

# ADVERTISED PLAN

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**Y2 Architecture**

Stormwater Management Strategy

Our Lady Help of Christians – 28 Selby Rd, Warrnambool VIC 3280

June 2024



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This report has been prepared by the office of RMG.

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RMG Job Number: 230388

Ver No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
1.0	A. Del Rosario	E. Ringor		J. Bish		

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## 1. INTRODUCTION

### 1.1 SCOPE

RMG has been engaged by Y2 Architecture Pty Ltd to prepare a Stormwater Management Strategy to support the planning application for the development of Our Lady Help of Christians Primary School in Warrnambool. The strategy will demonstrate that the appropriate drainage requirements are met for the proposed development, which includes:

- Conveyance of minor (piped) and major (overland) flows through the site,
- Flood Analysis
- Stormwater Treatment

This drainage strategy has been prepared in consideration of planning scheme clauses 53.18 Stormwater Management in Urban Development, 14.02-1S Catchment Planning and Management, and 19.03-3S Integrated Water Management.

### 1.2 LOCATION

The site is approximately 3.2 hectares in size and is located at 28 Selby Rd, Traralgon VIC 3844. The proposed developments are shown outlined in yellow and red below and are approximately 0.017 and 0.24 hectares respectively (Figure 1).



Figure 1 – Site Location

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## 1.3 BACKGROUND INVESTIGATION

### 1.3.1 SITE FEATURES

The existing survey has been taken in the location of the proposed development and its immediate surroundings; it does not include the road south of the building. The survey shows that there is an existing netball court, playground area and seating along with footpaths and carparks located within the proposed development area which are to be demolished and removed prior to construction of works.

The proposed development area contains a fall from south to north. The highest elevation according to the feature survey provided by Smith Land Surveyors Pty Ltd, dated April 26, 2024, is near the existing water tank on the western boundary which is at RL 31.25 which appears to be an isolated high point. The lowest elevation is located at the north-western corner with an RL of 24.6.

Road access is located to the east of the site via Selby Rd and the south also via Selby Rd.

Refer to appendix A for the site survey information.

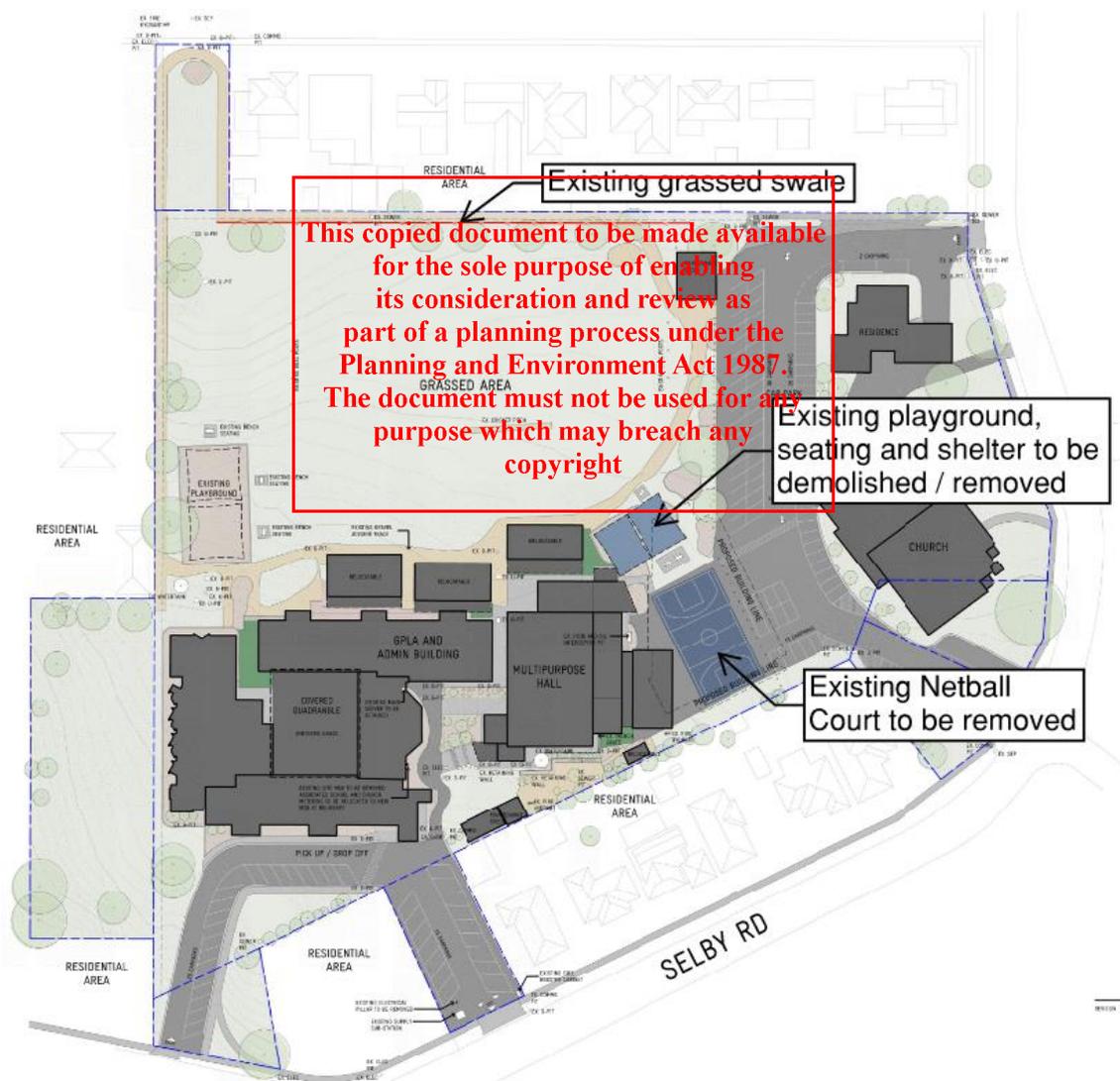


Figure 2 - Site Features

### 1.3.2 FLOOD DATA

An online flood map (VICPLAN) was used to determine if any flood overlays were present in or around the proposed site. The results show that the proposed development site is not within a flood overlay based on a 1% annual exceedance probability and the land is not subject to inundation. The local catchment management authority also contains data which confirms the information obtained from VICPLAN.

### 1.3.3 CULTURAL HERITAGE

The proposed development area sits within the Our Lady Help of Christians Primary School site and lies within an area of Aboriginal Cultural Heritage Sensitivity as seen in figure 3 below.

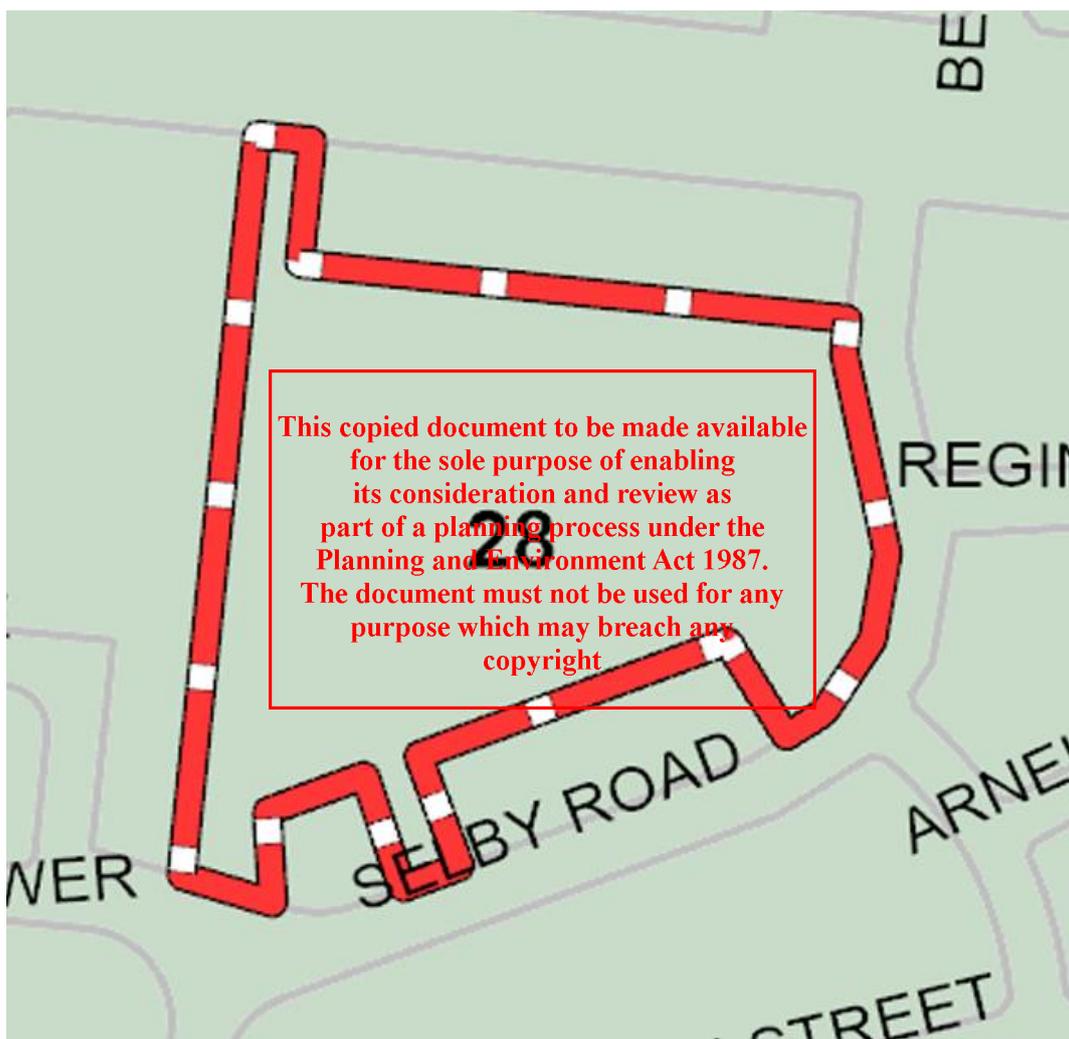


Figure 3 – Environmental Overlays and Zoning

### 1.3.4 ENVIRONMENTAL OVERLAYS

An analysis was undertaken for the site regarding any environmental overlays, and none were discovered within the proposed development area.

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## 2. PROPOSED DEVELOPMENT

The proposed development consists of a new building to be constructed between the existing classrooms and existing road/carparks, replacing the existing netball court, part of the multipurpose hall and some carparks. Additionally, a new netball court will be constructed over a portion of the existing grassed area in the Northwest corner of the school. Refer to Figure 4/Appendix B for the proposed development layout.

The stormwater drainage from the proposed netball court will be detained within a pit and pipe system containing a slow-release orifice which discharges to an existing grassed swale along the northern boundary of the site which will receive minor grading works. The proposed building will use a pit and pipe network that discharges to the existing grassed swale. The existing swale dissipates as it approaches the western boundary and, as such, the swale will be redirected north where a proposed bioretention swale will collect water and discharge to the council owned pit and pipe network in the road reserve.

The bioretention swale, swale drain, and onsite detention storage will treat the proposed development's stormwater runoff to meet best practice requirements, as noted in section 6, prior to discharging into the council network.

Refer to Figure 4 below and appendix B for the proposed development layout.

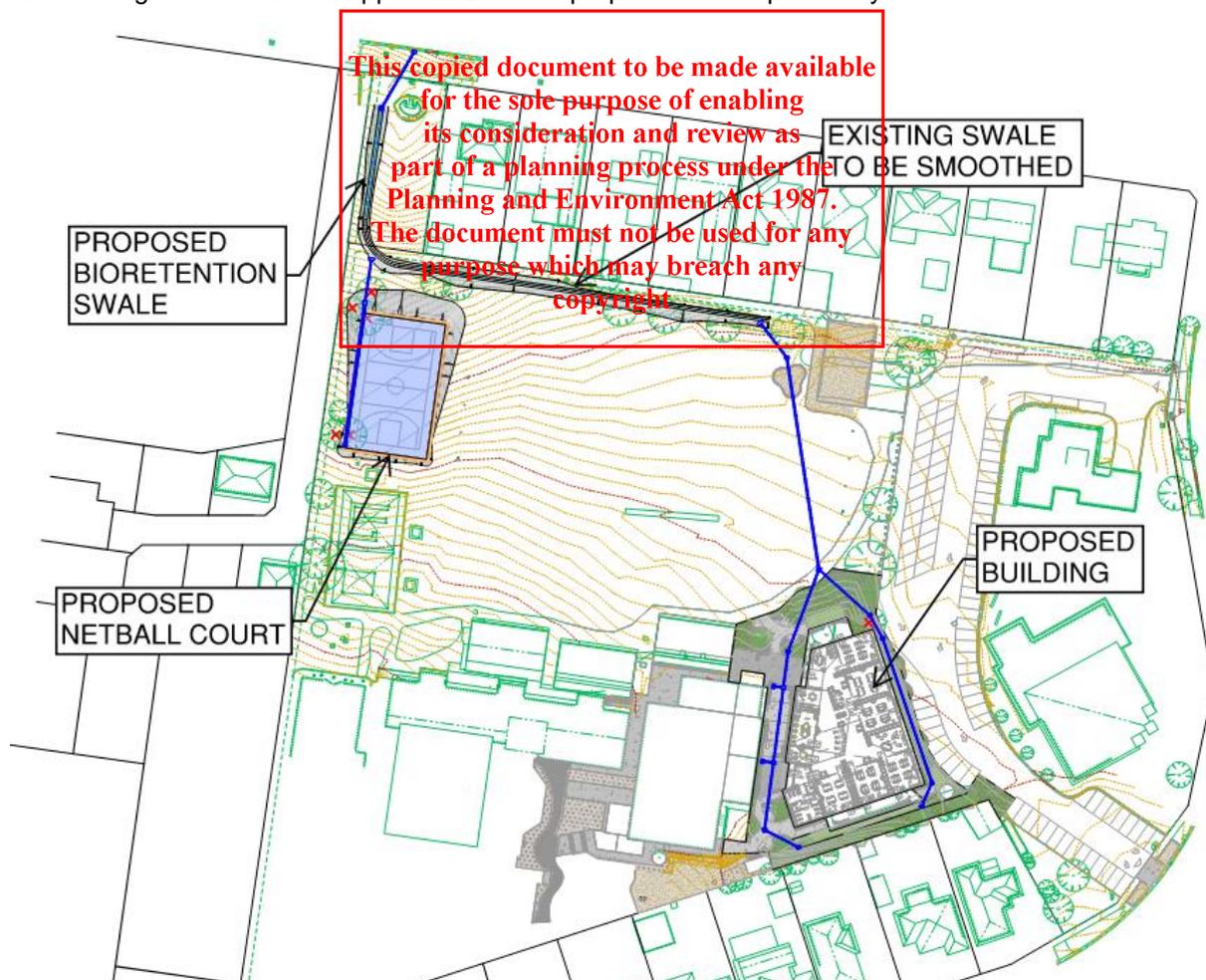


Figure 4 – Proposed Development

### 3. HYDROLOGY

#### 3.1 CATCHMENTS

Runoff coefficients for the 1% and 20% AEP events were based on values for the different surface types from the Infrastructure Design Manual (IDM) and the calculation methods outlined in the Australian Rainfall and Runoff guidelines. The following runoff coefficients were used in the rational calculations and MUSIC modelling and can be seen in Table 1 below.

**Table 1 - Runoff Coefficients**

	Runoff Coefficient
Landscaped areas	0.40
Paved Areas	0.90
Roof Areas	0.90
External Catchment	0.70

##### 3.1.1 PROPOSED NETBALL COURT

The netball court development was divided into catchment areas based on the proposed surface contours and proposed development layout and can be seen in Figure 5 below and Appendix C of this report. In the image below, blue and orange represents the paved area (665 m<sup>2</sup>)

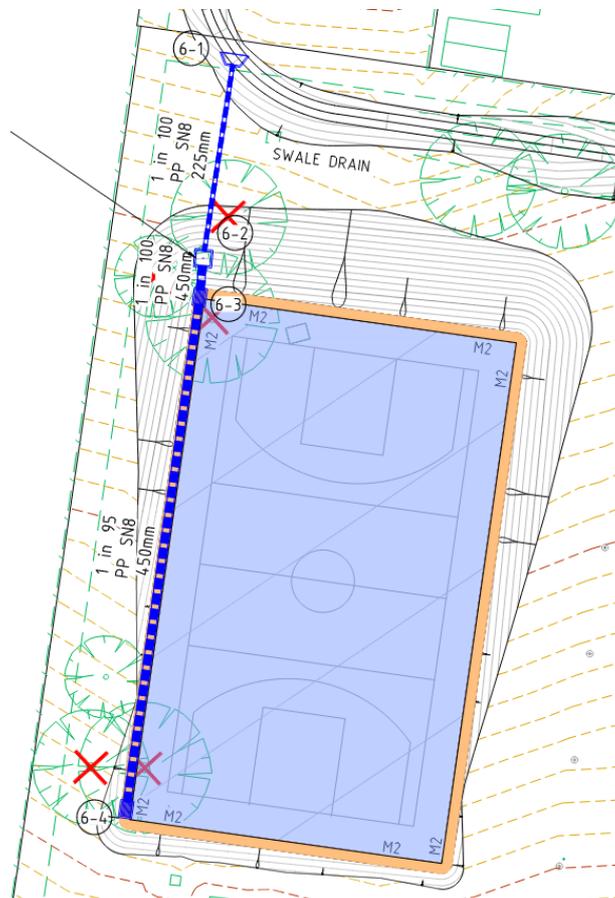


Figure 5 – Netball Court Catchment Plan

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## 3.1.2 PROPOSED BUILDING SITE

The proposed building site development was also divided into catchment areas based on the proposed surface contours and proposed development layout and can be seen in figure 6 below and Appendix C of this report. The proposed site contains a total of 1607 m<sup>2</sup> of pervious surface. In comparison, the existing site conditions of the development area is shown in Figure 7 below and divided into catchment areas to show a total pervious surface area of 1661 m<sup>2</sup>. Therefore, the total pervious area decreases with the new development and detention storage is not required. In the images below, the colours refer to the following surface types:

1. Orange - Roof Area (proposed - 1150 m<sup>2</sup>) (existing – 232 m<sup>2</sup>)
2. Blue - Paved Areas (proposed - 457 m<sup>2</sup>) (existing – 1429 m<sup>2</sup>)
3. Green - Landscaped Areas (proposed - 797 m<sup>2</sup>) (existing – 743 m<sup>2</sup>)



Figure 6 – Proposed Catchment Plan

Figure 7 – Existing Catchment Plan

## 3.2 RAINFALL

Rainfall Intensity Frequency Duration (IFD) information was obtained from the Bureau of Meteorology website for the subject site. In accordance with the Infrastructure Design Manual (IDM), the 2016 IFD rainfall design information was adopted for the strategy. Refer to Appendix E for the IFD coefficients and weather station information.

## 3.3 DETENTION STORAGE

The proposed underground pipe running along the netball court will be utilised as an onsite detention storage using a baffle wall and orifice plate within the downstream pit. This allows stormwater to be stored within the underground pipe network in rain events up to the 5% AEP discharging at a rate equivalent to a 20% predeveloped AEP.

The volume required for the proposed development was determined to be 4.59 m<sup>3</sup> using the Boyd's method of calculation for underground pit and pipe storage. The location of the pit holding the baffle wall and orifice plate can be seen in appendix D, denoted as pit 6-2. Refer to appendix G for detention storage calculations.

## 4. HYDRAULICS

### 4.1 LEGAL POINT OF DISCHARGE

The legal point of discharge for the site is likely to be located at the north-western corner of the site to an existing side entry pit within the road reserve.



Figure 8 – Legal Point of Discharge

### 4.2 MINOR DRAINAGE SYSTEM (20% AEP EVENT)

Flows less than the 20% AEP event from the developed site will be conveyed via an underground pit and pipe network through the development site. This includes runoff collected from the roof, landscaped areas, and paved areas. The minimum approximate size for the minor flows can be seen in Appendix F and Table 2. These sizes are subject to change following detailed design. Before reaching the legal point of discharge, the 4EY flows within the minor drainage system will be treated, as seen in Section 5.

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Table 2 - Minor Drainage Sizing

Minor Drainage	Catchment 1
Design flow (m <sup>3</sup> /s) (20% AEP)	0.025
Pipe Diameter (mm)	225
Pipe Grade	1 in 100
Pipe Capacity (m <sup>3</sup> /s)	0

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### 4.3 MAJOR DRAINAGE SYSTEM (1% AEP EVENT)

In the 1% AEP event, overland (gap) flows from the developed area are to be conveyed by the internal grading through the buildings and towards the large, grassed play area or to the pick up / drop off zone to the east and Selby Rd and will then follow natural overland flow paths. The overland flow paths can be seen in figure 9. The site grading will be designed to ensure 300mm of freeboard to the finished floor levels of the proposed buildings.

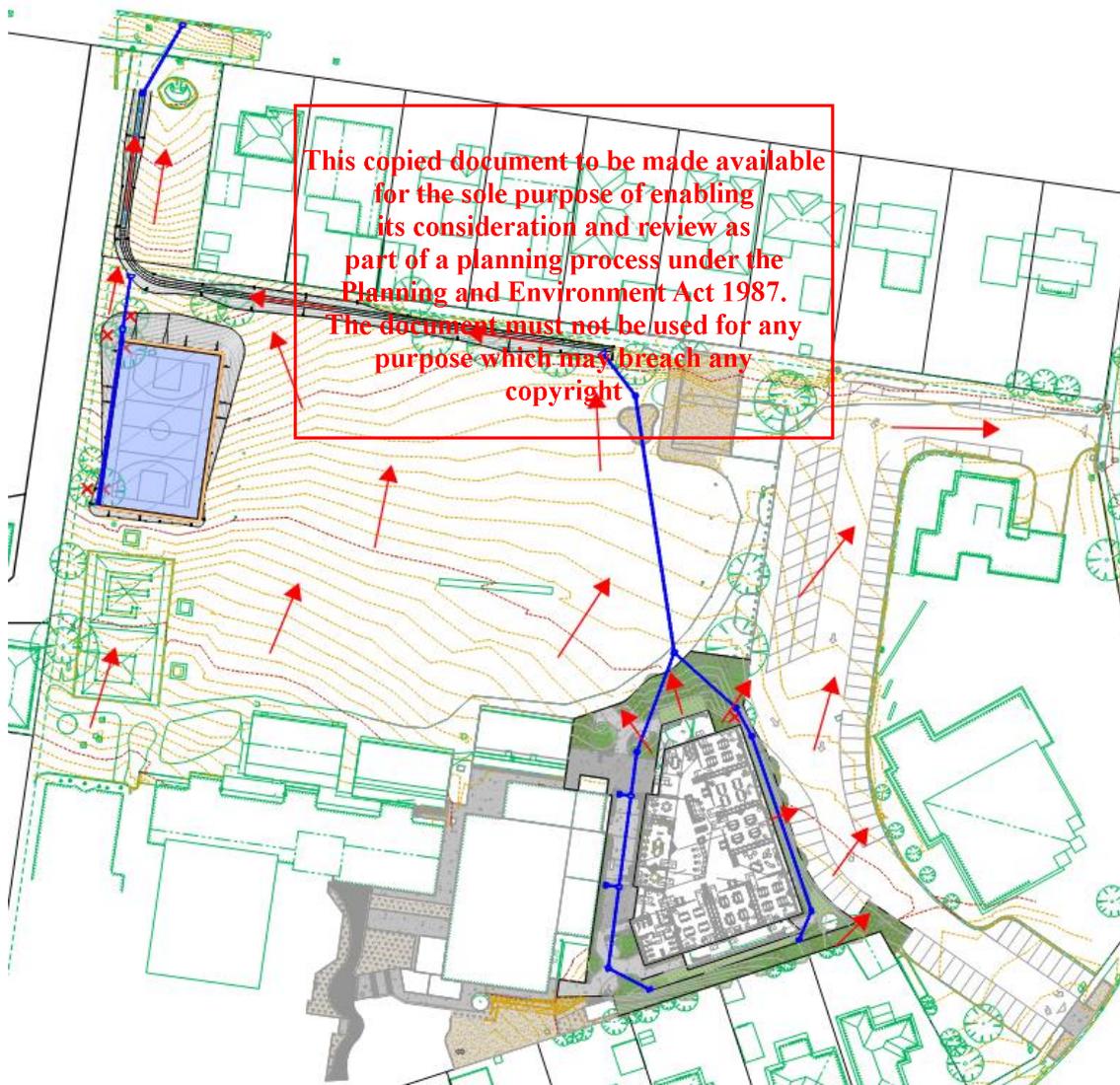


Figure 9 – Overland Flow Paths

## 5. STORMWATER TREATMENT

### 5.1 WATER QUALITY OBJECTIVES

The proposed development is required to meet stormwater quality objectives outlined in the Urban Stormwater – Best Practice Environmental Management Guidelines. The purposes of this guideline are listed in Table 5 below.

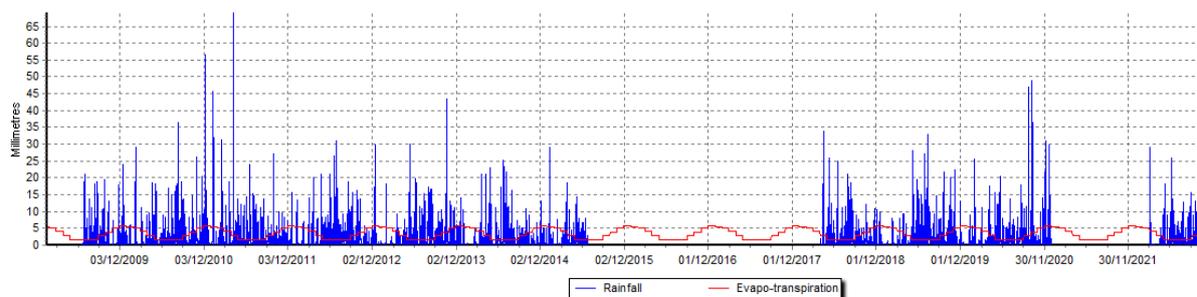
**Table 5 - Pollution Reduction Targets**

Pollutant	Performance Objective
<b>Total Suspended Solids (TSS)</b>	80% retention of the typical urban load
<b>Total Phosphorus (TP)</b>	45% retention of the typical urban load
<b>Total Nitrogen (TN)</b>	45% retention of the typical urban load
<b>Gross Pollutants (GP)</b>	70% retention of the typical urban load

### 5.2 RAINFALL AND TRANSPIRATION

Warrnambool Racecourse 2009-2024 daily rainfall meteorological data was taken from the Bureau of Meteorology and used for the MUSIC model in accordance with Melbourne Water MUSIC Guidelines.

The evapotranspiration distribution is also provided in the meteorological data, and the mean annual evapotranspiration is given as 1249mm. The distribution graph is shown in Figure 10 below.



**Figure 10 - Rainfall and Evapotranspiration Distribution Graph**

Additionally, the soil storage and field capacity are 120mm and 50mm, respectively and pollution concentration data for source node base flows, and storm flows have been adjusted as recommended within the Melbourne Water MUSIC Guidelines.

### 5.3 TREATMENT

The treatment for the site will utilise a bioretention swale and grassed swale as well as underground onsite detention storages for the proposed netball court and building development. This has been modelled in MUSIC using the appropriate treatment nodes.

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## 5.4 MODELLING AND RESULTS

Figure 11 shows the MUSIC model layout. The fraction impervious for each area was based on surface types of the corresponding urban node.

The subject site has been separated into 5 different urban nodes which are depicted by each surface type. The urban nodes used in the model are as follows:

- Roof areas
- Landscaped areas
- Paved areas (footpaths and pavements)
- Asphalt roads
- External catchment (combined surface types within the assumed catchment with a calculated fraction impervious)

The treatment train has been modelled based on the civil design drawings (refer appendix D) dated 07/06/2024.

The results of the MUSIC modelling are shown in Figure 12 below. As shown below, the model achieves the treatment objectives listed in Section 5.1 of this report.

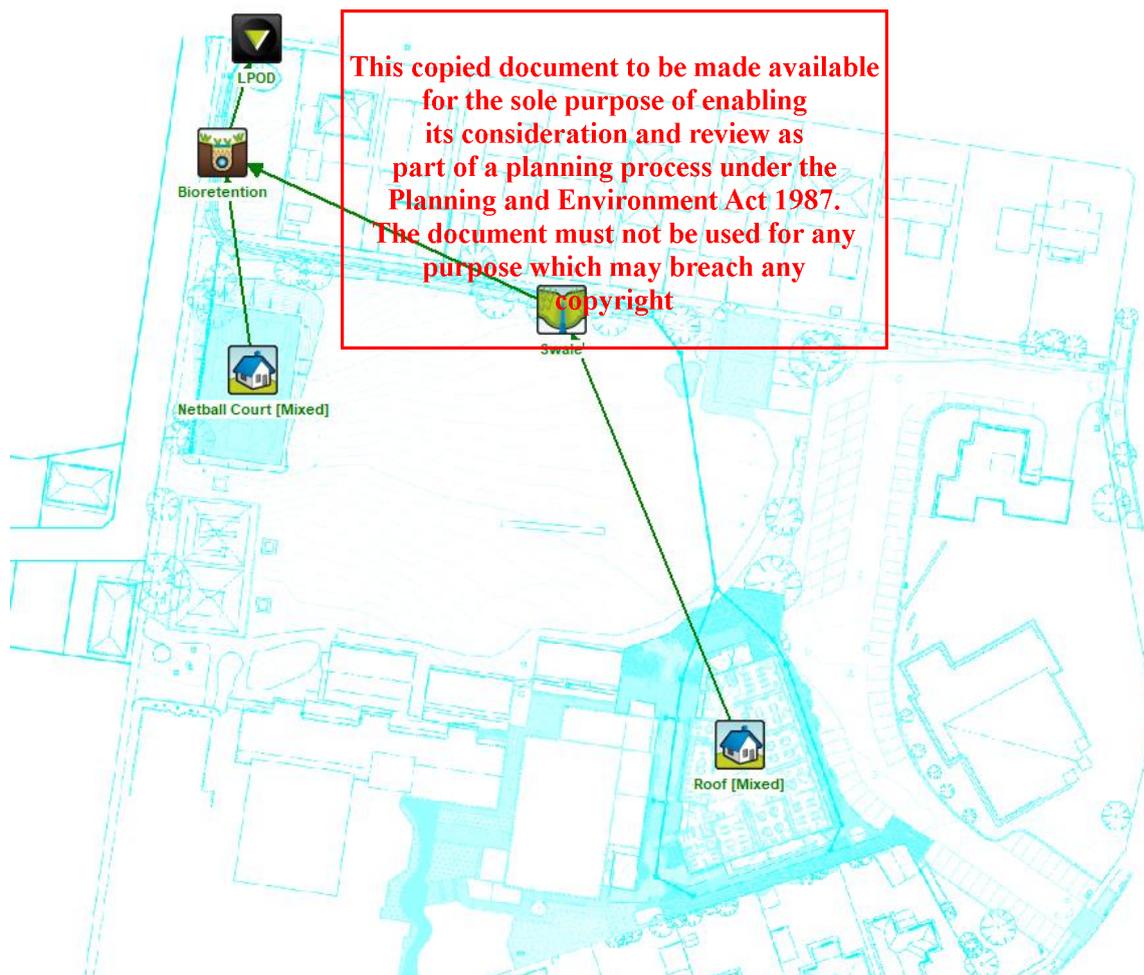


Figure 11 – MUSIC Model Layout

	Sources	Residual Load	% Reduction
Flow (ML/yr)	0.812	0.791	2.5
Total Suspended Solids (kg/yr)	168	1.68	99
Total Phosphorus (kg/yr)	0.332	0.0943	71.6
Total Nitrogen (kg/yr)	2.32	0.483	79.2
Gross Pollutants (kg/yr)	33	0	100

Figure 12 – Treatment Train Effectiveness

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## 6. SUMMARY/CONCLUSION

As detailed in the above report, the proposed drainage strategy for Our Lady Help of Christians PS is to be as follows:

- Minor drainage flows (20% AEP) will be conveyed via underground pits and pipes to the existing stormwater network.
- Overland flows will be conveyed via the internal site grading and discharged to the swale and consequentially, road reserve where flows will then follow natural overland flow paths.
- A bioretention swale is to be constructed in the north-western corner of the proposed works extent to provide stormwater treatment prior to discharging to the legal point of discharge.
- Existing swale is to be reshaped to smooth over any natural deformations and ensure swale is operating at optimal capacity.
- A detention system for the proposed building and surrounding works is not required since the impermeability of the proposed works is less than that of the predeveloped state.
- A detention system will be required for the netball court works and is calculated to be 4.59 m3.
- A pit with an orifice plate and baffle wall is to be installed within the underground stormwater network running along the proposed netball court to allow detention storage within the pipe network. Oversized pipes are to be used in order to meet site storage requirements.

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Appendix A

# EXISTING SITE LAYOUT & FEATURE SURVEY

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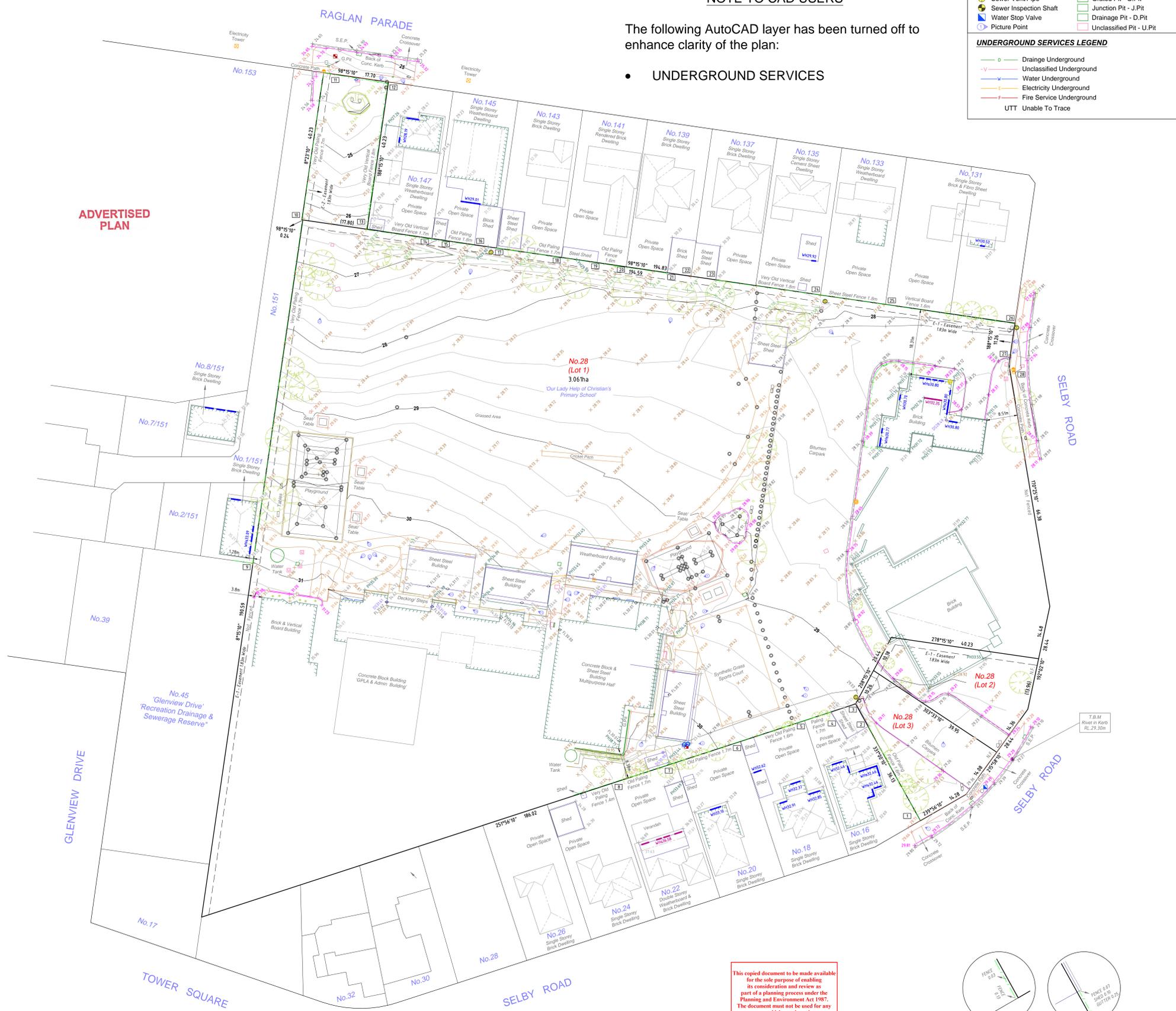
LEGEND	
Permanent Marker	Fire Plug
Title Peg	Fire Hydrant
Aluminium Rivet	Water Meter
Texter Mark	Water Unclassified
Etch Mark	Water Tap
Rod	Stay for Pole
Pipe	Unclassified Pit
Star Picket	Fence
Dumpy Peg	Gate
Nail	Toe of Bank
Spike	Top of Bank
Tree	Electricity Line Overhead
Pipe Invert	Telcomm Line Overhead
Sign	Lower Storey Window
Letter Box	Upper Storey Window
Bollard	Lower Storey Door
Electricity Main	Upper Storey Door
Light Pole	Highlight Window
Electricity Pole	Window Head
Electricity Pole/Light	Non Habitable Window Head
Electricity Pit	Window Sill
Telstra Pit	Door Head
Gas Meter	DS Door Sill
Gas Meter Post	Parapet Height
Sewer Pit	FL Floor Level
Sewer Unclassified	Side Entry Pit - S.E.P
Sewer Vent/Pipe	Grated Pit - G.Pit
Sewer Inspection Shaft	Junction Pit - J.Pit
Water Stop Valve	Drainage Pit - D.Pit
Picture Point	Unclassified Pit - U.Pit

**NOTE TO CAD USERS**

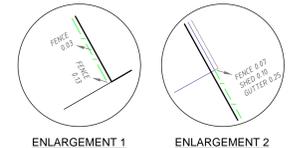
The following AutoCAD layer has been turned off to enhance clarity of the plan:

- UNDERGROUND SERVICES

UNDERGROUND SERVICES LEGEND	
Drainage Underground	Unclassified Underground
Water Underground	Electricity Underground
Fire Service Underground	UTT Unable To Trace



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**CERTIFICATE BY LICENSED SURVEYOR**  
 I, Glenn Graham Smith of Smith Land Surveyors Pty. Ltd. 142a Fyans Street, South Geelong 3220, certify that this plan has been prepared from a survey made under my direction and supervision in accordance with the Surveying Act 2004 and completed on 26/04/2024, that this plan is accurate and correctly represents the adopted boundaries and that the survey accuracy accords with that required by regulation 7(1) of the Surveying (Cadastral Surveys) Regulations 2015.  
 Date: 06/05/2024  
 Licensed Surveyor, Surveying Act 2004.

**GENERAL NOTES:**

- Please refer to Certificate of Title for any easements or encumbrances.
- Where occupation including fences and buildings around the perimeter of a property encroach onto the subject site, the land beyond the occupation may not be recoverable as rights of possession may have passed to adjoining owners. Full title dimensions should not be assumed for design purposes / re-fencing until these issues have been resolved with adjoining landowners.
- Where occupation including fences and buildings around the perimeter of a property encroach onto the neighbouring site, the land beyond the title may not be utilized until a formal application with Land Registry is approved. Until this time you must limit any future building works to the current title position.
- The position of fencing and other occupation in relation to the title boundaries has been exaggerated for the purposes of clarity, and only applies at the natural surface level on the date of the survey and does not show any encroachments that may exist below the natural surface. If no offsets are shown, the fencing is in the correct position.

- Before proceeding with any design, construction or use of the land adjoining neighbours must be consulted to resolve any differences between fencing and the title position shown on this plan.
- Feature and levels shown on this plan are intended to aid in general design works only. Any critical dimensions required should be requested independently of this plan.
- Services that were not visible at the time of survey may not be shown on this plan. Prior to any demolition, excavation, or construction on this site the relevant Authorities should be contacted to ascertain detailed locations of all existing services and the possible locations of future services.
- The title boundaries shown beyond the subject land have been informed from the digital Cadastral Map Base (DCMB) and are approximate only.
- Location of buildings beyond site boundaries is indicative only. Information relating to abutting properties has only been shown where visible or accessible.
- Assume any windows shown are for habitable rooms unless stated otherwise. A site visit to determine the exact status of each room should be carried out before proceeding.

**TITLE INFORMATION**  
 Title Reference: Vol.8351 Fol.162  
 Last Plan Reference: LP 53987 (LOTS 1, 2 & 3)  
 Title Reference: Vol.8155 Fol.837  
 Last Plan Reference: LP 29755 (LOT 1)

**LAND SUBJECT TO EASEMENT:**  
 E-1 - Drainage & Sewerage Easement  
 E-2 - Drainage Easement

**DATUM:**  
 Levels are based on A.H.D. vide WANGOOM PM 386 with registered RL 29.967m.  
 Contour interval is 0.20m.  
 Refer to frozen layer 'TRIANGLE' for 3D triangles.

Client	Y2 ARCHITECTURE		
Project	28 SELBY ROAD WARRNAMBOOL 3280		
Details	PARTIAL RE-ESTABLISHMENT & LEVEL & FEATURE SURVEY		
Sheet	1 of 1	Drawn	C.H. Original sheet size A0
Job No.	2024-0167	Scale	A0 = 1:400
AMENDMENTS			
VERSION	DESCRIPTION	SURVEY DATE	SURVEYOR
1	ORIGINAL SURVEY PLAN	26/04/2024	LE

Appendix B

## PROPOSED SITE LAYOUT

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**PROPOSED SITE WORKS LEGEND**

[Pattern]	EXISTING BUILDING AND STRUCTURE TO BE RETAINED
[Pattern]	PROPOSED NEW BUILDING & STRUCTURE
[Pattern]	PROPOSED CONCRETE PAVING
[Pattern]	PROPOSED PAVING AND LANDSCAPING
[Pattern]	PROPOSED PAVING AND LANDSCAPING
[Pattern]	PROPOSED TOPPING AND LANDSCAPING
[Pattern]	PROPOSED LAWN
[Pattern]	PROPOSED GARDEN BEDS
[Symbol]	INDICATIVE LOCATION OF EXISTING VEGETATION TO BE RETAINED
[Symbol]	INDICATIVE LOCATION OF PROPOSED VEGETATION
[Line]	— DENOTES SITE BOUNDARY
[Line]	— DENOTES SITE HOARDINGS (NOTE: 2.1M HIGH WIRE MESH FENCING) PROVIDE SHADECLOTH TO AREAS AS DIRECTED. ALLOW TO MODIFY LOCATION OF HOARDINGS AS REQUIRED DURING THE COURSE OF THE WORKS

- TOTAL PROPOSED CARPARKS: 94
- GENERAL NOTES:**
- REFER TO CIVIL AND LANDSCAPE DRAWINGS FOR DETAIL RELATING TO LEVELS, PITS, PAVING, ASPHALT, KERBS ETC.
  - ARCHITECTURAL DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL AND LANDSCAPE DRAWINGS AND SPECIFICATIONS FOR EXTENT OF:
  - NEW PAVING, PATHS, STEPS AND CROSS-OVERS,
  - CONCRETE SAW CUTS AND PAVEMENT TYPE,
  - REFER ALSO TO PROPOSED PART SITE PLAN FOR PAVEMENT LAYOUT
  - NOTE: CONCRETE PITS AND PIT COVERS WITHIN COLOURED CONCRETE PAVED AREAS ARE TO BE CONSTRUCTED IN COLOURED CONCRETE TO MATCH PROPOSED PAVEMENT COLOURS WHERE PITS CROSS AREAS OF DIFFERENT COLOURS. CONSTRUCT PIT LIDS WITH VARYING COLOURS TO SUIT.
  - SITE CUT & BATTER NOT TO ENCRoACH TITLE BOUNDARY. PROVIDE AGGI DRAINS TO BASE OF CUTS. REFER TO CIVIL ENGINEERS' AND LANDSCAPE DRAWINGS FOR DETAILS RE. STORMWATER & AGRICULTURAL DRAINS.
  - CUT, REMOVE & GRUB OUT ALL ROOTS TO EXISTING TREES WHERE REQUIRED. REFER TO LANDSCAPE ARCHITECTS DRAWINGS.
  - BUILDER TO ENSURE & MAINTAIN PROTECTION TO ADJOINING TREES DURING WORKS.
  - SOIL CLASSIFICATION - REFER TO GEOTECH REPORT.
  - ALLOW TO MAKE GOOD ALL AREAS OF THE SITE AFFECTED BY THE PROPOSED WORKS. REFER TO ALL DOCUMENTATION AND SPECIFICATION FOR WORKS PROPOSED.

1 PROPOSED SITE PLAN  
225 SCALE 1 : 500

0 1.0m 5.0m 10.0m

ARCHITECTURE  
INTERIOR DESIGN  
URBAN PLANNING

Y2 ARCHITECTURE  
www.y2architecture.com.au  
MELBOURNE: 466 malvern road  
prahran victoria 3181  
t 03 9510 7880 f 03 9521 1484

BENDIGO: 5/41-43 mundy street (PO Box 860)  
bendigo victoria 3550  
t 03 5407 2130 f 03 9521 1484

Issue: **DESIGN DEVELOPMENT  
NOT FOR CONSTRUCTION**

Project: **OUR LADY HELP OF CHRISTIANS  
WARRNAMBOOL**

Title: **GRADE 5-6 GPLA CENTRE  
PROPOSED SITE PLAN**



Scale: 1 : 500 @ A1  
Date: MAY 2024  
Drawn: JO  
Checked: Checker

Project: 2117  
File:  
Drawing: **203**

Appendix C

## CATCHMENT PLAN

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BAFFLE WALL AND ORIFICE PLATE WITHIN PIT No. 6-2 TO ACHIEVE SITE DETENTION

BIORETENTION SWALE FOR APPROXIMATELY 27m TO ACHIEVE WSUD TREATMENT

CONNECT TO EXISTING SIDE ENTRY PIT. CONFIRM LPOD

NEATLY REGRADE EXISTING SWALE DRAIN. REINSTATE GRASS SURFACE.

167.32 sq m

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BENDIGO  
MELBOURNE  
GEELONG  
BALLARAT

**PRELIMINARY ISSUE**  
(NOT TO BE USED FOR CONSTRUCTION)



DRAWN  
A. DEL ROSARIO  
DESIGNED  
J. BISH  
DATE 20/12/23  
APPROVED  
DATE

PROJECT  
OUR LADY HELP OF CHRISTIANS PS  
28 SELBY ROAD, WARRNAMBOOL  
DRAWING TITLE  
LAYOUT PLAN - SHEET 1 OF 3

CLIENT  
Y2 ARCHITECTURE

PROJECT No	DRAWING No	REVISION
230388	C101	P1

1 0 1 2 3 4 5m  
SCALE 1:100 @ A1 SCALE 1:200 @ A3  
ORIGINAL SHEET SIZE: A1-COLOUR  
SCALE FOR REFERENCE ONLY DO NOT SCALE OFF THIS DRAWING

REV	DESCRIPTION	DATE	APPROVED
P1	PRELIMINARY DESIGN	7/06/24	J BISH

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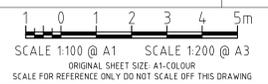
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BENDIGO  
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PROJECT  
 OUR LADY HELP OF CHRISTIANS PS  
 28 SELBY ROAD, WARRNAMBOOL

DRAWING TITLE  
 LAYOUT PLAN - SHEET 3 OF 3

CLIENT  
 Y2 ARCHITECTURE

PROJECT No	DRAWING No	REVISION
230388	C103	P1

REV	DESCRIPTION	DATE	APPROVED
P1	PRELIMINARY DESIGN	7/06/24	J BISH

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Appendix D

## CIVIL DESIGN DRAWINGS

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# Y2 ARCHITECTURE

# OUR LADY HELP OF CHRISTIANS PS

## 28 SELBY ROAD, WARRNAMBOOL

## CIVIL DRAWINGS

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BENDIGO  
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**PRELIMINARY ISSUE**  
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DRAWN A. DEL ROSARIO	PROJECT OUR LADY HELP OF CHRISTIANS PS 28 SELBY ROAD, WARRNAMBOOL	CLIENT Y2 ARCHITECTURE
DESIGNED J. BISH	DRAWING TITLE COVER SHEET	PROJECT No 230388
DATE 20/12/23	APPROVED	DRAWING No C000
APPROVED	DATE	REVISION P1

P1	PRELIMINARY DESIGN	7/06/24	J. BISH
REV	DESCRIPTION	DATE	APPROVED

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# INDEX PLAN

DWG No.	TITLE	SHEET No.
230388-C-000	COVER SHEET	000
230388-C-001	INDEX AND LOCALITY PLAN	001
230388-C-002	GENERAL NOTES	002
230388-C-010	TYPICAL DETAILS	010
230388-C-100	KEY PLAN	100
230388-C-101	LAYOUT PLAN 01	101
230388-C-102	LAYOUT PLAN 02	102
230388-C-103	LAYOUT PLAN 03	103
230388-C-104	LAYOUT PLAN 04	104
230388-C-300	PIPE LONG SECTION 1	300
230388-C-301	PIPE LONG SECTION 2	301
230388-C-302	PIT SCHEDULE	302



LOCALITY PLAN

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## LEGEND

	TITLE BOUNDARY
	PROPOSED CONTOURS
	EXISTING CONTOURS
	SPOT ELEVATION
	PROPOSED B2/B3 KERB
	PROPOSED B1 KERB
	PROPOSED SWALE DRAIN
	PROPOSED Ø100mm AG DRAINAGE PIPE WITH FILTER SOCK.
	PROPOSED STORMWATER PIPE
	PROPOSED STORMWATER PIT
	EXISTING STORMWATER PIPE
	EXISTING STORMWATER PIT
	EXISTING SEWER MAIN
	EXISTING OVERHEAD POWERLINE
	EXISTING WATER MAIN
	EXISTING TELSTRA
	EXISTING UNDERGROUND ELECTRICAL CABLE
	UNCLASSIFIED UNDERGROUND SERVICE

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BENDIGO  
MELBOURNE  
GEELONG  
BALLARAT

**PRELIMINARY ISSUE**  
(NOT TO BE USED FOR CONSTRUCTION)



DRAWN  
A. DEL ROSARIO  
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PROJECT  
OUR LADY HELP OF CHRISTIANS PS  
28 SELBY ROAD, WARRNAMBOOL  
DRAWING TITLE  
INDEX AND LOCALITY PLAN

CLIENT  
Y2 ARCHITECTURE

PROJECT No	DRAWING No	REVISION
230388	C001	P1

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REV	DESCRIPTION	DATE	APPROVED
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GENERAL NOTES

- 1. EXISTING CONDITIONS SHOWN REFLECT SITE CONDITIONS AT TIME OF SURVEY PREPARED BY # DATED (REFERENCE NUMBER #)
2. THESE DESIGN PLANS ARE TO BE READ IN CONJUNCTION WITH GEOTECHNICAL REPORT BY # DATED # (REFERENCE NUMBER #). ALL PROVISIONS, RECOMMENDATIONS AND COMPACTION REQUIREMENTS CONTAINED WITHIN THE REPORT ARE TO BE STRICTLY COMPLIED WITH.
3. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL OTHER PROJECT DRAWINGS. ANY DISCREPANCIES SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH ANY WORK.
4. ALL CONSTRUCTION WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CIVIL SPECIFICATION, APPROVED PLANS AND TO THE SATISFACTION OF THE SUPERINTENDENT.
5. ALL WORKS IN THE PUBLIC ROAD RESERVE ARE TO BE CARRIED OUT TO THE SATISFACTION OF AND IN ACCORDANCE WITH THE SPECIFICATION AND STANDARDS OF CITY OF GREATER BENDIGO
6. THE CONTRACTOR IS TO REVIEW THE GEOTECHNICAL REPORT AND CIVIL SPECIFICATION FOR SUBGRADE PREPARATION, SOIL PARAMETERS AND CONSTRUCTION METHODOLOGY TO SUIT THE CONDITIONS ON SITE.
7. ALL DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
8. LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (m AHD).
9. ALL DIMENSIONS RELEVANT TO SETTING OUT SHALL BE CONFIRMED AND VERIFIED BY THE CONTRACTOR BEFORE CONSTRUCTION IS COMMENCED. THE CONTRACTOR SHALL REPORT ANY IDENTIFIED DISCREPANCIES TO THE SUPERINTENDENT FOR CLARIFICATION.
10. THE CONTRACTOR MUST ARRANGE THE REQUISITE INSPECTIONS OF THE WORKS WITH THE SUPERINTENDENT OR THEIR REPRESENTATIVE AS PER THE SPECIFICATIONS.
11. ALL REDUNDANT ASSETS AND THEIR ASSOCIATED INFRASTRUCTURE (I.E PIPE WORK/MANHOLE ETC) ARE TO BE REMOVED AND DISPOSED OF OFF SITE AT THE CONTRACTORS EXPENSE.
12. ALL TRENCHING WORKS TO BE IN ACCORDANCE WITH THE RELEVANT ACT AND REGULATIONS.
13. CONTRACTOR IS TO ALLOW FOR BACK FILLING ASSOCIATED TRENCHES IN ACCORDANCE WITH THE CIVIL SPECIFICATION / RELEVANT DRAWINGS.
14. ALL EXISTING ASSETS AFFECTED BY THE WORKS; e.g. SIGNS, VEHICLE CROSSINGS, FOOTPATHS, KERB AND LINEMARKING, SHALL BE REINSTATED BY THE CONTRACTOR PRIOR TO THE COMPLETION OF THE WORKS TO THE SATISFACTION OF THE SUPERINTENDENT OR THEIR REPRESENTATIVE.
15. AT THE COMPLETION OF ALL WORKS, ALL RUBBISH, DEBRIS AND SURPLUS SPOIL SHALL BE REMOVED AND THE SITE SHALL BE CLEARED TO THE SATISFACTION OF THE SUPERINTENDENT OR THEIR REPRESENTATIVE.
16. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SUBMIT THE AS-BUILT DRAWINGS (INCLUDING DIGITAL FORMAT) TO THE SUPERINTENDENT AND DESIGN ENGINEER AT THE COMPLETION OF THE CONSTRUCTION WORKS. ANY UNAPPROVED DISCREPANCIES MUST BE RECTIFIED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE SUPERINTENDENT AND / OR ENGINEER.

TREE PROTECTION

- 17. ALL TREES AND SHRUBS ARE TO BE RETAINED UNLESS OTHERWISE SHOWN ON THE DRAWINGS TO BE REMOVED OR DIRECTED BY THE SUPERINTENDENT OR THEIR REPRESENTATIVE. UNDER NO CIRCUMSTANCES SHALL WORKS BE CARRIED OUT, MATERIALS STORED OR CONSTRUCTION VEHICLES BE PARKED WITHIN THE CANOPY OF EXISTING TREES WITHOUT THE APPROVAL OF THE SUPERINTENDENT.
18. THE CONTRACTOR SHALL BRING TO THE ATTENTION OF THE SUPERINTENDENT ANY TREES THAT ARE IN CONFLICT WITH THE PROPOSED WORKS AND SEEK DIRECTION ON HOW TO PROCEED.

EXISTING SERVICES

- 19. RMG ACCEPTS NO RESPONSIBILITIES IN RELATION TO EXTENT AND LOCATION OF EXISTING SERVICES IN THE VICINITY OF THE SITE.
20. CONTRACTORS MUST ASCERTAIN THE PRECISE LOCATION AND DEPTH OF ALL EXISTING SERVICES WHICH COULD BE AFFECTED BY THE WORKS. WHERE EXISTING SERVICES ARE FOUND TO BE IN CLASH OF THE WORKS, THE CONTRACTOR SHOULD NOTIFY THE SUPERINTENDENT ACCORDINGLY.
21. THE CONTRACTOR SHALL LIAISE WITH ALL RELEVANT SERVICE AUTHORITIES WITH RESPECT TO ANY SERVICE ALTERATIONS OR FOR WORKS IN VICINITY OR CLOSE PROXIMITY TO EXISTING SERVICES. THE CONTRACTOR SHALL BE REQUIRED TO SEEK CLEARANCE, PROGRAM AND COORDINATE THESE WORKS WITH THE RELEVANT SERVICE AUTHORITY AND THEIR CONTRACTORS AT THEIR OWN EXPENSE.
22. ANY INFRASTRUCTURE DAMAGE DURING THE DEFECTS LIABILITY PERIOD IS THE RESPONSIBILITY OF THE CONTRACTOR AND IS TO BE REINSTATED TO THE SATISFACTION OF THE SUPERINTENDENT OR THEIR REPRESENTATIVE.
23. ALL SERVICE CONDUITS TRENCHES UNDER ROAD PAVEMENTS ARE TO BE BACKFILLED WITH 20mm 3% CEMENT TREATED CLASS 3 CRUSHED ROCK COMPACTED TO A DENSITY NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY VALUE DETERMINED BY THE MODIFIED COMPACTION TEST IN ACCORDANCE WITH A.S.1289.5.2.1-2003.

OCCUPATIONAL HEALTH AND SAFETY

- 24. PRIOR TO COMMENCEMENT OF WORKS ON SITE, THE CONTRACTOR MUST ENSURE THAT ALL MATTERS RELATING TO THE OCCUPATIONAL HEALTH AND SAFETY ACT 2004, HAVE BEEN AND WILL BE COMPLIED WITH.
25. CONTRACTOR TO INTRODUCE MANUAL HANDLING PROCEDURES PRIOR TO CONSTRUCTION AND MAINTENANCE WORKS.
26. CONTRACTOR TO INTRODUCE SAFE MAINTENANCE PROCEDURES PRIOR TO UNDERTAKING MAINTENANCE WORKS ON THESE ASSETS.

SEDIMENT CONTROL

- 27. ON COMMENCEMENT OF CONSTRUCTION WORKS, THE CONTRACTOR MUST COMPLY WITH THE RECOMMENDATIONS OF THE ENVIRONMENT PROTECTION AUTHORITY PUBLICATION "CONSTRUCTION TECHNIQUES FOR SEDIMENT POLLUTION CONTROL." APPROPRIATE SILTATION CONTROL IS TO BE MAINTAINED THROUGHOUT THE CONSTRUCTION AND MAINTENANCE PERIOD OF THE WORKS.

SITE CLEARING

- 28. TOP SOIL TO BE STRIPPED ACROSS THE DEVELOPMENT SITE AS REQUIRED.
29. STRIPPED TOPSOIL SHALL BE STOCKPILED ON SITE FOR FUTURE LANDSCAPING USE. THE LOCATION OF TOPSOIL STOCKPILE SHALL BE AS APPROVED OR DIRECTED BY THE SUPERINTENDENT. SUBJECT TO THE SUPERINTENDENTS APPROVAL TOPSOIL IN EXCESS TO SITE REQUIREMENTS SHALL BE DISPOSED OFF SITE.

EARTHWORKS

- 30. A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER SHALL BE ENGAGED AT CONTRACTORS EXPENSE TO WITNESS AND APPROVE THE SUBGRADE PREPARATION WORKS AND FINAL PROOF ROLLING AS ADEQUATE FOR CONSTRUCTION.
31. DESIGN LEVELS PROVIDED IN THE DRAWINGS ARE FINISHED SURFACE LEVELS. EARTHWORKS SHOULD THEREFORE BE FINISHED AT THE APPROPRIATE LEVELS TO ALLOW FOR THE CONSTRUCTION OF PAVEMENTS AND SHOULDERS AS DOCUMENTED.
32. EARTHWORK SPOIL IN EXCESS OF SITE FILL REQUIREMENTS SHALL BE DISPOSED OFF SITE.
33. PRIOR TO EARTH FILLING WORKS THE EXPOSED EMBANKMENT FOUNDATION SHALL BE MOISTURE CONDITIONED AND COMPACTED TO A MINIMUM OF 98% STANDARD COMPACTION PRIOR TO FILLING OR PAVEMENT CONSTRUCTION.
34. ANY SOFT, WET OR UNSUITABLE SUBGRADE MATERIALS, AS DEFINED IN THE SPECIFICATION, SHALL BE REMOVED AND REPLACED WITH AN APPROVED MATERIAL.
35. EXCAVATED MATERIAL THAT COMPLIES WITH THE SPECIFICATION REQUIREMENTS FOR FILL MAY BE USED AS BACKFILL.
36. ALL COMPACTION TO BE CARRIED OUT IN ACCORDANCE WITH COMPACTION TEST PROCEDURES DEFINED IN AS 1289. CERTIFICATION IS TO BE BY AN INDEPENDENT GEOTECHNICAL ENGINEER (AT CONTRACTORS EXPENSE).
37. ALL EXCAVATED AND FILLED BATTER AREAS SHALL BE SURFACED WITH A 150mm LAYER OF APPROVED TOPSOIL OR AS SHOWN OTHERWISE ON THE DRAWINGS.
38. CONTRACTOR TO ENSURE THAT ALL EXCAVATIONS ARE TO BE MAINTAINED IN A DRY CONDITION AND NO WATER PONDING OCCURS.
39. ANY FILL REQUIRED IS TO BE APPROVED BY THE GEOTECHNICAL ENGINEER.

PAVEMENTS

- 40. WHERE NEW ASPHALT, CONCRETE KERB & CHANNEL, PATHS AND DRIVEWAYS MATCH INTO EXISTING, THE EXISTING SURFACE IS TO BE SAW CUT AND MATCHED NEATLY.
41. ANY PAVEMENT SOFT SPOTS IDENTIFIED SHALL BE EXCAVATED TO A PROOF ROLLED BASE AND BACKFILLED WITH APPROVED MATERIAL COMPACTED IN 150mm LAYERS TO ACHIEVE THE REQUIRED DRY DENSITY VALUE.
42. CRUSHED CONCRETE COMPLYING WITH VICROADS SECTION 820 MAY BE USED IN LIEU OF VIRGIN CRUSHED ROCK SUBJECT TO APPROVAL BY THE SUPERINTENDENT.
43. ALL PAVEMENT WORKS SHALL BE IN ACCORDANCE WITH THE SPECIFICATION UNLESS SPECIFIED OTHERWISE.
44. PAVEMENTS HAVE BEEN DESIGNED BASED ON THE FOLLOWING PARAMETERS UNLESS NOTED OTHERWISE.
- DESIGN CBR = 3.5
- DESIGN TRAFFIC = 4.0 x 10^5 ESA
45. AFTER COMPLETION OF EARTHWORKS TO NEAR SUBGRADE LEVEL THE CONTRACTOR SHALL CONFIRM THE SUBGRADE CBR IS AT OR ABOVE THE DESIGN CBR. THE CONTRACTOR SHALL NOTIFY THE SUPERINTENDENT IF IT IDENTIFIED THAT THE SUBGRADE CBR IS LESS THAN THE DESIGN CBR.
46. PRIOR TO PLACING THE PAVEMENT MATERIAL, THE EXPOSED SUBGRADE SHOULD BE PROOF ROLLED

WITH A FULLY LADEN DUMP TRUCK OR WATER TRUCK. A SATISFACTORY PROOF ROLL IS WHERE THERE IS NO VISIBLE DEFORMATION OR SPRINGING/ HEAVING OF THE SURFACE. ANY AREAS THAT FAIL THE PROOF ROLL SHALL BE EITHER RECOMPACTED UNTIL SATISFACTORY OR EXCAVATED AND REPLACED WITH SUITABLY COMPACTED MATERIAL.

- 47. PAVEMENT TESTING TO BE COMPLETED IN ACCORDANCE WITH THE BELOW TABLES.

- BASE COURSE - 98% (MMDD)
- SUBBASE - 98% (MMDD)
- SUBGRADE - 98% (SMDD)

- 48. THE CONTRACTOR IS TO PROVIDE THE RATES OF APPLICATION FOR PRIME COAT TO BE USED FOR SPRAYED SEAL TREATMENTS.

KERBING AND THE ANCILLARY WORKS

- 49. SET OUT DIMENSIONS GIVEN TO KERBING ARE TO THE INVERT OF KERB AS DEFINED ON THE STANDARD DRAWINGS.
50. PEDESTRIAN CROSSING TO CONFORM TO AS 1428.1 AND RELEVANT AUTHORITIES STANDARD DETAILS WHERE APPLICABLE.

STORMWATER DRAINAGE

- 51. ALL STORMWATER DRAINS >150DIA ARE TO BE CLASS 2 RC, FRC, HDPE OR POLYPROPYLENE PIPES COMPLYING WITH REQUIREMENTS OF AS3500 UNLESS NOTED OTHERWISE. ALL PIPES ARE TO BE RUBBER RING JOINTED. ALTERNATIVE PIPE MATERIALS MAY BE USED SUBJECT TO APPROVAL BY THE SUPERINTENDENT.
52. ALL STORMWATER DRAINAGE PIPES LESS THAN 225DIA TO BE SEWER QUALITY UPVC WITH SOLVENT WELDED JOINTS, UNLESS NOTED OTHERWISE.
53. DRAINAGE TRENCHING WORKS TO BE IN ACCORDANCE WITH THE RELEVANT ACT AND REGULATIONS.
54. PIT COVER LEVELS (CL'S) TO EXISTING OR PROPOSED FINISHED LEVELS AS APPROPRIATE. ACCORDINGLY THE CONTRACTOR IS TO VERIFY DOCUMENTED CL'S PRIOR TO DRAINAGE INSTALLATION AND NOTIFY THE SUPERINTENDENT OF ANY ANOMALIES WITH CL'S AND FINISHED LEVELS FOR CLARIFICATION.
55. ALL DOWNPIPE CONNECTIONS TO BE MINIMUM 150Ø OR EQUAL TO DOWNPIPE DIAMETER, UNLESS OTHERWISE NOTED. ALL PIPES TO BE SEWER QUALITY UPVC, WITH SOLVENT WELDED JOINTS. DOWNPIPE CONNECTIONS SHALL TYPICALLY BE PLACED AT MIN GRADE OF 1:100.
56. EXISTING STORM WATER PIPE TO BE ABANDONED IS TO BE CUT AND SEALED WITH CONCRETE AT BOTH ENDS.
57. PIT SETOUT COORDINATES ARE TO THE CENTRE OF THE PIT.
58. ALL TABLE DRAINS AND VERGES ARE TO BE REINSTATED UPON COMPLETION OF WORKS TO THE SATISFACTION OF THE SUPERINTENDENT/OR THEIR REPRESENTATIVE.
59. DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTING AND MAINTAINING A TEMPORARY SITE DRAINAGE SYSTEM AND TO MAINTAIN THE SITE IN A DRY AND STABLE CONDITION. DETAILS OF THE DRAINAGE SYSTEM SHALL BE SUBMITTED FOR THE APPROVAL OF THE SUPERINTENDENT.
60. FOR REACTIVE CLAY SITES, ALL IN-GROUND STORMWATER DRAINAGE PIPE CONNECTIONS TO IN-GROUND STRUCTURES ARE TO BE INSTALLED WITH A FLEXIBLE JOINT.

SUBSOIL DRAINAGE

- 61. PAVEMENT SUBSOIL DRAINS ARE TO BE PLACED IN ACCORDANCE WITH STANDARD DRAWINGS BEHIND ALL KERB AND CHANNEL, ON THE LOW SIDE OF ALL PAVEMENTS, AND ROAD CROSSINGS AT SAG VERTICAL CURVES.
62. SUBSOIL DRAINAGE SHALL OUTLET TO DRAINAGE PITS OR LAND DRAINS.

LINEMARKING AND SIGNAGE

- 63. ALL REDUNDANT LINEMARKING SHALL BE PERMANENTLY REMOVED BY APPLICATION OF A SPRAY SEAL OR GRINDING OFF.
64. ALL LINE MARKING TO BE IN ACCORDANCE WITH AS1742.
65. ALL TRAFFIC CONTROL MEASURES, PROPOSED SIGNS AND LINEMARKING SHALL BE IN ACCORDANCE WITH AS1742 PARTS 1, 2 & 3.
66. ALL SIGNS TO BE CLASS 1 HIGH INTENSITY TYPE AND TO COMPLY WITH THE REQUIREMENTS OF A.S.1743 -2001.
67. ALL LINE MARKING TO BE SOLVENT BASED PAINT OF LONG LIFE QUALITY IN ACCORDANCE WITH VIC ROADS REQUIREMENTS AND AUSTRALIAN STANDARDS.
68. ROAD PAVEMENT MARKINGS TO BE MARKED OUT WITH 100mm WIDE WHITE LINES UNLESS DENOTED OTHERWISE.
69. CAR PARKING BAYS MARKINGS ARE TO BE 80mm WIDE WHITE LINES UNLESS DENOTED OTHERWISE.

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Table with 4 columns: P1, PRELIMINARY DESIGN, 7/06/24, J BISH. Includes a revision table with columns for REV, DESCRIPTION, DATE, and APPROVED.

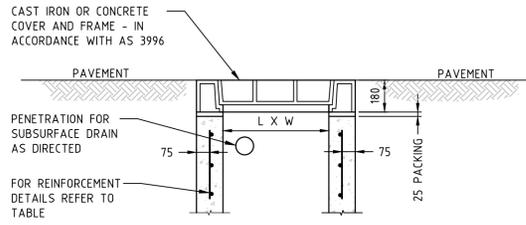
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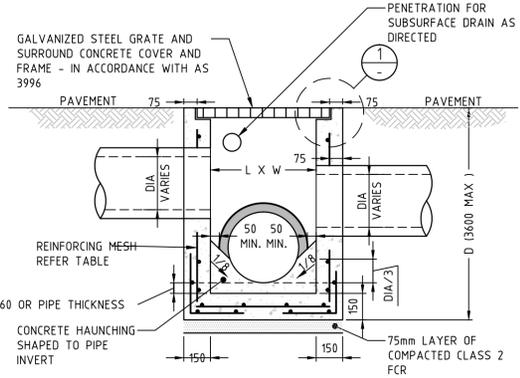
Table with 2 columns: DRAWN (A. DEL ROSARIO DESIGNED J. BISH DATE 20/12/23 APPROVED) and DATE

Table with 2 columns: PROJECT (OUR LADY HELP OF CHRISTIANS PS 28 SELBY ROAD, WARRNAMBOOL) and DRAWING TITLE (GENERAL NOTES)

Table with 3 columns: CLIENT (Y2 ARCHITECTURE), PROJECT No (230388), DRAWING No (C002), REVISION (P1)

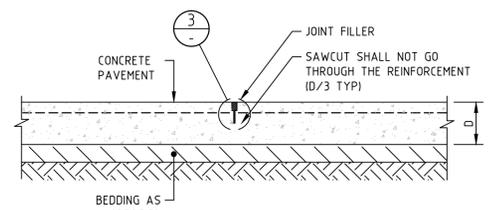


**JUNCTION PIT**  
SCALE 1:20



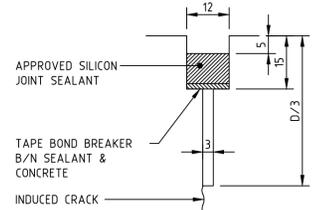
**GRADED PIT**  
SCALE 1:20

PIT NOTE: STORMWATER PITS ARE TO BE 600mm (W) x 900mm (L) UNLESS OTHERWISE SPECIFIED ON THE PLANS

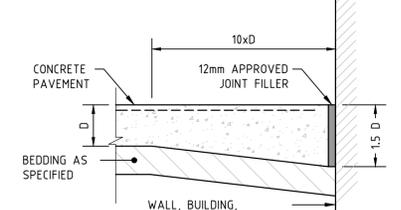


**SAWCUT JOINT DETAIL (SC)**  
LIGHT DUTY PAVEMENT (NO DOWEL)  
N.T.S

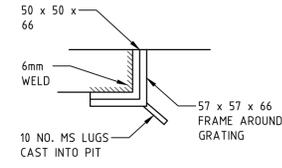
NOTE:  
SAWCUT WITHIN 24 HOUR PERIOD AFTER CONCRETE HAS BEEN PLACED.  
SPACING MAXIMUM OF 3.5x3.5m, MAXIMUM LENGTH TO WIDTH RATIO OF 2:1.



**JOINT FILLER DETAIL**  
SCALE 1:1

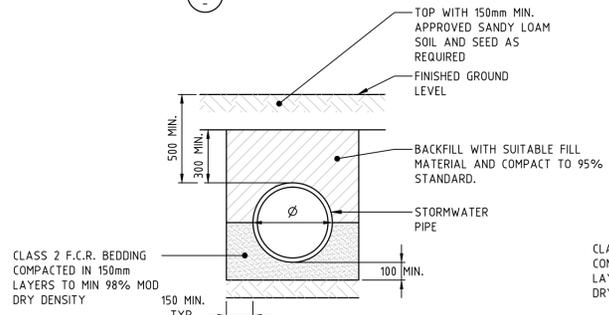


**ISOLATION JOINT**  
N.T.S

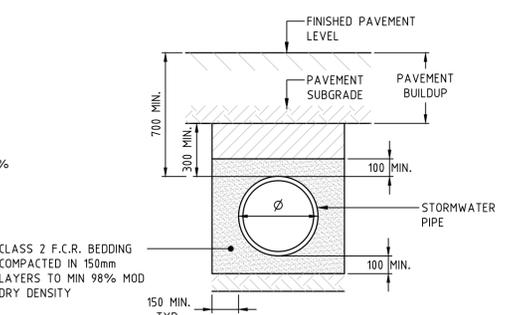


**GRADED FRAME DETAIL**  
N.T.S

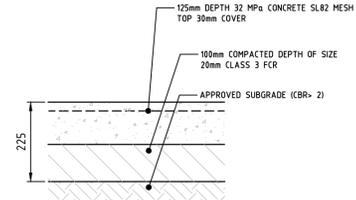
REINFORCEMENT DETAILS	
PIT LENGTH "D"	REINFORCEMENT
UP TO 1200	SL 92
1201 TO 1800	RL 918
1801 TO 2400	RL 1218
> 2400	AS DETAILED



**PIPE BEDDING DETAIL LANDSCAPE AREAS**  
SCALE 1:20

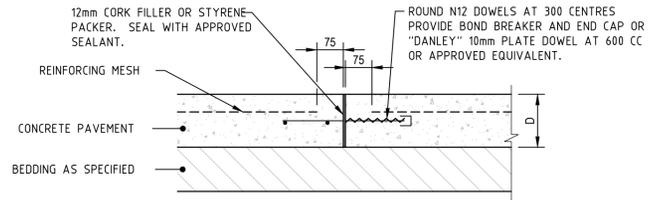


**PIPE BEDDING DETAIL UNDER DRIVEWAY PAVEMENTS**  
SCALE 1:20

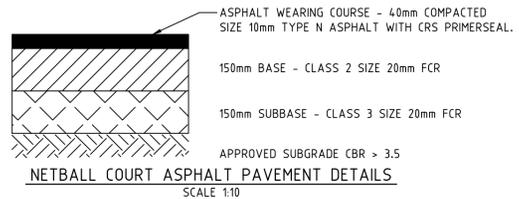


**LIGHT/ DARK CONCRETE PAVEMENT**  
SCALE 1:10

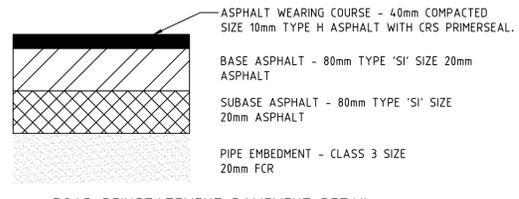
PAVEMENT NOTE: REFER LANDSCAPE ARCHITECT DRAWINGS FOR EXTENT OF PAVEMENT WORKS



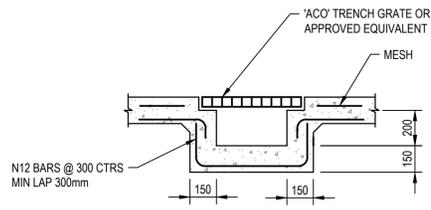
**DOWELED EXPANSION JOINT (CJ)**  
REINFORCED CONCRETE  
SCALE 1:10



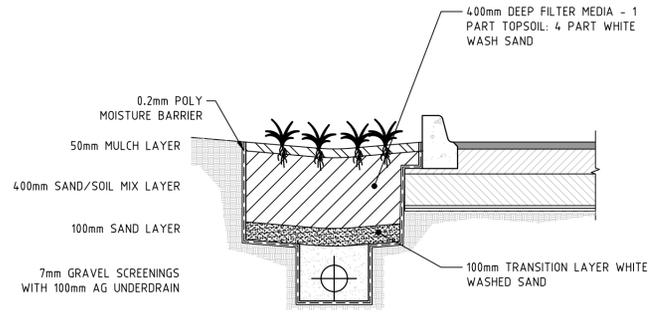
**NETBALL COURT ASPHALT PAVEMENT DETAILS**  
SCALE 1:10



**ROAD REINSTATEMENT PAVEMENT DETAIL**  
SCALE 1:10



**GRADED TRENCH DETAIL**  
SCALE 1:20



**BIORETENTION SWALE DETAIL**  
SCALE 1:20

- PAVEMENT NOTES**
- ALL PAVEMENT WORKS SHALL BE IN ACCORDANCE WITH THE SPECIFICATION UNLESS SPECIFIED OTHERWISE.
  - PAVEMENT DESIGN PARAMETERS.
    - DESIGN CBR = 3.5
    - HEAVY TRUCK PAVEMENT DESIGN TRAFFIC = 2.5 x 10<sup>-5</sup> ESA
    - CARPARK DESIGN TRAFFIC = 5 x 10<sup>-3</sup> ESA
  - AFTER COMPLETION OF EARTHWORKS TO NEAR SUBGRADE LEVEL THE CONTRACTOR SHALL CONFIRM THE SUBGRADE CBR IS AT OR ABOVE THE DESIGN CBR. THE CONTRACTOR SHALL NOTIFY THE SUPERINTENDENT IF IT IDENTIFIED THAT THE SUBGRADE CBR IS LESS THAN THE DESIGN CBR.
  - PRIOR TO PLACING THE PAVEMENT MATERIAL, THE EXPOSED SUBGRADE SHOULD BE PROOF ROLLED WITH A FULLY LADEN DUMP TRUCK OR WATER TRUCK. A SATISFACTORY PROOF ROLL IS WHERE THERE IS NO VISIBLE DEFORMATION OR SPRINGING/ HEAVING OF THE SURFACE. ANY AREAS THAT FAIL THE PROOF ROLL SHALL BE EITHER RECOMPACTED UNTIL SATISFACTORY OR EXCAVATED AND REPLACED WITH SUITABLY COMPACTED MATERIAL.
  - PAVEMENT TESTING TO BE COMPLETED IN ACCORDANCE WITH THE BELOW TABLES.
  - THE CONTRACTOR IS TO PROVIDE THE RATES OF APPLICATION FOR PRIME COAT TO BE USED FOR SPRAYED SEAL TREATMENTS.

PAVEMENT COMPACTION REQUIREMENTS	
- BASE COURSE	- 98% (MMDD)
- SUBBASE	- 97% (MMDD)
- SUBGRADE	- 98% (SMDD)

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P1	PRELIMINARY DESIGN	7/06/24	J BISH

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DRAWN  
A. DEL ROSARIO  
DESIGNED  
J. BISH  
DATE 20/12/23  
APPROVED

PROJECT  
OUR LADY HELP OF CHRISTIANS PS  
28 SELBY ROAD, WARRNAMBOOL

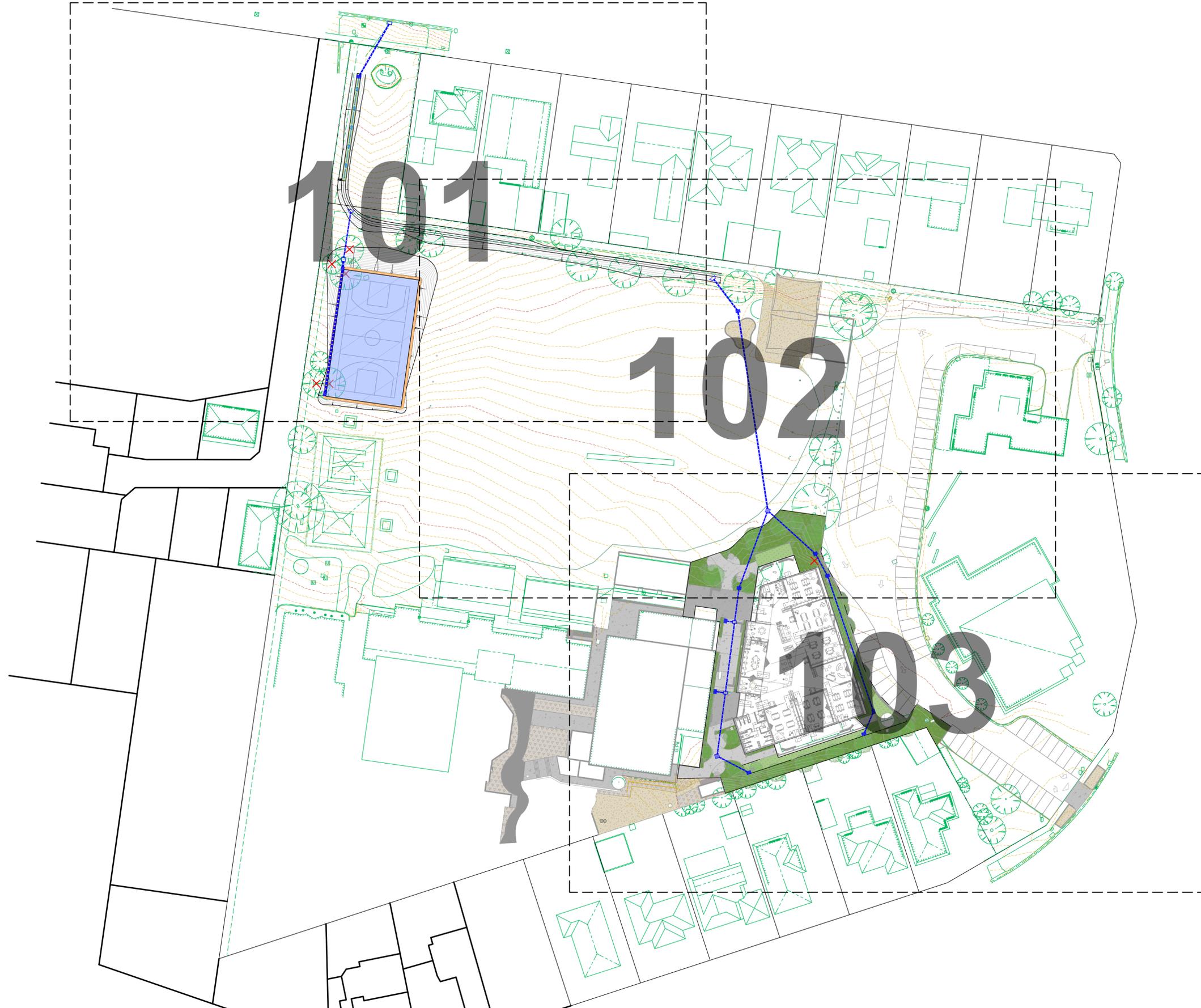
DRAWING TITLE  
TYPICAL DETAILS

CLIENT  
Y2 ARCHITECTURE

PROJECT No	DRAWING No	REVISION
230388	C010	P1

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 BALLARAT

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5 0 5 10 15 20 25m  
 SCALE 1:500 @ A1 SCALE 1:1000 @ A3  
 ORIGINAL SHEET SIZE: A1-COLOUR  
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DRAWN  
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 DESIGNED  
 J. BISH  
 DATE 20/12/23  
 APPROVED  
 DATE

PROJECT  
 OUR LADY HELP OF CHRISTIANS PS  
 28 SELBY ROAD, WARRNAMBOOL  
 DRAWING TITLE  
 KEY PLAN

CLIENT  
 Y2 ARCHITECTURE

PROJECT No	DRAWING No	REVISION
230388	C100	P1

REV	DESCRIPTION	DATE	APPROVED
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BAFFLE WALL AND ORIFICE PLATE WITHIN PIT No. 6-2 TO ACHIEVE SITE DETENTION

BIORETENTION SWALE FOR APPROXIMATELY 27m TO ACHIEVE WSUD TREATMENT

BASKET GRATED PIT

CONNECT TO EXISTING SIDE ENTRY PIT. CONFIRM LPOD

NEATLY REGRADE EXISTING SWALE DRAIN. REINSTATE GRASS SURFACE.

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 DATE

PROJECT  
 OUR LADY HELP OF CHRISTIANS PS  
 28 SELBY ROAD, WARRNAMBOOL  
 DRAWING TITLE  
 LAYOUT PLAN - SHEET 1 OF 3

CLIENT  
 Y2 ARCHITECTURE

PROJECT No	DRAWING No	REVISION
230388	C101	P1

1 0 1 2 3 4 5m  
 SCALE 1:100 @ A1 SCALE 1:200 @ A3  
 ORIGINAL SHEET SIZE: A1-COLOUR  
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REV	DESCRIPTION	DATE	APPROVED
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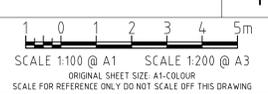
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 DATE

PROJECT  
 OUR LADY HELP OF CHRISTIANS PS  
 28 SELBY ROAD, WARRNAMBOOL  
 DRAWING TITLE  
 LAYOUT PLAN - SHEET 3 OF 3

CLIENT  
 Y2 ARCHITECTURE  
 PROJECT No 230388  
 DRAWING No C103  
 REVISION P1

REV	DESCRIPTION	DATE	APPROVED
P1	PRELIMINARY DESIGN	7/06/24	J BISH

Appendix E

# INTENSITY-FREQUENCY-DURATION TABLE

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Nearest grid cell

Latitude: 38.3875 (S)

Longitude: 142.5125 (E)

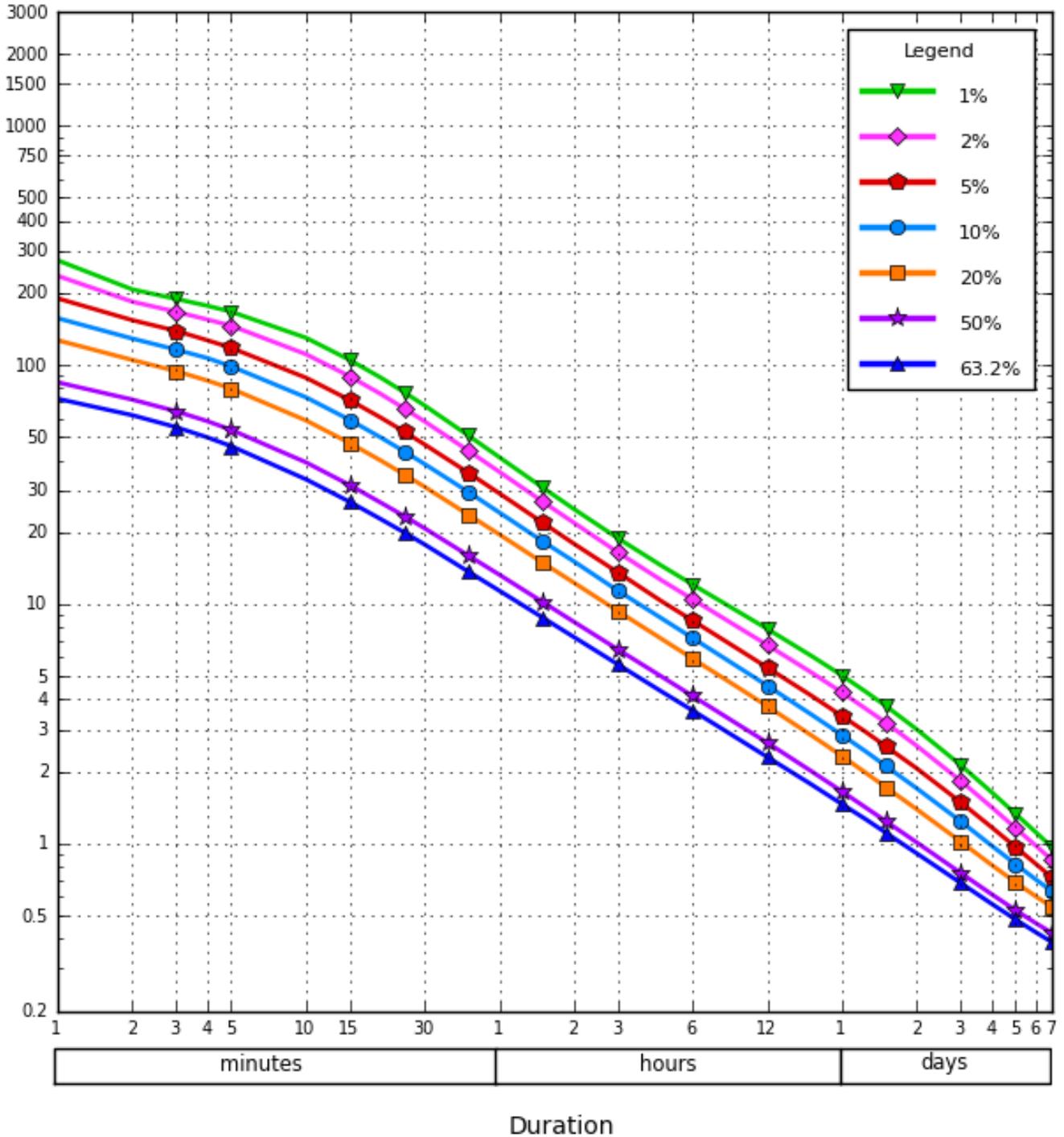
# IFD Design Rainfall Intensity (mm/h)

Issued: 18 June 2024

Rainfall intensity in millimetres per hour for Durations, Exceedance per Year (EY), and Annual Exceedance Probabilities (AEP).

Intensity  
(mm/h)

\*AEP - Annual Exceedance Probability  
\*\*EY - Exceedance per Year



Appendix F

# HYDROLOGIC AND HYDRAULIC CALCULATIONS

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AEP %	ARI
63.20%	1
50%	1.44
20%	4.48
10%	10
5%	20
2%	50
1%	100

Coefficient	63.20%	50%	20%	10%	5%	2%	1%
C0	0.1871987	0.348927	0.7562963	0.97786999	1.1670797	1.387877	1.5396854
C1	0.7877834	0.755239	0.6781786	0.6359458	0.59826732	0.45705989	0.33377391
C2	0.0077147	0.048665	0.1386095	0.18315658	0.22031206	0.38305321	0.52572602
C3	-0.0492523	-0.067525	-0.1044235	-0.1203162	-0.1321238	-0.19917877	-0.2583265
C4	0.0123868	0.016075	0.0228452	0.02521255	0.0265848	0.03913255	0.05028877
C5	-0.0012263	-0.001576	-0.0021541	-0.0022986	-0.0023321	-0.003419411	-0.004394296
C6	-0.0012263	5.63E-05	7.485E-05	7.7305E-05	7.5198E-05	0.000110591	0.000142617

Catchment	Area (ha)	Σ Area (ha)	C5%	C20%	Ae 5% (ha)	ΣAe 5% (ha)	Ae 20% (ha)	ΣAe 20% (ha)	Flow Length (m)	Velocity 5% (m/s)	Velocity 20% (m/s)	Tc 5% (mins)	Tc 20% (mins)	Intensity 5% (mm/hr)	Intensity 20% (mm/hr)	Q5% (m³/s)	Q20% (m³/s)	Q gap (m³/s)	Comments		
1	0.2404	0.2404	0.691	0.625	0.166	0.166	0.150	0.150	275.322	0.6	1	12.65	9.59	117.75	60.62	0.054	0.025	0.029	Full Proposed Catchment		
1	0.2404	0.4808	0.691	0.625	0.166	0.332	0.150	0.301	275.322	0.6	1	12.65	9.59	117.75	60.62	0.109	0.051	0.058	Full Predeveloped Catchment		

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Appendix G

# ONSITE DETENTION AND ORIFICE CALCULATIONS

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**Project Information**

Client: **Y2 Architecture**  
 Job Title: **Our Lady Help of Christians PS**  
 Job Number: **230338**  
 Job Manager: **J. Bish**  
 Discipline: **CIVIL**  
 Date: **18/06/2024**  
 Designer: **J. Bish**  
 Reviewed by: **J. Bish**

**Intensity-Frequency-Duration Information**

Locality = **WARRNAMBOOL**  
 Latitude = **38.3333 (S)**  
 Longitude = **144.3167 (E)**

Intensities are calculated with the following polynomial coefficients from Design Rainfall Data System (2016) of Bureau of Meteorology.

Coefficients	63.2%	50.0%	115mm	10.0%	5.0%	2.0%	1.0%
<b>C0</b>	0.18719865	0.34892741	0.75629628	0.97786999	1.1670797	1.387877	1.5396854
<b>C1</b>	0.78778344	0.75523871	0.67817855	0.6359458	0.59826732	0.45705989	0.33377391
<b>C2</b>	0.007714728	0.048664693	0.13860948	0.18315658	0.22031206	0.38305321	0.52572602
<b>C3</b>	-0.04925229	-0.06752487	-0.10442353	-0.12031616	-0.13212381	-0.19917877	-0.2583265
<b>C4</b>	0.012386833	0.016074823	0.022845227	0.025212552	0.026584797	0.03913255	0.05028877
<b>C5</b>	-0.00122632	-0.001576	-0.0021541	-0.00229861	-0.0023321	-0.00341941	-0.0043943
<b>C6</b>	-0.00122632	5.62559E-05	7.48472E-05	7.7305E-05	7.5198E-05	0.000110591	0.000142617

DepthP -  $e^{(C0 + C1 \ln(T) + C2 \ln(T)^2 + C3 \ln(T)^3 + C4 \ln(T)^4 + C5 \ln(T)^5 + C6 \ln(T)^6)}$  (in mm)  
 intensity (mm/hr) = depth (mm) / duration (hour)

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Design Criteria

Location =	WARRNAMBOOL
Permissible Site Discharge AEP =	10%
Storage AEP =	5%
Catchment Area (A) =	0.1994 ha
Runoff Coefficient =	0.5
Restricted outflow requirement =	0.018 m <sup>3</sup> /s
100 Year Effective Catchment Area =	0.10 ha

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Boyd's Calculation Method

$$S_{max} = V_1 \left( 1 - \frac{Q_p}{I_p} \right)$$

Where

S<sub>max</sub> =

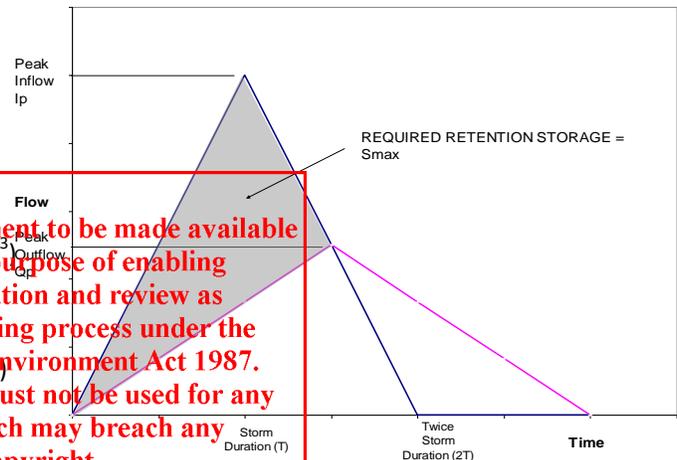
Maximum Volume of Temporary Storage (m<sup>3</sup>)

V<sub>1</sub> = Volume of inflow stormwater (m<sup>3</sup>)

Q<sub>p</sub> = Peak discharge of inflow hydrograph (m<sup>3</sup>/s)

I<sub>p</sub> = Peak discharge of outflow hydrograph (m<sup>3</sup>/s)

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Site Storage Requirement

Storage requirement is highest value of S<sub>max</sub> calculated in the table below. Critical storm duration is the storm duration when S<sub>max</sub> occurs

Tc (min)	Intensity (mm/hr)	I <sub>p</sub> (m <sup>3</sup> /s)	Q <sub>p</sub> (m <sup>3</sup> /s)	V <sub>1</sub> (m <sup>3</sup> )	S <sub>max</sub> (m <sup>3</sup> )
5	120.2072	0.03	0.02	10	4.59
10	89.93235	0.02	0.02	15	4.14
15	72.60358	0.02	0.02	18	1.90
20	61.30038	0.02	0.02	20	-1.23
25	53.31562	0.01	0.02	22	-4.85
30	47.35852	0.01	0.02	24	-8.79
45	35.99999	0.01	0.02	27	-21.68
60	29.46416	0.01	0.02	29	-35.42
90	22.14868	0.01	0.02	33	-64.08
120	18.09731	0.01	0.02	36	-93.51

Therefore, the required storage volume for the site is = 4.59 m<sup>3</sup>

Overflow/Weir Wall Level = 27.8

**Pipe Volume Equation**

$$V_{pipe} = \pi \left(\frac{d}{2}\right)^2 h$$

Where  $Q_u$  = Permissible Site Discharge  
 h = Length of Pipe

**150mm Pipe**

d = 150 mm  
 h = 0 m

V = 0.00 m<sup>3</sup>

**225mm Pipe**

d = 225 mm  
 h = 0 m

V = 0.00 m<sup>3</sup>

**300mm Pipe**

d = 300 mm  
 h = 0 m

V = 0.00 m<sup>3</sup>

**375mm Pipe**

d = 375 mm  
 h = 0 m

V = 0.00 m<sup>3</sup>

**450mm Pipe**

d = 450 mm  
 h = 32.05 m

V = 5.10 m<sup>3</sup>

**525mm Pipe**

d = 525 mm  
 h = 0 m

V = 0.00 m<sup>3</sup>

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**Pit Volume Equation**

$$V_{pit} = L \times W \times H$$

Where L = Length of pit  
 W = Width of pit  
 H = Height of pit

**900x900 Pit**

L = 900 mm  
 W = 300 mm  
 H = 1500 mm

Number of pits = 1 units

V = 0.405 m<sup>3</sup>

**900x600 Pit**

L = 900 mm  
 W = 600 mm  
 H = 500 mm

Number of pits = 2 units

V = 0.54 m<sup>3</sup>

Total Volume Required = 4.59 m<sup>3</sup>

Total Volume Provided = 6.04 m<sup>3</sup> OK

Orifice Equation

$$Q_u = C_d \times A_o \times \sqrt{2 \times g \times h}$$

Where

- Q<sub>u</sub> = Permissible Site Discharge
- C<sub>d</sub> = Orifice Coefficient
- g = Gravitational Acceleration
- h = Height above orifice

	C <sub>d</sub>
Sharp Edge	0.61
Rounded Edge	0.98
Short Tube	0.80
Borda	0.51

Pit 1-2

- Q<sub>u</sub> = 18 L/s
- C<sub>d</sub> = 0.61 Sharp Edge
- g = 9.81 m/s<sup>2</sup>
- h = 1500 mm to invert of outlet pipe

Solve for A<sub>o</sub> = 5439.4 mm<sup>2</sup>

Where  $A_o = \frac{\pi D^2}{4}$

Solve for D = 83.2 mm

Therefore, use an orifice of 80mm

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