Report

Civil Design Report

277 The Grand Parade, Ramsgate Beach

SCP Ref: S220042-CV-RP-01

Client Bronxx Pty Ltd

Project 277 The Grand Parade, Ramsgate Beach

Date 19 January 2025

Revision table

Rev #	Date	Issue description	Prepared by	Reviewed by	Issued by
A	08/12/23	Re-issued for Development Application	KZ	DY	KZ
B	21/12/23	Report Update	KZ	DY	KZ
C	06/12/24	Updated for DA Re-Submission	BA	AV	BA
D	19/01/25	Updated for DA Re-Submission	AV	BA	AV

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1 Introduction

SCP Consulting has been engaged by Bronxx Pty Limited to prepare a Civil Stormwater Development Application (DA) Report for the proposed development at 277 The Grand Parade, Ramsgate Beach.

1.1 Background

The development site is located at 277 The Grand Parade, Ramsgate Beach and lies within the Bayside Council Local Government Area (LGA). The site is bound by The Grand Parade to the East, a council parking lot to the North, residential buildings to the South and commercial buildings to the West. The site currently accommodates a single-storey Coles supermarket and parking lot. Refer to Figure 1 for an aerial view of the development site boundary.

Figure 1 - Aerial View of Site Boundary (Source: - Bayside Council Intramaps)

2 Existing Site

A desktop review was carried out in order to determine the existing drainage infrastructure within the development site. The inspection revealed the following:-

- Bayside Council's Intramaps shows stormwater pipe reticulation within the existing Council parking lot reticulating in a northern direction to discharge into Botany Bay;
- Google street view and the site survey further confirms the presence of existing stormwater pits fronting the development site, within the Council parking lot, in Ramsgate Road and in The Grand Parade, and;
- The stormwater from the existing site appears to connect to an existing stormwater pit in The Grand Parade that discharges directly into Botany Bay.

Refer to Figure 2 and Figure 3 for the existing stormwater infrastructure.

Figure 2 – Existing Stormwater Infrastructure (Source: Bayside Council Intramaps)

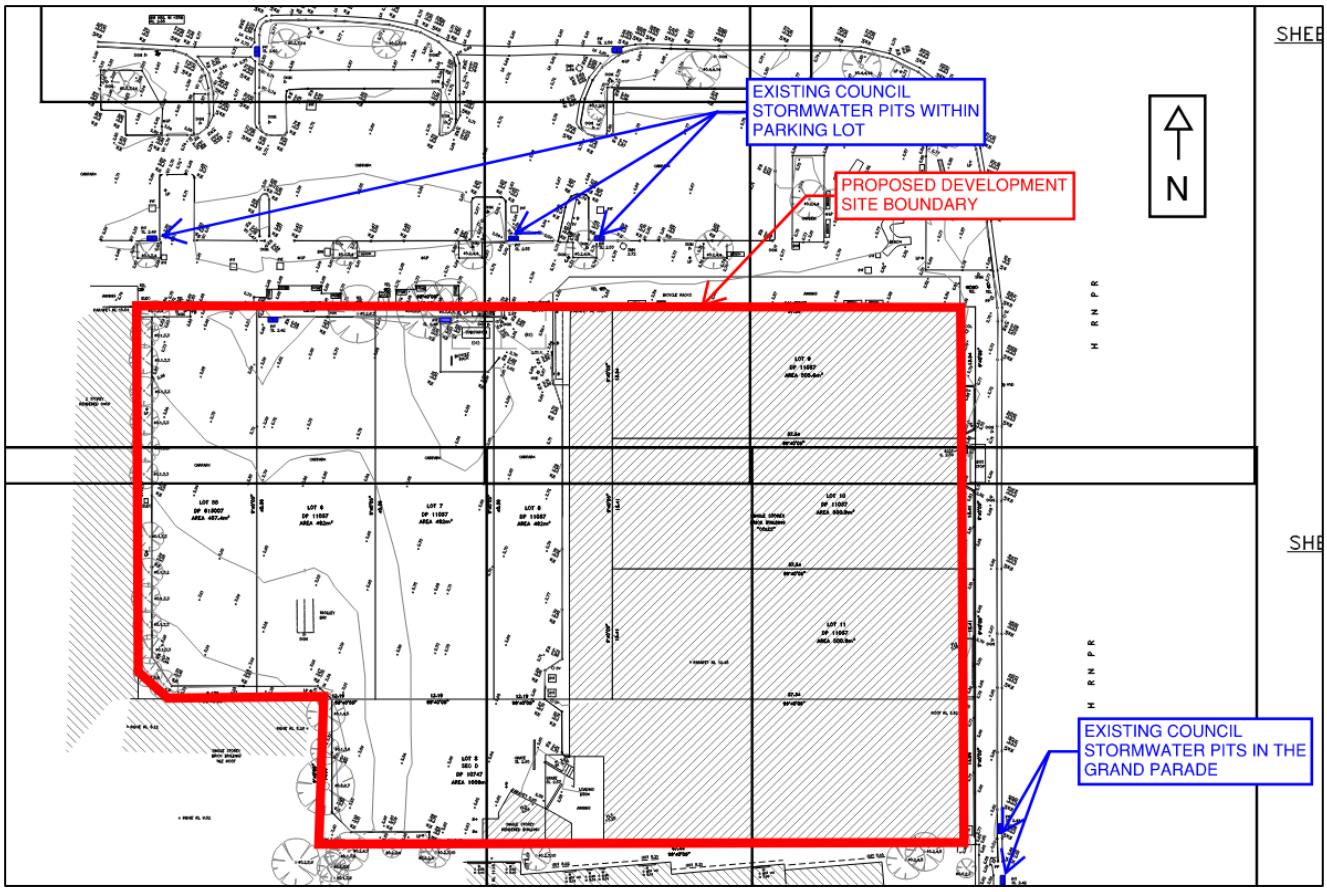

Figure 3 – Existing Stormwater Infrastructure (Source: Citisurv)

3 Proposed Development

The proposed development is a six-storey building with an additional three basement levels for car parking. Primary access to the building will be from Ramsgate Road into the residential lobbies, supermarket and other retail stores. Vehicular access to basement parking and the loading docks will also be provided from Ramsgate Road.

Refer to Figure 4 for the proposed development ground floor layout.

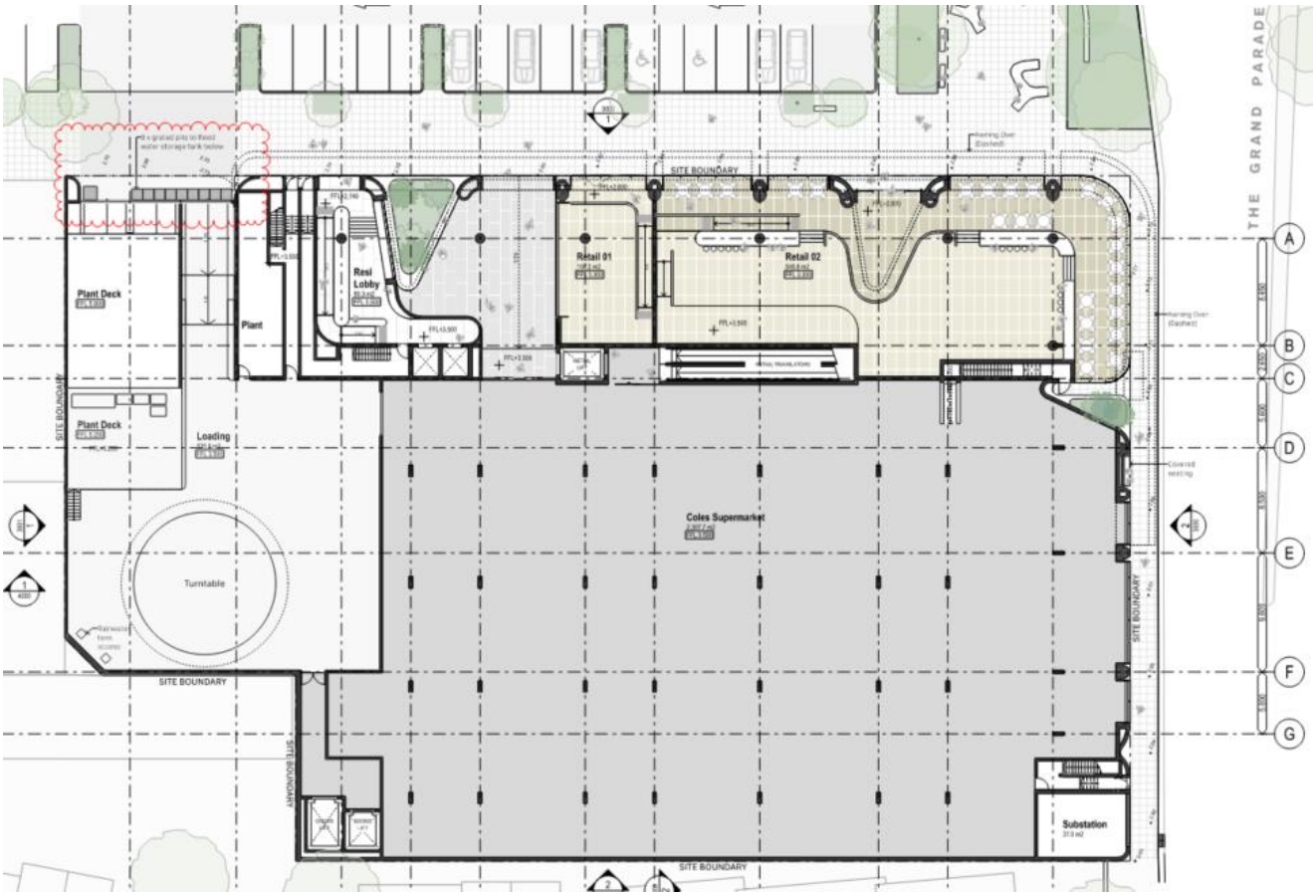

Figure 4 - Proposed Ground Floor Plan (Source: FJCStudio – 2000 [05])

4 Civil Services

4.1 Purpose of this Document

The purpose of this document is to describe the Civil stormwater services in relation to the mixed use development at 277 The Grand Parade, Ramsgate Beach.

4.2 Reference Documents

This report is based on the following reference documents

- Survey Plan by CitiSurv Pty Ltd, undertaken 31/05/2022
- fjcstudio Architecture DA Drawing Set, Dated 20/09/2024
- Dial Before You Dig

4.3 Civil Scope of Work

The Civil Services scope of work consists of the following

- Proposed connections to Council stormwater drainage system
- Proposed stormwater drainage design works
- WSUD requirements, and
- Sediment and erosion control

The Civil scope for proposed stormwater drainage is comprised of the stormwater quality system, on-site flood storage tanks and connection to the property “Legal Point of Discharge” (Council’s stormwater pit and pipe network). For stormwater drainage associated with suspended slabs, refer to the Hydraulic Engineer’s design documentation.

4.4 Limitations

This report is based primarily on the information provided by the architect, design team, survey drawings, Dial Before You Dig data, and information communicated during the design development process. Any assumptions made through the design process have been communicated in this report.

4.5 Design Criteria

Table 1: Civil Design Criteria

ITEM	DESIGN CRITERIA
Stormwater Drainage	Australian Rainfall and Runoff (ARR) 2019 AS/NZS 3500.3-2022 – Stormwater Drainage Bayside Technical Specification Stormwater Management
Stormwater Quality	NSW MUSIC modelling Guidelines Bayside Technical Specification Stormwater Management Section 7.1.1
Sediment and Erosion Control	Landcom 'Blue Book' – Managing Urban Stormwater Soils and Construction Guideline Edition 4
On-Site Detention (OSD)	Bayside Technical Specification Stormwater Management
Flooding	Sans Souci (2D) Flood Study Review (2015), Cardno NSW Floodplain Development Manual Flood Advice Letter for 277 The Grand Parade, Ramsgate Beach Council supplied TUFLOW Model

5 Flooding

The proposed development site has been identified as being flood affected in the 1% AEP and PMF storm events as modelled in TUFLOW. The flood level for the 1% AEP and PMF storm events is 2.98m AHD and 3.35m AHD, respectively. Refer to Figure 5, Figure 6 and Figure 7 for the 1% AEP, 1% AEP + Climate Change and PMF flood extents, respectively.

Figure 5 - 1% AEP Flood Extent Map (Source: TUFLOW Model Run)

Figure 6 - 1% AEP + Climate Change Flood Extent Map (Source: TUFLOW Model Run)

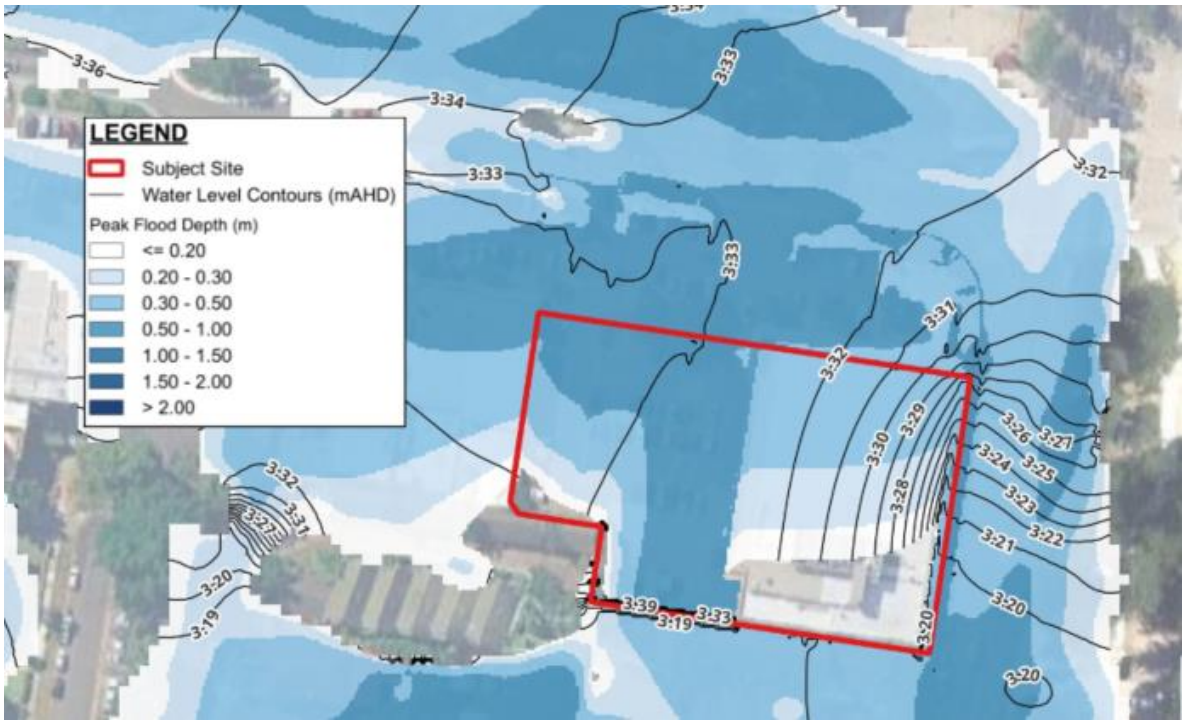

Figure 7 - PMF Flood Extent Map (Source: Source: TUFLOW Model Run)

As per the results of the TUFLOW modelling, the flood planning level (FPL) for the site is 3.48m AHD (1% AEP flood level plus 0.5m freeboard). Basements and below ground garages are to be physically protected to the FPL. All electrical connections, air conditioning units and external power points are to be set above the FPL.

The new development is required to adhere to the following development controls:

- Any new portion of the building that is lower than the applicable Flood Planning Level (FPL) must be built from flood compatible materials specified by the project architect and the structural engineer
- All new services associated with the development shall be flood proofed to the habitable floor level.
- A civil/hydraulic engineer must assess the impacts of filling before and after development using a 2D hydraulic model.
- Structures up to the habitable floor must be able to withstand the forces of floodwater, debris, and buoyancy in a 1% AEP flood event, as determined by suitably qualified engineer.
- A Flood Risk Management Plan is required to be lodged with the CC which will detail any necessary evacuation procedures.

A flood impact assessment has been undertaken for the site by SCP Consulting and has been addressed a separate report. Refer to the flood report for the analysis of the flood impacts.

It is noted that the loading dock, basement ramp and supermarket are all located at or above the Flood Planning Level of RL3.48m AHD. The retail stores (non-habitable floor) are set at a floor level of RL3.30m AHD. All building materials shall be flooding compatible and critical infrastructure shall be located above the FPL of 3.48m AHD to ensure minimal risk to the building and the retail stores.

6 Proposed Stormwater Drainage

6.1 Stormwater Drainage Design Requirements

6.1.1 Stormwater Drainage Requirements

With reference to the Bayside Council Technical Specification; the stormwater requirements are as follows;

- The minor (piped) drainage system must be designed to convey stormwater runoff for storm events up to, and including, the 5% Annual Exceedance Probability (AEP) storm event
- The major (overland) drainage system must be designed to convey stormwater runoff for storm events up to, and including, the 1% AEP storm event

6.1.2 On-Site Detention (OSD) Requirements

With reference to the Rockdale Council Technical Specification, OSD is to be provided in the form of infiltration, where feasible, or detention to limit site discharge. OSD shall not be required for the proposed development for the following reasons

- There is no increase in impervious area as a result of the proposed development. Therefore, there would be no increase in flows or a negative impact to downstream water levels
- A proportion of the development site is inundated in the 1% AEP storm event, making any storage redundant in a storm event
- A 70kL RWT is proposed for the site to capture building stormwater for reuse
- It is noted that Green Star credits will not be targeted for this development

6.1.3 Water Sensitive Urban Design (WSUD) Requirements

With reference to the Bayside Technical Specification Stormwater Management Section 7.1.1, the WSUD requirements are presented in Table 2 below. It is noted that Green Star credits will not be targeted for this development.

Table 2: Stormwater Pollution Reduction Targets

POLLUTANT	REDUCTION TARGET (%)
Gross Pollutants (GP)	90
Total Suspended Solids (TSS)	85
Total Phosphorus (TP)	60
Total Nitrogen (TN)	45

6.2 Proposed Stormwater Drainage System

The proposed site development area is 0.4479Ha. As the development proposes a boundary-to-boundary building, the building drainage shall be captured via the building hydraulic stormwater system and reticulated to a 70kL rainwater tank (RWT) located in Basement Level 1. Flows from the RWT will discharge into the existing stormwater pit located in the existing Council carpark. OSD shall not be required as discussed in Section 6.1.2 of this report.

Refer to Figure 8 for the proposed stormwater layout plan.

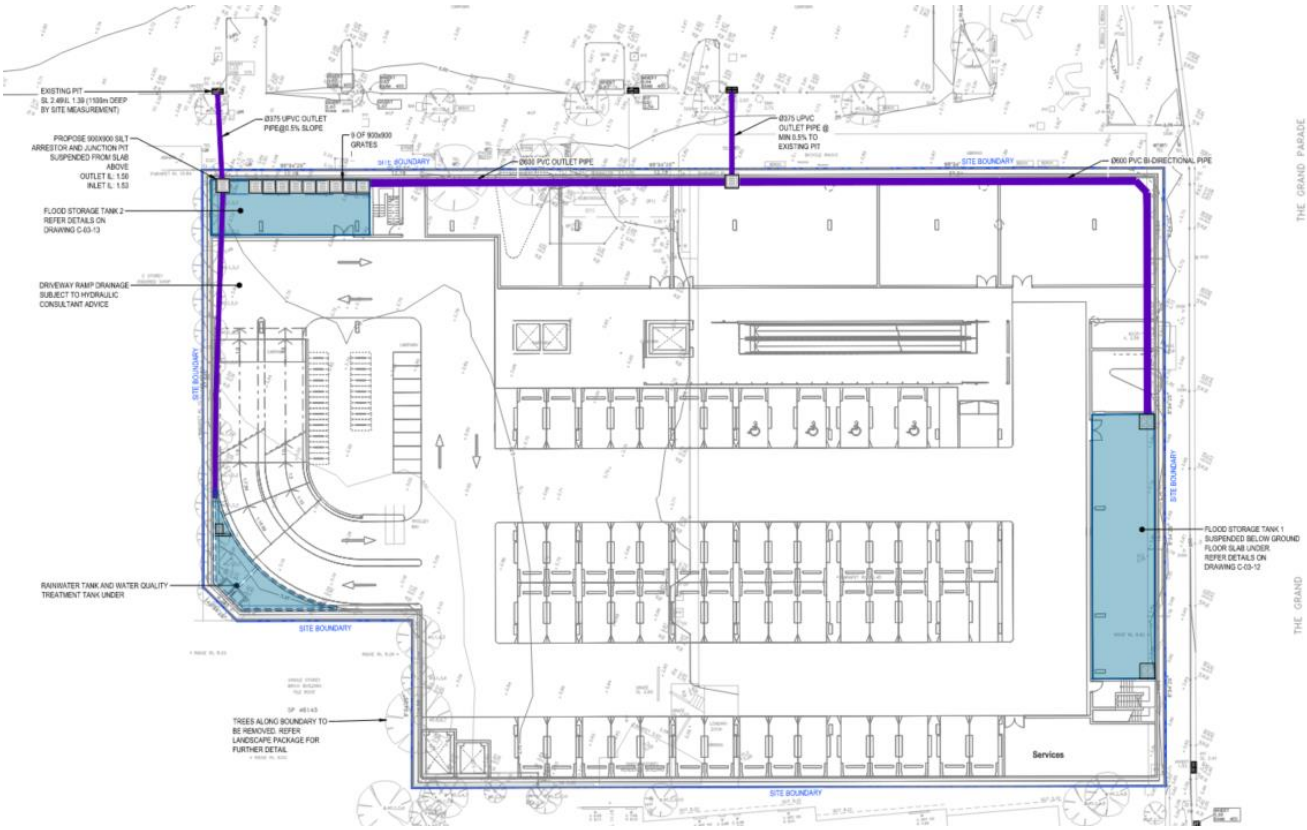

Figure 8 – Proposed Stormwater Layout Plan

7 Water Quality Management Plan

To comply with Bayside Council's stormwater quality requirements, the proposed treatment system has been modelled in MUSIC (Model for Urban Stormwater Improvements Conceptualisation). MUSIC conceptually models and estimates the performance of the proposed treatment devices, which is then compared against the performance targets specified for the project. The pollutants modelled in MUSIC include TSS, TP, TN, and GP.

7.1 Rainfall and Runoff Properties

The rainfall data used in the model is based on the Bureau of Meteorology (BoM) gauge data at rainfall station 066058 Sans Souci. A rainfall period of ten (10) years has been utilised in the model from 01/01/2011 to 31/12/2021 with a six (6) minute timestep. Music Source node data in the model is based on Table 5-6 of the NSW MUSIC Modelling Guidelines.

Refer to Table 3 and Table 4 for the soil characteristics and stormwater water quality parameters used for the MUSIC source nodes respectively.

Table 3: Soil Characteristics

PARAMETER	VALUE
Rainfall Threshold (mm)	0.3 (Roof) 1.0 (Footpaths/Landscape)
Soil Capacity (mm)	120
Initial Storage (%)	25
Field Capacity (mm)	80
Infiltration Capacity Coefficient – 'a'	200
Infiltration Capacity Coefficient – 'b'	1.0
Initial Depth (mm)	10
Daily Recharge Rate (%)	25
Daily Baseflow Rate (%)	5
Deep Seepage (%)	0

Table 4: Stormwater Water Quality Parameters for MUSIC Source Nodes

AREA OF INTEREST		LOG_{10} TSS (mg/L)		LOG_{10} TP (mg/L)		LOG_{10} TN (mg/L)	
		STORM FLOW	BASE FLOW	STORM FLOW	BASE FLOW	STORM FLOW	BASE FLOW
Roof	Mean	1.30	-	-0.89	-	0.30	-
	Std. Dev	0.32	-	0.25	-	0.19	-
Communal Open Space, Green Roof & Balconies, GF Bypass, Upper Floor uncovered balconies	Mean	2.15	1.20	-0.60	-0.85	0.11	0.30
	Std. Dev	0.32	0.17	0.25	0.19	0.12	0.19

7.2 Proposed Stormwater Treatment Plan

The total catchment area to be treated as part of the development is 0.4479Ha. The proposed site treatment shall consist of a 70kL RWT located within Basement Level 1.

In order to calculate the proposed total rainwater reuse demand, an average demand of 0.4kL/m²/year has been assumed for irrigation from ground floor to Level 2. An average 560kL/year has been estimated for irrigation. Please refer to Table 5 for the rainwater reuse demand calculation.

Stormwater runoff and RWT overflow is to be directed to the treatment chamber adjacent to the RWT, fitted with 20 OceanProtect StormFilter Cartridges. All stormwater inlet pits on ground floor are to be fitted with OceanProtect OceanGuard litter basket inserts.

Table 5: Rainwater Reuse Demand

USE	AVERAGE WATER DEMAND	NO. OF TOILETS/AREA TO BE IRRIGATED	AVERAGE DEMAND
Irrigation	0.4kL/m²/year	1408.4m²	560kL/year

7.3 MUSIC Modelling Results

The proposed treatment system has been modelled in MUSIC; refer to Figure 6 below for the treatment plan and Table 6 for the MUSIC modelling results.

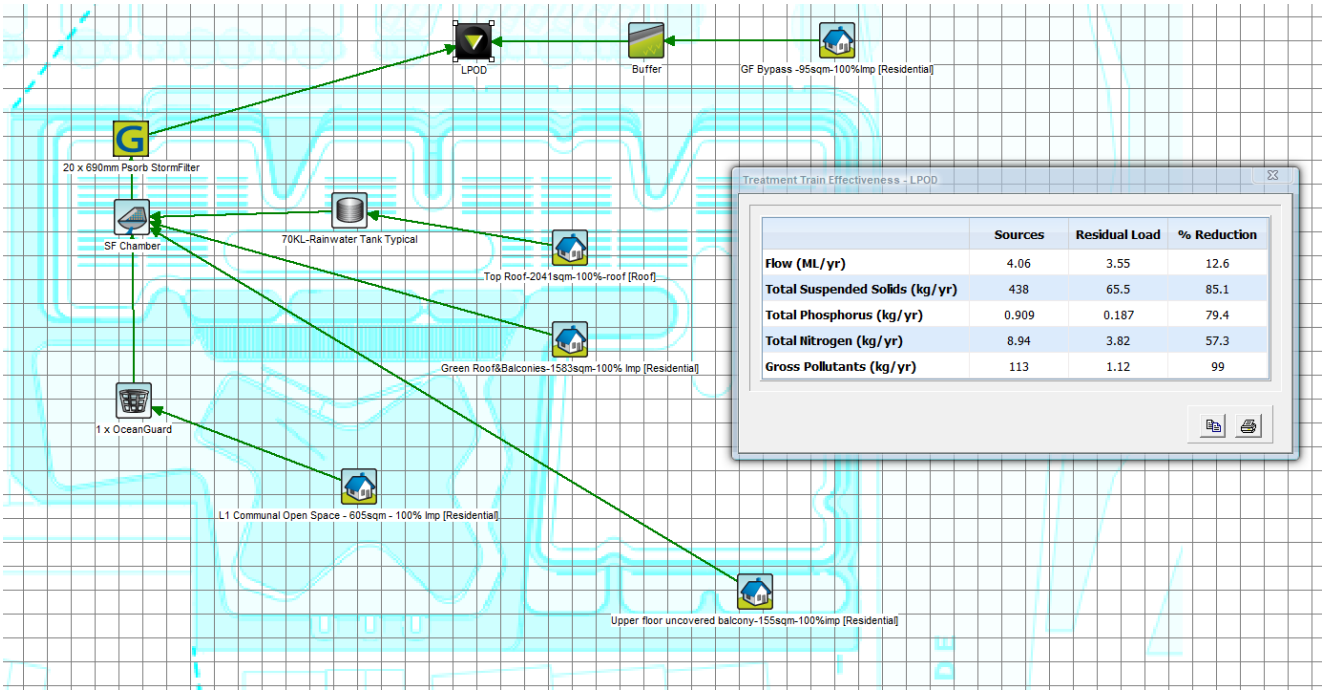

Figure 9: MUSIC Model Treatment Plan Table

Table 6: MUSIC Modelling Results

POLLUTANT	SOURCES	RESIDUAL LOAD	REDUCTION ACHIEVED (%)	REDUCTION TARGET (%)
Gross Pollutants (GP)	113	1.12	99	90
Total Suspended Solids (TSS)	438	65.5	85.1	85
Total Phosphorus (TP)	0.909	0.187	79.4	60
Total Nitrogen (TN)	8.94	3.82	57.3	45

As demonstrated by the results above, the stormwater quality targets meet those specified by Bayside Council.

8 Erosion and Sediment Control

A Soil and Water Management Plan has been prepared in accordance with Landcom's Soil and Construction manual (commonly known as the Blue Book). The Contractor for the works is required to provide the specified measures in accordance with the general requirements outlined below:-

8.1 Site Access

Site access shall be provided via two (2) stabilised construction vehicle entry points which consists of a minimum 5m long by 3m wide 'shaker grid'.

The following should be adhered to with regards to vehicle entry

- All construction vehicles entering/exiting the site shall be required to pass over the vehicle entry to prevent them becoming a source of sediment. The vehicle entry may consist of a timber, concrete or steel shaker grid or rubble area
- The vehicle exit area is to be maintained in a clean and serviceable condition throughout construction
- All public roads are to be cleaned immediately in the case that sediment is tracked onto the public roadway by vehicles leaving the construction site
- Unsealed roads within the site are to be topped with 100mm compacted thickness, 40mm nom. aggregate

8.2 Sediment Control

All disturbed areas where it may be possible for runoff to transport silt and sediment down a slope, and particularly allow it to enter an adjacent site or stormwater system, a sediment fence will be installed along the boundaries of the site.

In accordance with the Department of Conservation and Land Management and the Clean Waters Act 1970, the sediment fence will be constructed with geotextile fabric preventing suspended particles greater than 50mg/L non-filterable solids to pass through.

The sediment fence will be constructed at a minimum in accordance with the following

- Geotextile fabric to be buried 150mm below surface level
- 150mm overlaps will be provided at joins in the fabric at support posts
- The ends of the fabric will be turned up for a length of 1 metre in order to prevent volumes of suspended solids escaping in a storm event
- Sediment fence will be installed as close as parallel to the contours of the site or at the toe of a slope
- 1.5m long star pickets are to be driven into the ground at 3m intervals to provide rigid support for the fence. Where there is insufficient soil depth over the rock, holes are to be drilled into rock to accept the star pickets
- Backfill trench over base of fabric and compact
- On hard/rocky ground, smooth a 500mm wide strip upslope of the fence line, turn the bottom 500mm of the fabric upslope and anchor in place with suitable aggregate
- Where a sediment fence is constructed down slope from a disturbed batter, the sediment fence shall be located approximately 2m down slope from the toe of the batter

8.3 Dust Control

The following dust control procedures will be adhered to within the construction site

- Construction vehicles and other machinery leaving the site will have their wheels washed and agitated prior to travelling on public Council roads
- All fences will have shade cloth fixed to the inside of the fence
- Dust will be suppressed within the construction site through the use of water sprinklers or water carts across ground surfaces when the surface has dried and there is potential to generate visible levels of dust. Dust can be generated through the operation of equipment or wind
- Water will be sprayed at a rate of not less than 3L/s and not less than 700kPa pressure to suppress dust within the site. The area within which sprays are used will be small enough to maintain damp surfaces but not generate runoff
- Materials will not be burned on site
- Soil transportation into the site will be done from the main access into the site
- Loose loads entering/leaving the construction site will be secured using a tarpaulin or similar material in accordance with RMS and local Council guidelines

8.4 Stockpile

The following stockpile control procedures will be adhered to within the construction site

- Constructed on the contour at least 2 (preferably 5) metres from hazard areas, particularly likely areas of concentrated water flow e.g. waterways, roads, slopes steeper than 10 percent
- Stabilised if they are to be in place for more than 10 days
- Protected from water by installing water diversion structures upstream
- Formed with sediment filters placed immediately downslope to protect other lands and waterways from pollution

8.5 Maintenance Requirements

The following maintenance requirements will be adhered to throughout the duration of construction

- It is the responsibility of the contractor to ensure erosion and sediment control measures are installed properly and maintained on site
- Accumulated silt and sediment will be removed from site at regular intervals and after major storm events
- Silt and sediment will be removed from site or moved to a location within the site where it will not erode, and Council approval is given to do so
- Sediment fences and pit sediment traps are to be regularly inspected, particularly after major storm events, and kept in good condition to ensure effective functionality
- Prior to the closing of the site every day, the public road will be swept, and materials deposited back onto the site
- Appropriate and approved covering material such as plastic sheeting will be used to cover stockpiles and other unsealed surfaces
- Sediment traps are only to be removed once the specific construction area has been properly stabilised
- Site and sediment fences are only to be removed once all construction works are completed

It is considered that by complying with the above, appropriate levels of protection are afforded to the site and the adjacent public roads, footpaths and environment.