Woolacotts.
CONSULTING ENGINEERS

# Schools Infrastructure NSW

# New Primary School in Mulgoa Rise

## Integrated Water Management Report

20-306 / 12 August 2021 / SSDA Submission

# Contents

# Document control

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| A | 06.05.21 | SSDA Submission | KEC | AP | JH |
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# 1.0 Introduction

The proposed primary school at Mulgoa Rise / Glenmore Park is a new school on a brownfield site, the site is a former quarry that has been filled to the current surface levels.

The new primary school in Mulgoa Rise /Glenmore Park is to be designed and built to significantly improve educational outcomes and address the capacity shortfall across the area for an approximate 414 students initially, with the potential expansion to 1000 as demand grows.

Refer Figure 1 below for the proposed site plan.

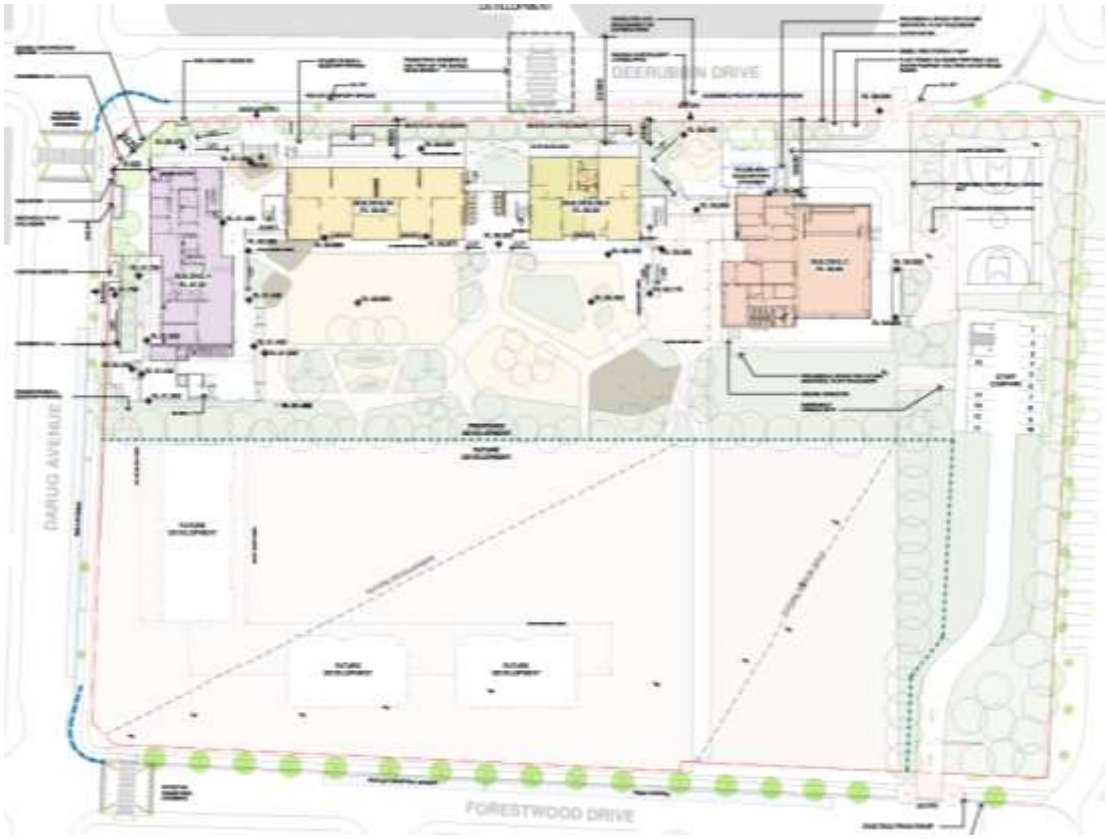


*Figure 1 Site Plan*

The purpose of this report is to detail the following:

- Proposed alternative water supply (i.e. rainwater harvesting)
- Proposed end uses of potable and non-potable water (including irrigation and toilet flushing)
- Water sensitive Urban Design measures

# 2.0 Existing Site Conditions

## 2.1 Site Characteristics

The proposed primary school site ("The Site") is a brownfield site. The subject site is bounded to the north by Deerubbin Drive, to the south by Forestwood Drive, to the west by Darug Avenue and to the east by the existing Mulgoa Rise Sports Fields and on-grade carpark. The site is located within a parent subdivision, consisting of predominately low-density residential dwellings. The subject site is shown in Figure 2 below:

*Figure 2 New Primary School in Mulgoa Rise Site – Aerial Image. Source: Sixmaps (2021)*

The total existing site area is approximately 3 hectares based on the surveyed site boundaries. The site grades gently from a high point in the south-west corner, to a low point in the north east corner. An existing grassed batter (approximately 1V:10H) is located along the southern site boundary. Remaining gradients within the site, from the toe of the batter to the north west corner of the site, varies between 1% to 4%.

# 3.0 Proposed Development

The new primary school in Mulgoa Rise / Glenmore Park is to be designed and built to significantly improve educational outcomes and address the capacity shortfall across the area for an approximate 414 students initially, with the potential expansion to 1000 as demand grows.

This proposal will facilitate a Core 21 school with 18 learning spaces (also known as Home bases) + 2 support classes, with the selected core facilities at Core 35, for the Hall, Library, Staff facilities and Admin.

The current proposal includes the following buildings:

| | |
|---|---|
| Building A | Administration and Library |
| Buildings B2 | Home bases learning |
| Building B3.S | Home bases learning and Support Unit Hub |
| Building C | Hall and ancillary facilities |

# 4.0 Integrated Water Management Plan

## 4.1 Existing Environment

### 4.1.1 Catchment Hydrology and Hydrogeology

**Hydrology**

Based on the location of The Site and regional topography, excess surface runoff (not captured by the below ground pit and pipe network) is expected to discharge into Surveyors Creek located approximately 200m east of the site.

Two-dimensional flood modelling shows a large external catchment area is directed towards The Site. Due to the sizeable frontage of The Site, in combination with the limited channel capacity of the surrounding roadways, overland flow flooding enters The Site during the 1% AEP. The overland flow flooding occurs in the north-western corner and eastern portion of The Site. This flooding is shallow (less than 300mm) and is low hazard.

Refer to the *Flood Impact Assessment* report by Woolacotts, Revision B, dated 10th August 2021 for further information.

**Hydrogeology**

Hydrogeological information obtained from the *Preliminary Site Investigation (PSI) - Contamination* by JK Environments (dated 3 June 2020) indicates that the regional aquifer on-site and in the areas immediately surrounding the site includes porous, extensive aquifers of low to moderate productivity.'

Based on the local topography and surrounding land features, groundwater is assumed to flow eastwards towards Surveyors Creek. Refer Section 4.1.4 for groundwater conditions.

### 4.1.2 Soil Conditions

The site was previously a quarry which has been filled to current surface levels. Generally, the fill material is a clayey fill material with gravel inclusions, which is well compacted but there are pockets which are poorly compacted in the in the area proposed for the two-storey home base building B2. Rock was encountered at the base of the fill material at depths varying from 11.2m to 14.5m.

For further information on the soil profile refer to the *Supplementary Geotechnical Investigation* by JK Geotechnics (dated 16 November 2020).

### 4.1.3 Vegetation Cover

The site is currently covered by typically short-medium length grass. There are no trees within the site boundaries, however there are trees within the road reserve adjacent the northern, western and southern sides boundaries of The Site.

### 4.1.4 Ground Water

Groundwater seepage was encountered during auger drilling at depths between 3.8m and 9.0m. On completion of the drilling, standing groundwater was recorded at depths between 1.3m and 5.0m in the boreholes. 24 hours after the drilling, a standing groundwater level of 2.3m deep was recorded.

It is noted that groundwater levels may not have stabilised over the relatively short observation period.

### 4.1.5 Site Constraints

The major site constraints identified for this site include the fixed single stormwater discharge location within Deerubbin Drive at the north-east corner of the site.

The single discharge location is an existing Council stormwater pit to the north-east of the site within the public reserve. This existing pit is a constraint as the location and invert level of Councils existing stormwater assets are fixed and it is proposed to discharge the post-developed site's stormwater runoff into this pit.

### 4.1.6 Water Quality Conditions

The *Detailed Site Investigation (DSI)* by JK Environments (dated 5 November June 2020) states that the investigation *"has not identified contamination that was assessed to pose a risk in the context of the proposed development. Therefore, based on the findings of the investigation, JKE are of the opinion that the site is suitable for the proposed development … remediation and/or further investigation is not considered to be required based on the information and data collected and evaluated by JKE."*

In general, the water quality in the existing discharge locations will be typical of an urban environment, with the main pollutants consisting of litter, oils/ grease from roadways, and existing soil condition pollutants described above.

## 4.2 Site Stormwater Discharge

Stormwater runoff from all pervious and impervious surfaces within the proposed development will generally be collected by an in-ground pit and pipe gravity pipe system. The in-ground pit and pipe system has been sized to accommodate the 5% AEP (20-year ARI) storm flows for the site.

In the event of the in-ground system blockage or a major storm event greater than the 5% AEP (i.e. storm events up to and including the 1% AEP), overland flow paths have been provided around the proposed buildings to safely convey flows to the Deerubbin Drive road reserve, which acts as the overland flow path for the site catchment.

The proposed stormwater system will connect into the existing Council's stormwater pit located within Deerubbin Drive at the north-east corner of the site. For more detail on the site's stormwater management system refer to the *Stormwater Management Report.*

## 4.3 Objectives and Performance Standards

### 4.3.1 Water Consumption

The total water consumption may be offset through the use of latest technology water saving devices (subject to the project requirements) such as:

- Dual flush toilets
- Flow limited taps
- Hose tap irrigation for landscaping

In addition to this, a rainwater collection and reuse tank may be used to collect clean rainwater for toilet flushing and irrigation of landscaping subject to project requirements.

# 5.0 Water Sensitive Urban Design Measures

## 5.1 Rainwater Reuse

It is proposed to provide a rainwater collection and reuse to collect clean rainwater for toilet flushing and irrigation of landscaping subject to project requirements.

## 5.2 Erosion and Sediment Control

During construction, erosion and sediment control measures will be provided in accordance with the requirements of "Managing Urban Stormwater Soils and Construction, 4th Edition (Blue Book)". These measures will include silt fences on the low side of the site, silt traps at stormwater pits. Dust control measures will also be provided.

Other measures to be provided on site during construction include construction exits for all vehicles leaving the site, and revegetation of the site as soon as practicable. Erosion control measures must be inspected and maintained after each rain event and at intervals not exceeding two weeks.

## 5.3 Stormwater Quality / Treatment

Water quality and water quantity treatment systems have been provided as part of the parent subdivision works, however the site specific WSUD measures that will be provided for this site include:

- Grassed swales
- Open turf areas
- All grated inlet pits will have gross pollutant traps, to remove gross pollutants prior to site discharge
- Collection, reuse and bypass of clean roof water (subject to project requirements)

The above proposed treatment devices are incorporated within the system design to achieve an overall increase of stormwater quality.

Refer to the *Civil Engineering Schematic Design Report* by Woolacotts, Revision B, dated 10th August 2021 for further information.