

ATTACHMENT C – AMENDED CONCEPTUAL STORMWATER MANAGEMENT PLAN



The experience **you deserve** 



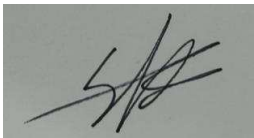
**38 Timor Avenue, Loganholme
Conceptual Stormwater Management Plan**

Client:	Brookmoore Group
Project Number:	BE260151
Document Number:	BE260151-RP-CSMP-02

Date of Issue:	18 August 2026
-----------------------	----------------



Document Control Record

Prepared by:	Sheldon Whitworth
Position:	Civil Engineer
Signed:	
Date:	July 2026

Approved by:	Rod Barry
Position:	Principal Engineer RPEQ 7067
Signed:	
Date:	18/08/26

Version No.	Description	Date	Prepared	Approved
01	Original Issue	01/05/2026	SW	RB
02	Response to Information Request	18/08/2026	SW	RB

Recipients are responsible for eliminating all superseded documents in their possession.

Coote Burchills Engineering Pty Ltd ACN: 166 942 365
GOLD COAST – Level 2, 26 Marine Parade Southport QLD 4215 - PO Box 3766, Australia Fair Southport QLD 4215 BRISBANE – Level 25, 215 Adelaide Street Brisbane QLD 4000 – GPO Box 3083, Brisbane QLD 4001 TOOWOOMBA – Unit 4, 462 Ruthven Street Toowoomba QLD 4350 - PO Box 1439, Toowoomba QLD 4350 MORETON BAY SUNSHINE COAST IPSWICH BANGALOW

RELIANCE, USES and LIMITATIONS
This report is copyright and is to be used only for its intended purpose by the intended recipient and is not to be copied or used in any other way. The report may be relied upon for its intended purpose within the limits of the following disclaimer. This study, report and analyses have been based on the information available to Burchills Engineering Solutions at the time of preparation. Burchills Engineering Solutions accepts responsibility for the report and its conclusions to the extent that the information was sufficient and accurate at the time of preparation. Burchills Engineering Solutions does not take responsibility for errors and omissions due to incorrect information or information not available to Burchills Engineering Solutions at the time of preparation of the study, report or analyses.





Executive Summary

Brookmoore Group has engaged Burchills Engineering Solutions to prepare a Conceptual Stormwater Management Plan (CSMP) for the proposed development located at 38 Timor Avenue, Loganholme.

This CSMP has been prepared in accordance with the Logan City Council and is to accompany the development application for a proposed subdivision. The CSMP has referenced relevant guidelines relating to stormwater management to form the conceptual basis of the stormwater plan. The following conclusions have been made as a result of this study.

This CSMP has been updated in response to Council's Information Request dated 25 June 2026 (Council Ref: 19536981/MILNEC).

Stormwater Quantity

- As a result of the proposed development, the magnitude of peak stormwater discharge exiting the site has increased.
- In the existing case, there is 1 Lawful Point of Discharge (LPD) prescribed for the site; the existing drainage infrastructure to the south of the site in Timor Avenue.
- In the developed case;
 - All flow from the post-developed catchment will be conveyed to an on-site detention tank where it will be released at the LPD in a controlled manner to ensure that there is non-worsening peak flow. This detention device will require a 1% AEP volume of 50m³.
 - Flows from the detention tank will be discharged via a new piped stormwater extension to the existing gully pits further down Timor Avenue.
 - It is assessed that the downstream stormwater network proposed as part of the adjacent development on Lot 298 RP118026 (Council Ref: OW/68/2026) has sufficient capacity to convey the 10% AEP design event runoff from both subject site and the adjacent site.

Stormwater Quality

- To achieve Logan City Council's Water Quality Objectives, it is proposed to use Ocean Protect stormwater quality treatment devices to treat stormwater runoff from the developed areas of the site.

Erosion and Sediment Control

- An Erosion Hazard Assessment has identified that the site is high-risk with regard to erosion potential.
- Sediment loss estimates have been used to determine that Type 2 sediment controls are required, given a soil loss of 81.2 t/ha/yr for the disturbed catchment.
- A sediment pond has been sized and is required during construction





Table of Contents

1.	Introduction	1
1.1	Background	2
1.1.1	Regulatory Requirements and Technical Guidelines	2
1.2	Purpose	2
1.3	Scope	2
2.	Site Detail	3
2.1	Location	3
2.2	Existing Land Uses and Topography	3
2.3	Downstream Environment	3
2.4	Rainfall	4
2.5	Proposed Development	4
2.6	External Catchment	5
3.	Stormwater Quantity Assessment	6
3.1	Overview	6
3.2	Drainage Catchment Parameters	6
3.2.1	Conveyance of Flows	6
3.3	DRAINS Analysis	8
3.3.1	Development Drainage Infrastructure	9
3.4	DRAINS Results	10
3.5	On Site Detention (OSD) Details	10
4.	Stormwater Quality Assessment	11
4.1	Water Quality Objectives (WQOs)	11
4.2	Treatment Train	11
4.3	MUSIC Results	13
5.	Erosion and Sediment Control	14
5.1	Best Management Practices	14
5.2	Erosion Hazard Assessment	14
5.3	Erosion Control Standard	14
5.4	Sediment Loss Estimate	15
5.5	Sediment Pond Requirement	15
5.5.1	Sedimentation Forebay Area	16
5.5.2	Sedimentation Storage Volume	16
5.6	Sediment Control Standard	17
6.	Conclusion	18





Tables

Table 1.1 Information Request Response	1
Table 3.1 Catchment Parameters.....	6
Table 3.2 Conveyance of Flows	6
Table 3.3 Pre-Development vs Post-Development Peak Discharges at LPD A	10
Table 3.4 OSD Details	10
Table 4.1 Treatment Train Effectiveness.....	13
Table 5.1 Erosion Hazard Assessment	14
Table 5.2 Potential Sediment Loss (RUSLE)	15
Table 5.3 Sediment Control Standard (default) based on soil loss rate (IECA, 2008)	15
Table 5.4 Sedimentation Pond Design Parameters (Sediment forebay)	16
Table 5.5 Sediment Pond	16
Table 5.6 Sediment Control techniques	17
Table B.6-1 Time of Concentration for Pre-Development Scenario	20
Table B.6-2 Time of Concentration for Post-Development Scenario	20
Table B.6-3 Pre-Development Hydrology	1
Table B.6-4 Un-Mitigated Post-Development Hydrology.....	1
Table C.6-5 Adopted Initial & Continuing Losses	1
Table C.6-6 Pre-Development Catchment Parameters.....	1
Table C.6-7 Post-Development Catchment Parameters (Unmitigated)	1

Figures

Figure 2.1 Site Locality Plan	3
Figure 2.2 Proposed Development (MODE, 2026)	4
Figure 3.1 Pre-Development Catchments	7
Figure 3.2 Post-Development Catchments.....	7
Figure 3.3 DRAINS Schematic	9
Figure 4.1 Typical OceanGuards (Ocean Protect, 2026)	12
Figure 4.2 Typical StormFilter (Ocean Protect, 2026).....	12
Figure 4.3 Operational Control Plan	Error! Bookmark not defined.
Figure 4.4 Treatment Train Layout & MUSIC Results	13

Appendices

Appendix A – Proposed Plans of Development
Appendix B – Time of Concentration and Rational Method Calculations
Appendix C – XP-SWMM Input Parameters
Appendix D – Burchills Engineering Solutions Civil Drawings
Appendix F – MUSIC Input Parameters





1. Introduction

This Conceptual Stormwater Management Plan (CSMP) has been prepared for Brookmoore Group the proponent of this Development Application. The proponent is seeking Development Approval for the proposed development at 38 Timor Avenue, Loganholme, Queensland, properly described as Lot 297 on RP118026 (the subject site).

The subject site is situated within Logan City Council Local Government Area (LGA) and is zoned by the LCC as 'Low-Medium Density Residential.'

This CSMP has been updated in response to Council's Information Request dated 25 June 2026 (Council Ref: 19536981/MILNEC).

Response to Council's Information Request is summarised in Table 1.1.

Table 1.1 Information Request Response

INFORMATION REQUEST ITEM	RESPONSE
2.1. As the proposed development involves a material change of use on a premises within the Loganholme Local Plan Area, the Stormwater quality management design objective must be achieved (refer to Section 6.2.5 Planning scheme policy 5-Infrastructure 3.6.1.4). Provide a Conceptual site-based stormwater management plan or deemed to comply solution in accordance with Section 6.2.5 Planning scheme policy 5 – Infrastructure to demonstrate how the proposed development will achieve the stormwater quality design objective. Alternatively, a monetary contribution for stormwater quality in lieu of on-site treatment is available to comply with the stormwater quality design objective. This is administered via an infrastructure agreement provided by Council. Confirm if a monetary contribution is sought.	The stormwater quality management section of the CSMP has been updated to include quality treatment measures with products by Ocean Protect. Refer to Section 4.
3.1.1. Clarify if the references to Coral Avenue should be amended to Timor Avenue.	The reference has been amended to "Timor Avenue".
3.1.2. Provide the required reference on page 7.	The missing reference has been fixed.
3.1.3. Amend Figure 2.3 to display the full extents of the external catchment.	The external catchment delineation has been updated. Refer to Section 2.6.
3.1.4. With reference to the item above, estimate the peak flow rates up to and including the 1% AEP event for the external catchment and demonstrate how the external catchment runoff will be collected, conveyed and discharged from the post development site.	An assessment of the peak flows of the defined external catchment and the management measures are included in Section 2.6.
3.1.5. Clarify the operational status of the downstream stormwater pipe drainage in Timor Avenue	Operational status of the downstream stormwater pipe drainage in Timor Avenue has been included in Section 3.2.1.
3.1.6. Demonstrate there is stormwater capacity for the proposed connection of the post development subject site to the downstream stormwater pipe drainage.	A capacity assessment of the downstream stormwater pipe for site connection has been included in Section 3.2.1.





1.1 Background

1.1.1 Regulatory Requirements and Technical Guidelines

The strategies proposed in this CSMP have been developed to address the requirements of the Logan City Council Plan, and have also been prepared in accordance with the following guidelines:

- SC6.2.5 Planning Scheme Policy – Infrastructure 2.4 Stormwater Infrastructure Documentation – Logan Planning Scheme 2015 v.8.1 (Logan City Council, 2015);
- State Planning Policy July 2017 (DSPIP, 2017);
- Queensland Urban Drainage Manual (QUDM) Fourth Edition (IPWEAQ, 2017);
- Australian Rainfall & Runoff: A Guide to Flood Estimation (ARR 2019)
- Australian Government – Bureau of Meteorology (Bureau of Meteorology, n.d.);
- MUSIC Modelling Guidelines (Water By Design, 2019);
- WSUD Technical Guidelines for South East Queensland – Version 1 (Healthy Waterways, BCC, MBWCP, 2006);
- Best Practice Erosion and Sediment Control (IECA, 2025); and
- Best Practice Erosion and Sediment Control Appendix B - Draft Document Revision December 2016 (IECA, 2018).

1.2 Purpose

The main objectives of this CSMP have been established from the criteria set out in the Logan Planning Scheme SC6.2.5 Planning Scheme Policy (Logan City Council, 2015) and are summarised as follows:

- Avoid the creation of nuisance flow or hazard problems;
- Protect the quality of surface and ground waters during construction and operation of new development;
- Maintain the natural hydraulic behaviour of catchments;
- Protect existing natural features and ecological processes;
- Integrate stormwater management infrastructure carefully in the urban and natural landscape; and
- Assess the proposed development design and ensure safety for end users with respect to flooding.

1.3 Scope

To achieve the above-mentioned objectives, this CSMP details the following:

- Site description including:
 - Topography;
 - Land Use; and
 - Vegetation.
- Stormwater Quantity:
 - Control measures to ensure no net increase in peak discharge from the subject site (up to the 1% Average Exceedance Probability (AEP)).
- Stormwater Quality:
 - Address requirements of the SPP 2017.

To minimise the impact of the proposed development on the external environment and to avoid significant and / or sustained deterioration in downstream water quality the proponent shall implement this CSMP. This CSMP may be amended as required, in response to a monitoring and maintenance program.





2. Site Detail

2.1 Location

The site is legally described as Lot 297 on RP118026. The street address is 38 Timor Avenue, Loganholme, QLD 4129. The site is rectangular occupies a total area of approximately 2120m² (0.2120 ha). The subject site is situated within Logan City Council Local Government Area (LGA) and is zoned by the LCC as '*Low-Medium Density Residential*.'



Figure 2.1 Site Locality Plan

2.2 Existing Land Uses and Topography

The subject site at 38 Timor Avenue, Loganholme is currently occupied by a single existing residential dwelling and associated ancillary structures. The site has frontage to Timor to the south-west and is otherwise bounded by established residential properties on all remaining sides.

The site is predominantly pervious, with much of the land area comprising grassed surfaces and mature vegetation, including several trees distributed across the property. Built form on the site is limited to the existing dwelling and ancillary structures, with the remainder of the site generally open and landscaped in character.

The site grades from the north-west to south-east, with a height differential of approximately 3.58m. The highest point within the site is at the north-western corner at RL 14.42 AHD, and the lowest point is in the south-eastern corner at approximately 10.84m AHD.

2.3 Downstream Environment

Under existing conditions, rainfall falling on pervious portions and ancillary structures of the site predominantly infiltrates into the ground or disperses as shallow overland sheet flow. Roof runoff from the existing dwelling is collected through gutters and downpipes and discharged to the existing kerb and channel on Timor Avenue via a single kerb adaptor.





2.6 External Catchment

There is a very minor external catchment to the north of the site as shown in Figure 2.3 below of approximately 400m². The catchment area is 100% pervious and already has a solid timber paling fence along the boundary which will contribute in retaining any flows from this catchment to the neighbouring site side as per the existing conditions.

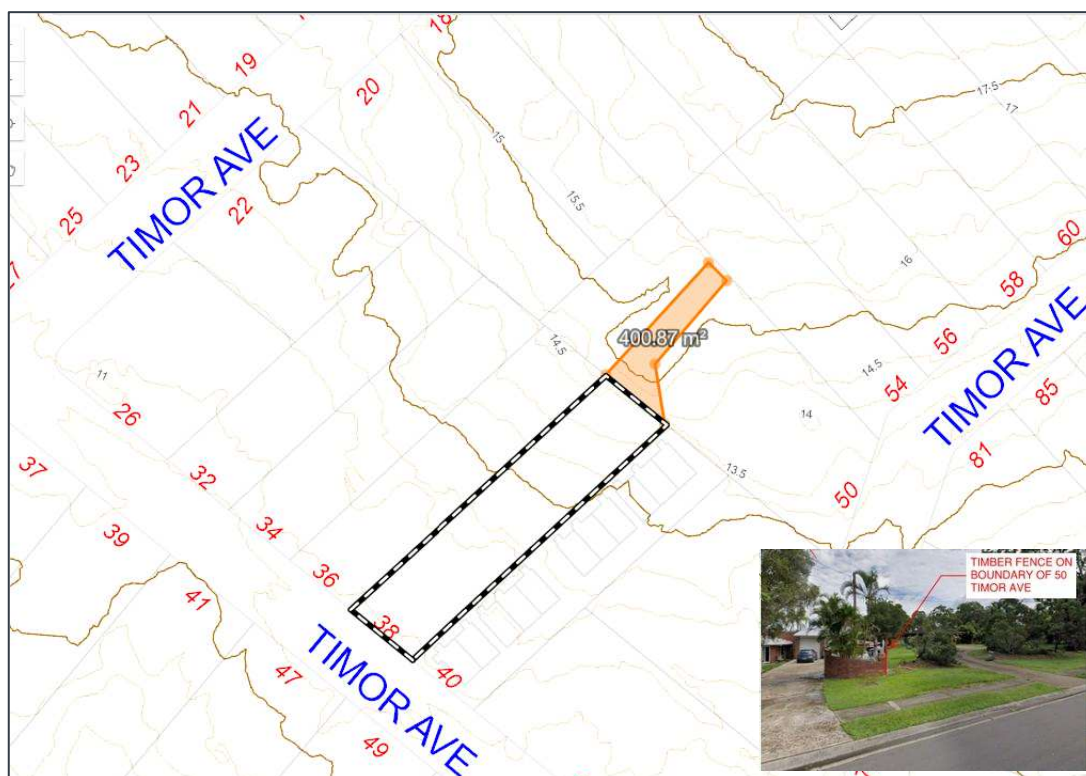


Figure 2.3 External Catchment

As part of the proposed development, the access driveway located along the boundary of the subject site and 40 Timor Avenue will act as an overland flow path.

The peak flows generated from the defined external catchment is calculated via Rational Method and is shown in table below.

Catchment Area (ha)	Time of Concentration (minutes)	63% AEP peak flow (m ³ /s)	39% AEP peak flow (m ³ /s)	20% AEP peak flow (m ³ /s)	10% AEP peak flow (m ³ /s)	5% AEP peak flow (m ³ /s)	2% AEP peak flow (m ³ /s)	1% AEP peak flow (m ³ /s)
0.04	5	0.007	0.009	0.013	0.016	0.019	0.025	0.028

Runoff from the external catchment is considered relatively minor and will be captured and conveyed by the pits and pipe along the proposed driveway within the site, and then discharge into the drainage infrastructure along Timor Avenue.

Runoff from in events exceeding the capture capacity of the pits will be conveyed via the proposed driveway as overland flows and discharged onto Timor Avenue.





3. Stormwater Quantity Assessment

3.1 Overview

This section outlines the measures proposed to achieve the stormwater quantity management objectives identified above. In accordance with industry best practice and relevant guidelines, stormwater management for the development is required to ensure that post-development runoff does not adversely impact downstream properties. Specifically, the development must satisfy the non-worsening principle, whereby post-development discharge conditions do not exceed those that existed under pre-development conditions (IPWEAQ, 2017).

The proposed development will increase the proportion of impervious surfaces within the site, resulting in increased runoff volumes and higher peak flow rates during storm events. Without appropriate mitigation measures, this increase in impervious area would result in greater peak discharges entering the downstream drainage network.

To address this, an On-Site Detention (OSD) system is proposed as part of the stormwater management strategy. The OSD system will temporarily store stormwater runoff generated during rainfall events and release flows at a controlled rate. The system will be designed such that the post-development peak discharge does not exceed the pre-development peak discharge for the nominated design storm events. By attenuating peak flows in this manner, the proposed development will maintain downstream hydraulic conditions consistent with existing conditions and comply with the non-worsening requirements.

3.2 Drainage Catchment Parameters

Drainage catchments have been delineated using site survey, aerial imagery and development plans in the post developed scenario. Pre and post development catchment parameters are summarised in Table 3.1. Catchment plans are provided in Appendix E.

Table 3.1 Catchment Parameters

Scenario	Catchment ID	Total Area (ha)	Impervious (%)
Pre-developed	A	0.2120	15
Post-developed	A	0.2120	75

3.2.1 Conveyance of Flows

Important information about the conveyance of flows for the pre-development and post-development scenarios are included in Table 3.2 below.

Table 3.2 Conveyance of Flows

Subject	Description
Lawful Points of Discharge	One (1) Point of Discharge (PD) is proposed for the developed site and is defined as a new stormwater manhole and extension connection to the stormwater infrastructure proposed under development application number OW/68/2026 for the neighbouring site 36 Timor Avenue.
Pre-Development	In the existing case, runoff from the roof area is drained and discharged to Timor Avenue via a kerb adaptor. The remainder of the site is conveyed via overland flow, where it is collected by the existing kerb and channel in Timor Avenue. Refer to Figure 3.1 for more information.





Subject	Description
Post-Development	In the developed case, runoff is conveyed to the proposed underground detention tank via overland flow and piped drainage where it will be discharged to a new stormwater manhole and pipe in the roadway of Timor Avenue. The new drainage infrastructure is proposed to be connected into the manhole and pipe to be constructed as part of the adjacent development (Council Ref: OW/68/2026). Refer to Figure 3.2 for more information.

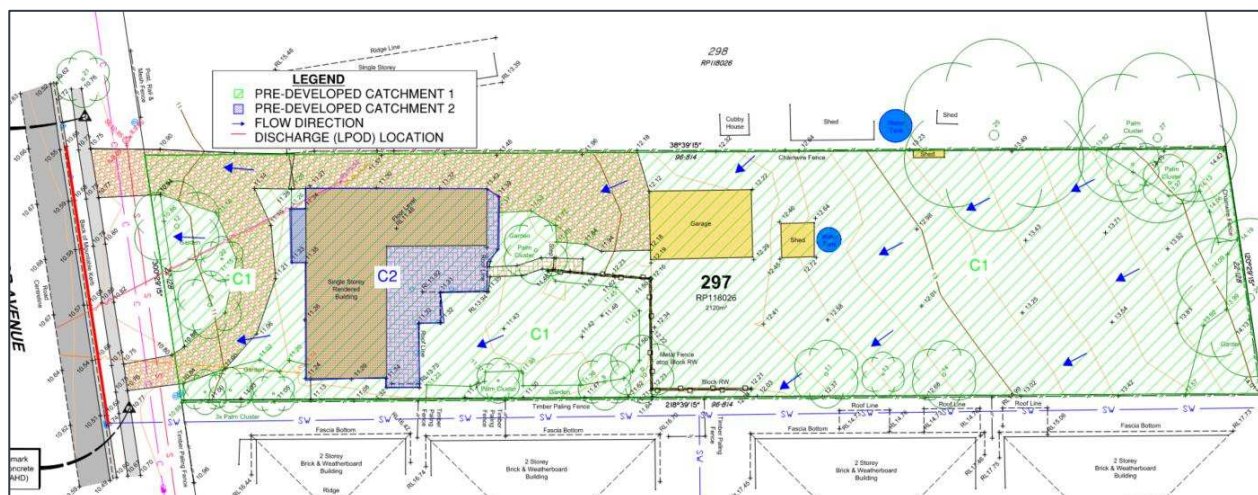


Figure 3.1 Pre-Development Catchments

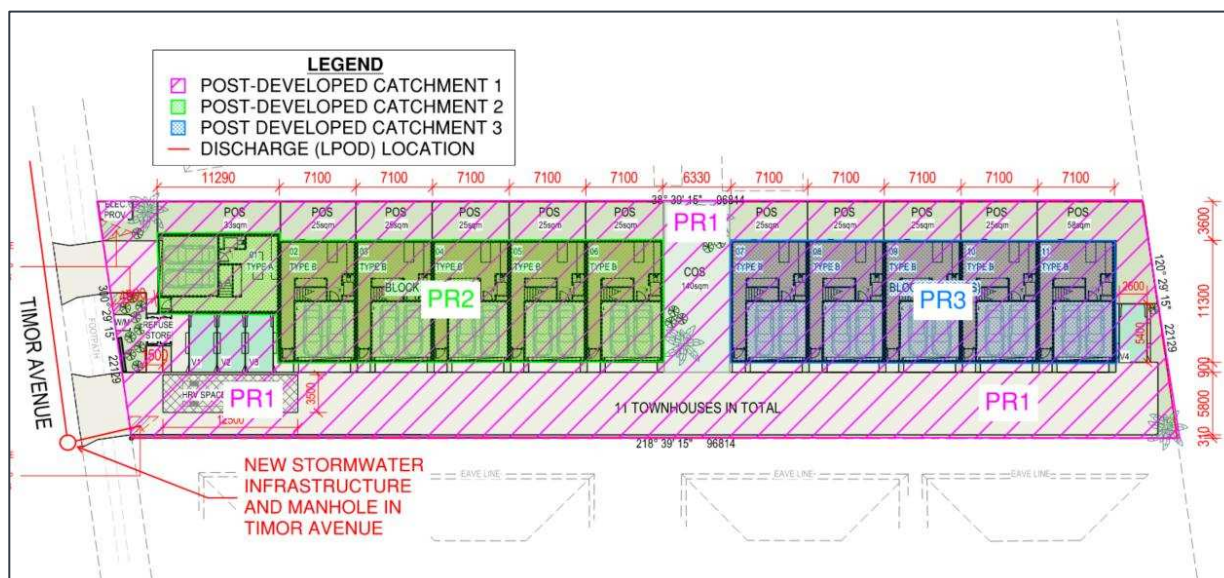


Figure 3.2 Post-Development Catchments

The development is proposed to connect into the new underground drainage network forming part of the approved adjacent development on Lot 298 RP118026 (Council Ref: OW/68/2026).

It is noted that the OPW Decision Notice for this adjacent development was issued on 29 May 2026, indicating that the drainage infrastructure associated with this OPW Approval (that the development is proposed to connect into) is yet to be constructed.





Based on the approved SWMP under the MCU Approval for the adjacent development on Lot 298 RP118026 (Council Ref: MCUI/37/2025), the underground drainage is designed for 10% AEP minor design storm. The mitigated 10% AEP peak flow is reported as 0.088m³/s.

The internal drainage for the site will also be designed to have a level of service of 10% AEP. Based on Section 3.4 below, the mitigated 10% AEP peak flow for the post-development site is 0.054 m³/s.

This results in a total 10% AEP peak flow of 0.142m³/s.

Based on the approved drawing (drawing number CW25130-SW03) under the OPW Approval for the adjacent development on Lot 298 RP118026, the propped underground pipe along Timor Avenue is 375mm diameter in 0.54% grade. A pipe flow capacity assessment has been undertaken with Manning's Equation to be approximately 0.14 m³/s.

Therefore, it is concluded that the proposed downstream drainage pipe is sufficient to convey the mitigated 10% AEP peak flows from both the development site (Lot 297 RP118026) and the adjacent site (Lot 298 RP118026).

3.3 DRAINS Analysis

DRAINS is a widely used hydrologic and hydraulic modelling software developed in Australia for the analysis and design of urban stormwater drainage systems. It is commonly applied in Development Application (DA) reports to assess stormwater impacts and to design on-site detention (OSD) systems in accordance with local council requirements. This modelling software is a link-node model capable of performing hydrology and hydraulic of stormwater drainage systems simultaneously.

The primary purpose of detention modelling in DRAINS is to ensure that post-development peak discharge does not exceed pre-development (or permissible site discharge, PSD) conditions. This is achieved by incorporating an on-site detention system within the model, which temporarily stores excess runoff and releases it at a controlled rate via an outlet structure (e.g. orifice or weir).

Details of the assumptions and input parameters used within the DRAINS model inputs are included in Appendix C. The layout of the DRAINS model is illustrated in figure 3.3.



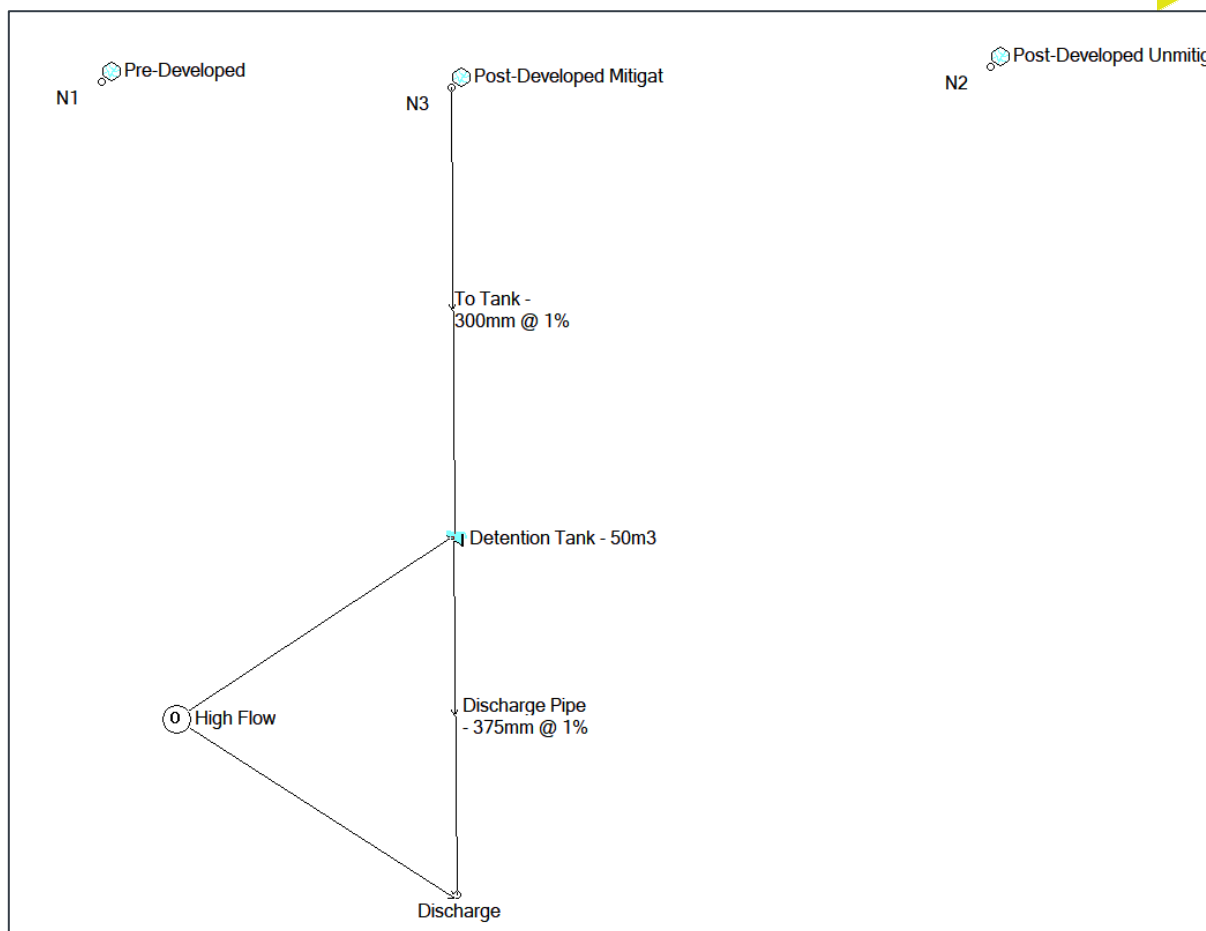


Figure 3.3 DRAINS Schematic

3.3.1 Development Drainage Infrastructure

To confirm the performance of the proposed OSD system and that peak flow discharging the site has not been worsened, a pre- and post-development model was constructed.

A summary of the modelling results for different AEP events is contained in Table 3.3. Results of the modelling indicate the proposed system is capable of maintaining the pre-development peak discharges for all storm events up to the 1% AEP event at LPD A.

The critical temporal patterns for the DRAINS model are based off the 2019 AR&R Rainfall Data and the max median event of each duration is selected as the critical storm.





3.4 DRAINS Results

Table 3.3 Pre-Development vs Post-Development Peak Discharges at LPD A

AEP Event (%)	Pre-Development Peak Discharge (m³/s)	Post-Development Peak Discharge Mitigated (m³/s)	Post-Development Peak Discharge Unmitigated (m³/s)
1	0.090	0.085	0.135
2	0.079	0.076	0.121
5	0.065	0.065	0.103
10	0.054	0.054	0.089
20	0.037	0.035	0.075
39	0.029	0.026	0.061
63	0.021	0.021	0.048

3.5 On Site Detention (OSD) Details

The proposed OSD systems are to be implemented to ensure a non-worsening of peak discharges at LPD A.

Table 3.4 below contains the details of the proposed OSD systems within the subject site.

Table 3.4 OSD Details

Detention ID	Outlet Structures				1% AEP Detention Volume (m³)
	Low Flow Orifice	High Flow Orifice	Pit	Outlet Pipe	
Detention Tank A	0.140mm @ tank invert	0.180mm @ 0.6m above base	0.6m x 0.6m (1.8m weir length) @ top of tank	1 x 375mm dia RCP @ invert	50





4. Stormwater Quality Assessment

4.1 Water Quality Objectives (WQOs)

In accordance with the State Planning Policy (SPP), the total effect of permanent water quality control measures is to achieve reductions in the mean annual load generated by the development site at a minimum of:

- 80% for Total Suspended Solids (TSS);
- 60% for Total Phosphorus (TP);
- 45% for Total Nitrogen (TN); and
- 90% for Gross Pollutants (>5 mm).

These targets have been adopted as the Water Quality Objectives for the development to maintain the environmental values of the downstream receiving waters.

4.2 Treatment Train

To demonstrate that the above WQOs can be achieved at the site LPD(s), a treatment train has been developed and assessed using the Model for Urban Stormwater Improvement Conceptualisation software (MUSIC).

The treatment train has been designed to treat the runoff from the new development using proprietary products.

The proposed treatment train is shown in the updated civil drawings within Appendix D.

Further information and design of the treatment train will be provided in Detailed Design phase.

4.2.1 Proprietary Devices

It is proposed that a precast end-of-line treatment device be used to treat minor flows from site catchment. For the purpose of this assessment, Ocean Protect products have been adopted as representative proprietary treatment devices for the purpose of this conceptual assessment.

The conceptual parameters of the proposed Ocean Protect products are presented below, and further detail of the input parameters used within MUSIC are included in Appendix E.

The recommended filter configuration is as follows:

- 1 x OceanGuards with 200µm mesh bags (OG-200);
- 4 x Tall(690) PSorb (SQIDEP) cartridge StormFilter system within a 6m² StormFilter chamber, inside the precast UrbanPond detention tank.

A typical section of the proposed Ocean Protect products has been included in the figures below. The stormwater treatment system is proposed to be designed and installed by Ocean Protect.



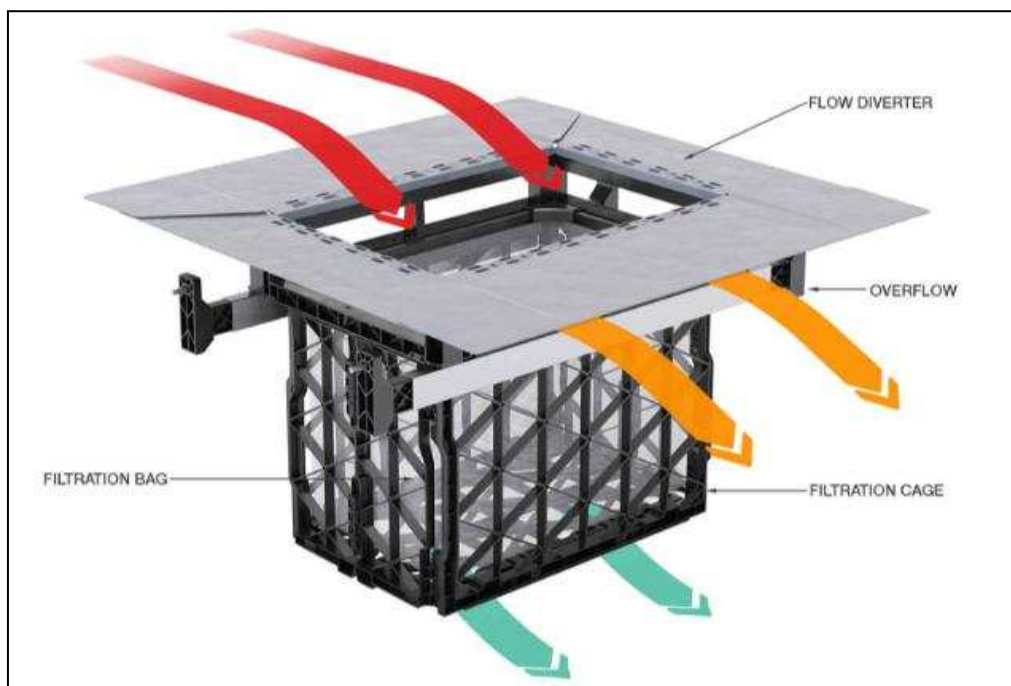


Figure 4.1 Typical OceanGuards (Ocean Protect, 2026)

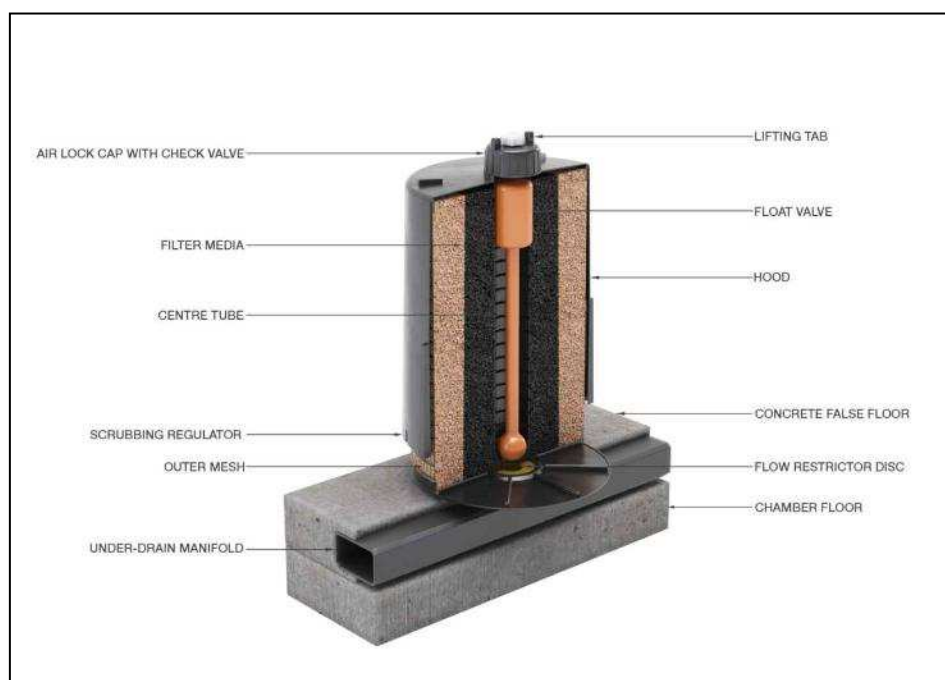


Figure 4.2 Typical StormFilter (Ocean Protect, 2026)





4.3 MUSIC Results

The MUSIC modelling results for treatment train effectiveness are summarised in Table 4.1. The results indicate the WQOs are achieved for the rainfall data set simulated.

Table 4.1 Treatment Train Effectiveness

Pollutant	Inflows (kg/yr)	Outflows (kg/yr)	Reduction Achieved (%)	Water Quality Objective (%)
TSS	393	77.2	80.4	80
TP	0.85	0.213	75	60
TN	6.34	2.98	53	45
GP	39.6	0	100	90

Note: All simulations have been run with pollutant export estimation set to “stochastic generation”.

A screen capture of the MUSIC model and treatment train effectiveness results is presented in Figure 4.3.

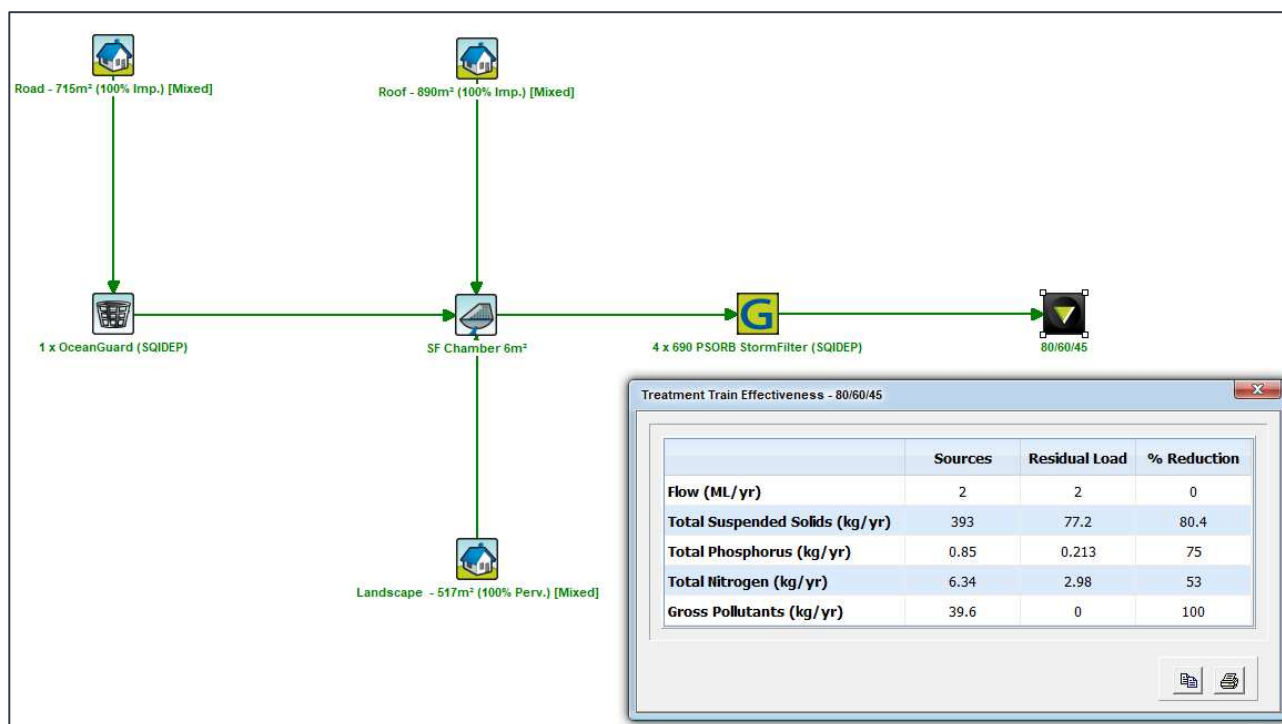


Figure 4.3 Treatment Train Layout & MUSIC Results





5. Erosion and Sediment Control

5.1 Best Management Practices

Stormwater runoff quality during the construction phase of this development shall be managed in accordance with Best Practice Erosion and Sediment Control (IECA, 2025), which is the current recognised construction industry best management practice (BMP) for erosion and sediment control.

Erosion and Sediment Control (ESC) plans are required to be implemented during the construction phase to minimise environmental harm to on-site stormwater treatment devices and downstream receiving waters.

It is important to note that the measures identified below are a generic approach to construction phase stormwater quality management. Erosion and sediment control is highly dependent on local site conditions and staging of the proposed earth disturbing activities. Therefore, further details of the erosion and sediment control systems and procedures will be provided for each development stage when more information is available regarding in-situ soils and development staging.

5.2 Erosion Hazard Assessment

As part of the IECA guidelines, an erosion hazard assessment is to be completed to identify low-risk and high-risk short-term land disturbances within a given region (IECA, 2025). This Erosion Hazard Assessment estimates a TASK number which triggers if a site should be treated as high or low risk in regard to erosion control measures. A trigger value for high-risk site of 200 will be adopted for future stage as recommended by IECA. High risk sites trigger further need for assessment.

Table 5.1 Erosion Hazard Assessment

Catchment ID	Area (m ²)	Duration of Disturbance (months)	Slope Factor	K Factor	TASK Number
Post A	2120	6	0.48	0.040	333.8

From Table 5.1 the results show that the Post A Catchment requires high-risk ESC treatment. Given the development proposal is at a conceptual phase, further details of the erosion and sediment control systems and procedures will be provided at the detailed design stage.

5.3 Erosion Control Standard

The best practice erosion control measures for high-risk development as detailed in Best Practice Erosion and Sediment Control (IECA, 2025) include the following:

- All reasonable and practical steps to be taken to apply best practice erosion control measures to completed earthworks, or otherwise stabilise such works, prior to anticipated rainfall - including existing unstable, undisturbed, soil surfaces under the management or control of the building/construction works;
- Land clearing limited to maximum 4 weeks work;
- Disturbed soil surfaces stabilised with minimum 75% cover within 10 days of completion of works within any area of a work site;
- Staged construction and stabilisation of earth batters; and
- Soil stockpiles and unfinished earthworks are suitably stabilised (covered) if disturbance is expected to be suspended for a period exceeding 10 days.





5.4 Sediment Loss Estimate

The potential volume of sediment loss from the subject site has been estimated using the Revised Universal Soil Loss Equation (RUSLE).

RUSLE calculates annual soil loss rates based on:

$$A = R \cdot K \cdot LS \cdot C \cdot P$$

Where:

A = annual soil loss due to erosion (t/ha/yr)

R = rainfall erosivity factor

K = soil erodibility factor

LS = topographic factor derived from slope length and slope gradient

C = cover and management factor

P = erosion control practice factor

Table 5.2 Potential Sediment Loss (RUSLE)

Catch. ID	Area (ha)	Soil Type*	Slope Length (m)	Slope Grade (%)	Intensity ⁶ I ₂ (mm/hr)	R	K	LS	C	P	A (t/ha/yr)	Yield (m ³ /yr)
Post A	0.212	Silt Loam	80	3	11.8	3004	0.04	0.52	1	1.3	81.2	13.2

*Note soil testing will need to be carried out to confirm soil type

Table 5.3 Sediment Control Standard (default) based on soil loss rate (IECA, 2008)

Area limit (m ²) ^[1]	Soil loss rate limit (t/ha/yr) ^[2]			Soil loss rate limit (t/ha/month) ^[3]		
	Type 1	Type 2	Type 3	Type 1	Type 2	Type 3
250	N/A	N/A	[4]	N/A	N/A	[4]
1000	N/A	N/A	All cases	N/A	N/A	All cases
2500	N/A	> 75	75	N/A	> 6.25	6.25
>2500	> 150	150	75	> 12.5	12.5	6.25

5.5 Sediment Pond Requirement

Sediment ponds are generally required during construction where:

- The disturbed area is greater than 10,000m² and the expected sediment loss is greater than 75 t/ha/yr;
- The disturbed soils are dispersive; and/or
- Where there is a need to control runoff suspended solids/turbidity.

As presented in Table 5.2, it is expected that the potential annual soil loss will exceed 75 t/ha/yr for the catchments, and therefore a sediment pond is required during construction.





5.5.1 Sedimentation Forebay Area

The required sediment forebay area was determined using Equation 4 in Section 3.4.3.2 of the Bioretention Technical Design Guidelines (Water By Design, 2014) as shown below.

$$R = 1 - \left[1 + \frac{1}{n} \times \frac{v_s}{Q/A_f} \right]^n$$

Where:

R = fraction of target sediment removed (%)

v_s = settling velocity of target sediment (m/s)

Q = 3-month ARI flow rate (m³/s)

A_f = minimum forebay area for sediment capture (m²)

n = turbulence or short-circuiting parameter

The proposed sediment forebay design parameters are presented in Table 5.4.

Table 5.4 Sedimentation Pond Design Parameters (Sediment forebay)

Catchment ID	R (%)	v_s (m/s)	Q (m ³ /s)	n	A_f (m ²)
A	80	0.1	0.0117	0.5	1.4

5.5.2 Sedimentation Storage Volume

The volume and area of a sediment pond is calculated as:

$$V_s = A_c \cdot R \cdot L_o \cdot F_c$$

Where:

V_s = volume of forebay sediment storage required (m³)

A_c = contributing catchment area (m²)

R = capture efficiency

L_o = sediment loading rate (m³/ha/year)

F_c = desired cleanout frequency (years)

Table 5.5 Sediment Pond

Catchment ID	R (%)	A_c (ha)	L_o (m ³ /ha/yr)	F_c (years)	V_s (m ³)
A	80	0.212	1.6	1	0.271





5.6 Sediment Control Standard

Table B1 of the guidelines (IECA, 2018) provides a method for determining the sediment control standard for construction activities based on the estimated soil loss rate. Based on the size of the development, it is likely that Type 2 sediment controls are required for this site. A list of Type 2 and supplementary sediment control techniques is provided in Table 5.6 below based on Table 4.5.3 and Table 4.5.4 of the guidelines (IECA, 2008). These control techniques provide a guide that is recommended to be used to minimise the downstream effect of sediments.

Table 5.6 Sediment Control techniques

Techniques	Type 2	Supplementary
Sheet flow treatment	➤ Buffer Zone capable of infiltrating the majority of flows from design storms ➤ Block & Aggregate Drop Inlet Protection ➤ Compost/Mulch Berm ➤ Filter Sock ➤ Filter Sock Drop Inlet Protection ➤ Mesh & Aggregate Drop Inlet Protection ➤ Rock & Aggregate Drop Inlet Protection	➤ Grass Filter Strips ➤ Fibre Rolls ➤ Stiff Grass Barrier
Concentrated flow treatment	➤ Filter Tube Dam ➤ Rock Filter Dam ➤ Sediment Basin (smaller than the design standard) ➤ Sediment Trench ➤ Sediment Weir	➤ Straw Bale Barrier ➤ Kerb Inlet Sediment Traps (on-grade and sag inlet traps, including Gully Bags) ➤ Check Dam Sediment Traps
De-watering sediment control	➤ Filter Bag or Filter Tube ➤ Filter Pond ➤ Filter Tube Dam ➤ Portable Sediment Tank ➤ Settling Pond ➤ Sump Pit	➤ Grass Filter bed
Instream sediment control	➤ Filter Tube Barrier ➤ Modular Sediment Barrier ➤ Rock Filter Dam ➤ Sediment Weir	➤ Straw Bale Barrier (short-term device only)
Other		➤ Construction exits (Rock Pads, Wash Bays)





6. Conclusion

This Conceptual Stormwater Management Plan (CSMP) has been prepared for Brookmoore Group for Development Application for Lot 297 RP118026. This CSMP has referenced relevant guidelines relating to stormwater management to form the conceptual basis of the stormwater plan.

This development is compliant with the stormwater quantity objectives. Peak runoff at the proposed development's LPD has been maintained in all AEP events through the inclusion of an on-site detention system, with a 1% AEP volume of 50m³.

To achieve Logan City Council's Water Quality Objectives, it is proposed to use Ocean Protect stormwater quality treatment devices to treat stormwater runoff from the developed areas of the site.

An Erosion Hazard Assessment has identified that the site is high-risk with regard to erosion potential. Sediment loss estimates have been used to determine that Type 2 sediment controls are required, given a soil loss of 81.2 t/ha/yr for the disturbed internal catchment. Additionally, a sediment pond has been sized and is required during construction. More detailed ESC controls and measures are to be designed and prepared in the detailed design phase of the project.

