# Integrated Water Management Plan

11-19 Middle Harbour Road, Lindfield

**Issue A**

Prepared For Castle Hill No.7 Pty Ltd

Date: Friday, 30 May 25

File Ref: 20250042-R01_IWMP [A].docx

**P:** 02 8883 4239

**A:** Suite 311, Level 3, 480 Pacific Highway, St Leonards NSW 2065

**W:** www.sgce.com.au

**Postal:** PO Box 7855, Baulkham Hills, NSW 2153

## REVISION TABLE

| Revision | Date | Issue Description | Issued by | Approved by | Signed |
|---|---|---|---|---|---|
| P01 | 21.05.2025 | Preliminary Issue | SELH | SELH |  |
| A | 30.05.2025 | Final Issue | SELH | SELH |  |

The information given in this document takes into account the particular instructions and requirements of our Client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

## Table of Contents


1 Executive Summary ..... 5

1.1 Addressing Relevant SEARs ..... 5

1.2 Limitation ..... 5

1.3 Description ..... 6

2 Site and Project Description ..... 9

2.1 Natural & Built Environment ..... 9

2.2 Proposed Development ..... 10

2.3 Reference Documents ..... 11

3 Assessment Methodology ..... 12

3.1 Addressing Ku-Ring Gai Council's LEP Requirements ..... 12

3.2 NSW Government's SEPP Requirements ..... 13

3.3 Addressing Ku-Ring Gai Council's DCP Requirements ..... 13

3.3.1 Rainwater Tank ..... 13

3.3.2 Water Quality ..... 14

3.3.3 Water Quantity / On-Site Detention ..... 17

4 Stormwater Disposal ..... 19

5 Overland Flow Management ..... 19

6 Soil & Water Management ..... 19

6.1 Construction Stage ..... 19

7 Maintenance Strategy ..... 21

8 Design Statement ..... 22

A1 Appendix 1 ..... 23


## List of Figures


Figure 1-1 Ground Floor Plan ..... 7

Figure 2-1 Cadastral Map ..... 9





P: 02 8883 4239 W: www.sgce.com.au

Figure 2-2 Aerial Photography ..... 10
Figure 3-1 Rainwater Tank Inputs ..... 14
Figure 3-2 Runoff Days Calculations ..... 14
Figure 3-3 MUSIC Targets ..... 15
Figure 3-4 MUSIC Diagram ..... 15
Figure 3-5 MUSIC Results ..... 16
Figure 3-6 Norbe MUSIC Diagram ..... 16
Figure 3-7 Pre-Development & Post-Development MUSIC Results ..... 17
Figure 3-8 NORBE Results ..... 17
Figure 3-9 OSD Calculation Sheet ..... 18

## List of Tables

Table 1-1 Project Details ..... 6
Table 7-1 OSD & Ocean Guard Basket & Rainwater tank Maintenance Strategy Requirements ..... 21
Table 7-2 Stormfilter Maintenance Strategy Requirements ..... 21

# 1 Executive Summary

## 1.1 Addressing Relevant SEARs

| Item | Description | Section Reference |
|---|---|---|
| **11. Water Management** | Outline proposed drainage design and servicing infrastructure to be incorporated as part of the development (stormwater only). | Appendix 1<br>Stormwater Plans |
| | Demonstrate how the development complies with council's drainage requirements (in concept). | Section 4.1, Section 4.2,<br>Section 4.3 |

## 1.2 Limitation

This report is intended solely for Castle Hill No.7

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.

## 1.3 Description

Castle Hill No. 3 Pty Ltd are proposing to develop the site into a residential flat building. The ground floor plan is illustrated in Figure 1-1 below. The details of the project are included in the table below.

**Table 1-1 Project Details**

| Item | Details |
|---|---|
| Project Name | Middle Harbour Lindfield |
| Landowner(s) | Castle Hill No. 7 Pty Ltd |
| Applicant / Principal | Castle Hill No. 7 Pty Ltd |
| Client Representative | Nicholas Rieck – Development Manager |
| Site Address | 11-19 Middle Harbour Rd, Lindfield |
| Lot & DP | B/DP349665<br>9/DP4665<br>10/DP4665 |
| Site Area | 5217 sqm |
| SSD Number | SSD-77829461 |
| Proposal Description | - Demolition of existing structures<br>- Tree removal and site clearing<br>- Construction of a new a new 9-storey residential flat building comprising of residential apartments (inclusive of affordable housing apartments) and basement car parking<br>- External landscaping works |
| QTY Apartments | Approximately 174 apartments |
| Affordable Housing | 17% of total proposed GFA to be dedicated as affordable housing utilising the TOD provisions of SEPP (Housing) 2021 Chapter 5 and Infill affordable housing provisions of SEPP (Housing) 2021 Chapter 2. |
| Parking | **Approximately 290** |


**Figure 1-1 Ground Floor Plan**

This document is an Integrated water management plan (IWMP) for stormwater related components associated with the proposed development located at 11-19 Middle Harbour Rd, Lindfield to address Planning Secretary's Environmental Assessment Requirements (SEARs).

This report describes how the proposed stormwater drainage design and servicing infrastructure will be incorporated as part of the development and how the development complies with council's drainage requirements and identify proposed stormwater treatment and water quality management measures to minimise adverse environmental impacts.

The concept stormwater drainage plans have been prepared by S&G Consultants (SGC) to comply with the following:

- Ku-ring-gai Development Control Plan 24C;
- Ku-ring-gai Council's LEP clause 6.2.(3)(a), clause 6.2.(3)(g), clause 6.2.(3)(h) & clause 6.5;
- Section 6.7(1)(c) and (f) of the Biodiversity and Conservation SEPP (State Environmental Planning Policy); and

- Section 6.10 of the Biodiversity and Conservation SEPP (State Environmental Planning Policy).

The stormwater devices/ assets incorporated in the concept stormwater drainage design for the development are as follows:

- A 30m$^3$ volume rainwater tank to ensure rainwater retention and re-use as per Ku-ring Gai council's guidelines. (Ku-ring-gai Development Control Plan 24C.4 MANDATORY RAINWATER TANK REQUIREMENTS);
- 105.18m3 volume On-Site Detention (OSD) tank to ensure post-development site discharge is minimised to permissible site discharge as per Ku-ring Gai council's policy. (DCP 24R.4 "ON-SITE DETENTION CALCULATION SHEET"); and
- 3x200 Micron Oceanguard baskets and Stormfilter chamber consist of 22 x 690 PSorb Stormfilter cartridges to comply with Ku-ring-gai DCP Section 24C.6 "STORMWATER QUALITY CONTROL".

# 2 Site and Project Description

## 2.1 Natural & Built Environment

The site is bounded by Middle Harbour Rd to the North-West and adjoining residential properties in al other directions. The site is rectangular in shape exhibiting a total area of 5,217 square meter. In its current state, the site is made of four (4) residential properties. Vehicular access is currently provided to the individual dwellings from Middle Harbour Road.

The proposal seeks consent for construction of  a new a new 9-storey residential flat building comprising of residential apartments (inclusive of affordable housing apartments) and basement car parking.

The existing site context is shown in Figure 2-1 and Figure 2-2 below.


**Figure 2-1 Cadastral Map**


**Figure 2-2 Aerial Photography**

## 2.2 Proposed Development

The SSDA proposes the demolition of the existing structures, the removal of trees and site clearing, the construction of a residential flat building comprising of residential apartments (inclusive of affordable housing apartments) and basement car parking and external landscaping works.

Reference is made to the architectural plans for details.

## 2.3 Reference Documents

The following documents have been referenced in this report:-

1. Site survey prepared by Norton Survey Partners dated 24/02/2025;
2. Architectural plans prepared by DKO Architects;
3. Engineers Australia, Australian Rainfall & Runoff (AR&R 1999);
4. Ku-Ring-Gai Councils DCP Part 24;
5. Ku-ring-gai Council's LEP; and
6. NSW Government State Environmental Planning Policy.

# 3 Assessment Methodology

## 3.1 Addressing Ku-Ring Gai Council's LEP Requirements

The council requirements for water management are provided in Part 24 of the DCP, specifically Section 24C.

Below is a table showing how the design responds to the council's requirements.

| SGC Reponse to Council's LEP and the Biodiversity and Conservation SEPP | | |
|---|---|---|
| | **CLAUSES** | **RESPONSE** |
| LEP | **Clause 6.2(3)(a)** - In deciding whether to grant development consent for earth works (or for the development involving ancillary earthworks), the consent authority must be consider the following matters - the likely disruption of , or any detrimental effect on, drainage patterns and soil stability in the locality of the development | Proposed drainage assets do not require intensive/ deep excavataion that may cause any disruption of , or any detrimental effect on, drainage patterns and soil stability in the locality of the development |
| LEP | **Cause 6.2(3)(g)** - In deciding whether to grant development consent for earth works (or for the development involving ancillary earthworks), the consent authority must be consider the following matters - the proximity to, and potential for adverse impacts on, any waterways, drinking water catchment or environmentally sensative area | A Music (Model for Urban Stormwater Improvement Conceptualisation) model has been prepared to ensure that the water quality of runoff from the devlopment is improved to ensure no adverse impact to the downstrean waterbody (Stoney Creek) |
| LEP | **Clause 6.2(3)(h)** - In deciding whether to grant developmen consent for earth works (or for the development involving ancillary earthworks), the consent authority must be consider the following matters - any appropriate measures proposed to avoid, minimise or mitigate the impacts of development. | Proposed drainage assets do not require intensive/ deep excavataion. |
| LEP | **Clause 6.5** - **(1)** The objective of this clause is to avoid or minimise the adverse impacts of urban stormwater on the land on which development is to be carried out, adjoining properties, native bushland, waterways and groundwater systems.<br>**(2)** Before granting development consent to development on any land to which this Plan applies, the consent authority must be satisfied that—<br>**(a)** water sensitive urban design principles are incorporated into the design of the development, and<br>**(b)** riparian, stormwater and flooding measures are integrated, and<br>**(c)** the stormwater management system includes all reasonable management actions to avoid any adverse impacts on the land to which the development is to be carried out, adjoining properties, native bushland, waterways and groundwater systems, and<br>**(d)** if a potential adverse environmental impact cannot be feasibly avoided, the development minimises and mitigates the adverse impacts of stormwater runoff on adjoining properties, native bushland, waterways and groundwater systems.<br>**(3)** For the purposes of subclause (2)(a), the water sensitive urban design principles are—<br>**(a)** protection and enhancement of water quality, by improving the quality of stormwater runoff from urban catchments,<br>**(b)** minimisation of harmful impacts of urban development on water balance and on surface and groundwater flow regimes,<br>**(c)** integration of stormwater management systems into the landscape in a manner that provides multiple benefits, including water quality protection, stormwater retention and detention, public open space, and recreational and visual amenity,<br>**(d)** retention, where practical, of on-site stormwater for use as an alternative supply to mains water, groundwater or river water. | Water sensitive urban design (WSUD) principals have been considered. A water qulaity Music model has been prepared to ensure that the water quality of runoff from the devlopment is improved to ensure no adverse impact to the downstrean waterbody (Stoney Creek) |

## 3.2 NSW Government's SEPP Requirements

The table below provides a response to the requirements of the SEPP.

| | | |
|---|---|---|
| SEPP | **Section 6.6(1)(a)-(d) and (f)** - In deciding whether to grant development consnet to development on land in a regulated catchment, the consent authority must consider the following - **(a)** whether the development will have a neutral or beneficial effect on the quality of water entering a waterway, **(b)** whether the development will have an adverse impact on water flow in a natural waterbody, **(c)** whether the development will increase the amount of stormwater run-off from a site, **(d)** whether the development will incorporate on-site stormwater retention, infiltration or reuse and **(f)** the cumulative environmental impact of the development on the regulated catchment, | An On-site Detention System has been proposed to ensure the runoff from the proposed development do not exceed the pre-development scenario. |
| SEPP | **Section 6.6(2)** - Development consent must not be granted to development on land in a regulated catchment unless the consent authority is satisfied the development ensures— **(a)** the effect on the quality of water entering a natural waterbody will be as close as possible to neutral or beneficial, and **(b)** the impact on water flow in a natural waterbody will be minimised. | NORBE (Neutral or Beneficial Effect on Water Quality Assessment) analysis has been carried out to ensure impact is minimised on water flow in a natural waterbody |
| SEPP | **Section 6.7(1)(c) and (f)** - In deciding whether to grant development consent to development on land in a regulated catchment, the consent authority must consider the following—**(c)** whether the development will minimise or avoid— **(i)** the erosion of land abutting a natural waterbody, or **(ii)** the sedimentation of a natural waterbody and **(f)** if the development site adjoins a natural waterbody—whether additional measures are required to ensure a neutral or beneficial effect on the water quality of the waterbody. | An erosion & sediment control plan has been plan has been prepared as a part of the stormwater concept plan. |
| SEPP | **Section 6.10** -In deciding whether to grant development consent to development on land in a regulated catchment, the consent authority must consult with the council of each adjacent or downstream local government area on which the development is likely to have an adverse environmental impact. | Stormwater plans and Stormwater management report is to be submitted to council for approval |

## 3.3 Addressing Ku-Ring Gai Council's DCP Requirements

### 3.3.1 Rainwater Tank

Ku-Ring-Gai DCP 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 30kL rainwater tank is proposed as part of the stormwater management for the proposed development to drain 1763m$^2$ roof area. The rainwater tank is to be used for irrigation of minimum 2000m$^2$ of landscape/planter area.

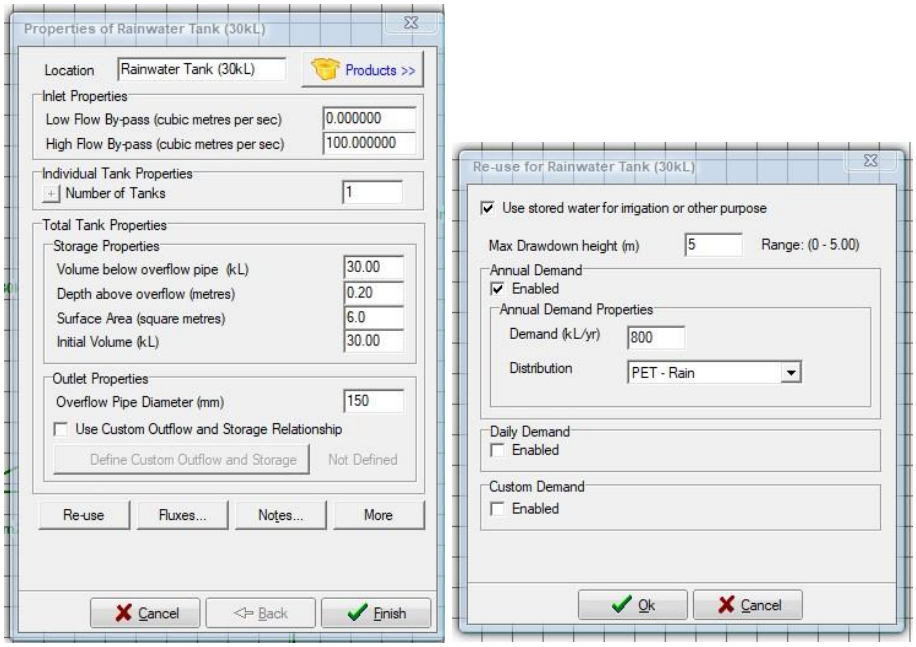



**Figure 3-1 Rainwater Tank Inputs**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Rainfall loss | 1 | mm | Water Usage - Landscape Watering | | | Water Usage - AAA Toilets | | | |
| Roof area | 1763 | m2 | Area to be watered | 2000 | m2 | No. of Toilets | 0 | | |
| Rainwater tank size | 30 | m3 | Watering rate | 0.4 | m3/yr/m2 *[a]* | AAA Toilet flush rate | 0 | L/flush *[c]* | |
| %Full at start | 80 | % | Total water used | 2.190 | m3/day | Flushes | 0 | flush/pers/day *[c]* | |
| | | | Water Usage - Car Wash Bay | | | Total water used | 0 | m3/day | |
| Total# days | 9611 | days | Number units | 0 | | Water Usage - 4A Washing Machines | | | |
| Total# wet days | 1935 | days | % of units using car wash | 0 | % | No. of units w. machines | 0 | | |
| Total# OF days | 797 | days | Average washes | 0 | washes/yr/unit | Water use | 0 | L/wash | |
| %reduction in wet days | 58.8 | % | Usage Rate | 0 | L/wash *[b]* | Washes per week | 0 | | |
| | | | Total water used | 0.000 | m3/day | Total water used | 0.00 | m3/day | |
| %of time tank is empty | 46 | % | | | | | | | |
| %of time tank is full | 8 | % | **Total Water usage** | 2.190 | m3/day | | | | |

**Figure 3-2 Runoff Days Calculations**

### 3.3.2 Water Quality

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 (1763 $m^2$) will be directed to the rainwater tank. The overflow from the tanks along with the surface runoff will be directed towards 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 3-3 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:

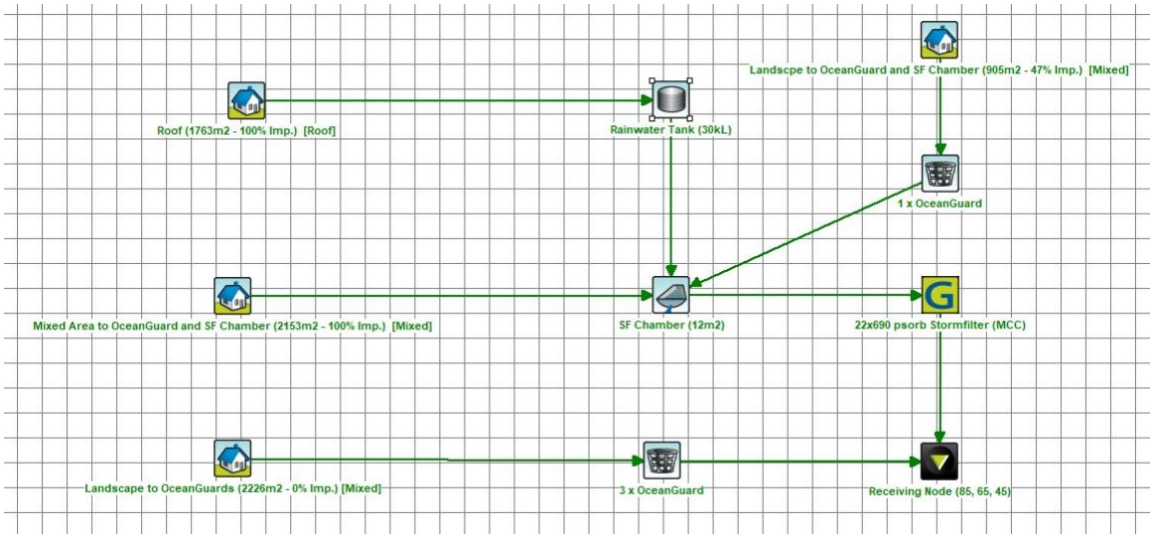



**Figure 3-4 MUSIC Diagram**

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

| | Sources | Residual Load | % Reduction |
|---|---|---|---|
| Flow (ML/yr) | 6.12 | 5.6 | 8.4 |
| Total Suspended Solids (kg/yr) | 653 | 98.1 | 85 |
| Total Phosphorus (kg/yr) | 1.39 | 0.395 | 71.7 |
| Total Nitrogen (kg/yr) | 12.7 | 6.14 | 51.6 |
| Gross Pollutants (kg/yr) | 109 | 0 | 100 |

**Figure 3-5 MUSIC Results**

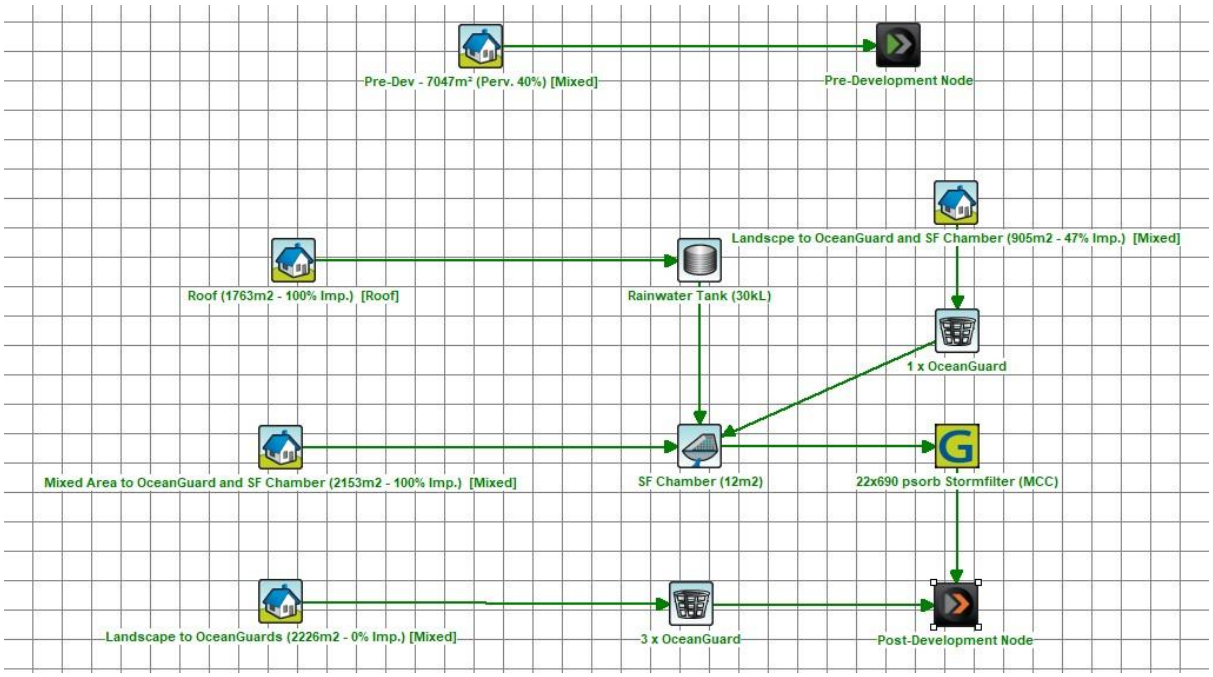
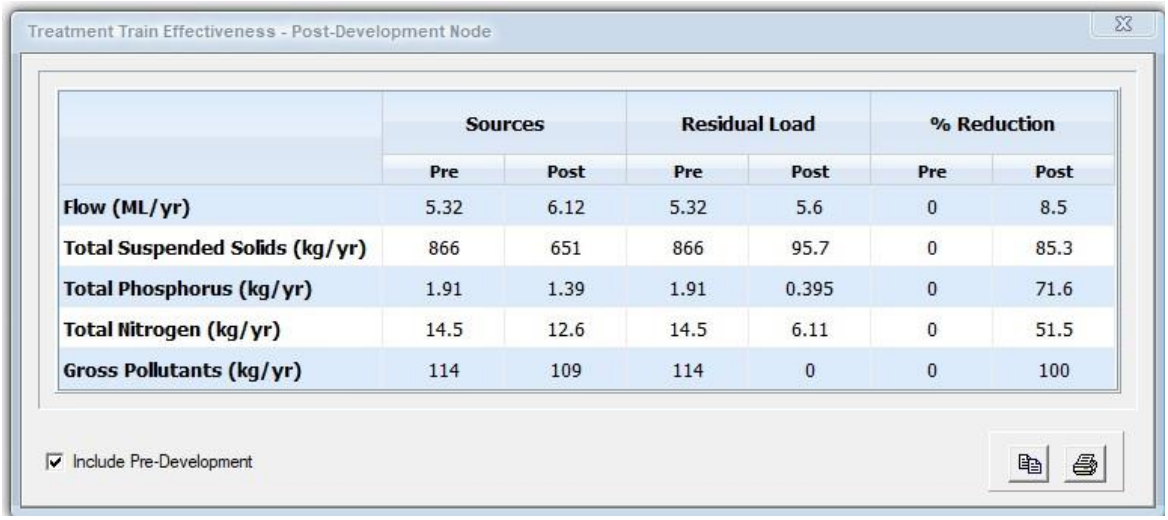



**Figure 3-6 Norbe MUSIC Diagram**




| | Sources | | Residual Load | | % Reduction | |
|---|---|---|---|---|---|---|
| | Pre | Post | Pre | Post | Pre | Post |
| Flow (ML/yr) | 5.32 | 6.12 | 5.32 | 5.6 | 0 | 8.5 |
| Total Suspended Solids (kg/yr) | 866 | 651 | 866 | 95.7 | 0 | 85.3 |
| Total Phosphorus (kg/yr) | 1.91 | 1.39 | 1.91 | 0.395 | 0 | 71.6 |
| Total Nitrogen (kg/yr) | 14.5 | 12.6 | 14.5 | 6.11 | 0 | 51.5 |
| Gross Pollutants (kg/yr) | 114 | 109 | 114 | 0 | 0 | 100 |

**Figure 3-7 Pre-Development & Post-Development MUSIC Results**

| Pre-Development | Source (kg/yr) | Residual Load (kg/yr) | % Reduction |
|---|---|---|---|
| Flow (ML/yr) | 5.32E+00 | 5.32E+00 | 0 |
| Total Suspended Solids (kg/yr) | 8.66E+02 | 8.66E+02 | 0 |
| Total Phosphorus (kg/yr) | 1.91E+00 | 1.91E+00 | 0 |
| Total Nitrogen (kg/yr) | 1.45E+01 | 1.45E+01 | 0 |
| Gross Pollutants (kg/yr) | 114 | 114 | 0 |

| Post-Development | Source (kg/yr) | Residual Load (kg/yr) | % Reduction |
|---|---|---|---|
| Flow (ML/yr) | 6.12E+00 | 5.60E+00 | 5.37 |
| Total Suspended Solids (kg/yr) | 6.51E+02 | 95.7 | 85.6 |
| Total Phosphorus (kg/yr) | 1.39E+00 | 3.95E-01 | 77.7 |
| Total Nitrogen (kg/yr) | 12.6 | 6.11 | 53.6 |
| Gross Pollutants (kg/yr) | 109 | 0.00E+00 | 100 |

| NorBE | Pre-Development Load (kg/yr) | Post Development Load (kg/yr) | % Pre. Vs Post Reduction |
|---|---|---|---|
| Flow (ML/yr) | 5.32 | 5.6 | -5.3% |
| Total Suspended Solids (kg/yr) | 8.66E+02 | 95.7 | **88.9%** |
| Total Phosphorus (kg/yr) | 1.91 | 0.395 | **79.3%** |
| Total Nitrogen (kg/yr) | 14.5 | 6.11 | **57.9%** |
| Gross Pollutants (kg/yr) | 114 | 0 | **100.0%** |

**Figure 3-8 NORBE Results**

### 3.3.3 Water Quantity / On-Site Detention

100.13m$^3$ 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 3-9. The permissible site discharge from the site is 36.24 L/s.

## PART 4: On-site Stormwater Detention

### 4.1 On-site Detention Calculation Sheet

**On-Site Detention Calculation Sheet**

**Address** 11-19 Middle Harbour Road, Lindfield

| | | | | | |
|---|---|---|---|---|---|
| **Catchment Detail** | | | | | |
| 1. | Catchment Name | Gordon Creek - GC1 | | | |
| 2. | Catchment Discharge Rate | 0.0128 | l/sec/m² | | **A** |
| 3. | Catchment Storage Rate | 0.0336 | m³/m² | | **B** |
| **Site Details** | | | | | |
| 4. | Site Area 5217 m² ^ 60% of site area | 3130.2 | m² | | **C** |
| 5. | Area(s) not draining to the detention system. 1000 m² | | | | |
| 6. | Total impervious area (roofs, driveways, paving, etc.) | 4000 | m² | | **D** |
| 7. | Impervious area bypassing detention system | 200 | m² | | **E** |
| **Permitted Site Discharge** | | | | | |
| 8. | **C** [3130.2 m²] x **A** [0.0128 l/sec/m²] = | 40.07 | l/sec | | **Flow 1** |
| 9. | Adjustment for any uncontrolled impervious flow **E / D** = | 0.05 | (<0.25) | | **F** |
| 10. | **Flow 1** [40.07 l/sec] x **F** [0.05] = | 2.00 | l/sec | | **Flow 2** |
| 11. | **Flow 1** [40.07] – **Flow 2** [2.00] = | 38.07 | **l/sec** | | **PSD** |
| **Site Storage Requirement** | | | | | |
| 12. | **C** [3130.2 m²] x **B** [0.0336 m³/m²] = | 105.175 | m³ | | **SSR1** |
| 13. | If the storage is in a landscaped basin, **SSR1** x 1.2 = | N/A | m³ | | **SSR2** |
| **Outlet Control** | | | | | |
| 14. | Height difference between top water surface level and the centre of the orifice | 1.2 | m | | **G** |
| 15. | Orifice Diameter $21.8 \times \sqrt{\frac{PSD}{G}}$ | 76.0 | mm | | **OD** |

PSD = Permitted Site Discharge
SSR1 = Site Storage Requirement (except for landscaped basins)
SSR2 = Site Storage Requirement (landscaped basins) **(Note: Use only SSR1 or SSR2)**
OD = Orifice Diameter

**Signature** ..... **Name** Samer El Haddad

**Qualifications** MIEAust CPEng NER 2247040 **Date** 21/05/2025

*Ku-ring-gai Council Technical Guideline for Water Management* 15

**Figure 3-9 OSD Calculation Sheet**

# 4 Stormwater Disposal

It is proposed that Stormwater is discharged to the street gutter of Middle Harbour Road The peak flow discharge is limited to the PSD (Permissible Site Discharge) and peak flows from other areas that do not drain to the OSD.

Please refer to Stormwater plans prepared by S&G Consultants P/L. Council's existing drainage infrastructures do not require upgrade.

# 5 Overland Flow Management

A FIRA report is prepared by S&G Consultants P/L to address item 19 of the SEARs. Reference is made to the report for details.

# 6 Soil & Water Management

## 6.1 Construction Stage

A Soil and Water Management Plan (SWMP) has been prepared for the DA submission. The implementation of the SWMP shall be in accordance with the guidelines of the NSW Department of Housing publication "Managing Urban Stormwater: Soils & Construction" (The Blue Book) and relative sections of the DCP.

The SWMP outlines the erosion and sediment control processes for the duration of the project. Emphasis should be placed firstly on minimising erosion then on preventing movement of sediment.

The clearing of the site leaves the land surface susceptible to increased erosion. The eroded particles can be transported off site and into natural waterways causing siltation, loss of hydraulic capacity and environmental stress. The SWMP aims to minimise the extent of erosion of the site, restrict movement of soil particles and mitigate the impacts of the works on the natural environment.

The SWMP provides for the:-

- Protection of disturbed ground through devices such as temporary vegetation, diversion banks and sediment fences;
- Early installation and progressive implementation of erosion controls;
- Early construction of permanent drainage structures, culverts, sediment basins traps and catch drains;
- Progressive revegetation of disturbed areas;
- Use of geotextile to stabilise disturbed surfaces during construction of culverts;
- Control of runoff from embankments through shaping of fill and construction of temporary windrows and batter drains;

- Implementation of erosion control measures at associated sites, including access tracks, roads, office/compound site and extraction sites;
- Progressive and continual implementation of temporary sediment controls;
- Diversion of runoff from disturbed areas to sediment control structures;
- Management of turbid water in basins after rain through flocculation or extraction and use for construction or dust suppression;
- Construction of temporary sediment traps at strategic locations;
- Routine maintenance of sediment control devices to ensure that they remain fully functional at all times;
- Removal of sediment from basins and other structures and placement in secure locations where further movement will not occur;
- Minimisation of transportation of mud and soil by vehicles onto Gordon Avenue and Hammond Lane, through the use of shakers and wash-bays;
- Provision for regular inspections of the control measures by a trained personnel to review and update control measures. Inspections should be conducted weekly and immediately after every significant storm event;
- Dust control through progressive revegetation and application of water;
- A procedure to ensure that water is not released from basins until achieving the appropriate quality standard; and
- Meeting EPA requirements & the guidelines of the Department of Housing publication “Managing Urban Stormwater: Soils & Construction” (Blue Book).

# 7 Maintenance Strategy

The maintenance strategy relating to the internal drainage system involves inspecting and maintaining the following structures:-

- On-Site Detention systems including the orifice plates and the mesh screens;
- Stormfilter Chamber;
- Ocean guard Baskets; and
- Rainwater tank.

The corporate body managing the development, or their contractors have the obligation to inspect and maintain these structures.

The following table indicates the minimum requirements for the inspection of the above structures and the maintenance procedures to be adopted.

**Table 7-1 OSD & Ocean Guard Basket & Rainwater tank Maintenance Strategy Requirements**

| Item | Inspection Frequency | Inspection Check Items | Maintenance Procedures |
|---|---|---|---|
| OSD Tanks | 6m | Clogging and blockage of mesh screen. Sediment depth in trap. | Leaves and debris to be removed from screen. Trap flood to be cleaned out |
| Ocean Guard Basket | 6m | Maintenance Contractor | Follow recommended procedure set out in Stormwater 360 “Operation and Maintenance Guidelines” |
| Rainwater Tank | 6m-1yr | Clogging and blockage of tank | First flush device and tank to be cleared of any debris. |

**Table 7-2 Stormfilter Maintenance Strategy Requirements**

| Item | Inspection Frequency | Inspection Check Items | Maintenance Procedures |
|---|---|---|---|
| Inspection – Minor Maintenance | 2 years and after major storms | Maintenance Contractor | Follow recommended procedure set out in Ocean Protect “Operation and Maintenance Guidelines” |
| Inspection – Major Maintenance | 1 year (except in case of spill) | Maintenance Contractor | Follow recommended procedure set out in Ocean Protect “Operation and Maintenance Guidelines” |

# 8 Design Statement

I, Sam Haddad of S&G Consultants P/L, confirm that this report addresses the requirement of SEAR No. 11 “Water Management” (Stormwater components only) and relevant State and local legislation, policies and guidelines including DCP of the Ku-Ring Gai Council. I further confirm that none of the information contained in the concept SSDA is false or misleading.

Yours faithfully,

**For & on behalf of S&G Consultants Pty Ltd**

**Sam Haddad**

Director (Civil)

MIEAust CPEng NER

# A1 Appendix 1

## Stormwater Plans


P: 02 8883 4239 W: www.sgce.com.au

**P:** 02 8883 4239

**W:** www.sgce.com.au

**A:** Suite 311, Level 3,
480 Pacific Highway,
St Leonards, NSW 2065

SGC