

# 19-23 Horswood Road, Narre Warren North

## STORMWATER MANAGEMENT STRATEGY REPORT (FINAL)

29<sup>th</sup> May, 2023

PARED Victoria Limited (TA Lysterfield Lake College)

### **ADVERTISED PLAN**

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### DOCUMENT ISSUE

ISSUE VERSION	DATE	DESCRIPTION	PROJECT CONSULTANTS	DIRECTOR APPROVAL
1	1 <sup>st</sup> November, 2019	DRAFT ISSUE	BK	
2	6 <sup>th</sup> November, 2019	FINAL ISSUE	BK	NP
3	6 <sup>th</sup> December, 2019	FINAL ISSUE UPDATED	BK	NP
4	29 <sup>th</sup> May, 2023	FINAL ISSUE UPDATED	BK	NP

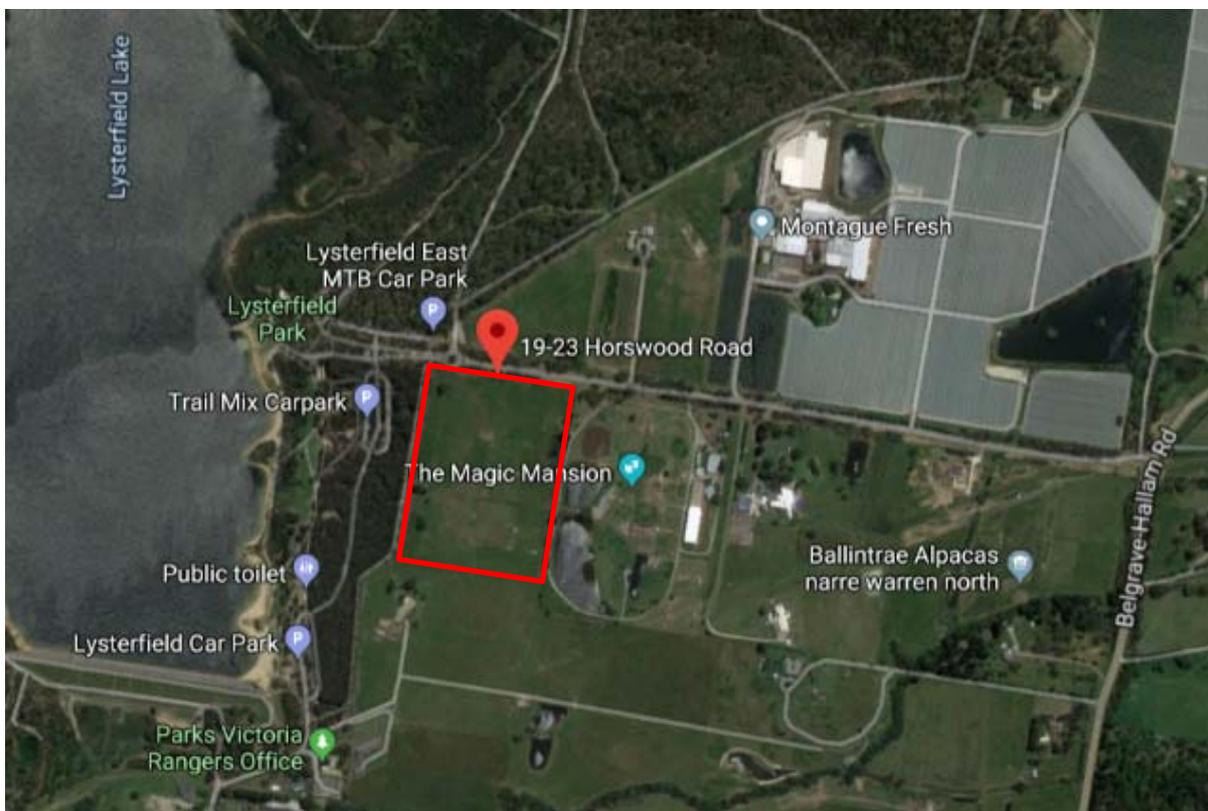
## 1.0 EXECUTIVE SUMMARY

Paroissien Grant and Associates Pty Ltd has been commissioned by PARED Victoria Limited to prepare a Stormwater Management Strategy Report to support a planning application for the proposed Lysterfield Lake College which is planned to be located on the site at 19-23 Horswood Road, Narre Warren North.

The strategies outlined in this report provide an appropriate response to the various requirements for the City of Casey to allow for the increase in stormwater runoff generated by the proposed development of the site back to pre-developed levels.

## 2.0 INTRODUCTION

The property is located at 19-23 Horswood Road, Narre Warren North, Victoria, and is proposed to be developed as a college. The site location is shown in Figure 1.



(Source: Google Maps-Online 31/10/19 NTS:

<https://www.google.com.au/maps/place/19-23+Horswood+Rd,+Narre+Warren+North+VIC+3804/@-37.9668066,145.3064901,2099m/data=!3m1!1e3!4m5!3m4!1s0x6ad6178d6ac45805:0x4b0255b86dfb592f!8m2!3d-37.966562!4d145.304616>)

**Figure 1: Site Locality Plan: 19-23 Horswood Road, Narre Warren North**

### 2.1 Site Locality and Description

The site is bounded to the north by Horswood Road, to the east by an adjacent landholding (The Magic Mansion), to the south by an adjacent land holding and to the west by Lysterfield Lake Park, which includes an equestrian trail west of the site boundary, vegetated parkland and Lysterfield Lake located further to the west. Access to the site from Horswood Road consists of rural farm gate entry points at several locations along Horswood Road.

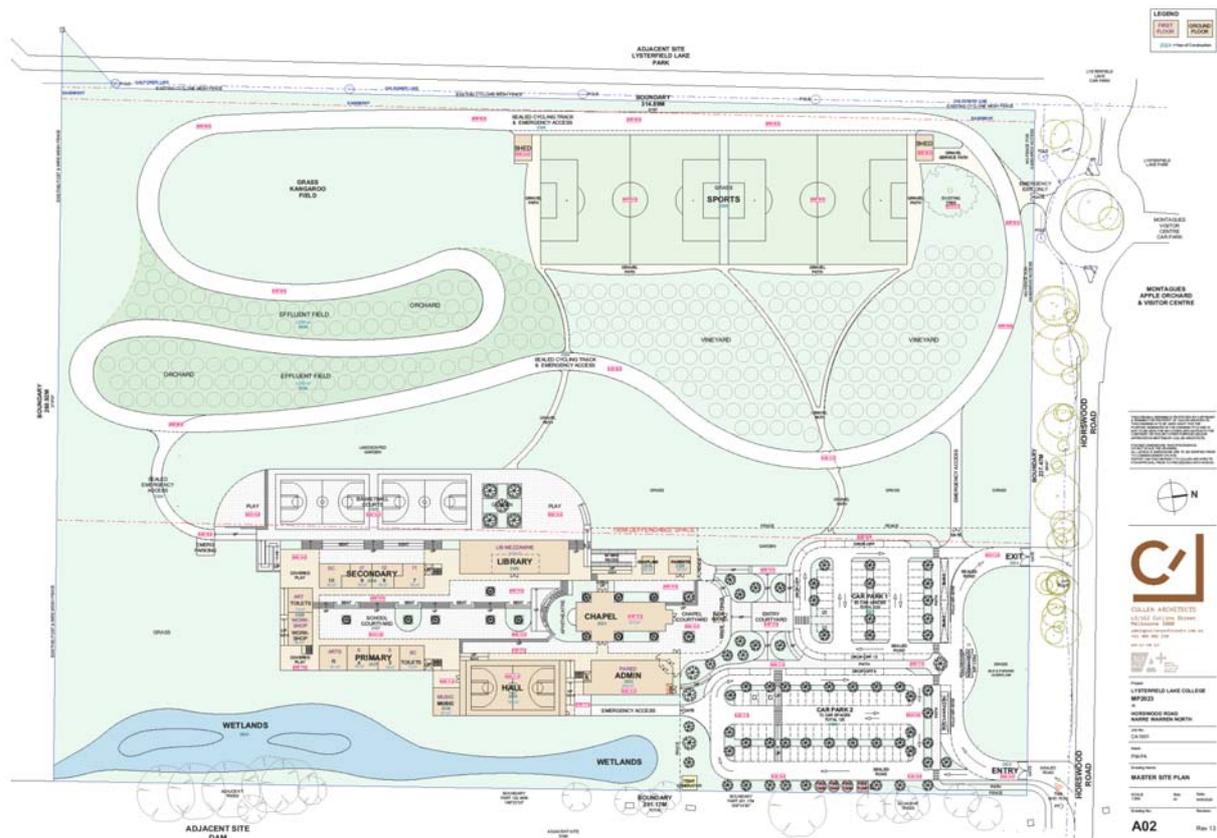
The site topography generally falls from west to east, with the low point in the south-east corner of the site at approximately 66.0m AHD. Some water ponds are evident with pooling of water occurring in part along the eastern boundary of the site, and further east into the adjacent property.

A copy of the Level and Feature Survey Plan of the site is provided in Appendix A.

The site is currently vacant land, with mainly grass cover and patches of trees and dispersed vegetation, and appears to have recently been used for rural uses.

## 2.2 Proposed Site Development Plan-Lysterfield Lake College

The proposed development plan for the site is shown below in Figure 2. A copy of the plan is also provided in Appendix B.



(Source: Cullen Architects, Master Site Plan, Dwg No. A02 Rev 13 CA1901 PM-PA Master Site Plan dated 9/05/2023)

**Figure 2: Proposed Development Plan for Lysterfield Lake College**

## 3.0 EXISTING STORMWATER DRAINAGE

### 3.1 Catchment Characteristics

The site broadly falls from west to east, and then to its lowest point in the south-east corner. A portion of the site along the west boundary plateaus and falls to the north/north-west, then along the west boundary of the site. The drainage of the site is generally via a meandering depression along the eastern boundary, including a series of informal pools, prior to discharge generally through the south-east corner of the site.

There is an external drainage catchment north and north-east of the site (refer Figure 3) comprising an area of approximately 12.6ha. The external catchment is intercepted by drainage swales along the northern side of Horswood Road, which fall to a low point, and cross Horswood Road via a piped culvert approximately 375mm in diameter near the north-east corner of the site. Swales on the southern side of Horswood Road also contribute flow to this point. The stormwater run-off from this catchment enters the north-east corner of the site and drains to the south along the eastern boundary of the site.

A copy of the External Drainage Catchment Plan is provided in Appendix A.



**Figure 3: External Drainage Catchment Plan**

Photos taken on 31st October 2019, indicate the condition of the external catchment drainage in the vicinity of the site:



Photo 1 – External catchment flows received from the culvert beneath Horswood Road, north-east of the site.



Photo 2 - External catchment flows at north-east corner of the site adjacent Horswood Road.



Photo 3 - External catchment open drain north-east of the site, on north side of Horswood Road.

## 4.0 STORMWATER MANAGEMENT DESIGN RESPONSE

### 4.1 Design for Stormwater Conveyance

City of Casey requirements include an 'Onsite Stormwater Detention Policy (25/5/2018 Version 1.2: <https://www.casey.vic.gov.au/policies-strategies/onsite-stormwater-detention-policy>) which ensures that stormwater runoff generated by new developments does not adversely impact downstream properties for all storm events up to and including the 100 year ARI event. The scope of the policy applies where:

- A development increases the impervious area of a site.
- The existing drainage system is unable to accommodate an increase in stormwater discharge from the site.

The design of the OSD system must be to the satisfaction of Council. OSD Guidelines assist applicants to design an OSD system in accordance with Council's requirements.

In light of this, the following is proposed. As there is no formal outlet from the site, and the existing stormwater flows are to the south-east of the site, the development will be required to retard stormwater flows back to pre-developed levels.

#### 4.1.1 Minor/Major Stormwater Strategy and Stormwater Quality Treatment

For the minor stormwater strategy, it is proposed that the sporting fields, carpark and access road areas and all other outdoor paved areas be drained by way of a compliant underground stormwater pipe drainage system as shown in Appendix C. The discharge point for the underground stormwater pipe drainage system is to the proposed onsite retarding basin. Stormwater quality treatment for the stormwater flows from the 3-month recurrence interval will be directed to the proposed wetland/sediment pond. It will therefore be necessary to ensure these stormwater flows are diverted prior to discharge to the retarding basin. This will be by way of bypass drainage pits with internal weir

walls that will be determined during the detailed design phase of the underground stormwater pipe drainage system. The wetland will be designed with a spillway such that after treatment, stormwater flows can discharge into the proposed retarding basin.

For the major stormwater strategy, the carpark and access road areas and all other outdoor paved areas are to be drained by way of appropriate design shaping and grading of these areas towards open swales. The open swales will adjoin the north and west side of the proposed wetland/sediment pond and retarding basin and be graded to the proposed retarding basin. The proposed wetland will then release stormwater runoff onsite to the current south-east point of discharge to a rate that does not exceed the rate of pre-developed stormwater runoff. This will be by way of a restricted pipe outlet to ground level at the south-east corner of the site with a shaped open outlet that disperses such runoff rather than concentrating it and also ensures there is no erosion.

In accordance with the Land Capability Assessment Report prepared by Civiltest Pty Ltd, it will be necessary to provide a 60m buffer between any effluent disposal and the proposed swales, wetland/sediment pond and retarding basin. This buffer distance can be reduced by 50%, where secondary treatment of the effluent is adopted, based on the quality of wastewater.

The existing external catchment non-developed stormwater flows will also need to be catered for. It is proposed to design for the flows through sub-surface drainage and/or overland flows through Car Park 2 with discharge to the wetland/sediment pond and retarding basin south of Car Park 2

An agricultural (AG) drain must be installed on the high side of any wastewater irrigation envelope. The drain is to be installed a minimum of 100mm into the naturally occurring clay soils, and allow sufficient fall to intercept and drain all overland and subsurface runoff to the proposed minor and major stormwater systems.

#### 4.1.2 Closed Roof Rainfall and Storage Strategy

It is proposed for the development that all rainfall collected on roofs be stored on site, treated and re-used for both irrigation and firefighting purposes. Storage tanks are proposed immediately south of Car Park 2 adjacent to the proposed site entry, refer Figure 4 below

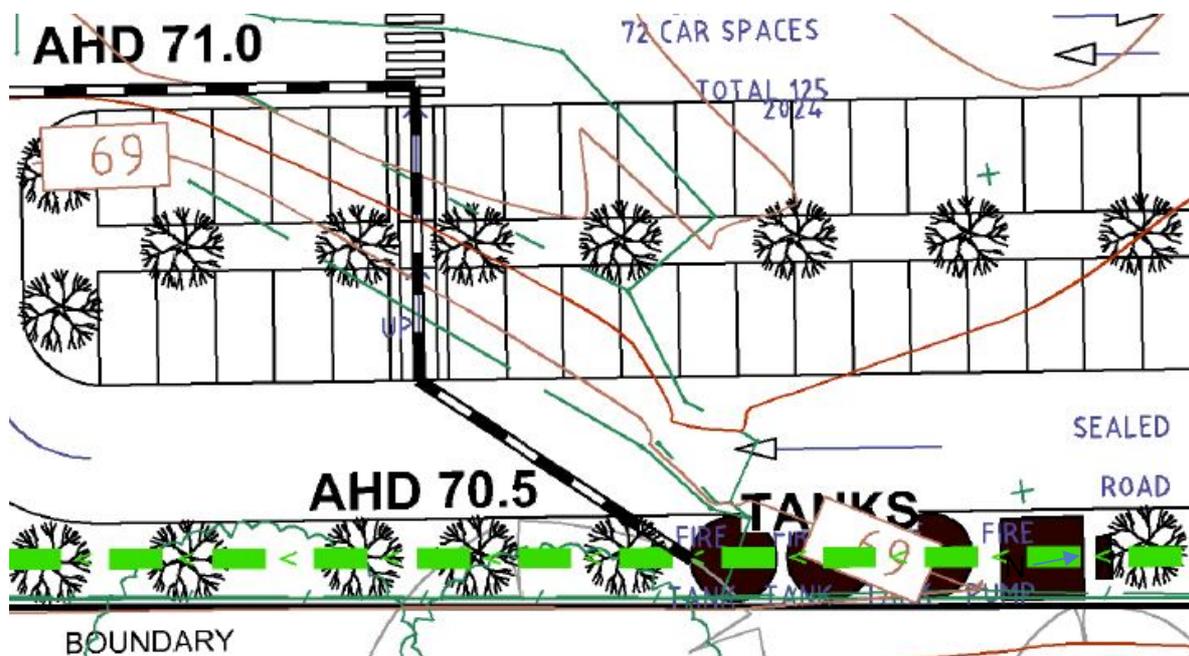


Figure 4: Rainwater Tank Location

Appendix D shows an indicative pipe network connecting each of the buildings to the tanks. This system will be a closed system, meaning that it is separate from the ground runoff drainage network to maintain the water quality of the roof runoff. Any overflow from the collection tanks will be connected to the minor drainage pipe network (refer Section 4.1.1 & Appendix C) and discharged to the wetland/retarding basin.

## 5.0 CONCLUSION

The stormwater management of the site for the proposed use as Lysterfield Lake College will require that:

- The existing external catchment non-developed stormwater flows will need to be catered for. It is proposed to design the site entry road and the circulating road on the east side of Car Park 2 as an overland flow path to direct flows to the proposed wetland/sediment pond and retarding basin.
- As there is no formal outlet from the site, and the existing stormwater flows are to the south-east, the development will be required to retard stormwater flows back to pre-developed levels.
- A minor stormwater network is proposed for the sporting fields, carpark and access road areas and all other outdoor paved areas such that they be drained by way of a compliant underground stormwater pipe drainage system. The discharge point for the underground stormwater pipe drainage system is to the proposed onsite wetland and retarding basin.
- A major stormwater network is proposed for the carpark and access road areas and all other outdoor paved areas such that they be drained by way of appropriate design levels and grading towards overland flow paths and open swales. The open swales will adjoin the north and west side of the proposed wetland/sediment pond and retarding basin and be graded to the proposed retarding basin. The wetland will then release stormwater runoff onsite to the current south-east point of discharge at a rate that does not exceed the rate of pre-developed stormwater runoff. This will be by way of a restricted pipe outlet to ground level at the south-east corner of the site with a shaped open outlet that disperses runoff rather than concentrating it and reduces the risk of erosion.
- A closed roof rainfall and storage strategy is proposed for the development, whereby all rainfall collected on roofs around the site is to be stored on site, treated and re-used for both irrigation and firefighting purposes. Storage tanks are proposed to be located immediately south of Car Park 2 adjacent to the site entry. Overflow from these collection tanks will be connected to the minor drainage pipe network and discharged to the wetland/retarding basin.
- Water Sensitive Urban Design modelling will be carried out as part of detailed design modelling of the proposed development, to confirm ultimate retarding and wetland basin sizing and configuration for treatment of stormwater prior to discharge from the site.

It is therefore considered that the strategies outlined in this report provide an appropriate response to managing the onsite and external stormwater flows, and the increase in stormwater runoff generated by the proposed development back to pre-developed levels.

For and on behalf of  
Paroissien Grant & Associates Pty Ltd



BOBBY KORONEOS, BE(Civil),  
GENERAL MANAGER - ENGINEERING

## Appendix A – Existing Conditions Plans

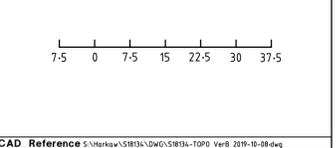


**LEGEND**

- PP POWER POLE
- ▲ PSM SURVEY POINT
- ▲ SIGN
- PEG
- Tree Trunk to scale, Spread indicative
- //// BUILDING
- TOP OF BANK
- - - - BOTTOM OF BANK
- FENCE
- NOMINAL TITLE BOUNDARY
- NOMINAL EASEMENT (ELECTRICITY SUPPLY)
- 88.92 - GROUND HEIGHT OF TREE
- H-20 - APPROX HEIGHT 20M

- NOTES**
1. THIS PLAN WAS PREPARED FOR HARKAWAY HILLS COLLEGE FOR PLANNING PURPOSES, AND IS NOT TO BE USED FOR ANY OTHER PURPOSE OR BY ANY OTHER PERSON OR CORPORATION. PAROISSIEN GRANT AND ASSOCIATES P/L ACCEPTS NO RESPONSIBILITY FOR ANY LOSS OR DAMAGE SUFFERED HOWSOEVER ARISING TO ANY PERSON OR CORPORATION WHO MAY USE OR RELY ON THIS PLAN IN CONTRAVENTION OF THIS OR ANY OTHER CLAUSE.
  2. LEVELS ARE IN TERMS OF A.H.D. BASED ON VICPOS (GPS).
  3. BEARINGS ARE TO M.G.A. ZONE 55 DATUM BASED ON VICPOS (GPS).
  4. SITE BOUNDARIES ARE PLOTTED IN ACCORDANCE WITH TITLE DIMENSIONS SEE PLAN OF SUBDIVISION LP130932 FOR DIMENSIONS AND EASEMENT DETAILS.
  5. THE LOCATION OF VISIBLE SURFACE PITS ETC. HAVE BEEN DETERMINED BY SURVEY. THE LOCATION OF ANY UNDERGROUND SERVICES HAVE NOT BEEN DETERMINED AND PRIOR TO ANY EXCAVATION, OR CONSTRUCTION ON OR NEAR THE SITE, THE RELEVANT SERVICE AUTHORITY SHOULD BE CONTACTED TO ASCERTAIN THE POSSIBLE LOCATION OF SUCH SERVICES.
  6. TREE TRUNKS ARE PLOTTED TO SCALE, SPREADS ARE INDICATIVE ONLY.
  7. ALL FENCES ARE HIGH WOVEN WIRE UNLESS NOTED
  8. THIS PLAN SHOULD NOT BE SCALED.
  9. DATE OF ORIGINAL SURVEY 12.12.2018, TREE HEIGHT SURVEY 01.10.2019
  10. CONTOUR INTERVAL 0.5m.
  11. REFER TO FROZEN LAYERS IN CAD FOR DTM TRIANGLES & ADDITIONAL LEVELS.
  12. REFER TO CAD FOR ADDITIONAL ENTITY DEFINITIONS.
  13. THIS PLAN MUST NOT BE COPIED UNLESS THESE NOTES ARE INCLUDED.

Version	Amendment	Date	Appr'd	Version	Drawing Issue To	Number of Copies	
						Uncontr'd	
B	ADJOINING TREES - HEIGHTS ADDED	03.10.2019		B	CLIENTS AND CONSULTANTS	07.10.2019	DIG
A	INITIAL ISSUE	14.12.2018		A	CLIENTS AND CONSULTANTS	14.12.2018	DIG



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ISO 9001 Quality Management FS521077

Designed ---	Scale 1:750 (A1)
Survey RM	PGA Job No. s18134
Drawn RM	Date OCT 2019
Checked	Date
Approved	Date

**LEVEL & FEATURE SURVEY**

**19 HORSWOOD ROAD**  
**NARRE WARREN NORTH**

HARKAWAY HILLS COLLEGE

Drawing Number  
**8134-TOPO**  
Vers.  
B

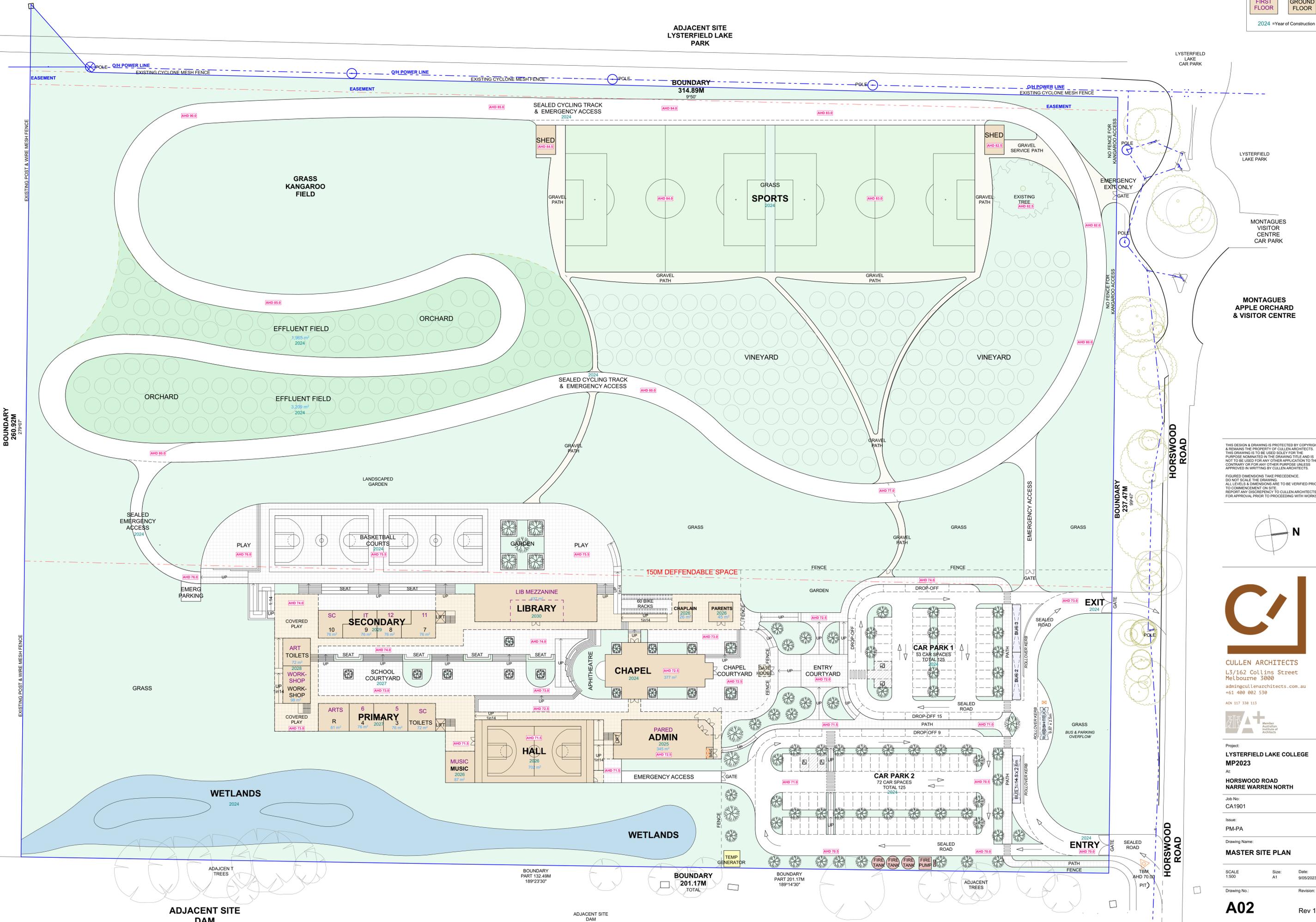
## Appendix B – Proposed Development Plan for Lysterfield Lake College

**LEGEND**

FIRST FLOOR

GROUND FLOOR

2024 =Year of Construction



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Project:  
**LYSTERFIELD LAKE COLLEGE  
 MP2023**  
 At:  
**HORSWOOD ROAD  
 NARRE WARREN NORTH**  
 Job No:  
 CA1901  
 Issue:  
 PM-PA  
 Drawing Name:  
**MASTER SITE PLAN**

SCALE  
 1:500

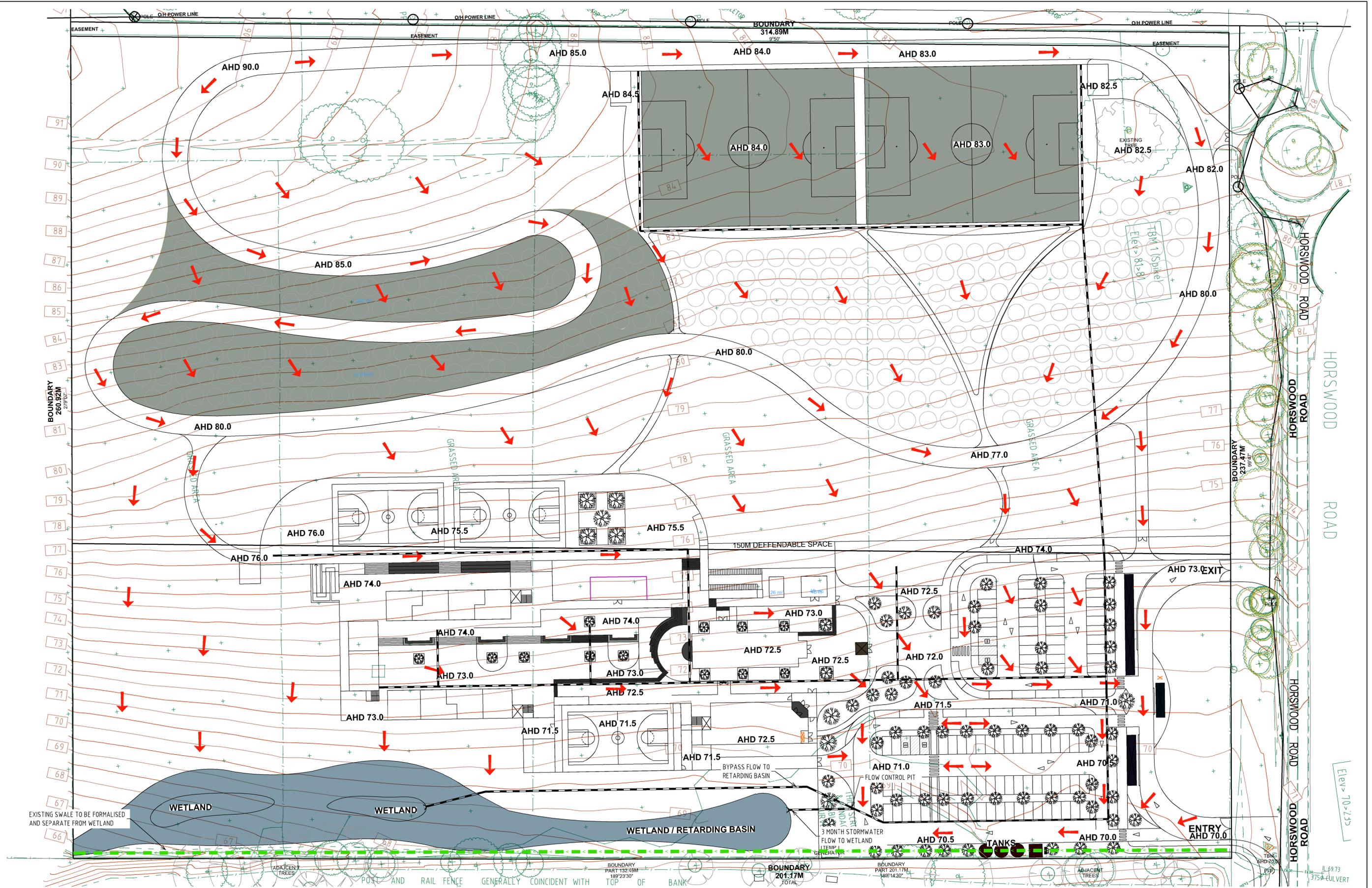
Size:  
 A1

Date:  
 9/05/2023

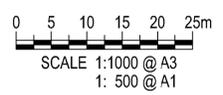
Drawing No.:  
**A02**

Revision:  
 Rev 13

## Appendix C – Minor and Major Overland Stormwater Strategy



REV	DESCRIPTION	DATE
1	PRELIMINARY ISSUE	06.11.2019
2	PRELIMINARY ISSUE	05.12.2019
3	PRELIMINARY ISSUE	22.05.2023



MINOR AND MAJOR OVERLAND  
STORMWATER STRATEGY  
1:500



PROPOSED LYSTERFIELD LAKE COLLEGE  
19-23 HORSWOOD RD  
NARRE WARREN NORTH  
STORMWATER MANAGEMENT STRATEGY

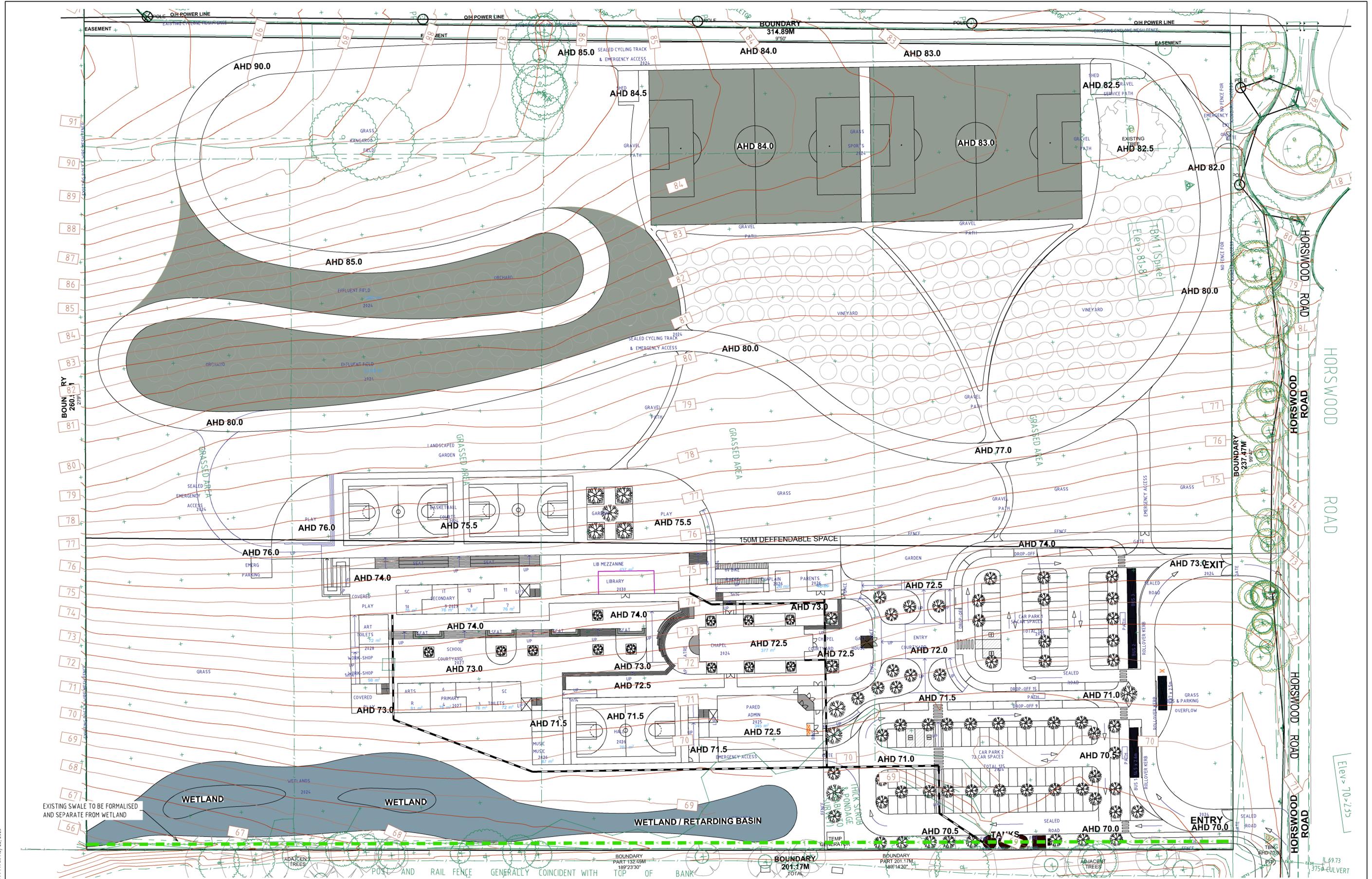
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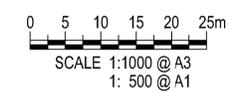
PLOT INFO: JARRID WILSON @ 4:19:55 PM on May 22, 2023

## Appendix D – Proposed Closed Roof Rainfall and Storage Strategy



REV	DESCRIPTION	DATE
1	PRELIMINARY ISSUE	06.11.2019
2	PRELIMINARY ISSUE	05.12.2019
3	PRELIMINARY ISSUE	22.05.2023

DRAWING No. 19102 - SK03 Rev. 3



PROPOSED CLOSED ROOF RAINFALL AND STORAGE STRATEGY

1:500



PROPOSED LYSTERFIELD LAKE COLLEGE  
19-23 HORSWOOD RD  
NARRE WARREN NORTH  
STORMWATER MANAGEMENT STRATEGY

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