

Southern Schools – Jindabyne Central School

Civil Engineering Report

Prepared for School Infrastructure NSW / 22 March 2019

TTW Job No: 181098

**Structural
Civil
Traffic
Facade
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Engineers**

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PREPARED BY	APPROVED BY	STATUS	ISSUE	DATE
Grace Carpp	Glen Hetherington	DA	A	22 March 2019

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1.0 Introduction

Taylor Thomson Whitting Pty. Ltd. (TTW) has been engaged by School Infrastructure NSW to provide the associated Civil Engineering design and documentation for the proposed works located at Jindabyne Central School. This report has been prepared to highlight the proposed civil engineering works.

1.1 The Development Site

The development site is within the existing grounds of Jindabyne Central School, as shown below. The major design and construction works focuses on the new Learning Building and adjacent carpark. The site is currently occupied by demountable buildings and existing school buildings.



Figure 1. Site Plan

1.2 Reference Documents

- Architectural Drawings prepared by Graypuksand on 14 January 2019
- Landscape Architectural Drawings prepared by 360 on 01 February 2019
- Snowy River Development Control Plan 2013

2.0 Civil Design

2.1 Existing Services

The site is constrained by existing services including stormwater, sewer, gas, water, and electricity.

Existing services have been investigated through Dial Before You Dig, School records, site investigations, and survey. Where services clash with the proposed development they will be relocated or removed. No detailed services investigation has been undertaken to date. Redundant services will be capped off and/or removed.

Whilst attempts are being made to identify all services which will be impacted, there is still the possibility that unknown services are encountered during demolition or construction.

2.2 Existing Stormwater

Internally to the school a network of pit and pits has been provided. TTW are not aware of any current issues concerning the existing stormwater network. The stormwater system drains to the council in-ground pit and pipe network located in Kalkite and Clyde Streets.

2.3 Site Levels

The site generally falls towards the north to Kalkite and Clyde Streets at varying grades throughout the site.

Due to falls across the site, accessible access is difficult to achieve without the introduction of ramps through the site.

3.0 Civil Stormwater Design

In general, all roof stormwater will be collected in roof gutters and downpipes and conveyed to a proposed in-ground pit and pipe system. Surface stormwater will be collected in pits.

3.1 Hydraulics

Pipes and pits will be designed to satisfy the minimum provisions of AS 3500.2 and to meet Educational Facilities Standards and Guidelines (EFSG) requirements. Sizing of stormwater pipes and pits will be further refined during detailed design through DRAINS modelling following the methods detailed in Australian Rainfall and Runoff 2016.

The in-ground stormwater management system will be designed to convey, at minimum, the 5% Annual Exceedance Probability (AEP) flows. Where pipe capacity is exceeded, provision will be made for the conveyance of flows via an overland flow path. This will be designed to convey the 1% AEP storm event.

In line with EFSG requirements, building downpipes will discharge into surface pits. An air void will be located between the base of the downpipe and the surface of the pit. This air void will prevent downpipes from surcharging should the in-ground drainage block, make maintenance and access easier, and allow melted snow/ice in the downpipes and gutters to drain away without having the in-ground pipes clear of frozen stormwater.

As required by the EFSG, the minimum pipe diameter will be 225mm to allow for ease of maintenance and to prevent blockages.

3.2 Onsite Stormwater Detention (OSD)

The OSD storage has been sized to cater for the storm events including 20%, 10%, 5% and 1% Annual Exceedance Probability (AEP) storm events. The OSD storage has been modelled and analysed in DRAINS modelling software to ensure the proposed OSD system does not exceed the pre-development discharge flow rate. Note that the methodology for calculating stormwater flows has been based on the methods detailed in Australian Rainfall and Runoff 2016. Refer to Figure _ for DRAINS modelling layout.

A comparison of the pre and post development flows have been shown in **Figure 2** which illustrates that the two OSD storage systems on site do not exceed pre-development flows.

The proposed OSD for the New Middle School Building will have a footprint of 30m² and is designed to provide 27m³ of storage. The OSD will be located within a landscaped area adjacent to the proposed New Middle School Building. The total catchment captured by this system is equal to 1728m². The restricted flow from the OSD system is to be conveyed by the proposed inground drainage system and connected to an existing stormwater pit on Kalkite Street.

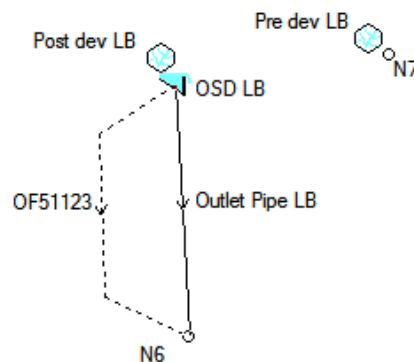


Figure 2 - DRAINS Schematic

New Middle School Building (LB) –

AEP Storm	Pre-Development (m ³ /s)	Post-Development (m ³ /s)
20%	0.022	0.020
10%	0.027	0.023
5%	0.032	0.026
1%	0.053	0.048

3.3 Flooding

The site is positioned away from creeks and the receiving water bodies. No flooding constraints were identified on site.

3.4 Water Sensitive Urban Design (WSUD)

Water Sensitive Urban Design includes water reuse, pollutant removal via natural systems, and the minimisation of hard structures to control stormwater and improve aesthetic and recreational appeal.

Where open space exists, an attempt to incorporate WSUD principles into the stormwater design. Although, as standing water poses waterborne health risk, careful attention to the WSUD type and how it is incorporated into a school environmental

3.5 Overland flow

In the event that the piped in-ground stormwater system fails due to blockage or other obstruction, stormwater flows will be required to be conveyed as overland flow. The overland flow is to be directed away from buildings

Overland flow paths will be sized to accommodate the 1% AEP storm flows and be designed away from areas on the site campus where snow may accumulate (adjacent walls and fences) that could block water flow.

Final overland flows paths will be confirmed after survey information is received.

3.6 Erosion and Sediment Control

During construction and while the site is disturbed, erosion prevention and sediment control measures will be required. Erosion prevention generally involves managing stormwater by diverting overland flow around construction areas as well as collecting stormwater within the construction zone and directing to sediment control devices. Devices likely to be incorporated are: silt removal like fences, hay bales, and grass lined swales; water flow dissipation and discharge control devices such as sand bags, pollution mattresses, and basins.

Erosion prevention and sediment removal strategies need to be inspected regularly during service and construction works, cleaned and maintained after storm events, and modified to suit construction work progress, decanting and demolition.

Erosion and sediment control is to be provided in accordance with Urban NSW's publication Managing Urban Stormwater: soils and construction.

Prepared by:

**TAYLOR THOMSON WHITTING
(NSW) PTY LTD**



GRACE CARPP
Civil Engineer

Authorised by:

**TAYLOR THOMSON WHITTING
(NSW) PTY LTD**



GLEN HETHERINGTON
Technical Director

Appendix A

Civil Drawings