STORMWATER MANAGEMENT PLAN

25th August 2023

CAROLINE CHISOLM CATHOLIC COLLEGE

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Issue PB – 25th August 2023

1. INTRODUCTION

This report has been prepared by BYP Consulting Structural and Civil Engineers in support of a Town Planning Submission to Maribyrnong City Council, for a new Vet and Stem Building and associated underground carparking at 204 Churchill Avenue Braybrook, Victoria for Stages 1.1 and 1.2.

Stage 1.1 involves construction of a new building and associated landscape over an existing crushed rock sealed carpark, and demolition of a building, referred to as Stage 1.1, refer aerial below.

Stage 1.2 involves replication of the existing sports arena at ground level after construction of a basement car park under the existing sports field, and a rework of the existing car zone to the East to improve pickup/drop off capabilities, then reinstatement of the sports field.

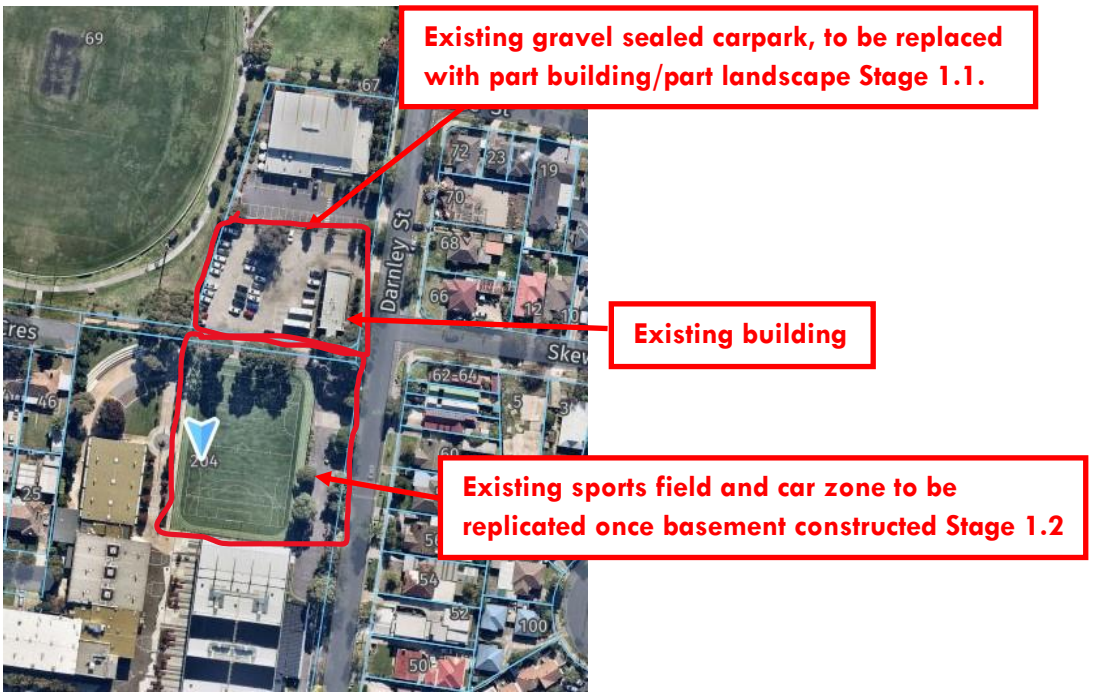


Figure 1: Site location- Adjoins Darnley Street, Braybrook.

2. EXISTING CONDITIONS.

For Stage 1.1 the site has natural fall to Darnley Street (East). The intention is that this will be maintained. The site has stormwater drainage infrastructure existing, and given that the runoff will be similar, it is intended that we connect to existing drainage infrastructure.

For Stage 1.2 the sports field falls to the East to a concrete spoon drain and collection pits that connect to an underground stormwater system. The existing adjoining car zone, similarly, falls to the East and is drained via kerbs and pits connected to the existing drainage infrastructure.

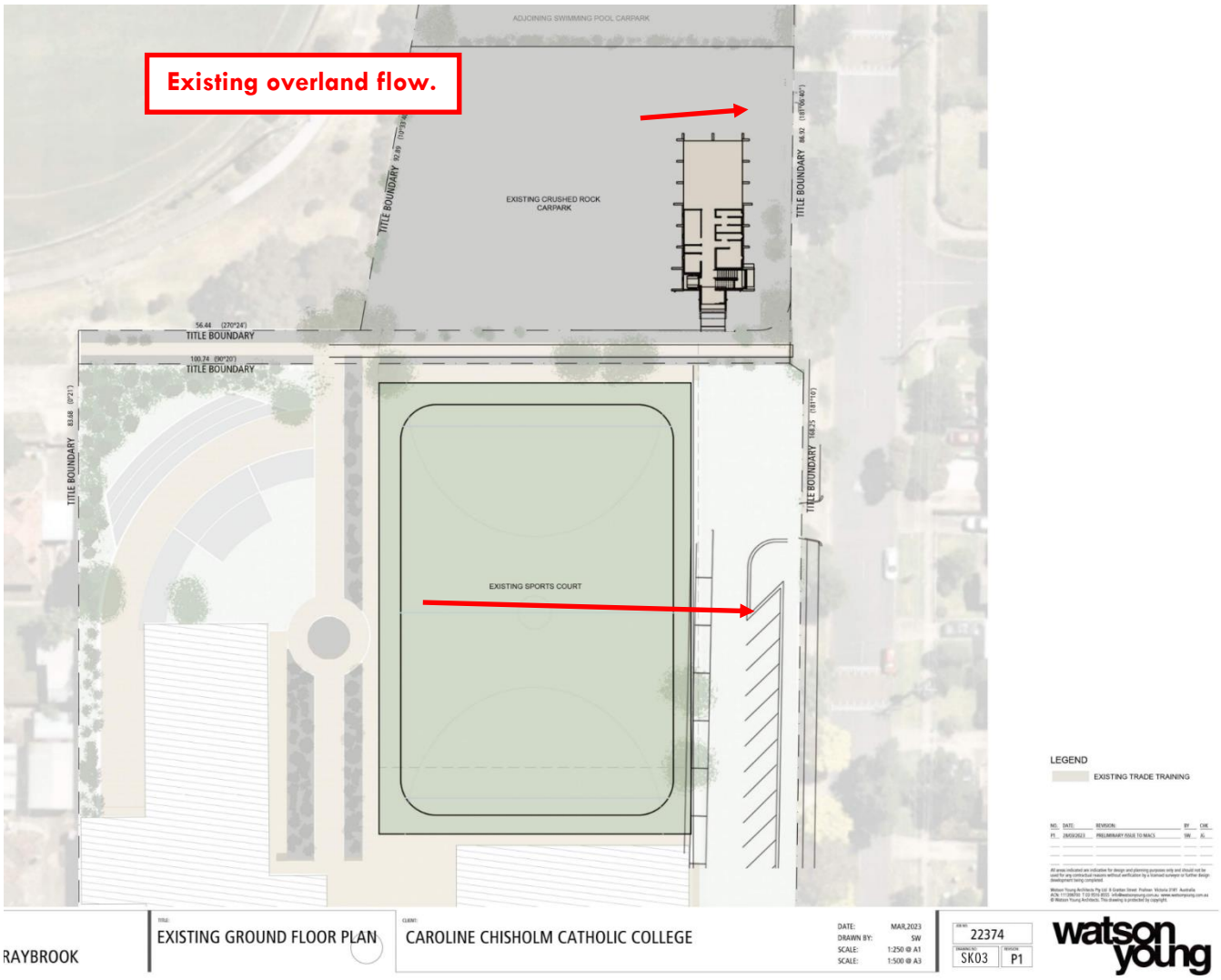


Figure 2: Existing Conditions – Showing existing carpark, and building – Stage 1.1.

3. PROPOSED CONDITIONS.

As can be seen from the proposed site plan, Stage 1.1 involves the existing car park and building to be replaced with a 2-storey building with basement carparking and perimeter landscaping. Given that there is no landscaping at present, it is an improvement on the current situation, and a Spell system is to be incorporated to treat the building and hard surfaces runoff, which will dramatically improve the water treatment relative to the current situation and achieve best practice targets. A 6000 litre RWT is also incorporated for water re-use.

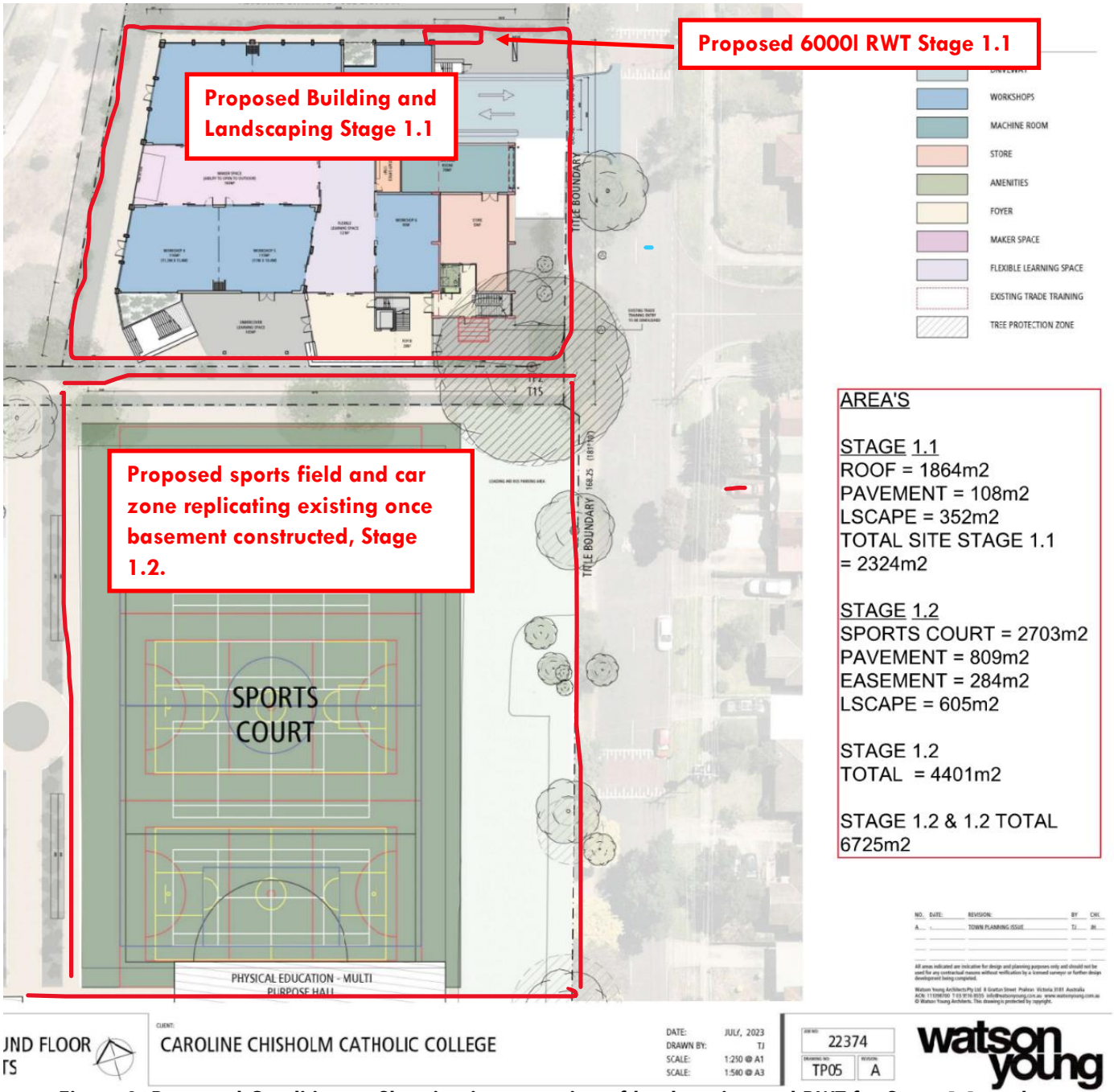


Figure 3: Proposed Conditions – Showing incorporation of landscaping and RWT for Stage 1.1, and Replication of The Existing Sports field and Car Zone for Stage 1.2.

4. OVERLAND FLOW AND LPD

Stage 1.1 has a natural fall to Darnley Street (East). The intention is that this will be maintained. The site has stormwater drainage infrastructure existing and given that the proposal is to transform a car park into a building footprint with landscaping, it is regarded as an improvement. The intent is to replace a compacted gravel car park to landscaping with a building component, the existing stormwater infrastructure will be connected to, and hence be the LPD.

The internal drainage will be sized to convey flows to the existing stormwater infrastructure, and overland flow more than the piped capacity will be directed East to Darnley Street.

Stage 1.2 will replicate the current situation with fall to the East, and the sports field and car zone to be drained as per existing and connected to existing infrastructure.

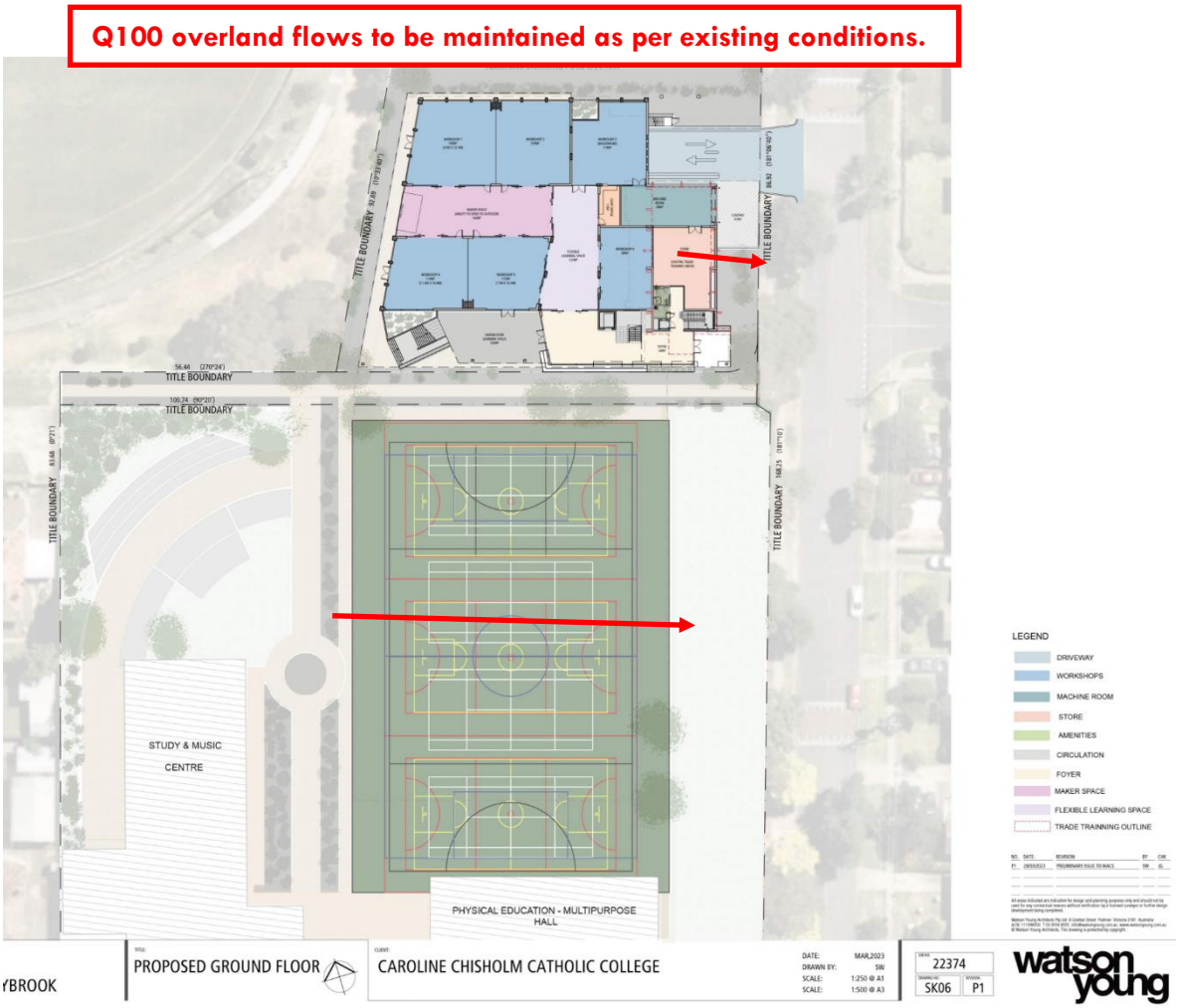


Figure 4: Overland Flow Status Quo Maintained.

5. FLOOD LEVEL AND DRAINAGE LAYOUT

Reviewing Vic Plan, it suggests that the site is not subject to flooding, but that it also be confirmed with the Maribyrnong Council.

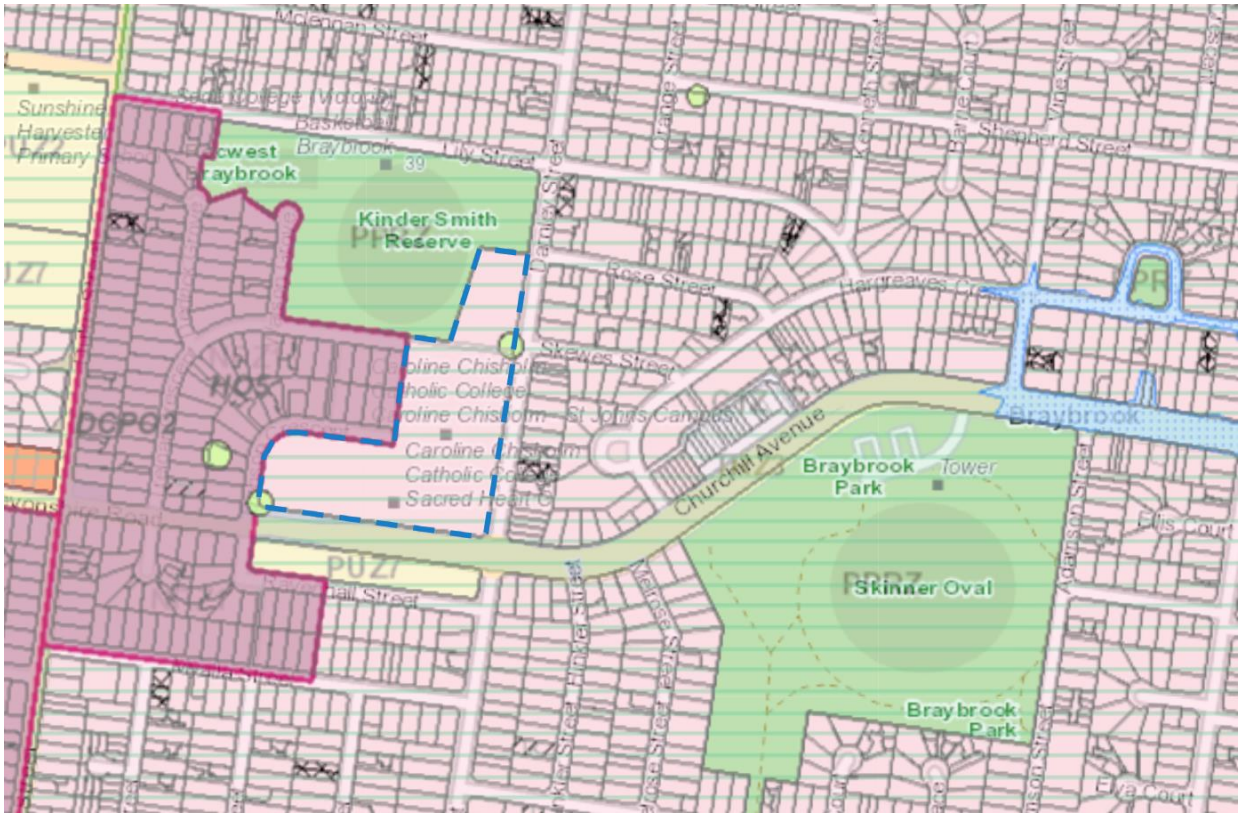


Figure 5: Vic Plan Flooding Overlay.

6. STAGE 1.1 AND 1.2 DETENTION.

STAGE 1.1
ROOF = 1864m2
PAVEMENT = 108m2
LSCAPE = 352m2
TOTAL SITE STAGE 1.1
= 2324m2

Given that the existing crushed rock car park is being replaced with a building OSD (On Site Detention) calculations have been performed due to the slight increase in runoff, resulting in 30.3 cubic metres of underground storage required – see attached Storm Detention Report on next page.

Stage 1.1 Detention Continued

STORM Report

OSD Design Summary Report

Method used for OSD calculations: SWINBURNE METHOD

OSD System Specified: Humes concrete Below ground pipe

Site Details	Area (m ^{2})	Runoff Coefficient
Pre-development impervious area	177	1
Pre-development pervious area	2149	0.4
Post-development impervious area	1980	1
Post-development pervious area	346.00	0.3
Uncontrolled impervious area	0	1
Uncontrolled pervious area	346	0.3

	Pre-development	Post-development	Uncontrolled
Total Site Area (m ^{2})	2326	2326	346
Weighted Runoff Coefficient	0.45	0.9	0.3

Catchment Times (minutes):

Time of concentration of catchment (Tc):	20 mins
Time of concentration of catchment to site outlet (Tcs):	10 mins
Time of concentration of site outlet to catchment outlet (Tso):	10 mins

Storage Design:

Storage Type:	Below ground pipe	
Rainfall Zone:	Latitude: -37.786433	Longitude: 144.8491447
AEP for PSD (%):	20	
AEP for OSD (%):	10	

Storm Duration and Intensity:

Flow:	Tc (mins): 20	I (mm/hr): 46.87
Storage:	Td (mins): 32.7	I (mm/hr): 42.33

Flow Calculations and Storage Details:

Pre-development peak site inflow (L/s):	12.15
Uncontrolled peak site inflow (L/s):	1.35
Post-development peak site inflow for PSD (L/s):	54.26
Post-development peak site inflow for OSD (L/s):	49
Calculated PSD (L/s):	14.86
Nominated PSD (L/s):	14.86
Required Storage Volume (m ^{3}):	30.28
Climate Change Adjustment (% change from required storage volume):	No climate change adjustment
Adjusted Required Storage Volume (m ^{3}):	30.28

Stage 1.2 - Detention

Stage 1.2 relates to the sports field, and the intent is that the existing sports field and associated car zone is to be replicated as per existing conditions once the basement is built, and that the existing drainage infrastructure be utilized, hence no increase in runoff and maintain existing concept, hence no detention required.

7. STAGE 1.1 AND 1.2

WSUD INITIATIVES & ACHIEVEMENT OF BEST QUALITY TARGETS.

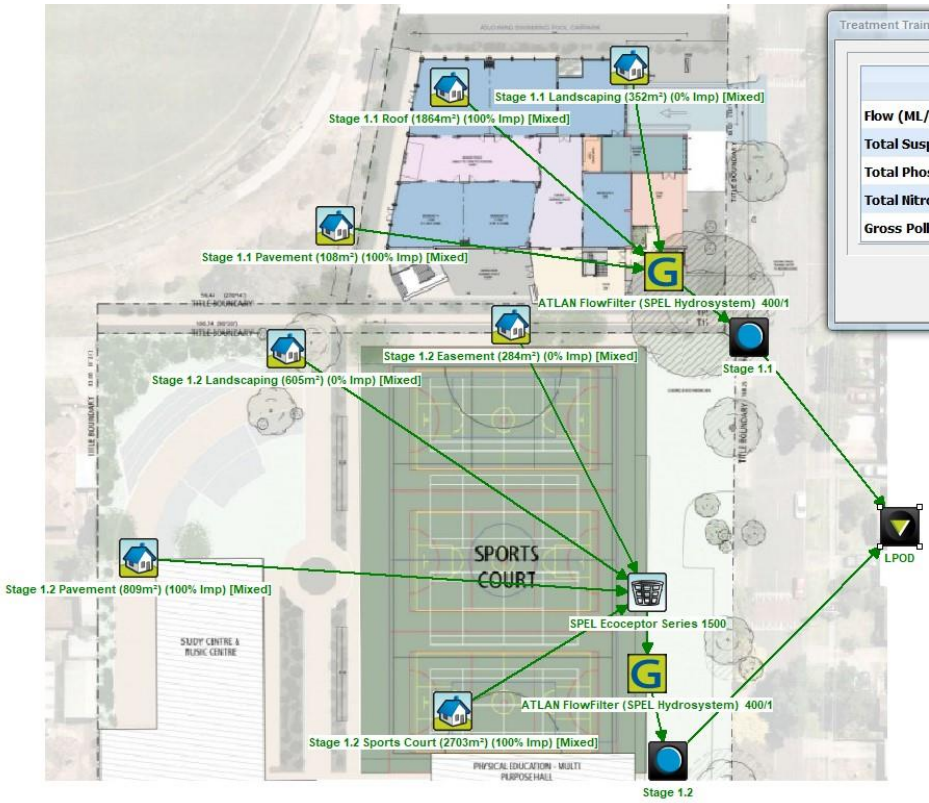
BYP has undertaken the review of the proposed site plan for the proposed development and prepared the civil engineering high level concept design for the proposed stages 1.1 and 1.2.

This MUSIC (Model for Urban Stormwater Improvement Conceptualization) modelling report has been prepared as part of the Water Sensitive Urban Design (WSUD) measures to achieve stormwater quality filtration targets of the development site.

The treatment train has been especially designed so that it can be implemented to support the 2 existing discharge points, and staging of the development, but yet still meet the desired targets when completed.

A stormwater quality treatment train using mainly biofiltration systems has been developed and modelled to determine the effectiveness of the proposed drainage system to achieve the relevant water quality objectives. The catchment data and meteorological data gathered for the site area including conceptualizing the possible stormwater pollution targets and mitigation requirements within the scope of the project and economic viability.

Treatment Trains Stage 1.1 and Stage 1.2



Treatment Train Effectiveness - LPOD

	Sources	Residual Load	% Reduction
Flow (ML/yr)	2.62	2.62	0
Total Suspended Solids (kg/yr)	312	53.7	82.8
Total Phosphorus (kg/yr)	0.707	0.135	80.8
Total Nitrogen (kg/yr)	5.64	2.81	50.1
Gross Pollutants (kg/yr)	93.9	4.6	95.1

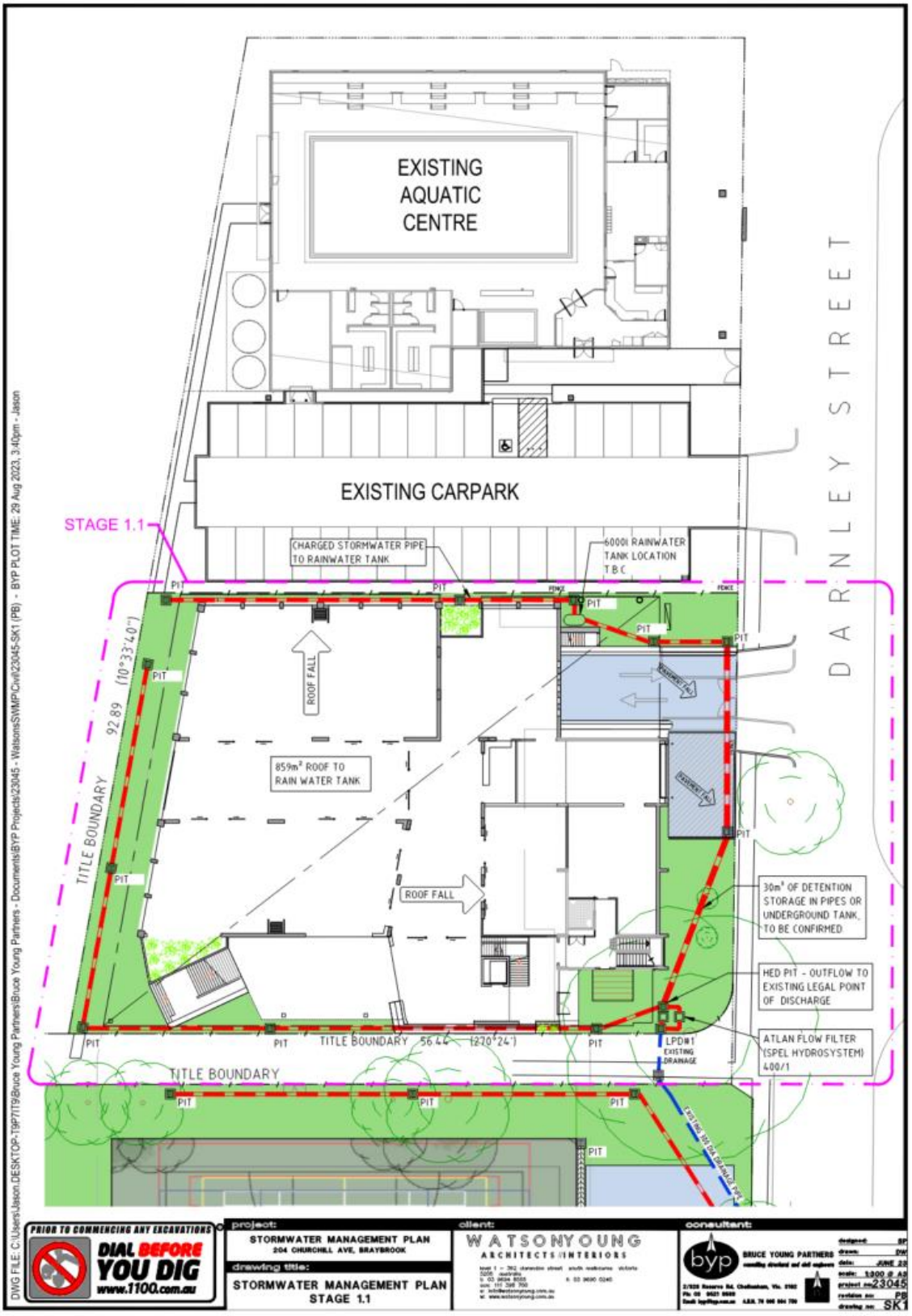


Figure 6 - Proposed Stormwater Concept Stage 1.1

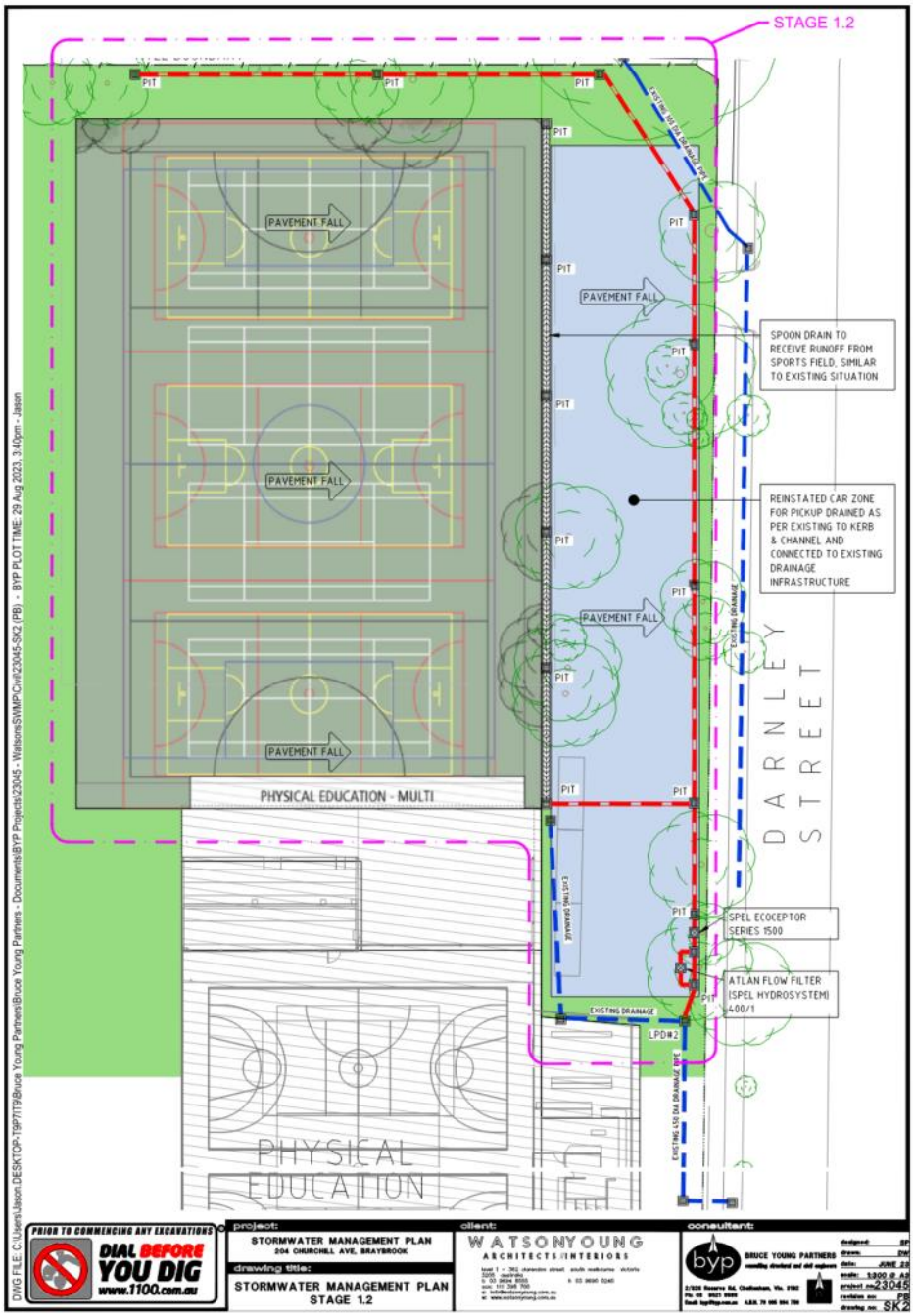


Figure 7 - Proposed Stormwater Concept Stage 1.2

Yours faithfully,

Stewart Pullin

Managing Director

B Eng(Honours) MIE Aust. NPER 3, RPEQ, Grad Dip(Prop) PE03541

ADVERTISED PLAN

EXISTING AQUATIC CENTRE

EXISTING CARPARK

STAGE 1.1

CHARGED STORMWATER PIPE TO RAINWATER TANK

6000l RAINWATER TANK LOCATION T.B.C.

PIT

FENCE

ROOF FALL

859m² ROOF TO RAIN WATER TANK

PAVEMENT FALL

TITLE BOUNDARY 92.89 (10°33'40")

TITLE BOUNDARY 56.44 (270°24')

TITLE BOUNDARY

30m³ OF DETENTION STORAGE IN PIPES OR UNDERGROUND TANK, TO BE CONFIRMED.

HED PIT - OUTFLOW TO EXISTING LEGAL POINT OF DISCHARGE

ATLAN FLOW FILTER (SPEL HYDROSYSTEM) 400/1

LPD#1 EXISTING DRAINAGE

EXISTING 300 DIA DRAINAGE PIPE

DARNLEY STREET

DWG FILE: C:\Users\Jason.DESKTOP-T9P7IT9\Bruce Young Partners\Bruce Young Partners - Documents\BYP Projects\23045 - WatsonsSWMP\Civil\23045-SK1 (PB) - BYP PLOT TIME: 29 Aug 2023, 3:40pm - Jason

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project:
STORMWATER MANAGEMENT PLAN
204 CHURCHILL AVE, BRAYBROOK

drawing title:
STORMWATER MANAGEMENT PLAN
STAGE 1.1

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designed: SP
drawn: DW
date: JUNE 23
scale: 1:300 @ A3
project no: 23045
revision no: PB
drawing no: SK1

STAGE 1.2

PIT
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EXISTING 300 DIA DRAINAGE PIPE

PAVEMENT FALL
PAVEMENT FALL
PAVEMENT FALL
PAVEMENT FALL
PAVEMENT FALL

SPOON DRAIN TO RECEIVE RUNOFF FROM SPORTS FIELD, SIMILAR TO EXISTING SITUATION

REINSTATED CAR ZONE FOR PICKUP DRAINED AS PER EXISTING TO KERB & CHANNEL AND CONNECTED TO EXISTING DRAINAGE INFRASTRUCTURE

EXISTING DRAINAGE
EXISTING DRAINAGE
EXISTING DRAINAGE

SPEL ECOCEPTOR SERIES 1500

ATLAN FLOW FILTER (SPEL HYDROSYSTEM) 400/1

LPD#2

EXISTING 450 DIA DRAINAGE PIPE

PHYSICAL EDUCATION - MULTI

PHYSICAL EDUCATION

DARLEY STREET

project:
STORMWATER MANAGEMENT PLAN
204 CHURCHILL AVE, BRAYBROOK

drawing title:
STORMWATER MANAGEMENT PLAN
STAGE 1.2

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