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WATER SENSITIVE URBAN DESIGN REPORT

Civil Engineering

**429 Albert Street, Brunswick - Brunswick Apartment
Stockland**

CONFIDENTIAL

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NDY
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VERIFICATION

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1 INTRODUCTION

1.1 BACKGROUND

This Water Sensitive Urban Design (WSUD) report is submitted to Merri-bek Council on behalf of Stockland (the Applicant), to support a Town Planning Application for the development of a residential development at 429 Albert Street, Brunswick.

1.2 THE SITE

The project is located at 429 Albert Street, Brunswick and is bound by Albert Street on the south, Clifton Park on the east, and existing buildings to the north and west. Refer **Figure 1** below.

The existing site is currently vacant.

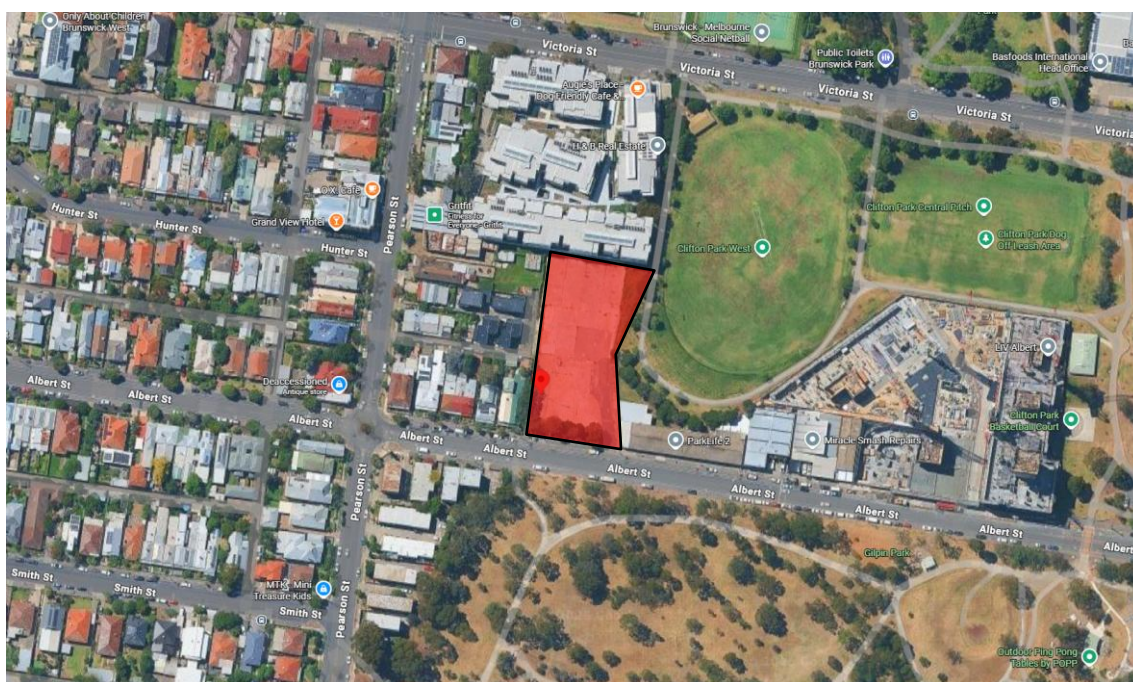


Figure 1 – Aerial image of the site

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2 STORMWATER QUALITY

The quality of runoff from a catchment depends upon many factors such as land use, degree of urbanisation, population density, sanitation, waste disposal practices, landform, soil types, and climate. Pollutants typically transported by runoff include litter, sediment, nutrients, oil, grease, and heavy metals. Whilst all these pollutants have a negative impact on the receiving water quality, suspended solids and nutrients cause the highest detrimental impact to the environment.

2.1 STORMWATER QUALITY TARGETS

Merri-bek Council aims to achieve the best practice stormwater quality outcomes. As such, the proposed development will be adopting the water quality performance targets as required by the Best Practice Environmental Management (BPEM) Guidelines for Urban Stormwater as outlined in the below table.

Table 5.1: Water Quality Performance Targets

POLLUTANT	POST-DEVELOPMENT ANNUAL LOAD REDUCTION
Total Suspended Solids (TSS)	80%
Total Phosphorus (TP)	45%
Total Nitrogen (TN)	45%
Gross Pollutant (GP)	70%

2.2 MODEL PARAMETERS

The following parameters shown in Tables 2.2, 2.3, and 2.4 were stipulated from current Melbourne Water's MUSIC guidelines (July 2024) and is subject to updates as advised by Melbourne Water.

Table 2.2. Meteorological and Rainfall and Runoff Data

PARAMETER	VALUE
Rainfall station	86282 – Melbourne Airport
Time step	6 minutes
Modelling period	1987-1996
Mean annual rainfall	574 mm
Evapotranspiration	1047 mm

2.2.1 CATCHMENT PARAMETERS

The site catchments have been modelled as urban source nodes due to the proposed land use. All other parameters are based off recommendations from Melbourne Water (July 2024).

Table 2.3: Rainfall Runoff Parameters

PARAMETER	ALL NODES
Rainfall threshold (mm)	1.0

PARAMETER	ALL NODES
Soil storage capacity(mm)	120
Initial storage	25
Field capacity (mm)	50
Infiltration capacity coefficient a	200
Infiltration capacity coefficient b	1
Initial depth (mm)	10
Daily recharge rate (%)	25
Daily base flow rate (%)	5
Daily deep seepage rate (%)	0

2.2.2 POLLUTANT GENERATION PARAMETERS

The following table describes pollutant generation parameters given by Melbourne Water (July 2024) to apply in MUSIC for each of the catchment types as part of the stormwater quality modelling.

Table 2.4 Pollutant Generation Parameters

Pollutant	Surface Type	Storm Flow (log mg/L)		Base Flow (log mg/L)	
		Mean	SD	Mean	SD
TSS	Roof	1.301	0.333	n/a	n/a
	Road	2.431	0.333	n/a	n/a
	All other urban areas	1.882	0.333	0.96	0.401
TP	Roof	-0.886	0.242	n/a	n/a
	Road	-0.301	0.242	n/a	n/a
	All other urban areas	-0.680	0.242	-0.731	0.360
TN	Roof	0.301	0.205	n/a	n/a
	Road	0.342	0.205	n/a	n/a
	All other urban areas	0.224	0.205	0.346	0.309

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2.3 MUSIC RESULTS

The results for the MUSIC model are summarized below in Figure 5.5. As shown in table below all reduction targets can be met and exceeded using the proposed treatment train.

	Sources	Residual Load	% Reduction
Flow (ML/yr)	2.57	1.93	25
Total Suspended Solids (kg/yr)	226	42.1	81.4
Total Phosphorus (kg/yr)	0.611	0.249	59.3
Total Nitrogen (kg/yr)	5.35	2.31	56.8
Gross Pollutants (kg/yr)	103	6.48	93.7

Figure 2 – MUSIC Model Results

2.4 DESIGN PROCESS

Modelling of the proposed layout was carried out in MUSIC. Below is a schematic diagram of the treatment train model indicating catchment areas and proposed treatment devices. A concept drainage layout detailing the proposed stormwater quality improvement strategy is attached in **Appendix A**.

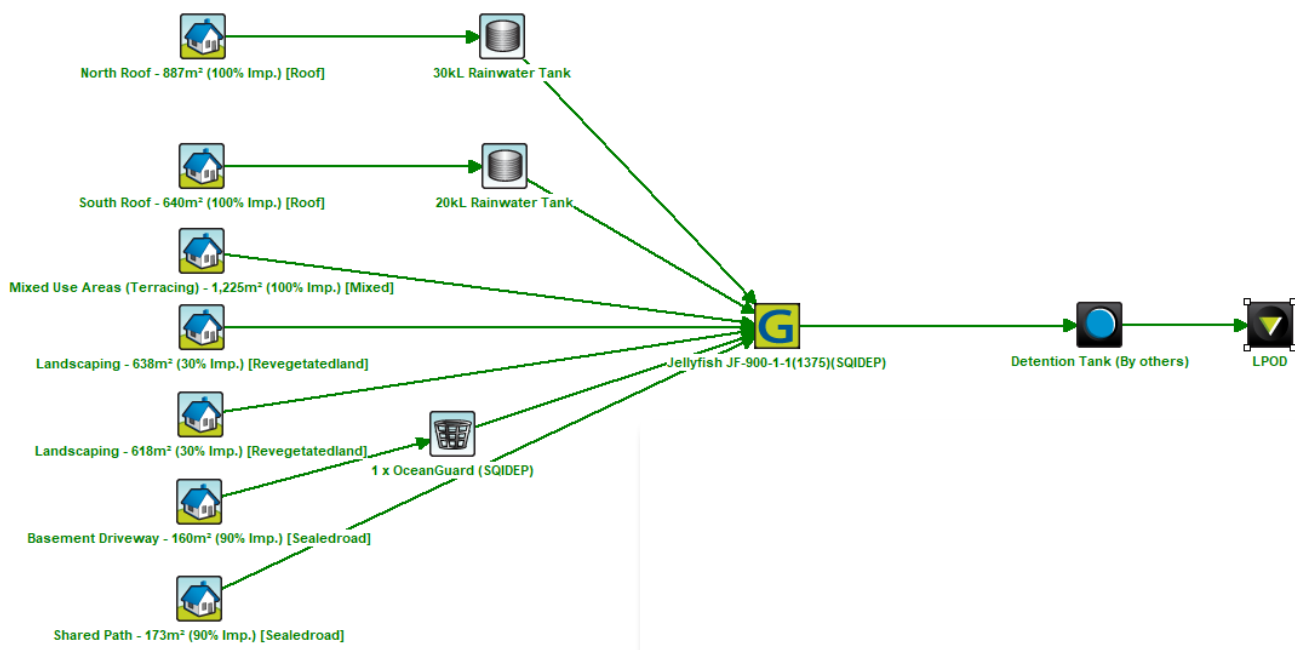


Figure 3 – Schematic Diagram of Treatment Train Model

The MUSIC modelling demonstrated that the required targets for stormwater quality can be achieved using a treatment train consisting of a rainwater tank and propriety stormwater treatment devices.

Table 5.6 Proposed Stormwater Quality Treatment Devices

STORMWATER QUALITY DEVICE	QUANTITY/SIZE
Rainwater Tank	1 x 30kL & 1 x 20kL (50kL total)
Landscape Irrigation area	850 m ²
Indicative Irrigation Rate	20 L/m ² /week
OceanGuard with 200µm mesh bags (OG-200)	1
JellyFish JF900-1-1(1375) 460mm Head	1

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3 CONCLUSIONS AND RECOMMENDATIONS

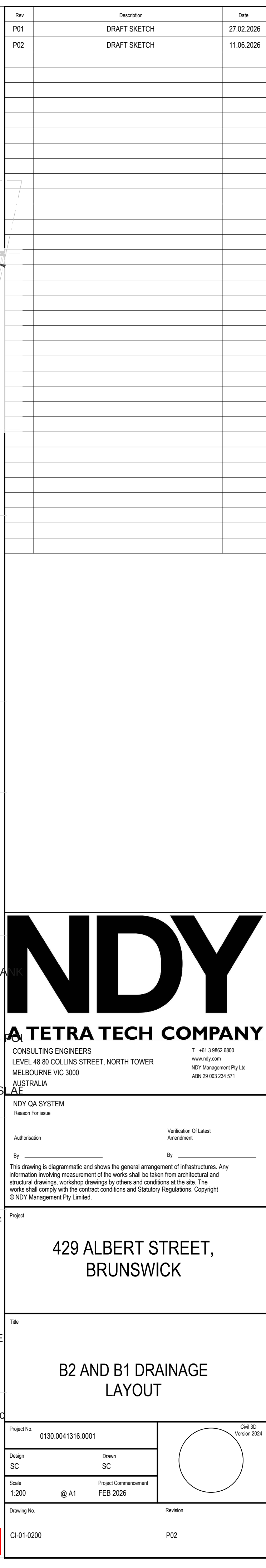
No reasonably foreseeable risk of damage to downstream properties is concluded, based on the proposed design, low potential for significant impacts, and the proposed treatment measures. It is noted that the developer must construct as per the approved plans and take all reasonable steps to ensure that site works do not result in an actionable nuisance.

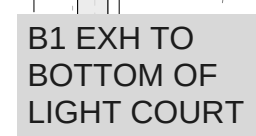
Based on the investigation undertaken, it can be concluded that the proposed water sensitive urban design and treatment measures demonstrate that stormwater pollutant reduction targets set out in the Best Practice Environmental Management Guidelines are met with a low potential for adverse impacts to neighbouring and downstream properties.

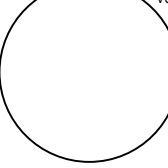
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4 APPENDIX A – CONCEPT DRAINAGE LAYOUT

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Title		
GROUND DRAINAGE LAYOUT		
Project No: 0130.0041316.0001		Civil 3D Version 02/24
Design SC Drawn SC		
Scale 1:200 @ A1 Project Comment: FEB 2025		
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