



# Stormwater Management Report

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59-63 Trafalgar Avenue and 1a\_b Valley Road,  
Lindfield  
**Issue B**

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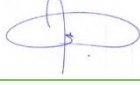
Prepared for Castle Hill No.8 Pty Ltd

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## REVISION TABLE

Revision	Date	Issue Description	Issued by	Approved by	Signed
P1	11.04.2025	Preliminary Issue	CS	SELH	
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B	23.10.25	Issue for Approval	MS	SELH	

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# 1 Executive Summary

This document is a stormwater management report for the proposed development located at 59-63 Trafalgar Avenue and 1a\_b Valley Road, Lindfield.

The proposed development is illustrated in Figure 1.1 below.



**Figure 1.1 Ground Floor Plan**

This report describes the stormwater on site detention and quality measures adopted for the development to address the local Council’s requirements in terms of stormwater quality targets.

The stormwater devices/assets that have been adopted for the development are as follows:

- 123.76m<sup>3</sup> volume On-Site Detention Tank
- 20m<sup>3</sup> volume Rainwater Tank
- Stormfilter Chamber consisting of 22 x 690 PSorb Stormfilter Cartridges
- 6x200 Micron Oceanguard Baskets



## 2 Introduction

### 2.1 Brief

S&G Consultants Pty Ltd (SGC) have been engaged by Castle Hill No.8 Pty Ltd to prepare the stormwater management report for the development at 59-63 Trafalgar Avenue and 1A\_B Valley Road, Lindfield.

The following tasks were carried out:

- Supplied documents and previous studies were reviewed;
- A concept stormwater drainage design has been prepared including supporting calculations; and
- This report has been compiled.

### 2.2 Limitation

This report is intended solely for Castle Hill No.8 Pty Ltd as the Client of SGC and no liability will be accepted for use of the information contained in this report by other parties than this client.

This report is limited to visual observations and to the information including the referenced documents made available at the time when this report was written.

### 2.3 Reference Documents

The following documents have been referenced in this report:

1. Site survey prepared by Norton Survey Partners, Ref: 21492, dated 20/01/2025;
2. Architectural plans prepared by DKO Architects;
3. Engineers Australia, Australian Rainfall & Runoff (AR&R 1999); and
4. Ku-Ring-Gai Council's DCP Part 24.

### 3 Natural & Built Environment

The site is located along Trafalgar Avenue in the suburb of Lindfield. The land is located in the Local Government Area of Ku-Ring-Gai Council.

The site is bounded by Trafalgar Avenue to the west and adjoining properties in all other directions. The use of this site has been previously for residential purposes.

The site has an irregular shape and is characterised by a natural gradient towards the south. Figure 3.1 shows the location of the site.



Figure 3.1 Locality Plan

## 4 On-Site Water Management

### 4.1 Objectives

On-site stormwater management report includes:

- a. Authorities Requirements;
- b. Water Conservation/Rainwater Tank;
- c. Stormwater Management & Treatment;
- d. On-Site Detention
- e. Stormwater Disposal; and
- f. Overland Flow Management.

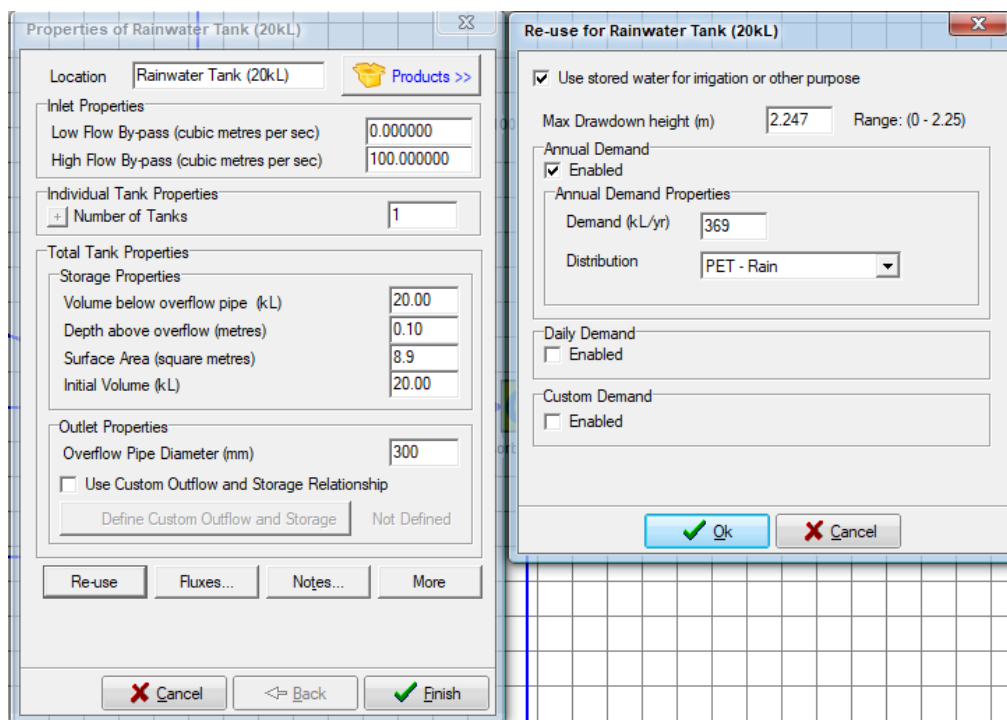
### 4.2 Authorities Requirements

The council requirements for water management are provided in Part 24 of the DCP, specifically Section 24C. Some of these requirements are included in this report for reference.

### 4.3 Water Conservation/Rainwater Tank

Ku-ring-gai Development Control Plan Part 24C.4 - Mandatory Rainwater Tank Requirements states that, "The minimum tank storage volume is that required to meet the 50% reduction in runoff days specified in control 24B.3-4, or compliance with BASIX or the Green Star Rating, whichever is the greater".

Based on the requirement above, a 20kL rainwater tank is proposed as part of the stormwater management for the proposed development to drain 838m<sup>2</sup> of roof area. The rainwater tank is to be used for irrigation of minimum 923m<sup>2</sup> of landscape/planter area.



**Figure 4.1 Rainwater Tank Inputs**

Rainfall loss	1	mm	<b>Water Usage - Landscape Watering</b>		<b>Water Usage - AAA Toilets</b>		
Roof area	838	m2	Area to be watered	923	m2	No. of Toilets	0
Rainwater tank size	20	m3	Watering rate	0.4	m3/yr/m2 [a]	AAA Toilet flush rate	0
%Full at start	80	%	Total water used	1.011	m3/day	Flushes	0
						Total water used	0
			<b>Water Usage - Car Wash Bay</b>				m3/day
Total# days	9611	days	Number units	0		<b>Water Usage - 4A Washing Machines</b>	
Total# wet days	1935	days	% of units using car wash	0	%	No. of units w. machines	0
Total# OF days	759	days	Average washes	0	washes/yr/unit	Water use	0
%reduction in wet days	60.8	%	Usage Rate	0	L/wash [b]	Washes per week	0
			Total water used	0.000	m3/day	Total water used	0.00
%of time tank is empty	40	%					m3/day
%of time tank is full	8	%	<b>Total Water usage</b>	1.011	m3/day		

**Figure 4.2 Runoff Days Calculations**

## 4.4 Stormwater Management & Treatment

It is proposed to collect and convey the roof and the surface water from the proposed development in a new stormwater system to cater for the 100-yr ARI storm event.

The runoff from the roof areas (838m<sup>2</sup>) will be directed to the rainwater tank. The overflow from the tanks along with the surface runoff will be directed towards the stormfilter chamber. Stormfilters have the capacity to remove suspended solids, fine particles and other nutrients such as TSS, TP & TN.

Table 24C.6-1: Captured Stormwater Treatment Standards

Pollutant	Baseline Annual Pollutant Load (kg/ha/yr)	Standard to be achieved (kg/ha/yr)
Gross Pollutants	500	30% (70% reduction) = 150
Total Suspended Solids	900	15% (85% reduction) = 135
Total Phosphorus	2	35% (65% reduction) = 0.7
Total Nitrogen	15	55% (45% reduction) = 8.25

### Figure 4.3 MUSIC Targets

A MUSIC model has been setup to determine if the proposed measures are adequate to treat the runoff from the catchment.

The MUSIC model diagram is included below for reference. The proposed measures achieve the requirements of council as detailed in the following table:

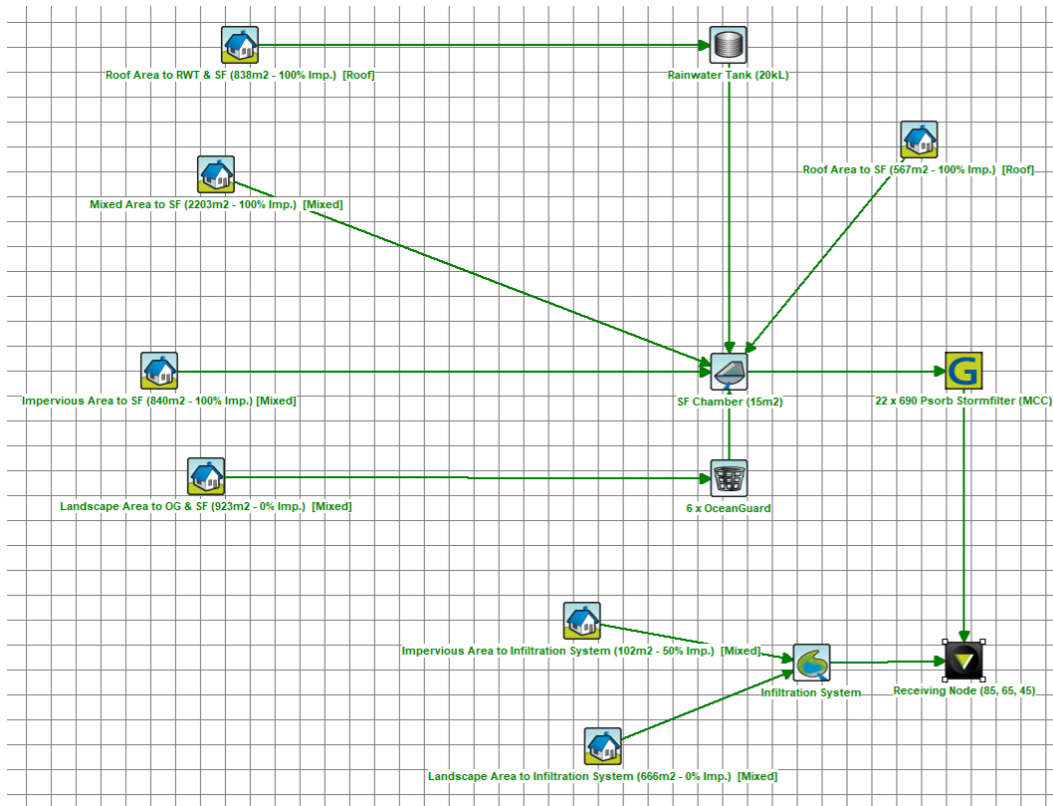


Figure 4.4 MUSIC Diagram

Treatment Train Effectiveness - Receiving Node (85, 65, 45)

	Sources	Residual Load	% Reduction
Flow (ML/yr)	6.04	5.35	11.5
Total Suspended Solids (kg/yr)	774	103	86.6
Total Phosphorus (kg/yr)	1.48	0.288	80.6
Total Nitrogen (kg/yr)	12.9	5.59	56.6
Gross Pollutants (kg/yr)	127	0	100

Figure 4.5 MUSIC Results

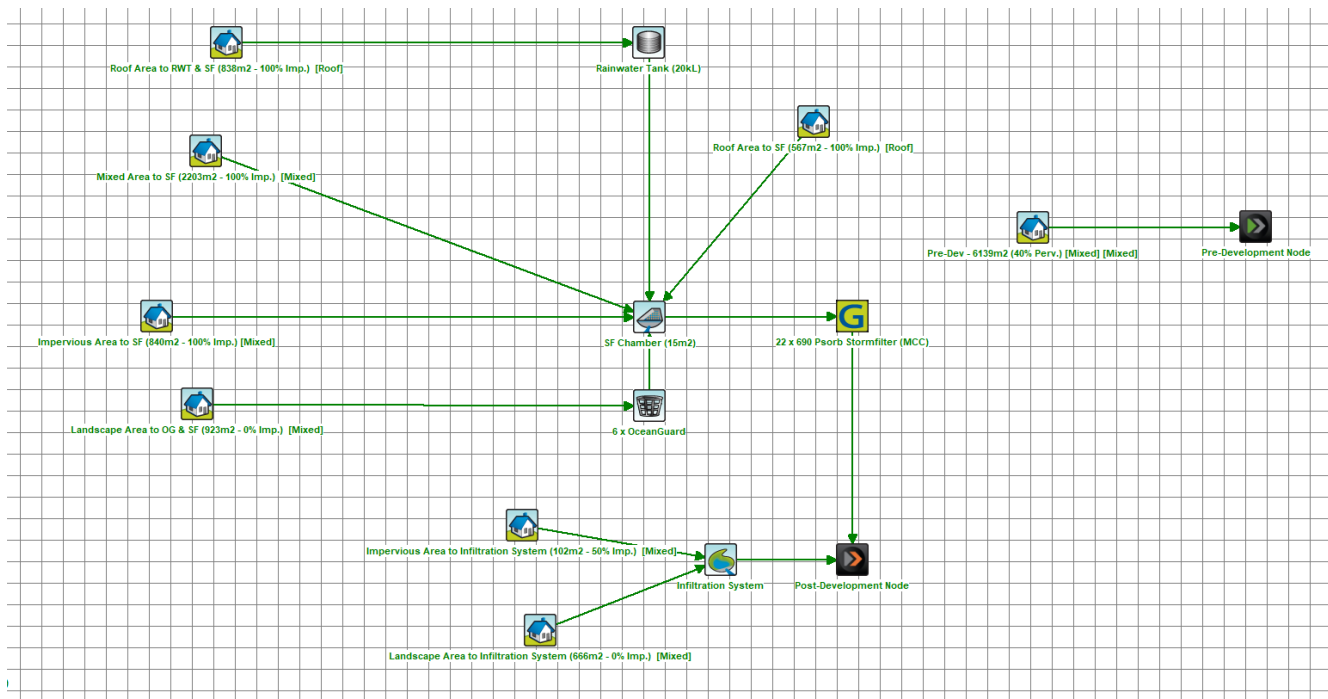


Figure 4.6 NORBE MUSIC Diagram

Treatment Train Effectiveness - Post-Development Node

	Sources		Residual Load		% Reduction	
	Pre	Post	Pre	Post	Pre	Post
<b>Flow (ML/yr)</b>	5.52	6.04	5.52	5.35	0	11.4
<b>Total Suspended Solids (kg/yr)</b>	891	778	891	105	0	86.5
<b>Total Phosphorus (kg/yr)</b>	1.52	1.49	1.52	0.292	0	80.4
<b>Total Nitrogen (kg/yr)</b>	11.5	12.8	11.5	5.56	0	56.6
<b>Gross Pollutants (kg/yr)</b>	132	127	132	0	0	100

include Pre-Development

Figure 4.7 Pre-Development & Post-Development MUSIC Results

<b>Pre-Development</b>		Source (kg/yr)	Residual Load (kg/yr)	% Reduction
Flow (ML/yr)		5.52E+00	5.52E+00	0
Total Suspended Solids (kg/yr)		8.91E+02	8.91E+02	0
Total Phosphorus (kg/yr)		1.52E+00	1.52E+00	0
Total Nitrogen (kg/yr)		1.15E+01	1.15E+01	0
Gross Pollutants (kg/yr)		132	132	0
<b>Post-Development</b>		Source (kg/yr)	Residual Load (kg/yr)	% Reduction
Flow (ML/yr)		6.04E+00	5.35E+00	11.4
Total Suspended Solids (kg/yr)		7.78E+02	105	86.5
Total Phosphorus (kg/yr)		1.49E+00	2.92E-01	80.4
Total Nitrogen (kg/yr)		12.8	5.56	56.6
Gross Pollutants (kg/yr)		127	0.00E+00	100
<b>NorBE</b>		Pre-Development Load (kg/yr)	Post Development Load (kg/yr)	% Pre. Vs Post Reduction
Flow (ML/yr)		5.52	5.35	3.1%
Total Suspended Solids (kg/yr)		8.91E+02	105	88.2%
Total Phosphorus (kg/yr)		1.52	0.292	80.8%
Total Nitrogen (kg/yr)		11.5	5.56	51.7%
Gross Pollutants (kg/yr)		132	0	100.0%

**Figure 4.8 NORBE Results**

## 4.5 On-Site Detention

126.03m<sup>3</sup> below ground on-site detention tank has been provided to meet council's on-site detention requirements. The OSD has been sized using a catchment-based spreadsheet as required by council which is shown in Figure 4.9.

<b>Project: Proposed Mixed-Use Development</b>			
<b>Our Job No 2024.0199</b>			
<b>Location: 59-63 Trafalgar Avenue and 1a_b Valley Road, Lindfield</b>			
<b>CATCHMENT CODE</b>	<b>GC1</b>		
<b>CATCHMENT DISCHARGE RATE</b>	<b>128.0 l/s/ha</b>		<b>[A]</b>
<b>CATCHMENT STORAGE RATE</b>	<b>336.0 m<sup>3</sup> / ha</b>		<b>[B]</b>
<b>SITE DETAILS</b>			
SITE AREA	6139 m <sup>2</sup>		
60% OF SITE AREA	3683.4 m <sup>2</sup>		<b>[C]</b>
AREAS NOT DRAINING TO OSD	768 m <sup>2</sup>		
TOTAL IMPERVIOUS AREA	4550 m <sup>2</sup>		<b>[D]</b>
IMPERVIOUS AREA BYPASSING OSD	102 m <sup>2</sup>		<b>[E]</b>
<b>PERMITTED SITE DISCHARGE</b>			
	$C \times A$	47.15 l/s	<b>[FLOW 1]</b>
ADJUSTMENT FOR ANY UNCONTROLLED IMPERVIOUS FLOW			
	$E / D (<0.25)$	0.02	<b>[F]</b>
	$FLOW 1 \times F$	1.06 l/s	<b>[FLOW 2]</b>
	$FLOW 1 - FLOW 2$	<b>46.09 l/s</b>	<b>PSD</b>
<b>SITE STORAGE REQUIREMENT</b>			
	$C \times B$	<b>123.76 m<sup>3</sup></b>	<b>[SSR 1]</b>
IF THE STORAGE IS IN A LANDSCAPED BASIN			
	$SSR 1 \times 1.2$	<b>N/A m<sup>3</sup></b>	<b>[SSR 2]</b>
<b>ORIFICE CALCULATIONS</b>			
HEIGHT DIFFERENCE BETWEEN TOP WATER SURFACE LEVEL AND THE CENTRE OF ORIFICE			
		<b>2.70 m</b>	<b>[G]</b>
ORIFICE DIAMETER	$21.85 \times \text{SQRT}(\text{PSD}/(\text{SQRT}($	<b>115.7 mm</b>	

**Figure 4.9 OSD Calculation Sheet**



#### **4.6 Stormwater Disposal**

It is proposed that the stormwater is to be discharged to a proposed kerb inlet pit located on Trafalgar Avenue. The proposed kerb inlet pit is to connect to a new pit downstream along 55 Trafalgar Avenue (existing headwall to be replaced by the new pit). Please refer to the Stormwater Plans prepared by S&G Consultants P/L.

#### **4.7 Overland Flow Management**

The site is not affected by overland flows.

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