Gestalt Engineers

Stormwater Management Plan

Project:	Proposed Learning & Science Centre, Trinity College
Address:	119 Hart Street, Colac
Authority:	Colac Otway Shire Council
Planning PA:	PA2604220
Reference:	24490
Prepared By:	Kyle Bennett (PE 0000221 Civil/Structural)
Revision:	01
Date:	20.03.2026

hello@gestaltengineers.com.au
1/22 Skipton Street, Ballarat Central
1/5 Villamanta Place, Geelong

Table of Contents

1. Site and Catchment Description

1.1 Existing Conditions

The existing site area is currently occupied by established trees and flat grassed surface areas falling towards the school entrance on Hart Street. The existing site is relatively flat with approximately 250mm of diagonal fall from the South West corner to the North East corner of the site. Refer appendices.

1.2 Legal Point of Discharge (LPOD)

The legal point of discharge nominated by the Colac Otway Shire is the existing stormwater drainage system (concrete side entry pit) located Hart Street to the East (front) of the site. Refer appendices for detail.

2. Design Standards and References

This SWMP has been prepared in accordance with:

- Infrastructure Design Manual (IDM)
- Colac Otway Shire Engineering Standards
- Melbourne Water WSUD Guidelines (2018)
- Urban Stormwater: Best Practice Environmental Management Guidelines (BPEMG)
- Amendment VC154 – Stormwater Management

3. Stormwater Management Objectives

3.1 Water Quality Targets (WSUD)

Compliance with BPEMG minimum standards:

- 80% reduction in Total Suspended Solids (TSS)
- 45% reduction in Total Phosphorus (TP)
- 45% reduction in Total Nitrogen (TN)
- 70% reduction in Gross Pollutants

3.2 On-Site Detention (OSD)

- Post-development peak flow ≤ pre-development peak flow
- As per the IDM:
    - Commercial development
    - Original design parameters, C = 0.9 for a 1EY event
    - Post design parameters, C = 0.9 for a 5% AEP

4. Hydrological Assessment

4.1 Design Rainfall Data (Colac IFD)

	Annual Exceedance Probability (AEP)						
Duration	**63.2%**	**50%#**	**20%***	**10%**	**5%**	**2%**	**1%**
1 min	70.9	79.8	109	131	153	185	210
2 min	59.6	66.5	89.3	106	123	143	158
3 min	53.4	59.7	80.6	95.7	111	130	145
4 min	48.8	54.7	74.2	88.3	103	122	137
5 min	45.0	50.6	68.9	82.2	95.9	114	129
10 min	33.2	37.4	51.4	61.6	72.3	87.8	101
15 min	26.8	30.1	41.5	49.8	58.4	71.2	81.7
20 min	22.7	25.5	35.1	42.1	49.4	60.0	68.8
25 min	19.9	22.3	30.6	36.6	43.0	52.1	59.6
30 min	17.7	19.9	27.2	32.6	38.2	46.2	52.7
45 min	13.8	15.4	20.9	24.9	29.1	34.9	39.6
1 hour	11.5	12.8	17.3	20.5	23.9	28.5	32.2

4.2 Catchment Areas

Catchment	Pre-Development (m²)	Post-Development (m²)	C
Roof	423	2310	0.90
Paving (concrete)	0	260	0.90
Paving (gravel)	0	0	0.70
Landscaping	2877	730	0.17
C average	0.264	0..739	

4.3 Permissible Site Discharge (PSD)

Permissible Site Discharge (PSD) (ARI of 5 years)

PSD Intensity (I) =	39.5	mm/hr	For catchment tc = 15 mins.
Pre-development (Qp = Cp*I*As/0.36) =	9.55	L/s	
Peak post development (Qa = 2*Cw*I*As/0.36) =	53.49	L/s	=(1.355 x I)
Storage method =	U	(A)bove,(P)ipe,(U)nderground,(C)ustom	
Permissible site discharge (Qu = PSD) =	12.898	L/s	

5. On-Site Detention (OSD)

The proposed storage method for the site is an underground detention tank. The tank is to be positioned at the end of stormwater network and will outfall via a pipe to the LPOD.

Design Storage Capacity (ARI of 20 years)

Above ground (Vs) = $[0.5*Qa*td-[(0.875*PSD*td)(1-0.917*PSD/Qa)+(0.427*td*PSD^2/Qa)]]*60/10^3$ m³

Below ground pipe (Vs) = $[(0.5*Qa-0.637*PSD+0.089*PSD^2/Qa)*td]*60/10^3$ m³

Below ground rect. tank (Vs) = $[(0.5*Qa-0.572*PSD+0.048*PSD^2/Qa)*td]*60/10^3$ m³

td (mins)	I (mm/hr)	Qa (L/s)	Above Vs (m³)	Pipe Vs (m³)	B/G Vs (m³)
5	102.3	138.7			18.60
14	62.1	84.1			29.21
19	52.1	70.6			31.98
24	45.3	61.3			33.73
29	40.2	54.5			34.82
33	37.0	50.1			35.35
38	33.7	45.7			35.69
43	31.1	42.1			35.75
47	29.3	39.6			35.65
52	27.3	37.0			35.36

Table 1 - Storage as function of time for ARI of 20 years

Type	td (mins)	I (mm/hr)	Qa (L/s)	Vs (m³)
Above Pipe B/ground	41.9	31.6	42.8	35.76

Table 2 - Storage requirements for ARI of 20 years

6. Water Sensitive Urban Design (WSUD)

The proposed treatments methods to improve the quality of the stormwater discharging from the site is a combination of below ground rainwater tank and raingarden to treat the roof catchment. A total catchment area of the roof at 1334m^2 is to be collected and distrubited across multiple raingardens which then feedback into the stormwater system to the OSD tank.

This has been used in the Blu Factor assessment.

Refer appendices for Blue Factor report demonstrating compliance with the treatment objectives outlined in section 3.1.

7. Overland Flow Path

As much of the site area is to consist of built form, the surrounding surfaces are graded to shallow swales to protect the building. The swales will contain stormwater pits and pipes to collect and convey the stormwater volume to the OSD tank.

Generally, the West side of the site is impervious and will grade to the North, towards the existing school carpark. The South to East side of the site will grade towards the North and North East.

Appendix A – Existing Conditions

hello@gestaltengineers.com.au
1/22 Skipton Street, Ballarat Central
1/5 Villamanta Place, Geelong

CROWN ALLOTMENT 129

LOT 1 ON PS 304089M

ADVERTISED PLAN

MGA2020 ZONE 55

LEGEND

Telstra Pit	Eave Level
Electricity Pit	Underside of Gutter
Sewer Inspection Shaft	Parapet Level
Bollard	Title boundary
Sign	Fence
Light Pole	Top of bank
Unclassified Pole	Toe of bank
Unclassified Utility	Retaining wall
Gate	Guardrail / Screen
Temporary Benchmark	
Tree	
Shrub	

GRATED PIT TOP R.L.133·78

TBM RIVET R.L.133·87

GRATED PIT TOP R.L.133·67

BITUMEN CARPARK

CONCRETE KERB & CHANNEL

GRATED PIT TOP R.L.133·52

TBM RIVET R.L.133·80

CONCRETE

GARDEN BED

BUS STOP

BUS STOP

CONCRETE

CONCRETE

GALVANIZED IRON BUILDING

GRATED PIT TOP R.L.133·51

GRASS

GRATED PIT TOP R.L.133·45

100°00'20"

GRASS

CONCRETE PATH

SIDE ENTRY PIT TOP: R.L.133·65

JUNCTION PIT TOP: R.L.133·73

JUNCTION PIT TOP: R.L.133·72

CONCRETE

AIR-CONDITIONING COMPRESSORS

BRICK TEXTILES CLASSROOM

GRASS

9°55'30" 90m

EDGE OF CONCRETE PATH

HART STREET

GRATED PIT TOP R.L.133·62

GRATED PIT TOP R.L.133·63

CONCRETE

GARDEN BED

DRAINAGE PIT TOP R.L.133·73

GRASS

GRATED PIT TOP R.L.133·52

CONCRETE

GRAVEL

GRATED PIT TOP R.L.133·82

GARDEN BED

CONCRETE

EDGE OF CONCRETE

SEE SHEET 2

STEPS

RAMP

PORTABLE CLASSROOM

UTUN

GRATED PIT TOP R.L.133·55

GRASS

SEE SHEET 2

TITLE PARTICULARS

TITLE REF: VOL.10050 FOL.625 (SUBJECT SITE). VOL.6226 FOL.048, VOL.677 FOL.374, VOL.8413 FOL.795 & VOL.10046 FOL.938 (REMAINDER OF SCHOOL SITE).

LAST PLAN REF: PS 304089M - LOT 1 (SUBJECT SITE). TP 401872R (LOTS 1, 2, 3 & 4), LP 58025 (LOT 14), TP 604677H, TP 66029R (REMAINDER OF SCHOOL SITE).

PARISH OF COLAC

TOWNSHIP OF COLAC

CROWN ALLOTMENTS 113, 114, 115, 116, 127, 128, 129 & 130

CERTIFICATION BY SURVEYOR

THIS SURVEY RE-ESTABLISHES THE SUBJECT CERTIFICATE OF TITLE IN ACCORDANCE WITH NEARBY REGISTERED SURVEYS AND ACCEPTED RE-ESTABLISHMENT PRINCIPLES. ANY QUERIES IN THIS REGARD SHOULD BE DIRECTED TO THE LICENSED SURVEYOR.

I, LACHLAN FINLAY MACRAE certify that this plan is in all respects accurate and correctly represents the occupation existing on 10/11/2025

Date: 17/11/2025 Licensed Surveyor Surveying Act 2004

WARNING :

REFER TO CERTIFICATES OF TITLE VOL.10050 FOL.625, VOL.6226 FOL.048, VOL.677 FOL.374, VOL.10046 FOL.938 AND INSTRUMENT AG888282H &FOR SECTION 173 AGREEMENT REGISTERED ON TITLES. THIS AGREEMENT HAS NOT BEEN INVESTIGATED AS PART OF THIS SURVEY.

WARNING :

THIS RE-ESTABLISHMENT SURVEY WILL NOT BE EXAMINED BY LAND REGISTRATION SERVICES (LRS), NO RESPONSIBILITY CAN THEREFORE BE ACCEPTED FOR ANY FUTURE DIFFERENCE IN BOUNDARY DEFINITION WHICH MAY RESULT FROM RE-SURVEYS OF ADJOINING LANDS OR SUBSEQUENT REGISTRATION BY LAND REGISTRATION SERVICES OF ANY NEW SURVEY PLANS.

NOTATIONS:

TREES HAVE BEEN SHOWN TRUE TO SCALE.

ONLY SIGNIFICANT TREES HAVE BEEN SHOWN.

LEVELS ARE TO AHD VIDE PREVIOUS SURVEY BY OTHERS.

THE CONTOUR INTERVAL IS 0.2m.

ONLY VISIBLE SERVICES HAVE BEEN LOCATED.

Macrae&Co LAND SURVEYORS
PO BOX 878, Ocean Grove,Vic, Australia 3226
M: 0409 165 769 E: lachlan@macraesndco.com.au
W: www.macraesndco.com.au

CLIENT: MORTON + CO

PROJECT: TRINITY COLLEGE, COLAC
RE-ESTABLISHMENT & FEATURE SURVEY

Job No: 25102
Version A
Date of Survey: 10/11/2025 Surveyor: LM/RdV
Date Drawn: 15/11/2025 Drawn: RdV
CAD Reference: 25102/CAD/25102 RFL.dwg

Sheet 1 of 3
Original Sheet Size: A1

0 1 2 3 4
Scale 1:100

AMENDMENTS

VER	BY	DESCRIPTION	DATE
A	LM	ORIGINAL PLAN	17/11/25

SEE SHEET 1

SEE SHEET 1

LEGEND

- Telstra Pit
- Electricity Pit
- SIO Sewer Inspection Shaft
- Bollard
- Sign
- Light Pole
- UPOL Unclassified Pole
- UTUN Unclassified Utility
- Gate
- Temporary Benchmark
- Tree
- Shrub
- Eave Level
- Underside of Gutter
- Parapet Level
- Title boundary
- Fence
- Top of bank
- Toe of bank
- Retaining wall
- Guardrail / Screen

MGA2020 ZONE 55

DRAINAGE PIT TOP R.L.133-73

GRATED PIT TOP R.L.133-52

GRATED PIT TOP R.L.133-82

GRATED PIT TOP R.L.133-55

GRATED PIT TOP R.L.133-71

GRATED PIT TOP R.L.133-58

GRATED PIT TOP R.L.133-72

CONCRETE

GRASS

GRAVEL

GARDEN BED

EDGE OF CONCRETE

PORTABLE CLASSROOM

RAMP

STEPS

CONCRETE RAMP

UTUN

SIO

UPOL

BUILDING - VARIOUS CONSTRUCTION

GRAVEL PATH

BUS STOP

EDGE OF CONCRETE PATH

HART STREET

9°55'30" 98m

SEE SHEET 3

SEE SHEET 3

ADVERTISED PLAN

Macrae&Co LAND SURVEYORS
PO BOX 878, Ocean Grove,Vic, Australia 3226
M: 0409 165 769 E: lachlan@macraeandco.com.au
W: www.macraeandco.com.au

CLIENT: MORTON + CO

PROJECT: TRINITY COLLEGE, COLAC
RE-ESTABLISHMENT & FEATURE SURVEY

Job No: 25102
Version A
Date of Survey: 10/11/2025 Surveyor: LM/RdV
Date Drawn: 15/11/2025 Drawn: RdV
CAD Reference: 25102/CAD/25102 RFL.dwg

Sheet 2 of 3
Original Sheet Size: A1

0 1 2 3 4
Scale 1:100

AMENDMENTS

VER	BY	DESCRIPTION	DATE
A	LM	ORIGINAL PLAN	17/11/25

SEE SHEET 2

SEE SHEET 2

BUILDING - VARIOUS CONSTRUCTION

CONCRETE

CONCRETE

GRAVEL

PORTABLE CLASSROOM

CONCRETE

STEPS

UPOL

GRATED PIT
TOP R.L.133·72

GRAVEL PATH

GRATED PIT
TOP R.L.133·97

GRATED PIT
TOP R.L.133·93

BITUMEN CARPARK

GRASS

GRASS

9°55'30" 90m

279°57'

EDGE OF CONCRETE PATH

EDGE OF CONCRETE PATH

EDGE OF CONCRETE PATH

POUND ROAD

HART STREET

TBM RIVET
R.L.134·09

3m

3m

LEGEND

- Telstra Pit
- Electricity Pit
- SIO Sewer Inspection Shaft
- Bollard
- Sign
- Light Pole
- UPOL Unclassified Pole
- UTUN Unclassified Utility
- Gate
- Temporary Benchmark
- Tree
- Shrub
- Eave Level
- Underside of Gutter
- Parapet Level
- Title boundary
- Fence
- Top of bank
- Toe of bank
- Retaining wall
- Guardrail / Screen

MGA2020 ZONE 55

ADVERTISED PLAN

Macrae&Co LAND SURVEYORS
PO BOX 878, Ocean Grove,Vic, Australia 3226
M: 0409 165 769 E: lachlan@macraeandco.com.au
W: www.macraeandco.com.au

CLIENT: MORTON + CO

PROJECT: TRINITY COLLEGE, COLAC
RE-ESTABLISHMENT & FEATURE SURVEY

Job No: 25102
Version A
Date of Survey: 10/11/2025 Surveyor: LM/RdV
Date Drawn: 15/11/2025 Drawn: RdV
CAD Reference: 25102/CAD/25102 RFL.dwg

Sheet 3 of 3
Original Sheet Size: A1
0 1 2 3 4
Scale 1:100

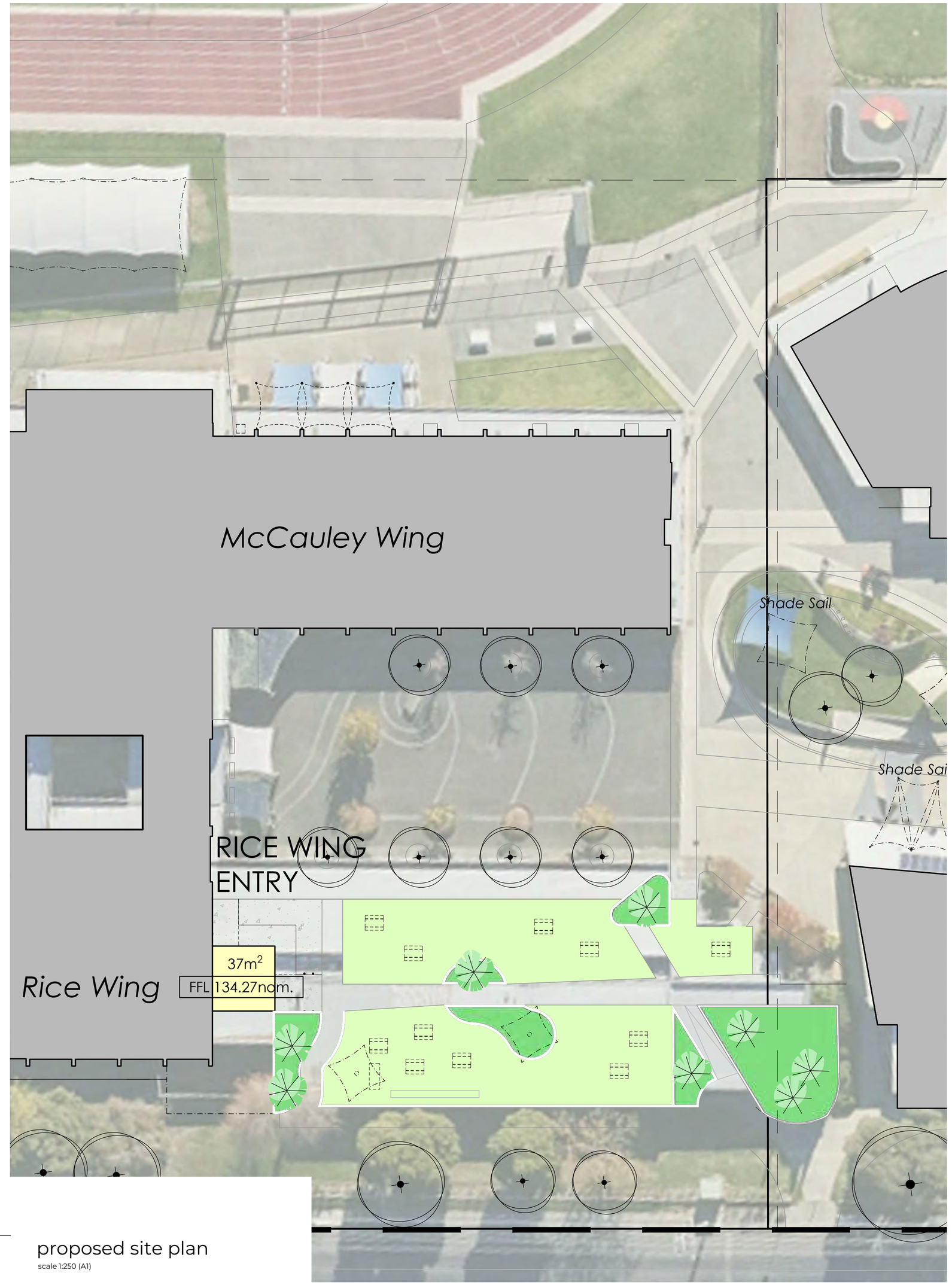
AMENDMENTS

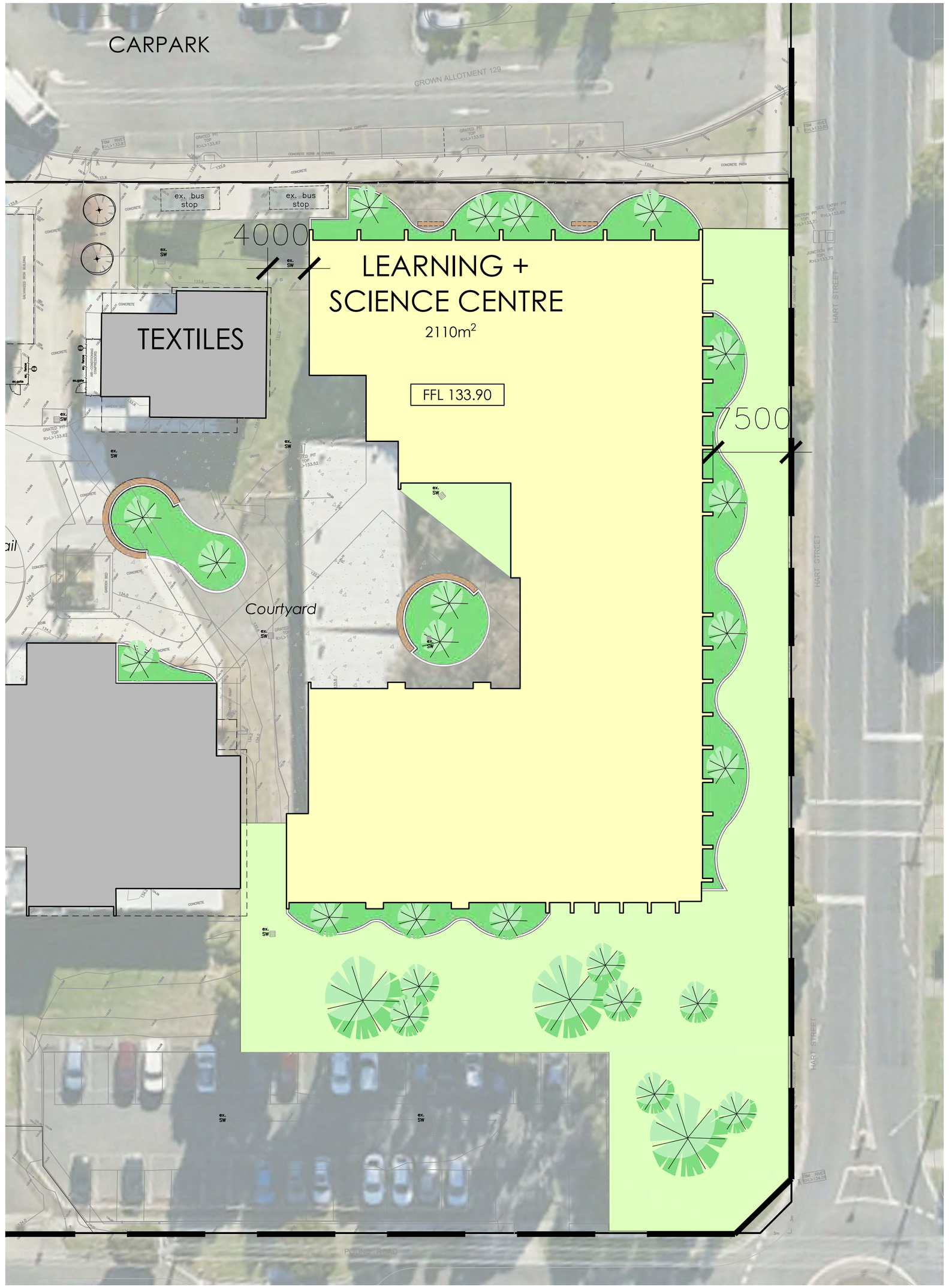
VER	BY	DESCRIPTION	DATE
A	LM	ORIGINAL PLAN	17/11/25

Appendix B – Proposed Conditions

hello@gestaltengineers.com.au
1/22 Skipton Street, Ballarat Central
1/5 Villamanta Place, Geelong

ADVERTISED PLAN





N

proposed site plan
scale 1:250 (A1)

LEGEND

- EXISTING PREVIOUS STAGED WORK
- EXISTING TREES
- EXISTING FENCE
- DEMOLITION WORKS
- TREES TO BE REMOVED
- NEWLY PLANTED TREES
- NEW WORKS

MORTON +CO

Ballarat
424 Sturt Street (PO Box 772) Ballarat VIC 3350
03 5331 5977

Geelong
2 Malop Street, Geelong VIC 3220
03 5221 7885

mortonco.com.au

Member Australian Institute of Architects

Rev:	Amendment:	Date:	Drawn:

Trinity College Colac
119 Hart Street, Colac

project
Learning + Science Centre

sheet title
Site Plan

project status
Design Development

PRELIMINARY

job no.	date		
24032	22 Dec 2025		
scale @ A1	drawn	checked	approved
1:250	NB,AS	LS	-
type	drawing no.		revision
DD	004		-

FILE NAME: Q:\Trinity College Colac - New Science + Learning Centre (24032)\1. Drawings\1. AutoCAD\1. Design\4. DD\251222_Issue For Consultants\251222_Trinity_DD_Issue For Consultants.rvt

Appendix C – Legal Point of Discharge

hello@gestaltengineers.com.au
1/22 Skipton Street, Ballarat Central
1/5 Villamanta Place, Geelong

LOCATION OF STORMWATER LEGAL POINT OF DISCHARGE

Colac Otway SHIRE

Ref# D25/197967

Property Information

Owner :

Parcel Details : *TP401872*

Property Address : *119 - 243 Hart Street, COLAC VIC 3250*

Property LOT no. : *4*

Applicant's Details

Name : *Ling Wang*

Postal Address : *1/22 SKIPTON STREET, BALLARAT CENTRAL VIC 3350*

Phone : *0430 159 329*

Email : ling@gestaltengineers.com.au

Other Information :

A WORKS WITHIN A ROAD RESERVE PERMIT is required for any connections within the road reserve (at an additional fee).

It is the Applicant's responsibility to:

(a) Liaise with other Authorities to ensure that damage does not occur to other services

(b) Adequately light and sign works and ensure safety of pedestrians and vehicular traffic at all times.

Drainage Location Warning:

Colac Otway Shire plans or details give only approximate locations of drainage networks and are a general guide only. Enquiries about plans and details should be made to the Infrastructure Department. Council reserves the right to recover compensation for loss or damage to its drainage network and other property.

Council, its employees or agents shall not be liable for any loss or damage caused or occasioned by the use of plant, as a result of details or information so supplied to the applicant and the applicant agrees to indemnify the Colac Otway Shire against any claim or demand for such loss or damage.

THE LEGAL POINT OF DISCHARGE FOR THE ABOVE PROPERTY IS:

N

All stormwater runoff, including overflow from water storage must be taken to and discharged to the existing stormwater pit as shown. The property connection is to be in accordance with the IDM 510.

Notes:

1. Prior to commencement of work, Stormwater Managment Plan (SWMP) must be submitted and approved by Council. SWMP must address detention and stormwater treatment in accordance with council stormwater policy/IDM standard.

2. Inspection of rainwater tank will be required.

3. Written approval from the Responsible Authority is required prior to change of LPOD location.

Council Officer: Suk Gurung

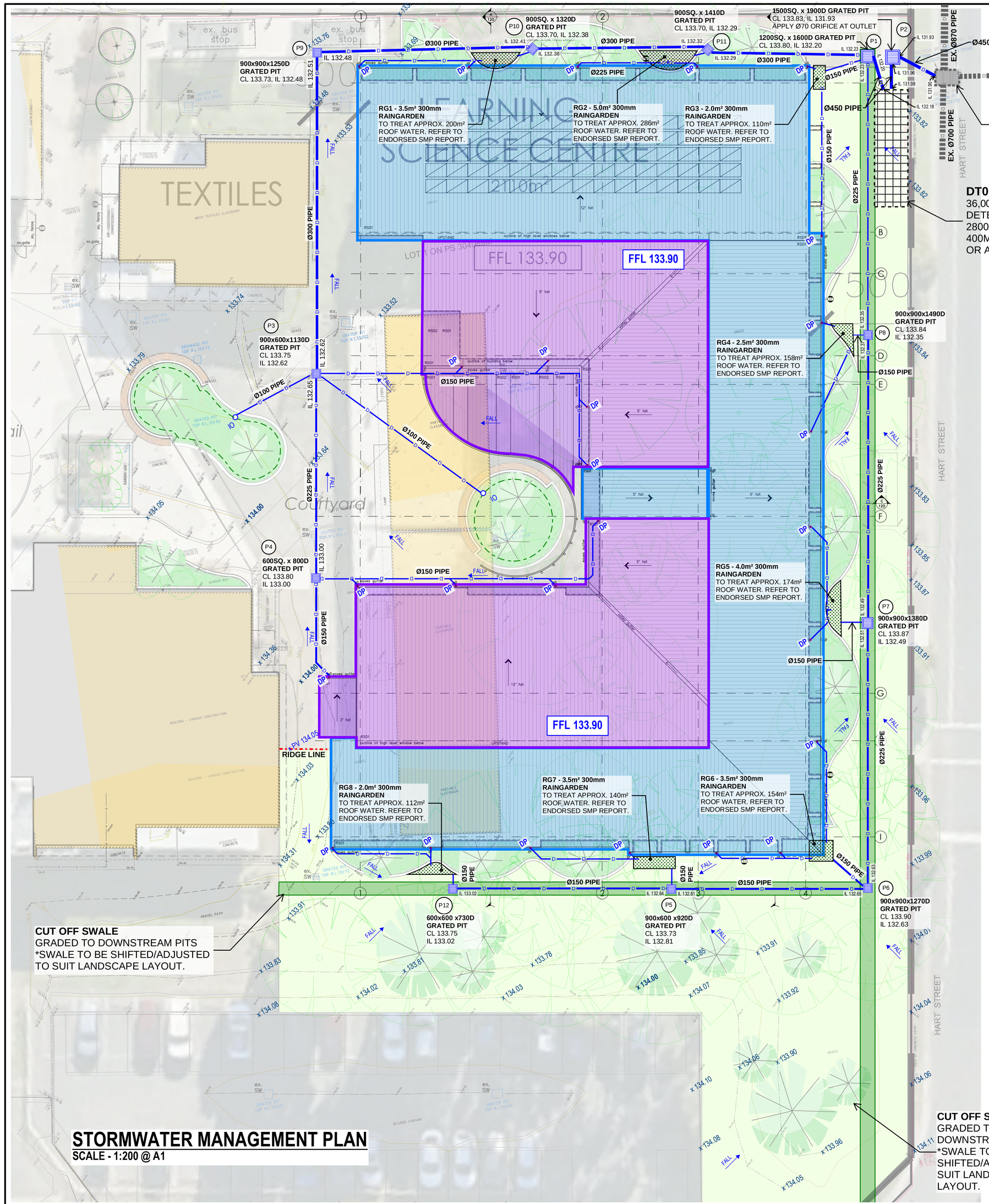
Date: 01/10/25

DECLARATION:

The Colac Otway Shire Council collects personal information to levy rates, issue permits and licences and provide a variety of community services. The information collected in this form is used only for the purposes contemplated by the form (primary purpose) and is not passed onto third parties. In some instances however, disclosure is required by law or is necessary for the protection of persons or property. Where this occurs, Council will take every reasonable step to ensure your privacy is protected in accordance with the Information Privacy Act 2000 (Vic). Should you need to change or access your personal details or require further information about Council's Privacy Policy contact our Privacy Officer on 5232 9400.

Appendix D – Civil Drawings

hello@gestaltengineers.com.au
1/22 Skipton Street, Ballarat Central
1/5 Villamanta Place, Geelong



STORMWATER MANAGMENT LEGEND

- 300mm RAINGARDEN
- 1334m² ROOF CATCHMENT AREA TREATED BY 26m² RAINGARDENS, REFER SMP REPORT PREPARED BY HEXICON.
- 914m² ROOF CATCHMENT AREA UNTREATED, REFER SMP REPORT PREPARED BY HEXICON.

STORMWATER DRAINAGE LEGEND

- FFL 00.00 — FINISH FLOOR LEVEL
- x PV 00.00 — FINISH SURFACE LEVEL
- x 00.00 — EXISTING GROUND LEVEL
- DP — DOWNPIPE
- DENOTES NEW PIT
- FALL — FALL — DENOTES FALL
- NEW STORMWATER PIPE
- Ex STORMWATER PIPE

ADVERTISED PLAN

STORMWATER MANAGEMENT PLAN

SCALE - 1:200 @ A1

ISSUE	ISSUED FOR	DATE	DRAWN	APPR
04	SCHEMATIC	20.03.26		
03	SCHEMATIC	17.02.26		
02	SCHEMATIC	03.02.26		
01	WIP	28.11.25		

DESIGNED: LW | DATE: -
DRAWN: - | SCALE: AS NOTED
SURVEY: | SHEET SIZE: A1 - (FULL SCALE)
CHECKED: KB | APPROVED:
DATE: | DATE:

Gestalt Engineers

CLIENT: MORTON +CO
Ballarat
424 Sturt Street (PO Box 772) Ballarat VIC 3350
03 5339 5977
Geelong
2 Malop Street, Geelong VIC 3220
03 5227 7885
mortonco.com.au

PROJECT:
TRINITY COLLEGE COLAC
119 HART STREET, COLAC

LEARNING + SCIENCE CENTRE

CIVIL SCHEMATIC DESIGN

NORTH

DRAWING TITLE:
STORMWATER MANAGEMENT PLAN

PROJECT No.: 24490 | SHEET: SWMP01 | ISSUE: 04

Appendix E – Blue Factor Report

hello@gestaltengineers.com.au
1/22 Skipton Street, Ballarat Central
1/5 Villamanta Place, Geelong

BLUE FACTOR®

Trinity College Colac, 119 Hart Street, Colac VIC 3250

106% SCORE

The proposed stormwater treatments provide 'deemed to comply' compliance with the minimum planning requirement for total nitrogen but does not comply with all the relevant objectives for management of stormwater flows on-site.

Project details

Name	Trinity College Colac, 119 Hart Street, Colac VIC 3250
Street address	119 Hart St, Colac VIC 3250, Australia
Municipality	Colac Otway
Site area	3863 m^2
Planning Number	

Flow and pollutant load reductions

Item	Result	Target
Mean annual runoff volume harvested or evapotranspired (%)	1%	>28%
Mean annual runoff volume infiltrated or filtered (%)	9%	>9%
Total suspended solids (%)	57%	>80%
Total phosphorus (%)	36%	>45%
Total nitrogen (%)	48%	>45%
Total gross pollutants (%)	58%	>70%

Water treatment

Catchments

Roof Catchment Area to Raingardens 1334m2

Roof Catchment Area Untreated 914m2

Permeable Area - Landscape Pervious (garden and lawn), 1589m2

Raingardens Pervious (garden and lawn), 26m2

Treatments

Raingardens Area: 26 m^2, Extended detention depth: 0.3 m, Submerged zone depth: 0.3 m, Site soil type: Sandy clay

Configuration 1

Roof Catchment Area to Raingardens 1334m2

Raingardens Area: 26 m^2,
Extended detention depth: 0.3 m,
Submerged zone depth: 0.3 m, Site soil type: Sandy clay,

Appendix F – Orifice Calculation

hello@gestaltengineers.com.au
1/22 Skipton Street, Ballarat Central
1/5 Villamanta Place, Geelong

ORIFICE OUTLET CONTROL

PSD 13 L/s
0.013 m^3/s

H = maximum depth of stored water above orifice centreline 1.70 m

Ao = area of orifice 0.003 m^2
(Note: minimum diameter 90mm)

Diameter of pipe required 0.066 m
66 mm

Gestalt Engineers

Project Number	24490
By	GE
Date	20/03/2026
Project Name	Trinity College Colac