Upgrade to Kingswood Public School

Hydraulic & Fire Engineering Services

Prepared for: NSW Department of Education (DoE)

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Revision

Revisions	Date	Purpose	Prepared by	Approved by
A	10.10.2024	Concept Design - Draft	BdK/MV	RE
B	20.12.2024	100% Schematic Design	RE	MS
C	14.01.2025	100% Schematic Design	RE	MS
D	17.02.2025	100% Schematic Design (incorporating RPI comments)	RE	MS
E	10.03.2025	100% Schematic Design (incorporating RPI comments)	RE	MS

It is the responsibility of the reader to verify the currency of the version number of this report.

Unless otherwise advised, the parties who have undertaken the Review and Endorsement confirm that the information contained in this document adequately describes the conditions for the Group 2 school packages.

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1 Executive summary

ACOR Consultants Pty Ltd, in the capacity of the project Hydraulic and Fire Services engineering consultants is currently reviewing and analysing the environmental and functional requirements as well as the performance standards to be met by the hydraulic & fire services.

This Schematic Design Report has been prepared to set the basis for staged planning and delivery phases of the hydraulic and fire protection requirements for the new, permanent building across the site.

The list below captures some key elements of the design progression thus far:

- The design team has attended each school to sight the proposed locations of the new buildings to gain a familiarisation of the scope
  - All site attendances were carried out in the second half of July 2024
- Applications have been lodged to the respective local authorities for:
  - Water supply performance (pressure and flow) characteristics
    - Results received are favourable and now authority mains augmentation required
  - Existing sewer services diagrams
    - Record plans of internal site infrastructure as lodged by the licensed installing plumbing contractor
    - These have been relied upon to inform the Phase 3 designs
- Site infrastructure reticulation pathways have been coordinated and consider the impact on existing trees, either those to be removed or retained
- A new fire hydrant system is required
- Embellishment of the Aust Standards and the EFSGs being considered to address project climate change

2 Introduction and Purpose

This hydraulic services report has been prepared to accompany a Review of Environmental Factors (REF) for the Department of Education (DoE) for the upgrades to Kingswood Public School (the activity) under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and *State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP TI)

This document has been prepared in accordance with the *Guidelines for Division 5.1 assessments* (the Guidelines) by the Department of Planning, Housing and Infrastructure.

This report examines and takes into account the relevant environmental factors in the Guidelines and *Environmental Planning and Assessment Regulation 2021* under Section 170, Section 171 and Section 171A of EP&A Regulation.

2.1 Hydraulic and Fire Services Principles/Systems

The proposed Hydraulic Services systems for the project is as follows:

- Sanitary plumbing and drainage systems
- Domestic potable cold-water supply
- Domestic hot and warm water supplies
- Roof water collection and disposal to civil trunk stormwater systems
- Dry fire detection and alarm systems
- Fire hydrant protection
- Fire hose reel protection
- Portable fire extinguishers and blankets

It is important to note that specifically for the new permanent buildings, our scope is limited to providing supplies (site infrastructure) to the battery limit of the building site. No internal layouts have been designed and or documented by our design team.

3 Project Description

Kingswood Public School is a K-6 co-educational public school with an approximate existing student population of 515 that is expected to increase through the coming years. The project scope is to provide permanent learning spaces and shared common areas in replacement of the existing demountables on site.

The project involves alterations and additions to existing school facilities, including:

- One (1) new single storey classroom building comprising eight (8) general learning spaces (GLS), two (2) learning commons areas, two (2) multi-purpose spaces and a verandah along the eastern side of the building;
- The construction of a covered walkway that will provide a connection between the proposed classroom building and an existing covered outdoor learning area (COLA) to the north west of the proposed building; and
- Removal of exiting portable classroom building containing ten (10) classrooms.

The project will be designed in accordance with the current DoE standards.

4 Existing Utility Asset Infrastructure

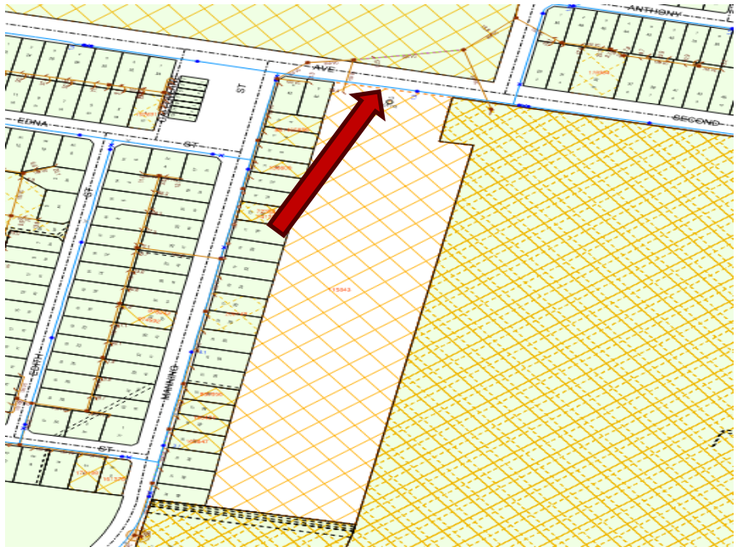
Applications have been made to the respective authorities. These applications have been summarised below:

4.1 Sewer Drainage

The authority sewer location and capacity are tabled below:

School	Location	Capacity / Commentary
Kingswood Public School	Authority sewer connection point is located to the Northeastern corner of the site	It is deemed suitable in size to service the proposed development

Sewer main:



4.2 Drinking Water Services

The authority drinking water services location and capacity are tabled below:

School	Location	Capacity / Commentary
Kingswood Public School	The authority water meter is located on the Second Avenue boundary	It is deemed suitable in size to service the proposed development

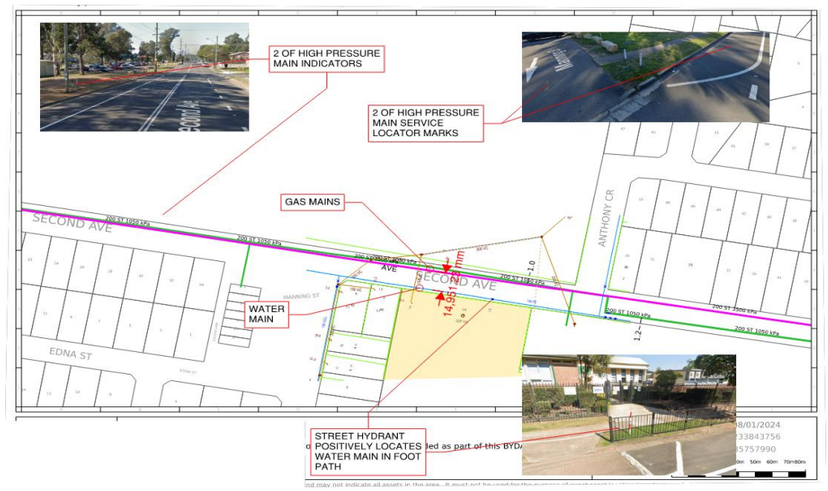
Authority Water Main:

4.3 Natural Gas

There is an existing high pressure gas main located in Second Avenue which is subject to an authority risk assessment, due its proximity to the school.

However, from a project perspective there is no impact on natural gas capacity to the proposed building.

Gas Mains:



4.4 Liquified Petroleum Gas

There is an existing LPG gas bullet located to the north of the existing amenities block and adjacent to the carpark which currently serves gas appliances at the school.

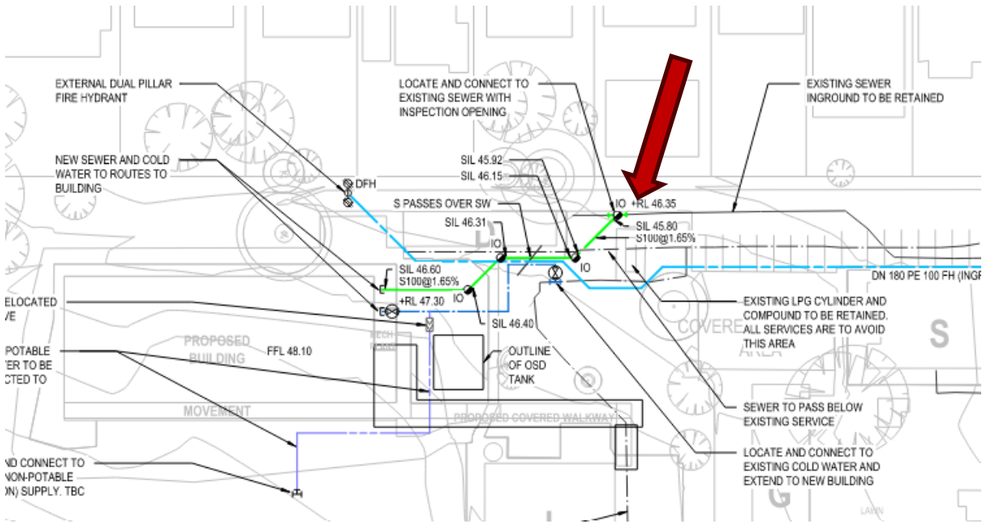
Existing LPG on Site:

5 Existing Site Infrastructure

5.1 Sewer Drainage

School	Location	Capacity / Commentary
Kingswood Public School	The existing sewer drainage traverses through the carpark to the sewer connection to the northeastern corner.	It is proposed to connect to existing sewer at the north side of the existing amenities block

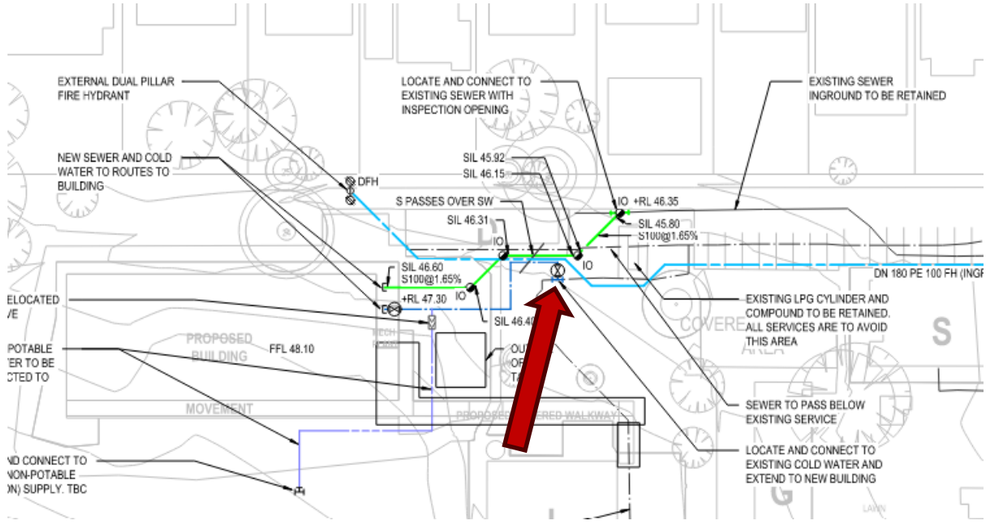
Proposed Sewer Drainage Connection Point:



5.2 Domestic Water Services

School	Location	Capacity / Commentary
Kingswood Public School	The domestic water service is reticulated directly under the proposed building footprint	It is proposed to divert existing water around building footprint and provide new connection

Proposed Site Water Service Reticulation:



5.3 Natural Gas

School	Location	Capacity / Commentary
Kingswood Public School	No impact on proposed building	Nil

5.4 Fire Hydrant

School	Location	Capacity / Commentary
Kingswood Public School	There is currently no fire hydrant system at the school.	A new fire hydrant service is required to service the new building.

6 Overarching Hydraulic Services and Fire Protection Services Design Principles

6.1 Design Standards and Criteria

6.1.1 Design Standards

Hydraulic and fire protection services will comply with all current statutory requirements and guidelines of the relevant Authorities including (but not limited to) the following:

- National Construction Code of Australia (NCC) 2022
- AS 2419.1:2021 - Fire hydrant installations System design, installation, and commissioning
- AS 2441:2005 - Installation of fire hose reels (non-student areas only)
- AS 3500:2021 (All Parts) Plumbing and drainage
- AS 1670.1:2017 – Fire detection, warning, control and intercom systems. Part 1 – Fire
- AS 2444:2001 – Portable fire extinguishers and fire blankets.
- Education Facilities Services Guidelines (V2) and the Pattern Book

6.2 Systems Description

6.2.1 Sanitary Drainage System

The proposed sanitary drainage system will be designed in accordance with AS3500.2 and NCC Volume 1 and 3.

Generally, all new in-ground drainage shall be constructed of 'Environment Best Practice' uPVC and extended from existing siter sewer infrastructure up to the proposed building footprint. The site sewer will be provisioned with access point (inspection openings) and will navigate the terrain and be deconflicted with existing services where / if they come across each other.

The system shall be designed to:

- Prevent blockages
- Provide accessibility into the system for maintenance in a way that does not place service persons at risk
- Prevent damage to the system from external factors, such as tree root infestation, ingress of stormwater and other foreign matter
- Provide a whole of life option in accordance with EFSG
- 20L/day sewer discharge per student
- 25L/day sewer discharge per staff

6.2.2 Domestic Potable Water Services

Domestic cold-water services will be designed in accordance with AS3500.1 and NCC Volume 3 Plumbing and Drainage Code.

An existing water supply meter is located on the site boundary. In addition to the authority supply meter, a subsidiary meter is to be provided to the new building to record water usage and enclosed as to prevent unwarranted tampering / vandalism.

The system shall be designed to:

- The water supply will be distributed to achieve:
  - 250 kPa (dynamic pressure) at the most disadvantaged outlet
  - 1.5m/s velocity through the pipes
- Provide backflow protection as required by the local authority
- Provide potable water to all fixtures in a way that does not cause nuisance to the occupants
- Provide accessibility to the system in a way that does not place service persons at risk
- Provide methods of disconnection in the event of damage to the system
- 25L/day water consumption per student
- 30L/day water consumption per staff

6.2.3 Natural Gas Services

Natural gas supply is not being provided to the proposed building as there are no gas fired appliances. This also aids in reducing the Greenhouse gas emissions and meeting Greenstar targets.

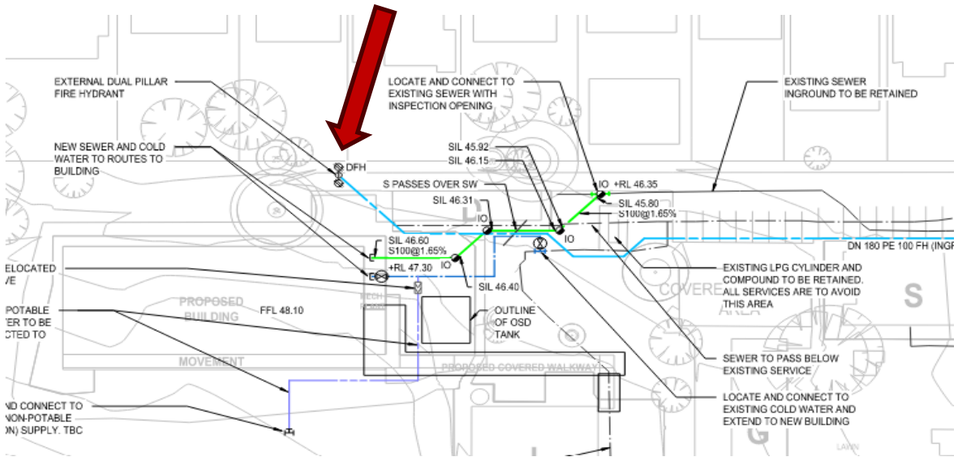
6.2.4 Fire Hydrants

The design of the fire hydrant system will be in accordance with the requirements of AS 2419.1 and of the National Construction Code of Australia Volume 1 and local brigade requirements.

The new external fire hydrant will provide 70m coverage and are to be installed >10m away from the building. The fire hydrant is to be within 50m of a hardstand that is accessible by the attending fire truck.

The system shall be designed to:

- Provide water to all on site firefighting equipment at a compliant pressure and flow rate
- Provide accessibility to the system in a way that does not place service persons at risk
- Fire hydrants located to prevent unnecessary risk / injury to staff and pupils
- Provide methods of disconnection in the event of damage to the system



6.2.5 Fire Hose Reels

In accordance with the NCC and the classification of building (Class 9b), fire hose reels are not required.

6.2.6 Dry Fire Detection and Alarms

Requirement of fire services are assessed based on Class 9b school building, rise in storeys of 3 and conventional construction.

Fire detection system – Not required (Class 9b building not more than 3 rise in storeys).

EWIS – Not required (Class 9b building not more than 3 rise in storeys).

However, fire detection system compliant with AS 1670.1-2018, Section 7 will be provided for the new building, for the purpose of mechanical system shutdown in fire mode.

6.3 System Materials

Materials used for construction of hydraulic and fire protection services have been selected based on current industry best practice, whole of life cost, ease of installation, ease of disassembly, ease of reassembly, durability, ease of maintenance. Generally, the materials proposed for hydraulic service piping shall be as follows. Other material selection options will be per AS3500 and EFSG requirements:

Sanitary Systems	PVC-U DWV
Domestic Cold Water	Copper type B for main installations.
Domestic Hot Water	Copper Type B (Thermally insulated).
Fire Hydrant (Above Ground)	Galvanised Mild Steel with Roll Groove joints
Fire Hydrant (Below Ground)	PE100 SDR11 PN16

6.4 Environmentally Sustainable Design Initiatives

The following ESD measures considered for the development:

- Additional metering of water supplies
- Electrification (no natural gas) to the proposed development
- Efficient and economical layout of pipework routes

The following ESD measures should considered for the development:

- Increased thickness of thermal insulation on all hot water supplies
- Use of recyclable materials
- Minimizing ground excavation

6.5 Safety in Design

The following are safety in design risks that have initially been identified. These will need to be further assessed and addressed during progression of design:

- Fire hydrants to be fitted with caps and tamper proof handle protection
- Fire brigade hydrant valving arrangement to sit proud of the school security fencing with no more than 200mm height differential between equipment plinth and the surrounding surface
  - Fencing to be suitable to prevent unwarranted entry into the school premises

7 Project Specific Challenges

The following list is identifying the unique challenges that will be addressed by the project team as the project design continues to evolve:

- Interrupting main water supply of the enabling diversion works of the existing water system under building footprint
- Installation of new fire hydrant system through existing carpark

Statement of Available Pressure and Flow

Sydney WATER

Katie Adamson
33 Herbert Street
St Leonards, 2065

Attention: Katie Adamson Date: 26/07/2024

Pressure & Flow Application Number: 1931933
Your Pressure Inquiry Dated: 2024-07-16
Property Address: Second Avenue, Kingswood 2747

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: Second Avenue	Side of Street: South
Distance & Direction from Nearest Cross Street	56 metres West from Anthony Crescent
Approximate Ground Level (AHD):	43 metres
Nominal Size of Water Main (DN):	100 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	67 metre head
Minimum Pressure	50 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	49
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	10 15 20 25	48 45 40 35
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	45 41 36 30
Maximum Permissible Flow	26	29

(Please refer to reverse side for Notes)

For any further inquiries regarding this application please email :

hydraulicassessment@sydneywater.com.au

Sydney Water Corporation ABN 49 776 225 038
1 Smith St Parramatta 2150 | PO Box 399 Parramatta 2124 | DX 14 Sydney | T 13 20 92 | www.sydneywater.com.au
Delivering essential and sustainable water services for the benefit of the community

Appendix B - Hydraulic Services Schematic Design Layouts – Site Infrastructure

DRAWING LIST	
DRAWING No.	**DRAWING NAME**
KIPS-ACOR-00-00-DR-H-0000	COVER SHEET
KIPS-ACOR-00-00-DR-H-0001	LEGEND & GENERAL NOTES
KIPS-ACOR-00-00-DR-H-1100	EXISTING SITE PLAN & DEMOLITION
KIPS-ACOR-00-00-DR-H-1200	PROPOSED SITE PLAN
KIPS-ACOR-00-00-DR-H-9000	DETAIL SHEET