaiting pressure and flow results to confirm sufficient pressure and flow to cater to the development's potable water and fire services demands. Due to the Greater Sydney lockdown because of the COVID-19 outbreak some of Sydney Water activities are being prioritised and to expect delays due to availability of resources.

The existing Sydney Water easement for the potable cold water main (DN500) C1CL is within the school. The project will need to be discussed with a Sydney Water Coordinator once the architectural plans are finalised. A Sydney Water Coordinator will need to be engaged to submit a Sydney Water Building Plan Approval to investigate if the proposed buildings will impact Sydney Water assets or proposed building works over the existing Sydney Water easement.

Initial discussions with a Sydney Water Coordinator will require them to conduct a site survey and asset peg out, review architectural plans, review the structural plans and provide a Specialist Engineering Assessment on the Sydney Water asset.



Notes:

1. Pipe asset is assumed to be in a soil trench. Other requirements may apply for asset in a rock trench or tunnel, poor or unstable ground.
2. Pipe asset is assumed to be in reasonable service condition. Inspect it if in doubt. Other requirements may apply for pipes vulnerable to damage.
3. If you do not understand the intent of this diagram, seek technical advice or consult Sydney Water.

Figure 9: Sydney Water Diagram -Asset Zone of Influence

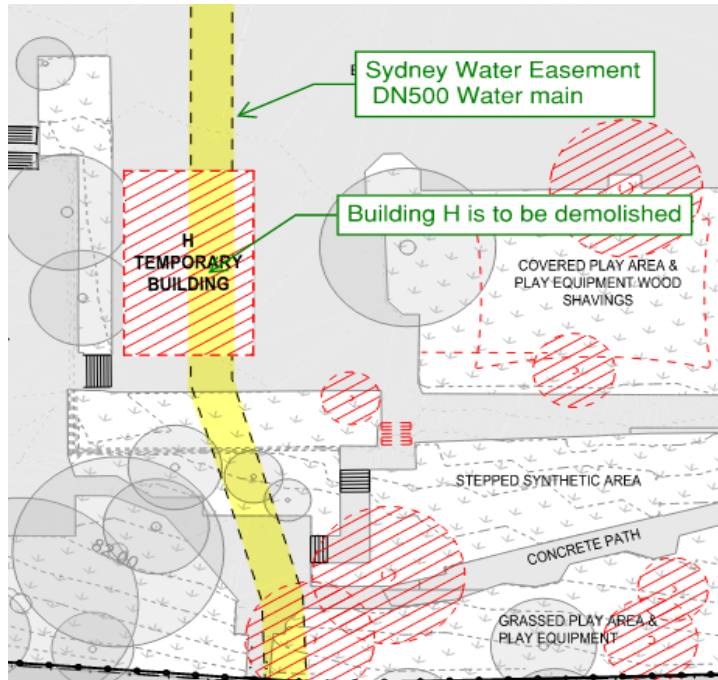


Figure 10: Sydney Water Easement and Building to be demolished

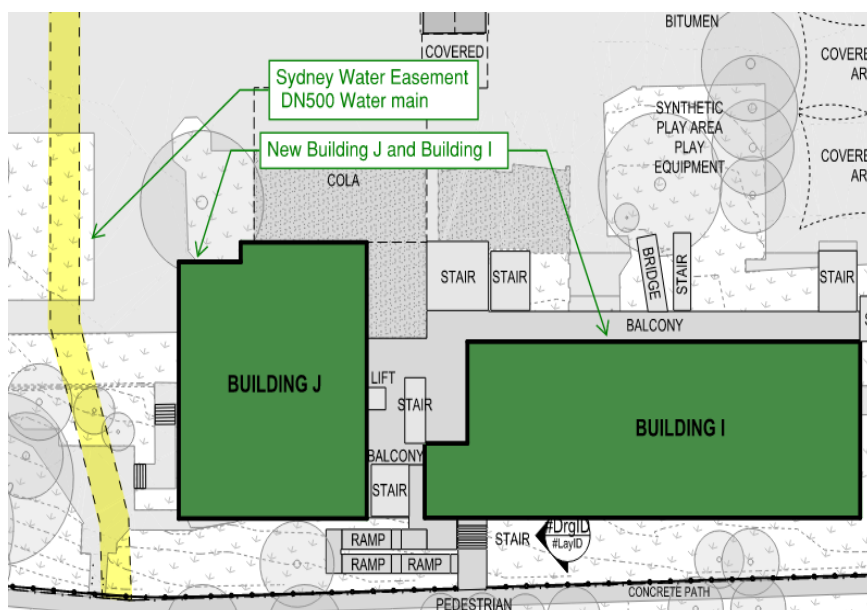


Figure 11: Sydney Water Easement and Proposed Buildings

4.2.2 Fire Services

Currently, North Sydney Public School does not appear to have a fire hydrant system installed as required by the Building Code Australia (BCA). No fire hydrants or fire brigade booster assembly were located on the property during the site inspection

As part of the works, a fire hydrant system will be required to be installed in accordance with the latest BCA, AS2419.1-2005 and fire engineering requirements to provide coverage. A performance solution will be required for the location of the fire hydrant booster as it will not be able to satisfy AS2419.1-2005 cl.7.3.(b) and

A new water main connection will be required and be extended from the DN200 CICL water main on Bay Road to serve the fire hydrant system. The final water tapping location and size will be subject to both coordination of the building layout and formal approval from Sydney Water.

4.2.3 Gas Service

There is one existing gas connection to North Sydney Public School from the DN32 Nylon @ 210kPa gas main located on Bay Road.

In recent years the school has removed and still has in place old gas space heaters (LB90 Gas Heaters). The hot plate in the canteen is used infrequently and as part of the canteen refurbishment we recommend installing electric appliances.

The gas meter and service to the school will be removed and decommissioned in accordance with Jemena Guidelines and AS/NZS 5601 requirements.

4.2.4 Sanitary Drainage System

In accordance with the Gravity Sewerage Code of Australia (WSA-Part 2), the proposed development will require frontage to a minimum DN225mm sewer main to connect into.

The development currently has two (2) frontage to sewer mains, based on initial investigations and site inspection of North Sydney Public School. Further investigations will be required to detail (survey) each sanitary drainage line, depth and what fixtures they serve throughout the school.

SSDA design calculation on the proposed new buildings and existing buildings we envisaged a new sewer connection might not be required (subject to final survey results).

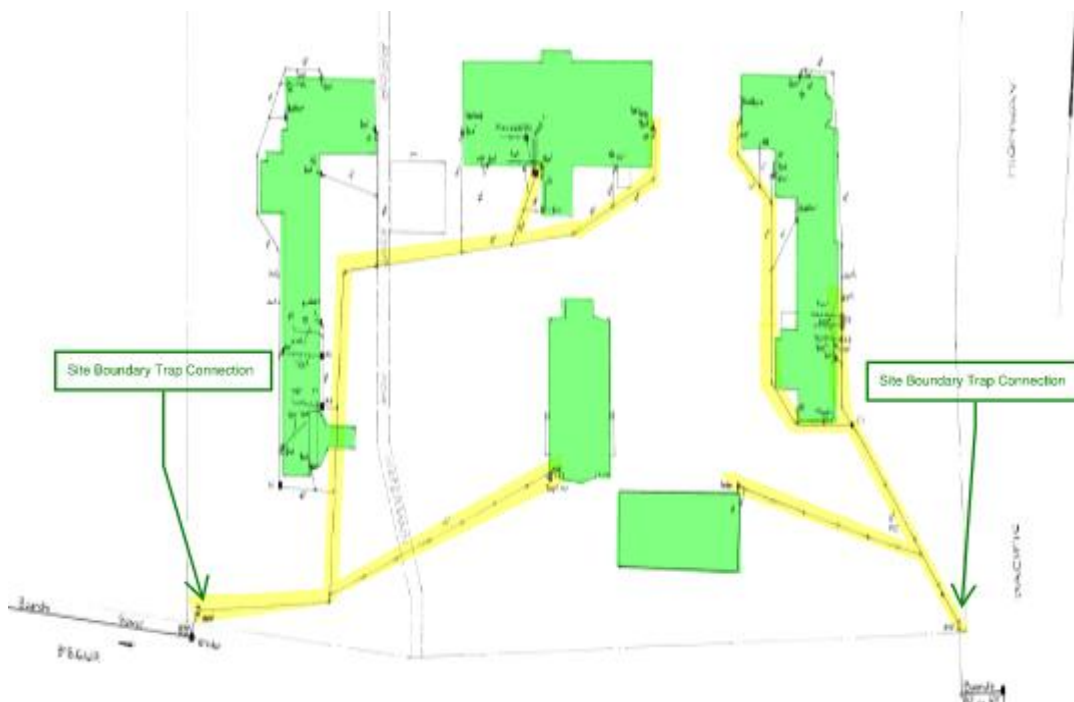


Figure 12: Sydney Water Sewer Service Diagram

4.3 Construction Period Services Continuity

4.3.1 Potable Cold Water

Further investigations will be required to detail (survey) each water service, exact location and what fixtures they serve throughout the school.

The SSDA design envisaged the connection point to proposed Building J & I will reticulate from the water meter connection adjacent to Edward St.

The assumption is that this water meter currently feeds the existing demountable buildings (to be removed), existing Hall (to be removed), Building H (to be removed) and Building D.

Prior to demolition of existing demountable buildings, Hall and Building H will need to be disconnected and capped off. The water service to Building D will need a temporary water service subject to further survey confirming the existing water service routes as a temporary solution.

4.3.2 Sanitary Drainage System

Further investigations will be required to detail (survey) each sanitary drainage line, depth, and what fixtures they serve throughout the school.

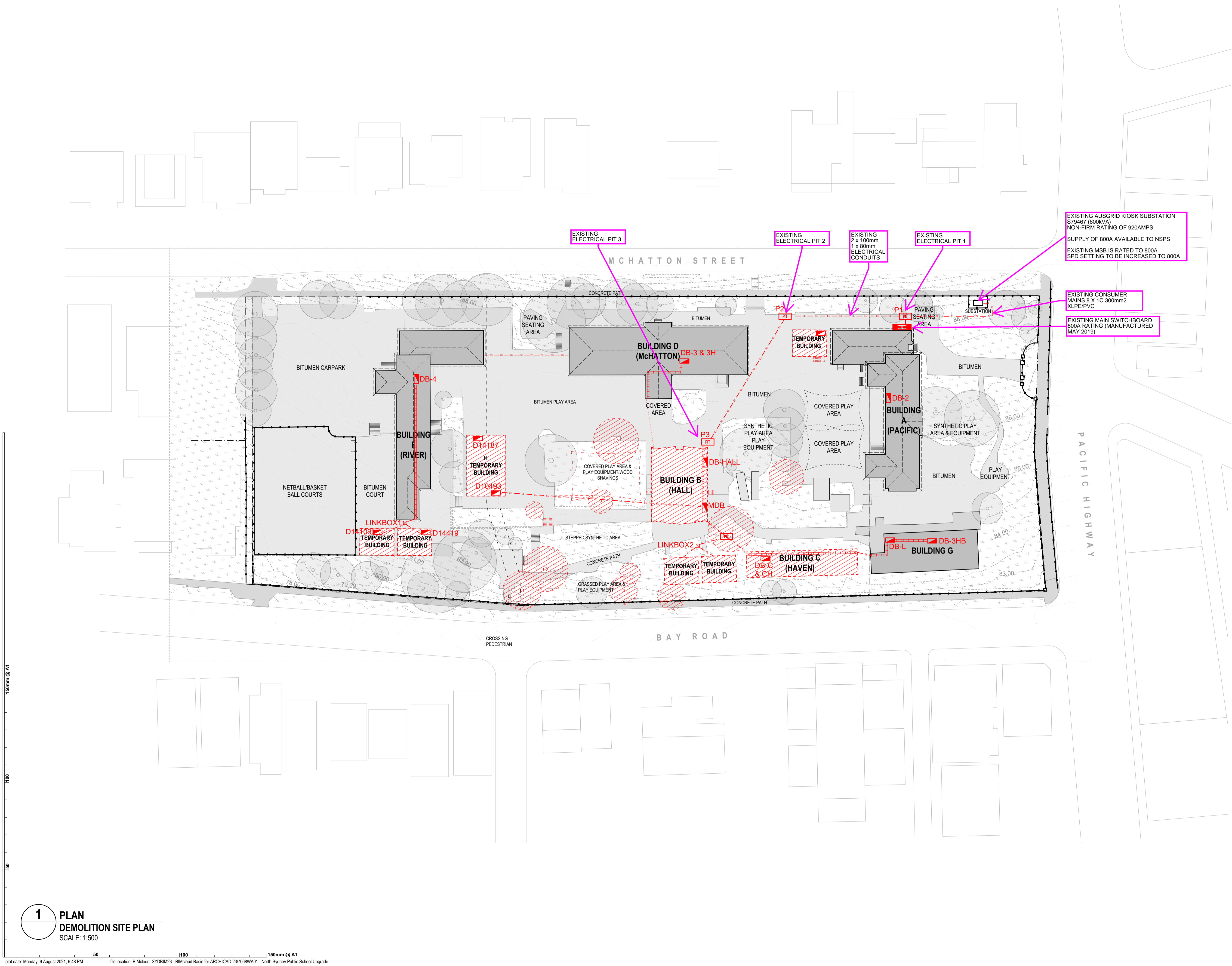
The SSDA design envisaged the connection point to proposed Building J & I will reticulate to the sewer connection located in the southeast corner of the school. The sanitary drainage line will reticulate in front of Building J & I, existing Building G and adjacent to Bay Road.

The assumption is that this sanitary drainage line from the southeast corner of the school serves the existing demountable buildings (to be removed) and the existing Hall (to be removed).

Prior to the demolition of existing demountable buildings and the Hall any sanitary drainage connections will need to be disconnected and capped off.

Appendix A

A.1 Electrical Services Site Plan



EXISTING SITE PLAN LEGEND

- EXISTING BUILDINGS
- EXISTING PAVING
- ROOF LINE (ABOVE)
- EXISTING LANDSCAPING
- ELEMENTS TO BE DEMOLISHED
- EXISTING FENCING
- EXISTING TREES
- TREES TO BE REMOVED
- EXISTING SITE CONTOURS (500MM)

- MAIN SWITCHBOARD
- SWITCHBOARD
- ELECTRICAL CONDUITS INGROUND
- CABLE TRAY (IN BUILDING)
- ELECTRICAL PIT
- CABLE LINK BOX INGROUND

INDICATIVE LOCATIONS SHOWN - NOT TO BE SCALED. LOCATION OF EXISTING EQUIPMENT, PIT/PIPE SUBJECT TO DETAILED SITE SURVEY

EXISTING AUSGRID KIOSK SUBSTATION
S79467 (600kVA)
NON-FIRM RATING OF 920AMPS
SUPPLY OF 800A AVAILABLE TO NSPS
EXISTING MSB IS RATED TO 800A
SPD SETTING TO BE INCREASED TO 800A

EXISTING CONSUMER MAINS 8 X 1C 300mm2 XLPE/PVC

EXISTING MAIN SWITCHBOARD 800A RATING (MANUFACTURED MAY 2019)

P3	SCHEMATIC DESIGN UPDATE	19.08.21	FY/RN/GM	DDC
P2	SCHEMATIC DESIGN	13.08.21	FY/RN/GM	DDC
P1	CONCEPT FOR COORDINATION	28.07.21	FY/RN/GM	DDC

No.	Description	Date	By	Chk
Services Consultant				



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Project
North Sydney Public School
Bay Rd, Waverton NSW

Drawing Title
ELECTRICAL/COMMS SERVICES
EXISTING SITE PLAN

Status
CONCEPT

Scale @ A3
1:500

Project No.
210557

Drawing No. **210557-SKE-02** Rev

P3



1 PLAN
DEMOLITION SITE PLAN
SCALE: 1:500

A.2 Hydraulic Services Site Plan



Services Consultant



SITE PLAN

Rev

2

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