

# HYDRAULIC AND FIRE SYSTEMS ENGINEERING

## State Significant Development Application

The new primary school at Gregory Hills

Prepared for: School Infrastructure NSW

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#### Revisions

Revision	Description	Date	Prepared by	Approved by	Signature
A	SSDA	23/09/2022	RE	Rhys Edwards	
B	SSDA	04/10/2022	RE	Rhys Edwards	

#### Review Panel

Division/ Office	Name
Building Services / St Leonards	Rhys Edwards

Unless otherwise advised, the parties who have undertaken the Review and Endorsement confirm that the information contained in this document adequately describes the conditions of the site located at Gregory Hills, NSW.

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# 1 Introduction

This Integrated Water Management Report, compiled by ACOR Consultants Pty Ltd accompanies an Environmental Impact Statement (EIS) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), in support of a State Significant Development Application (SSDA) for the construction and operation of a new primary school at Gregory Hills (SSD-41306367).

This report addresses the Secretary’s Environmental Assessment Requirements (SEARs) issued for the project, notably:

SEARs Requirement	Response
13. Stormwater and Waste Water	Section 6 and Section 7.1
21. Infrastructure Requirements and Utilities	Section 4

# 2 Site Description and Location

The site is located in Dharawal Country at 28 Wallarah Circuit, Gregory Hills NSW 2557, and is legally described as Lot 3257 DP1243285.

The site is located within the Camden Local Government Area and is within the Turner Road Precinct of the South-West Growth Centre.

The site has an area of approximately 2.926ha (by Deposited Plan). This will be reduced to 2.907ha under approved DA2022/742/1 once Long Reef Circuit has been widened.

Topography is minimal with a fall from the south-east corner (RL116.5) to the north- west corner (RL113).

The site has three (3) street frontages:

- Wallarah Circuit (southern boundary)
- Gregory Hills Drive (northern boundary)
- Long Reef Circuit (eastern Boundary)

The site is primarily vacant land, with the exception of an existing group of trees in the southwest corner of the site that pre-date the subdivision and development of the precinct. There is also an existing electrical substation located on the south-eastern boundary.

There are easements of varying widths located to the northern boundary identified for drainage.



Figure 1 Locality Map (Six Maps)



Figure 2 Site Aerial Map, (Source Bennett and Trimble)

### 1.1 Surrounding Development

To the north, east and south of the site is emerging and recently completed residential development.

To the east of the residential area fronting Long Reef Circuit are high voltage power lines within an easement which include pedestrian paths and cycleways.

To the west of the site, beyond Sykes Creek and Howard Park, is the Gregory Hills town centre. A pedestrian bridge links Wallarah Circuit with the town centre across Sykes Creek.



Figure 3 Surrounding Development (Nearmap)

## 3 Proposal

The proposal is for a new primary school at Gregory Hills that generally comprises the following:

- 44 General Learning Spaces.
- 4 Support Learning Spaces.
- Administration, staff hub, amenity and building service areas.

- Library, communal hall and canteen.
- Outside School Hours Care (OSHC) services.
- Sport courts, outdoor play space, a Covered Outdoor Learning Area (COLA) and site landscaping.
- Dedicated bicycle and scooter parking.
- Three (3) kiss and drop spaces for Supported Learning Students (SLS) located on Wallarah Circuit.
- On-site car parking.
- Signage.
- Footpath widening on Wallarah Circuit.



Figure 4 Site plan (source Bennett and Trimble)

## 4 Utility Services Assessment

The site infrastructure strategy will be designed to be a site wide network with main connections being established in Wallarah Circuit. These authority connections are proposed to be retained and utilised for the permanent school.

Authority (utility) services adequacy is summarized within the table below:-

**Table 1 – Utility Services Adequacy summary**

Sewer	Domestic Water	Natural Gas
Authority mains are capable	Existing supply mains in the surrounding streets have capable flow and pressure	Adequate capacity in street mains.  No connections to gas mains are envisaged due to the project being fully electrified.

## 4.1 Sewer Drainage

The proposed site has access to the authority sewer drains, which circumnavigate the site boundary. It is envisaged the school site will make connection to the existing DN150mm sewer located in the southwest corner of the site, as indicated with the blue arrow in the image below:



Image 1 – Sydney Water - Sewer

## 4.2 Domestic Water Services

The proposed site has access to the authority water supply mains, which surround the site. It is envisaged the school site will make connection to the existing DN150mm water supply located in the southwest corner of the site, as indicated with the blue arrow in the image below:



Image 2 – Sydney Water – Water Supply Mains

## 5 Standards and Design Guides

### 5.1 Australian Standards and Codes

The following lists the primary standards and codes our design approaches are reliant upon:

- National Construction Code (NCC) – 2019 amendment 1 (being the current version at the time of writing this report)
- Plumbing Code of Australia (PCA) – 2019
- Building Code 2016
- AS 3500 Plumbing and Drainage Suite of standards – 2018
- AS 3718:2005 Water Supply Tapware
- AS 4187:2014 Reprocessing of reusable medical devices in health service organizations
- AS 2419.1 Fire Hydrant Installations – 2005
- AS 2118.1 Fire Sprinkler Installations – 2017
- AS 2441 Fire Hose Reels – 2005

### 5.2 Authority and Regulatory Bodies

The following lists the primary authorities and regulatory bodies our design approaches are reliant upon:

- EP&A – ACT & Regulation
- Camden Council
- Jemena Gas Networks
- Sydney Water
- Department of Fair Trading
- Fire and Rescue NSW

### 5.3 NSW School Infrastructure Guidelines

This report will rely upon guidelines and policies mandated by School Infrastructure.

## 6 Scope of Services

Scope of services covered within the plan include:

- sanitary waste discharge
- roof water plumbing and drainage systems connecting to existing civil trunk stormwater, via rainwater tanks
- domestic potable water supply systems

Hydraulic services can be summarised as follows:

- Consultation with relevant utility supply agencies is to be conducted to verify the condition, capacity, compliance, reliability and efficiency of the existing sewer and water mains.
  - Note: the project's Water Services Coordinator (WSC) is the authorised party for liaison between Sydney Water and the project team for sewer and water supply capacity assessments
- Sewer and trade wastewater from the site to discharge to Sydney Water's sewer main via proposed internal 'house drainage' system in accordance with AS.3500 Part 2 and Sydney Water's requirements
- Water supply provided will be in accordance with Australian Drinking Water Guidelines (2011, updated 2016, version 3.4) and AS3500 Part 1 and Part 4

- Rainwater from roof areas will be collected, stored and re-used for landscape irrigation purposes
- Roofwater will drain/discharge through a series of rainwater outlets and gutters systems designed in accordance with AS3500 Part 3
- Ecological Sustainable Development (ESD) principles will be incorporated into the designs and the construction of the facility as per the agreed pathway

## 7 Hydraulic Services Overview

This section of the report sets out to describe compliance and capacity of the proposed hydraulic services site infrastructure.

### 7.1 Sanitary Plumbing & Drainage System

The proposed sanitary drainage system will be designed in accordance with AS3500.2-2018 and NCC Volume 1 and 3.

Generally, all new in-ground drainage shall be constructed of 'Environment Best Practice' uPVC.

Where possible and where permitted drainage vent pipes will be interconnected such to reduce penetrations through the roof.

Fire collars will be installed at all penetrations through fire and smoke rated elements in accordance with the NCC.

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

We have carried out preliminary demand calculations which are summarised below:

**Table 2 –Sewer Demands**

#### Sewer Loads

Existing	1100 Pupils	60 Staff
Nil	22 kL/day	1.5 kL/day

### 7.2 Domestic Cold-Water Services

Domestic cold-water services will be designed in accordance with AS3500.1-2018 and NCC Volume 3 Plumbing and Drainage Code.

A water supply meter will be located on the site boundary and enclosed as to prevent unwarranted tampering / vandalism. In addition to the authority supply meter, subsidiary meters will be provided throughout the buildings to record water usage.

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
- **Table 3 - Water Supply Loads**

Existing	1100 Pupils	60 Staff
Nil	27.5 kL/day	1.8 kL/day

### 7.3 Natural Gas Supply

Natural gas supply is not being provided to the school as there are no requirements for reticulation. Space heating and domestic water heating will be electrically energised.

### 7.4 Ecologically Sustainable Design Initiatives

ESD measures are being considered to be implemented to achieve a target comparable with 5 Star Greenstar framework.