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SCHEMATIC DESIGN REPORT-CIVIL

OUR REF:7855-SDR

PACIFIC BROOK CHRISTIAN SCHOOL AT LOT 100 DP 1261496 72-74 MAITLAND STREET, MUSWELLBROOK NSW 2133

PREPARED BY: CAMERON AMRI

DATE: 19/07/2021

REVISION: A

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DOCUMENT VERIFICATION

Project Title	Pacific Brook Christian School
Document Title	Schematic Design Report
Project No.	7855
Description	Civil schematic design report
Client Contact	NBRS Architecture

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Issued by	Michael Grogan	

REPORT DELIVERABLES

DOCUMENT HISTORY

Date	Revision	Issued to	Description
19/07/21	-A	NBRS	DRAFT Issue
23/07/21	B	NBRS	FINAL
14/10/21	C	NBRS	Stage 0 to 1 change

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1 EXECUTIVE SUMMARY

Birzulis Associates have been commissioned by NBR Architecture to provide a stormwater report on the basis of the targets that have been proposed to be achieved for Stage 1 for the redevelopment of the above-mentioned site.

This report has been prepared with reference to the architectural proposal and the stormwater guidelines that govern for this site.

2 OVERVIEW OF PROPOSED MODIFICATIONS

The following are key components to the Stage 1 development proposal:

- Site remediation;
- Removal of 7 trees;
- Facilities for a maximum of 140 students and 16 staff, including:
- One (1) administration and staff building;
- One (1) staff and student amenities block; and
- Six (6) General Learning Areas (GLAs);
- Onsite parking (15 spaces inclusive of 1 accessible space)
- Bicycle parking (6 racks catering for 12 spaces)
- Landscaping;
- Internal infrastructure works; and
- Vehicular access via Maitland Street.

3 EXISTING CONDITIONS

3.1 LOCATION

The site is located adjacent to Muswellbrook Golf Course and is approximately 24211m² (2.42 ha) and currently is partially developed with sparsely located and sized buildings with garden bed areas. See Figure 3.1.

The site has Muswellbrook Golf Course (Crown Land) to the north-east, Muswellbrook Street (RMS Classified Road) to south-west, residential development to the south-east.



Figure 3.1 – Proposed Overall Site Plan

The site is mostly an existing undeveloped site with agriculture type use with the existing unsealed ring road internally. From a stormwater point of view it is mostly a “green fields” type site.

3.2 GEOTECHNICAL

A geotechnical investigation has been undertaken by Douglas Partners and identifies that generally the site is a clay type site which would be unsuitable for bulk stormwater infiltration disposal.

3.3 EXISTING STORMWATER

Refer to our Service Infrastructure Report.

3.4 FLOOD DOCUMENTATION REVIEW

We have contacted Muswellbrook Council and they have confirmed the site is only partially affected by the 1:100 year stormwater event and as such a proposed stormwater system for the developed part of the site should perform as designed.



Figure 3.4 – Proposed Overall Site Plan

4 PROPOSED DEVELOPMENT

4.1 OVERVIEW

The proposed Stage 1 development comprised the demolition of existing ancillary type elements and the construction of a single storey development. The development is mostly temporary and minor in nature comprising 7 classrooms, a cola, amenities block and a small on-ground carpark.

4.2 CIVIL WORKS

4.2.1 EARTHWORKS

We do not anticipate large scale earthworks as the portable buildings are supported on isolated pad type footings. The main civil works are the pavements (footpath and carpark) which are less than 2500m² hence not triggering for sediment basin assessment.

Some contamination has been identified in the Contamination Report prepared by Douglas Partners and earthworks and spoil should be handled in accordance with the recommendations of that report.

4.2.2 EXTERNAL WORKS

The external works will consist of new pathways, and new carparking facilities. The new pathways will be a minimum of 110mm thick reinforced with jointing to control cracking.

The CBR for the site is low in the vicinity of 2%. Based on the geotechnical report it would be prudent to provide perimeter sub-soil drainage to protect trafficable pavements from shrink swell and other associated moisture effects.

The flexible pavement has been recommended by the geotechnical engineer to have a SMZ under a conventional flexible pavement design for 4 x 10⁵ ESA.

4.2.3 TRAFFIC

The traffic assessment and reporting is by others.

4.3 STORMWATER

4.3.1 WATER QUANTITY

We have contacted Muswellbrook Council and they have confirmed via email that the post-development discharge rates should not exceed pre-development discharge rates up to the 1% AEP rainfall-runoff. Council noted the design would need to be consistent with their DCP.

The site also partially falls to Crown Land and as such should also be consistent with the requirements of the document; Development adjacent to National Parks and Wildlife Service lands.

Muswellbrook Council DCP has been reviewed and has the following guidelines reference.

According to DCP 25.2.3 Flooding and Runoff Regimes

A - Replicating Natural Conditions

Controls

(i) Development is to be designed so that runoff from low intensity, common rainfall is equivalent to the runoff from a natural catchment. This can be achieved by intercepting and storing runoff in extended storage detention basins and discharging at greatly reduced rates.

B. Managing peak runoff

Runoff generated by more intense rainfall needs to be managed so that there is no downstream property damage or risk to public safety.

As noted above the site cannot discharge greater than the existing so when there is an increase in impervious area OSD will be required to meet the above target.

A DRAINS software model has been created to model the pre-development runoff condition and the post-development runoff condition.

Table 4.2.3.1 provides details for the pre-development and post-development flows and storage for the total detention system.

ARI (years)	Peak Flow (m3/s)		
	Pre-developed Condition	Post-developed Condition	
	Runoff (m3/sec)	Runoff (m3/sec)	Storage Required (m ³)
5 = 20% AEP	0.162	0.160	5.2
20 = 5% AEP	0.328	0.324	8.2
100 = 1% AEP	0.522	0.515	12.1

Table 4.2.3.1 - Site and Detention Hydrology

The modelling has shown that, with the provision of a total absorption tank volume of 374m³ contained in one modelled system, stormwater flows from the development will be attenuated to less than pre-development flows. Absorption tank storage will be fully active and will be provided by an underground tank. The proposed detention system meets the policy requirements of Bayside City Council.

4.3.2 WATER QUALITY

Muswellbrook Council DCP has been reviewed and has the following guidelines reference.

According to DCP 25.2.5 Pollutants

Objectives

a) To ensure that stormwater generated from development does not result in pollution of water courses or receiving waters

Controls

i) Stormwater management systems are to be designed to capture and remove all litter larger than 5mm in size.

ii) Pollution reduction devices. The objective of pollution reduction devices e.g. Gross Pollutant Traps, is to remove contaminants such as oil, sediment and other pollutants before stormwater discharges into the receiving system beyond the site of the development.

We have prepared a MUSIC software model to meet the requirements of the Muswellbrook Council DCP and the above Crown Land document. In MUSIC we have used the baseline targets of the below to comply with the above.

POLLUTANT	MINIMUM % REDUCTION	ACHIEVED REDUCTION %
Total Suspended Solids (kg/yr)	80	83.2
Total Phosphorus (kg/yr)	60	60.8
Total Nitrogen (kg/yr)	40	45.8
Gross pollutants (kg/yr)	80	94