



STORMWATER MANAGEMENT PLAN

86 Keona Road, McDowall

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APPLICATION REF
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REPORT CONTROL SHEET

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Site:	86 Keona Road, McDowall
Report Title:	Stormwater Management Plan
Prepared For:	River Quarter No.3 Development Co. PTY LTD

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TABLE OF CONTENTS

1.	Introduction.....	4
2.	Existing Site and Catchment Description.....	4
2.1	Existing Drainage Conditions	5
2.2	External Catchments.....	5
2.3	Flood Assessment.....	5
3.	Water Quantity Management.....	7
3.1	Overview and Objectives	7
3.2	Lawful Discharge.....	7
3.3	Design Storms.....	7
3.4	Hydrologic Modelling	7
3.4.1	Losses	7
3.4.2	Hydraulic Roughness	7
3.4.3	Existing Conditions	8
3.4.4	Proposed Mitigated Conditions.....	9
4.	Water Quality Management.....	11
4.1	Construction Phase	11
4.1.1	Pollutants of Concern.....	11
4.1.2	Water Quality Treatment.....	12
4.2	Operational Phase	12
4.2.1	Pollutants of Concern.....	12
4.2.2	Water Quality Treatment.....	12
4.2.3	Pollutant Export Modelling	12
4.2.3.1	Model Selection.....	12
4.2.3.2	Model Setup	13
4.2.3.3	Model Results.....	14
4.2.4	Water Quality Monitoring.....	14
4.2.5	Maintenance	14
4.2.5.1	OceanGuard Maintenance	14
4.2.5.2	StormFilter Maintenance.....	14
5.	Conclusions.....	15
	Engineering Drawings.....	16
	Appendix A – Rational Method Calculations	17
	Appendix B – XP RAFTS Outputs.....	18
	Appendix C – MUSIC Modelling Results	22

Appendix D – Maintenance Guidelines.....	24
Appendix E – Council Flood Report.....	25

1. Introduction

HCE Engineers have been engaged to prepare a Stormwater Management Plan to accompany the development application for the 13 lot residential subdivision, under a community title scheme (CTS), at 86 Keona Road, McDowall.

Revision 2 of this report has been prepared in response to the information requested dated 20 May 2026 with revised concept engineering drawings.

This report identifies stormwater quality and quantity management measures proposed to be incorporated within the development, to satisfy the required standards of the Brisbane City Plan

This report has been prepared expressly to provide commentary regarding compliance with Council requirements for the proposed development on the subject site. Information presented in this report should not be applied to properties or developments other than the subject development. No responsibility is accepted for use of any part of this report in any other context or for any other purposes or by any third party.

2. Existing Site and Catchment Description

This development site consists of Lot 2 SP 127997 which is more commonly known as 86 Keona Road, McDowall and has a total area of 5,416m².

Site inspection along with a review of available mapping, survey and aerial imagery indicates that the development site is currently developed with a single residential dwelling and associated structures. The site falls towards the south at approximate grade of 12%.



Image: Aerial View of Site (image from Nearmap.com)

2.1 Existing Drainage Conditions

Stormwater runoff from the site is conveyed towards the south towards the existing stormwater inlet within the subject site. Runoff is collected partially by the existing inlet and conveyed through the adjoining school towards Downfall Creek. Flow not captured by the existing inlet discharges across the southern boundary and into the adjoining school carpark, where it is then captured and conveyed within the school property. Stormwater drainage within the school is currently under easement in favour of the subject site.

2.2 External Catchments

No external catchments have been identified.

2.3 Flood Assessment

A flood search has been undertaken, and the subject site is located outside of the mapped flood area. Refer to appendices for the Council Flood Report.

A review of local topography has also been undertaken, and it is confirmed there are no localised overland flow paths to be considered.

26038 86 Keona Road, McDowall
26038-RPT-SMP-Rev2

3. Water Quantity Management

3.1 Overview and Objectives

Stormwater runoff is to be controlled to achieve development objectives, without unreasonable impact and in accordance with relevant safety parameters.

On site detention is proposed to meet the requirements that achieve the desired performance outcomes of *Planning Scheme Policy – SC6.16 Infrastructure Design Section 7.5*.

A model has been set up using XP-RAFTS software package to determine existing site runoff hydrographs and to determine the effectiveness of the proposed detention tank.

3.2 Lawful Discharge

The lawful discharge point is to the existing stormwater infrastructure within the subject site.

3.3 Design Storms

Design Storms for the development have been determined in accordance with Table 7.2.2.3.B of the Councils Infrastructure Design Planning Scheme Policy.

Storm Event	AEP
Minor	39%
Major	1%

Table 1 - Design Storms

3.4 Hydrologic Modelling

3.4.1 Losses

Initial and continuing rainfall losses for pervious and impervious are as tabulated below:

	Initial Loss (mm/hr)	Continuing Loss (mm/hr)
Pervious	10	2
Impervious	2	0

Table 2 - Rainfall Losses

3.4.2 Hydraulic Roughness

Manning's 'n' values have been used to represent the pervious and impervious surface. The following values were adopted.

Mannings 'n'	
Pervious	0.045
Impervious	0.025

Table 3 - Hydraulic Roughness

3.4.3 Existing Conditions

The XP RAFTS Source Node Parameters table summarises the input parameters for the XP-RAFTS model for the existing scenario.

An impervious percentage of 30% has been applied to reflect current improvements.

Refer to appended XP-RAFTS outputs.

Catchment ID	Area (ha)	Percentage Impervious (%)	Slope (%)
Site Ex	0.542	30%	5

Table 4 - XP-RAFTS Source Node Parameters for existing site conditions

Site Ex



Image - XP-RAFTS model set up for existing site conditions

RAFTS is an empirical runoff routing model recognised as a suitable method to predict runoff hydrographs in the urban environments. Rational Method is a simple hand calculation broadly accepted as being able to provide reasonable peak flow estimates in small urban catchments. Rational Method has been undertaken to verify the suitability of the RAFTS predicted flows.

Refer to appended Rational Method calculations.

Catchment ID	C ₁₀	Time of Concentration (min)	Area (ha)
Site Ex	0.76	10	0.542

Table 5 - Rational Methods Inputs

XP-RAFTS computer software package was used to model the peak discharges immediately downstream of the subject site under existing conditions during the 39%, 18%, 10%, 5%, 2% and 1% AEP rainfall events.

The below table compares peak discharges over a range of AEPs calculated by The Rational Method and the XP-RAFTS existing case model. It can be seen that good correlation is achieved and the XP-RAFTS model is therefore deemed suitable.

AEP	XP-RAFTS Existing Peak Discharge (m ³ /s)	Rational Method Existing Peak Discharge (m ³ /s)
39%	0.130	0.113
18%	0.206	0.160
10%	0.234	0.191
5%	0.257	0.231
2%	0.286	0.298
1%	0.332	0.347

Table 6 - Existing Peak Discharge Rates

Refer to appendices for Rational Method and XP-RAFTS outputs.

3.4.4 Proposed Mitigated Conditions

All 13 lots will discharge to the infrastructure within the private road to be collected at the end of the road in the proposed detention tank for controlled discharge to the existing infrastructure.

Input parameters under developed conditions are summarised below in the XP RAFTS Source Node Parameters table, and the XP RAFTS model setup is below.

Catchment ID	Area (ha)	Percentage Impervious (%)	Slope (%)
Dev Site	0.542	80	5

Table 7 - XP-RAFTS Source Node Parameters for developed site conditions

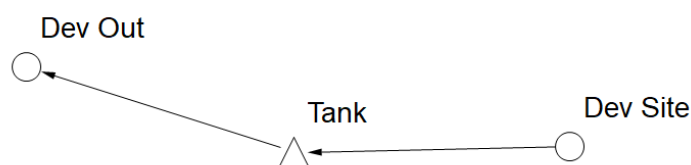


Image XP-RAFTS model set up for developed mitigated site conditions

The detention tank parameters including outlet control is shown below.

Detention ID	Base RL (m AHD)	Depth (m)	Total Volume (m ³)	Low Flow Outlet Control	High Flow Outlet Control
Tank	59.75	2	150	Orifice 1 at base Diameter: 260 mm Orifice 2 centre 0.7m from base of tank Diameter: 210 mm	Wier at 1.75m 0.250m from top 1m wide

Table 8 - Detention tank parameters

The detention tank peak inflow and outflow discharge rates are outlined below.

AEP	XP-RAFTS Tank Peak Inflow Discharge (m ³ /s)	XP-RAFTS Tank Peak Outflow Discharge (m ³ /s)	Detention Tank Ponding Level (m)	Total Detention Tank Storage (m ³)
39%	0.209	0.130	0.787	59
18%	0.277	0.198	1.036	78
10%	0.318	0.223	1.174	88
5%	0.372	0.253	1.377	103
2%	0.398	0.272	1.524	114
1%	0.447	0.298	1.737	130

Table 9 - Detention tank performance (developed mitigated conditions)

The pre-development and post-development peak discharge rates for the site are outlined below.

AEP	XP-RAFTS existing peak discharge (m ³ /s)	XP RAFTS developed peak discharge (m ³ /s)	Impact (m ³ /s)
39%	0.130	0.130	0
18%	0.206	0.198	-0.008
10%	0.234	0.223	-0.011
5%	0.257	0.253	-0.004
2%	0.286	0.272	-0.014
1%	0.332	0.298	-0.034

Table 10 - Existing and developed peak discharge rates

As it can be seen from existing and developed peak discharge rates table, the proposed detention basin will ensure the peak discharge rates leaving the site are less than existing for the 39%, 18%, 10%, 5%, 2% and 1% AEP rainfall events.

Refer to engineering design drawings attached.

Refer to appendices for XP-RAFTS outputs.

4. Water Quality Management

4.1 Construction Phase

4.1.1 Pollutants of Concern

The construction phase stormwater quality design objectives which may be relevant to this subdivision as set by the *Urban Stormwater Quality Planning Guidelines 2010* are as follows:

Objective	Measure
Drainage Control	Design life and design storm of temporary drainage works in accordance with time the disturbed area is exposed. <12 months – 1 in 2 ARI 12-24 months – 1 in 5 ARI >24 months – 1 in 10 ARI
Erosion Control	Minimise exposure of disturbed soils at any time. Avoid or minimise large construction activities in the wet season. Divert water run-off from undisturbed areas around disturbed areas. Use erosion risk ratings to determine appropriate erosion control measures.
Sediment Control	Use soil loss rates to determine appropriate sediment control measures. Design storm for sediment control basins should be based on retaining the maximum sediment quantity for the maximum volume of water runoff.
Water Quality Outcomes	Coarse sediment is retained on site. Nitrogen and phosphorus are managed through sediment control. Prevent litter/waste entering the site, the stormwater or watercourses that discharge from the site. Also minimise or sufficiently contain on-site litter and waste production and regularly clear waste bins. Hydrocarbons and other contaminants are prevented from entering the stormwater system or internal watercourses that discharge from the site. Washdown water is prevented from entering the stormwater system or internal watercourses that discharge from the site. Cations and anions including aluminium, iron and sulphate are managed as required under an approved acid sulphate soil management plan.
Stormwater Drainage / Flow Management	Take all reasonable and practicable measures to minimise significant changes to the natural waterway hydraulics and hydrology from: <ul style="list-style-type: none"> • Peak flow for the one year and the 100 year ARI event. • Runoff frequency and volumes entering receiving waters. • Uncontrolled release of contaminated stormwater.

Table 11 – Design objectives for Stormwater Quality Management Plan – Construction phase table

4.1.2 Water Quality Treatment

Appropriate erosion and sediment control measures can be prepared and implemented on site during construction activities to ensure 'best management practices' are achieved.

4.2 Operational Phase

4.2.1 Pollutants of Concern

Suspended Solids, Nutrients, Litter and Hydrocarbons are the common pollutants of concern for Urban Development projects.

Per *Section B of Councils' Stormwater Code* a development is considered high risk and required to achieve stormwater management design objectives outlined in the *Infrastructure Design Planning Scheme Policy Section 7.9.3.5* where the below criteria is applicable.

- a) a material change of use for an urban purpose which involves greater than 2,500m² of land that:
 - i. will result in an impervious area greater than 25% of the net developable area; or
 - ii. will result in 6 or more dwellings.
- b) reconfiguring a lot for an urban purpose that involves greater than 2,500m² of land and will result in 6 or more lots;
- c) operational work for an urban purpose which involves disturbing greater than 2,500m² of land.

As the development has more than 6 lots and is greater than 2,500m² the stormwater management design objectives are required to be met. The water quality design objectives as outlined in Section 7.9.3 of *Infrastructure Design Planning Scheme Policy* are required to be met.

Pollutant	Minimum Reduction in Mean Annual load
Total Suspended Solids (TSS)	80%
Total Phosphorus (TP)	60%
Total Nitrogen (TN)	45%
Gross Pollutants (>5mm)	90%

Table 12 - Water quality design objectives

4.2.2 Water Quality Treatment

Nine cartridges within a 6m² filter system are proposed within the detention tank along with pre-treatment of flows using gross pollutant traps before reaching the tank.

Refer to concept design drawings attached.

4.2.3 Pollutant Export Modelling

4.2.3.1 Model Selection

To determine the onsite pollutant generation, and the effectiveness of the proposed stormwater quality improvement devices, the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) version 6.4.0 was used.

4.2.3.2 Model Setup

The MUSIC model was set up in accordance with the Health Waterways, Water by *Design's MUSIC Modelling Guidelines Version 3.0 – 2018*. The rainfall runoff parameters and pollutant export parameters have been set up according to Table 3.9 for split of this guideline.

Refer to the image for the schematic model setup and the MUSIC Rainfall data table for the rainfall data and modelling time step that were used.

Rainfall Period	Rainfall Station	Modelling Time Step
1980 to 1989	Brisbane Regional Office (ID40214)	6 minutes

Table 13 - MUSIC Rainfall data table

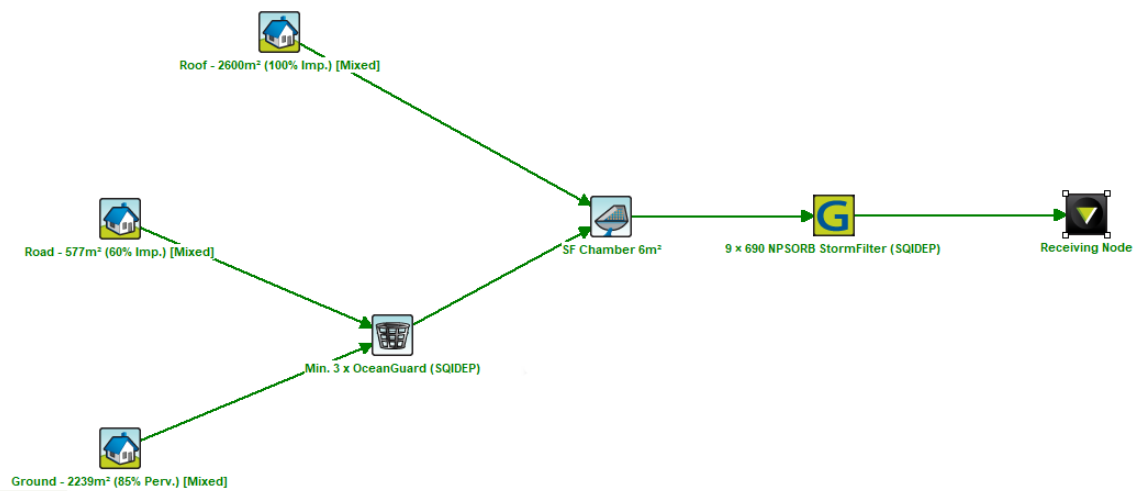


Image MUSIC Model setup

Source Node Catchment data as per the MUSIC model source nodes table.

Node	Catchment Area (ha)	Impervious Percentage
Roof	0.260	100%
Road	0.058	60%
Ground	0.224	15%

Table 14 - MUSIC model source nodes table

4.2.3.3 Model Results

The above proposed treatment measures have been modelled using MUSIC version 6.4.0 and the following pollutant load-based reductions have been predicted for the site.

Target Pollutant	Required Load Based Reduction	Achieved Reduction
Total Suspended Solids (TSS)	80%	81%
Total Phosphorus (TP)	60%	73%
Total Nitrogen (TN)	45%	56%
Gross Pollutants (GP)	90%	100%

Table 16 - MUSIC Modelling Results table

As the MUSIC modelling results table demonstrates, the installation of the proposed stormwater treatment measures achieves the required reduction requirements for Total Suspended Solids, Total Phosphorus, Total Nitrogen and Gross Pollutants.

Refer to appendices for the MUSIC results.

Trace and heavy metals are usually associated with fine sediment. The proposed treatment train removes very significant proportions of suspended solids therefore it is expected that the removal of trace and heavy metals will be acceptable to adequately protect downstream habitats and ecosystems from heavy metal contamination. No major sources of hydrocarbons are expected on site.

4.2.4 Water Quality Monitoring

No monitoring of water quality of the runoff from the site is proposed. Untrials stormwater quality management measures are not proposed. Additionally, the level of treatment proposed is considered best practice and little improvement in the treatment train proposed could be provided.

4.2.5 Maintenance

4.2.5.1 OceanGuard Maintenance

Maintenance and cleaning of the Ocean Protect 'OceanGuard' is to be undertaken per the Operation and Maintenance manual. A copy of this can be viewed in the appendices for Maintenance Guidelines.

4.2.5.2 StormFilter Maintenance

Maintenance and cleaning of the Ocean Protect 'StormFilter' is to be undertaken per the Operation and Maintenance manual. A copy of this can be viewed in the appendices for Maintenance Guidelines.

5. Conclusions

The proposed stormwater management system adequately and appropriately manages site runoff. Furthermore, it complies with the Brisbane City Council's requirements with respect to minor and major storm runoff management on site, lawful discharge and improvement in runoff quality.

The installation of the proposed detention tank will appropriately mitigate peak discharge flows. The installation of the proposed stormwater treatments measures, as detailed within, achieves target reductions in Total Suspended Solids, Total Phosphorus, Total Nitrogen and Gross Pollutants.

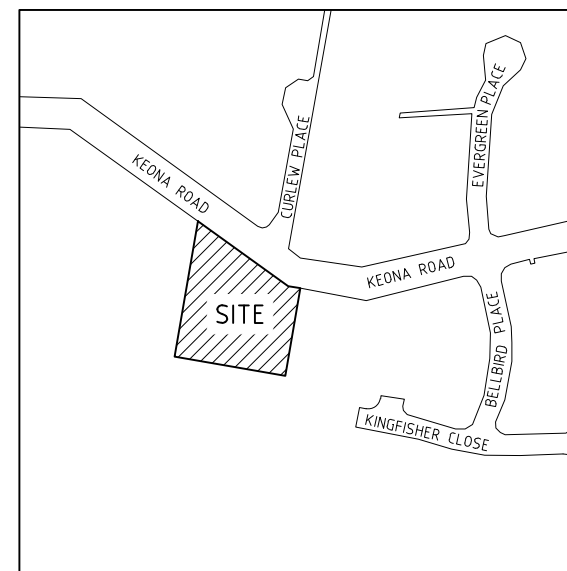
Engineering Drawings

13 LOT CTS SUBDIVISION

LOT 2 ON SP 127997

86 KEONA ROAD, McDOWALL, QLD 4053

DRAWING INDEX	
DRAWING No.	DESCRIPTION
26038-SK01	LOCALITY PLAN, DRAWING INDEX AND GENERAL NOTES
26038-SK02	CONCEPT GENERAL ARRANGEMENT PLAN
26038-SK03	CONCEPT CIVIL SERVICES PLAN
26038-SK04	CONCEPT EARTHWORKS PLAN
26038-SK05	CONCEPT EARTHWORKS SECTIONS



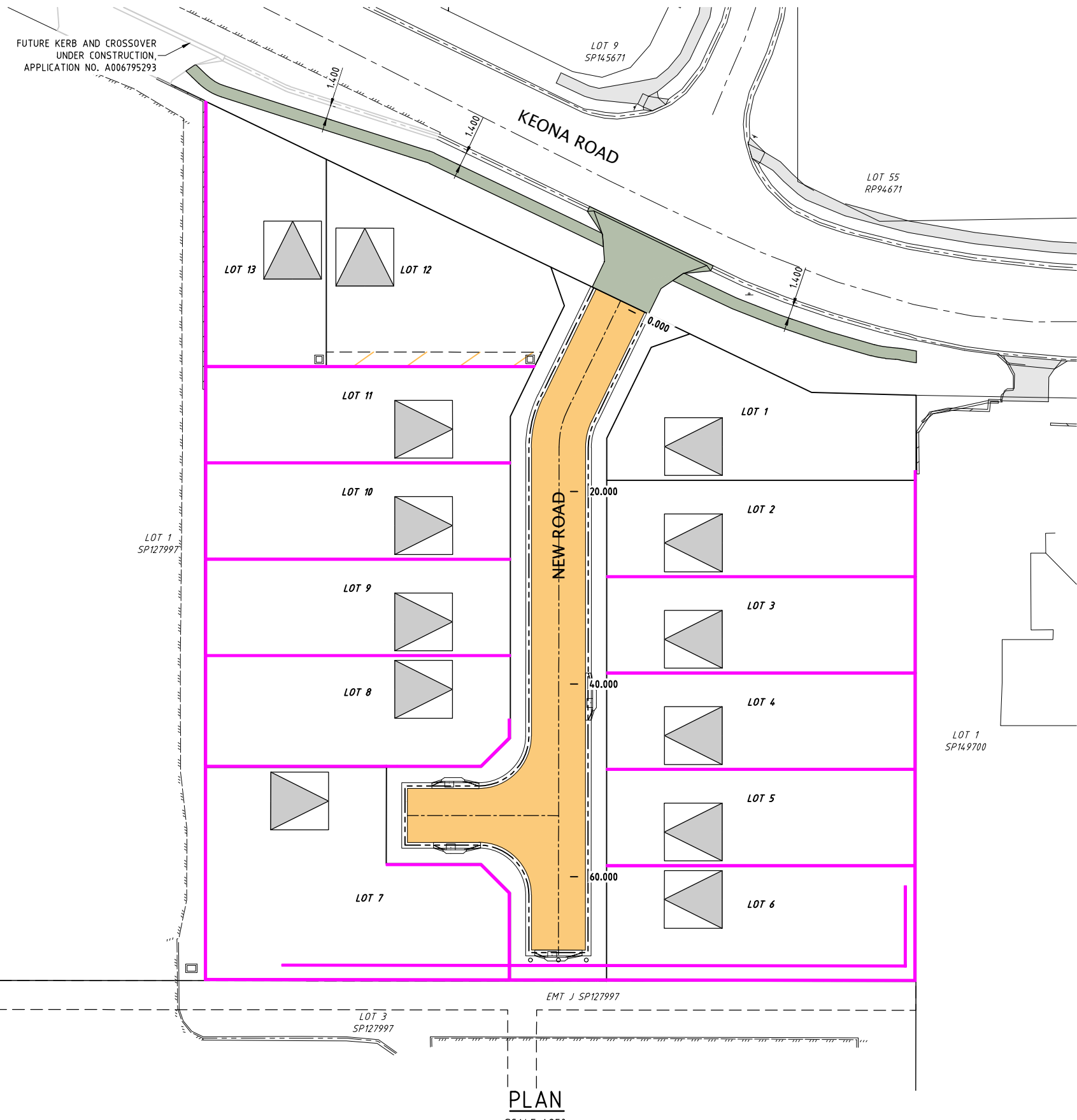
LOCALITY PLAN
SCALE 1:2500

GENERAL NOTES (v26.1)

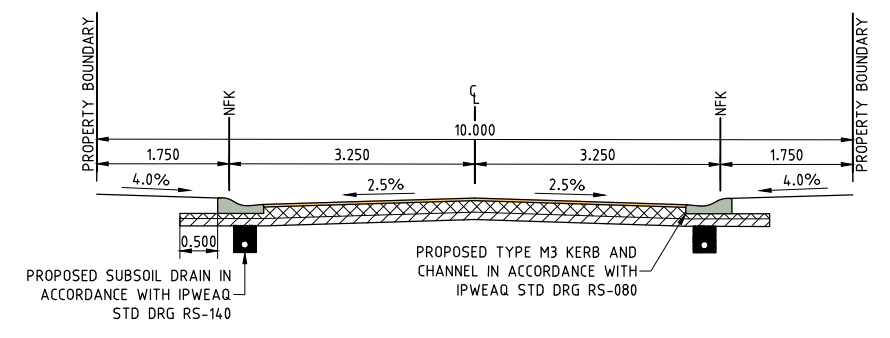
- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
- ALL TEMPORARY AND PERMANENT SIGNAGE AND LINEMARKING TO BE IN ACCORDANCE WITH MAIN ROADS STANDARDS (MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES).
- ALL DIMENSIONS ARE TO BE CHECKED ON-SITE BEFORE WORK COMMENCES.
- DIMENSIONS SHALL NOT BE OBTAINED BY SCALING THE DRAWING.
- DURING CONSTRUCTION BARRIERS, LIGHTS & SIGNS SHALL BE MAINTAINED TO ENSURE SAFE PASSAGE OF TRAFFIC AND PEDESTRIANS IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY.
- ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH S.A.A. CODES & BY-LAWS AND ORDINANCES OF THE RELEVANT LOCAL AUTHORITY AND WORKPLACE HEALTH AND SAFETY REQUIREMENTS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING ALL RELEVANT AUTHORITIES AND PAYING ALL FEES NECESSARY BEFORE COMMENCING WORK, FOR LOCATING ALL EXISTING SERVICES AND FOR REPAIR OF ANY SERVICES DAMAGED AS A RESULT OF THE WORKS.
- CONTRACTOR TO VERIFY ALL INVERT LEVELS, SURFACE LEVELS, COVER OVER DRAINAGE LINES, AND MINIMUM FALLS ARE CORRECT & OBTAINABLE PRIOR TO COMMENCEMENT OF WORK.
- THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF THE WORK HEALTH AND SAFETY ACT 2011. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THIS ACT AND IN PARTICULAR THE CONTRACTOR IS TO ENSURE THE REQUIREMENTS OF THIS SPECIFICATION WITH REGARD TO 'NOTIFICATION IN RELATION TO A NOTIFIABLE PROJECT', ARE FULFILLED.
- CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORK. ALL EXISTING SERVICES AND STRUCTURES ARE TO BE MAINTAINED IN GOOD ORDER FOR THE DURATION OF THE CONTRACT. ANY COST ASSOCIATED WITH REPAIRING DAMAGE TO EXISTING SERVICES SHALL BE BORNE BY THE CONTRACTOR.
- THE PERSON RESPONSIBLE FOR THE DEMOLITION WORKS SHALL ENSURE THAT ALL VEHICLES LEAVING THE SITE CARRYING DEMOLITION MATERIALS HAVE THEIR LOADS COVERED AND DO NOT TRACK SOIL OR WASTE MATERIALS ONTO THE ROAD.
- SHOULD ASBESTOS BE PRESENT, ITS REMOVAL SHALL BE CARRIED OUT IN ACCORDANCE WITH THE NATIONAL OH&S COMMITTEE - CODE OF PRACTICE FOR SAFE REMOVAL OF ASBESTOS AND ITS CODE OF PRACTICE FOR THE MANAGEMENT AND CONTROL OF ASBESTOS IN THE WORKPLACE.

SCALE 1:2500 (A1)
(SCALE BEFORE REDUCTION)

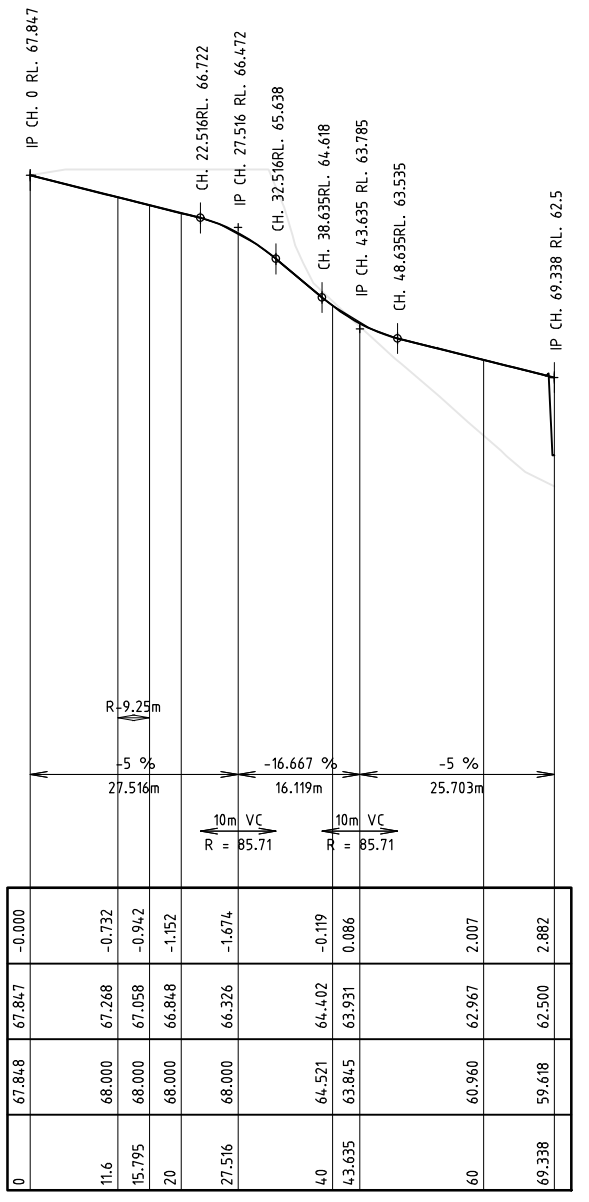
	HCE Engineers Pty Ltd ABN 42 664 382 610 mail@hce-engineers.com.au 07 3829 1399	PROJECT	TITLE	CLIENT	<div style="border: 2px solid red; padding: 5px; text-align: center;"> NOT FOR CONSTRUCTION. CONCEPT ONLY. </div>	REVISION	AMENDMENT	DATE	DO NOT SCALE. CONFIRM ALL DIMENSIONS ON SITE. Copyright ©		
		86 KEONA ROAD, MCDOWALL QLD 4053 LOT 2 SP 127997	LOCALITY PLAN, DRAWING INDEX AND GENERAL NOTES	RIVER QUARTER NO. 3 DEVELOPMENT CO. PTY LTD		A	REPORT ISSUE	09/04/26	Designed MB	Drawn JA	Date 20/03/2026
								Drawing No. 26038-SK01	Rev. A		



- LEGEND**
- EXISTING KERB AND CHANNEL
 - PROPOSED KERB AND CHANNEL
 - FUTURE KERB AND CHANNEL
 - EXISTING RETAINING WALL
 - PROPOSED RETAINING WALL
 - EXISTING CONCRETE
 - PROPOSED PAVEMENT
 - PROPOSED CONCRETE
 - EXISTING EASEMENT
 - PROPOSED EASEMENT
 - POTENTIAL FUTURE ACCESS LOCATION
 - 0.000 CHAINAGE



NEW ROAD TYPICAL ROAD SECTION
SCALE 1:50



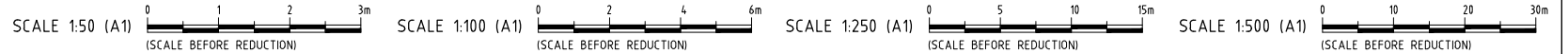
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 VERTICAL GEOMETRY GRADE (%)
 VERTICAL GRADE LENGTH
 VERTICAL CURVE LENGTH (m)
 VERTICAL CURVE RADIUS (m)
 DATUM R.L. 49.0

CUT / FILL DEPTHS
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11.6
15.795
20
27.516
4.0
43.635
60

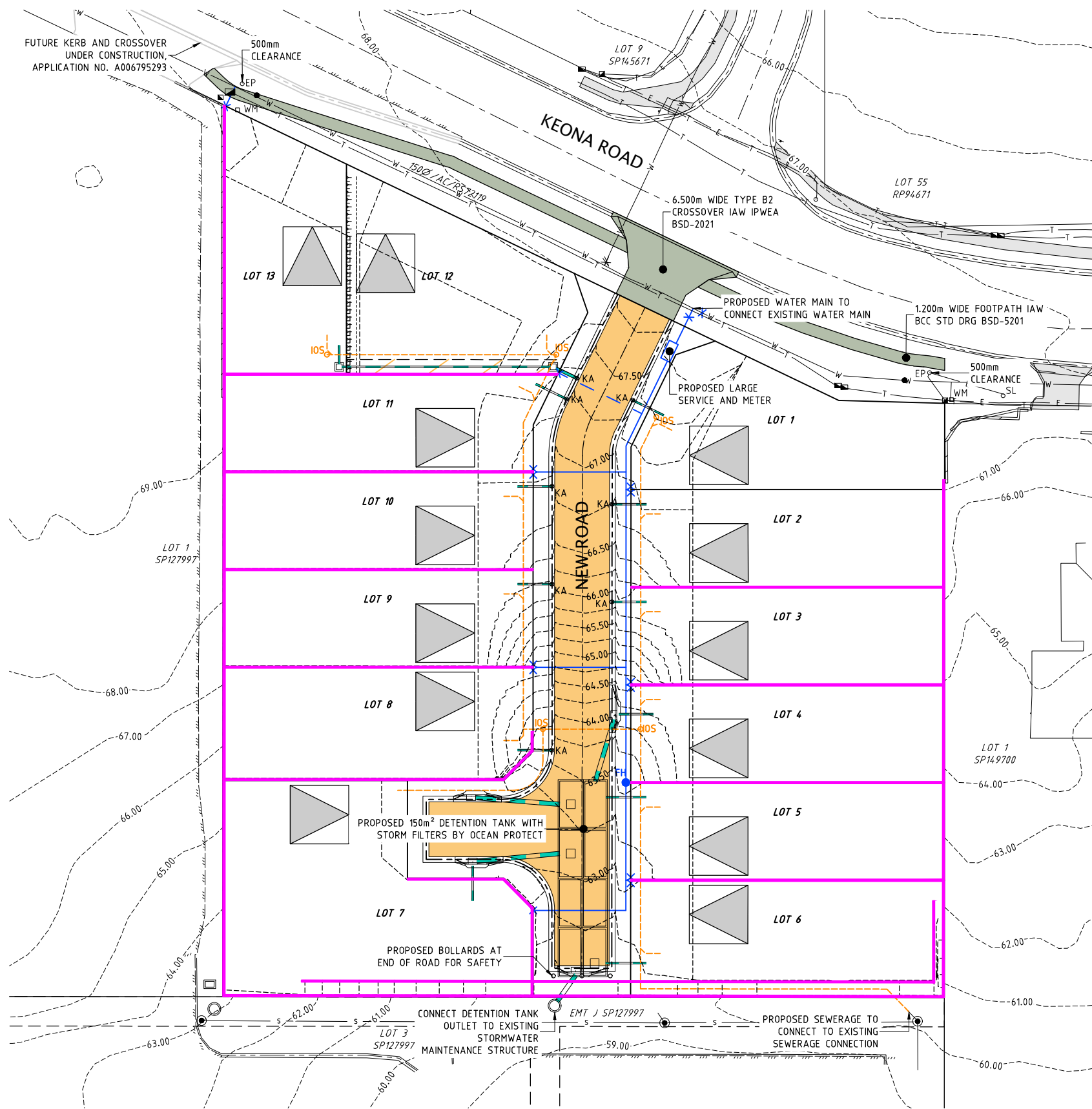
67.847	67.268	67.058	66.848	66.326	64.402	63.931	62.967	62.500	2.882
67.848	68.000	68.000	68.000	68.000	64.521	63.845	60.960	59.618	
0	11.6	15.795	20	27.516	4.0	43.635	60	69.338	

NEW ROAD CENTRELINE LONGITUDINAL SECTION
 SCALE(H) 1:500 (A1)
 SCALE(V) 1:100 (A1)

THIS DESIGN HAS BEEN PREPARED BASED ON SERVICE AUTHORITY AS CONSTRUCTED INFORMATION. NO POT HOLING HAS BEEN UNDERTAKEN TO VERIFY EXISTING SERVICE LOCATIONS AND DEPTHS. IT IS THE CONTRACTORS RESPONSIBILITY TO UNDERTAKE POT HOLING TO VERIFY THE DESIGN.



	HCE Engineers Pty Ltd ABN 42 664 382 610 mail@hce-engineers.com.au 07 3829 1399	PROJECT	TITLE	CLIENT	<div style="border: 2px solid red; padding: 5px; text-align: center; color: red;"> NOT FOR CONSTRUCTION. CONCEPT ONLY. </div>	REVISION	AMENDMENT	DATE	DO NOT SCALE. CONFIRM ALL DIMENSIONS ON SITE. Copyright ©			
		86 KEONA ROAD, MCDOWALL QLD 4053 LOT 2 SP 127997	CONCEPT GENERAL ARRANGEMENT PLAN	RIVER QUARTER NO. 3 DEVELOPMENT CO. PTY LTD		A	REPORT ISSUE	09/04/26	Designed	Drawn	Date	24/02/26
						B	COMMENTS ADDRESSED	10/04/26	MB	JA	Scale	AS SHOWN
						C	RFI RESPONSE	03/06/26	Approval No.	----	Rev.	
									Drawing No.	26038-SK02		C



LEGEND

- 10.0--- EXISTING SURFACE CONTOURS (1.00m INTERVAL)
- 10.0--- FINISHED SURFACE CONTOURS (0.25m INTERVAL)
- EXISTING STORMWATER DRAINAGE
- PROPOSED STORMWATER DRAINAGE
- EXISTING SEWERAGE
- PROPOSED PRIVATE SANITARY DRAINAGE
- EXISTING WATER RETICULATION
- PROPOSED PRIVATE WATER SUPPLY
- EXISTING UNDERGROUND ELECTRICAL
- EXISTING TELECOMMUNICATIONS
- EXISTING KERB AND CHANNEL
- PROPOSED KERB AND CHANNEL
- FUTURE KERB AND CHANNEL
- EXISTING RETAINING WALL
- PROPOSED RETAINING WALL
- EXISTING CONCRETE
- PROPOSED PAVEMENT
- PROPOSED CONCRETE
- EXISTING EASEMENT
- PROPOSED EASEMENT
- ▽ POTENTIAL FUTURE ACCESS LOCATION
- EP ○ EXISTING ELECTRICAL POLE
- WM □ EXISTING WATER METER
- ✕ PROPOSED WATER METER

NOTE:
OCEAN GUARDS BY OCEAN PROTECT TO BE INSTALLED IN ALL STORMWATER GULLIES

PLAN

SCALE 1:250

THIS DESIGN HAS BEEN PREPARED BASED ON SERVICE AUTHORITY AS CONSTRUCTED INFORMATION. NO POT HOLING HAS BEEN UNDERTAKEN TO VERIFY EXISTING SERVICE LOCATIONS AND DEPTHS. IT IS THE CONTRACTORS RESPONSIBILITY TO UNDERTAKE POT HOLING TO VERIFY THE DESIGN.



<p>HCE Engineers Pty Ltd ABN 42 664 382 610 mail@hce-engineers.com.au 07 3829 1399</p>	PROJECT	TITLE	CLIENT	NOT FOR CONSTRUCTION. CONCEPT ONLY.	REVISION	AMENDMENT	DATE	DO NOT SCALE. CONFIRM ALL DIMENSIONS ON SITE. Copyright ©			
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					B	COMMENTS ADDRESSED	10/04/26	Approval No.	----		Scale AS SHOWN
					C	COMMENTS ADDRESSED	13/04/26	Drawing No.	26038-SK03		Rev. E
					D	COMMENTS ADDRESSED	20/04/26				
			E	RFI RESPONSE	03/06/26						



- LEGEND**
- 10.0--- EXISTING SURFACE CONTOURS (1.00m INTERVAL)
 - 10.0--- FINISHED SURFACE CONTOURS (0.25m INTERVAL)
 - SWD— EXISTING STORMWATER DRAINAGE
 - S— EXISTING SEWERAGE
 - W— EXISTING WATER RETICULATION
 - E— EXISTING UNDERGROUND ELECTRICAL
 - T— EXISTING TELECOMMUNICATIONS
 - ==== EXISTING KERB AND CHANNEL
 - ==== PROPOSED KERB AND CHANNEL
 - ==== FUTURE KERB AND CHANNEL
 - ==== PROPOSED RETAINING WALL
 - --- EXISTING EASEMENT
 - ==== PROPOSED EASEMENT
 - EP ○ EXISTING ELECTRICAL POLE
 - WM □ EXISTING WATER METER

- CUT FILL LEGEND**
- 2.00m TO -1.00m
 - 1.00m TO 0.00m
 - 0.00m TO 1.00m
 - 1.00m TO 2.00m

EARTHWORKS VOLUMES

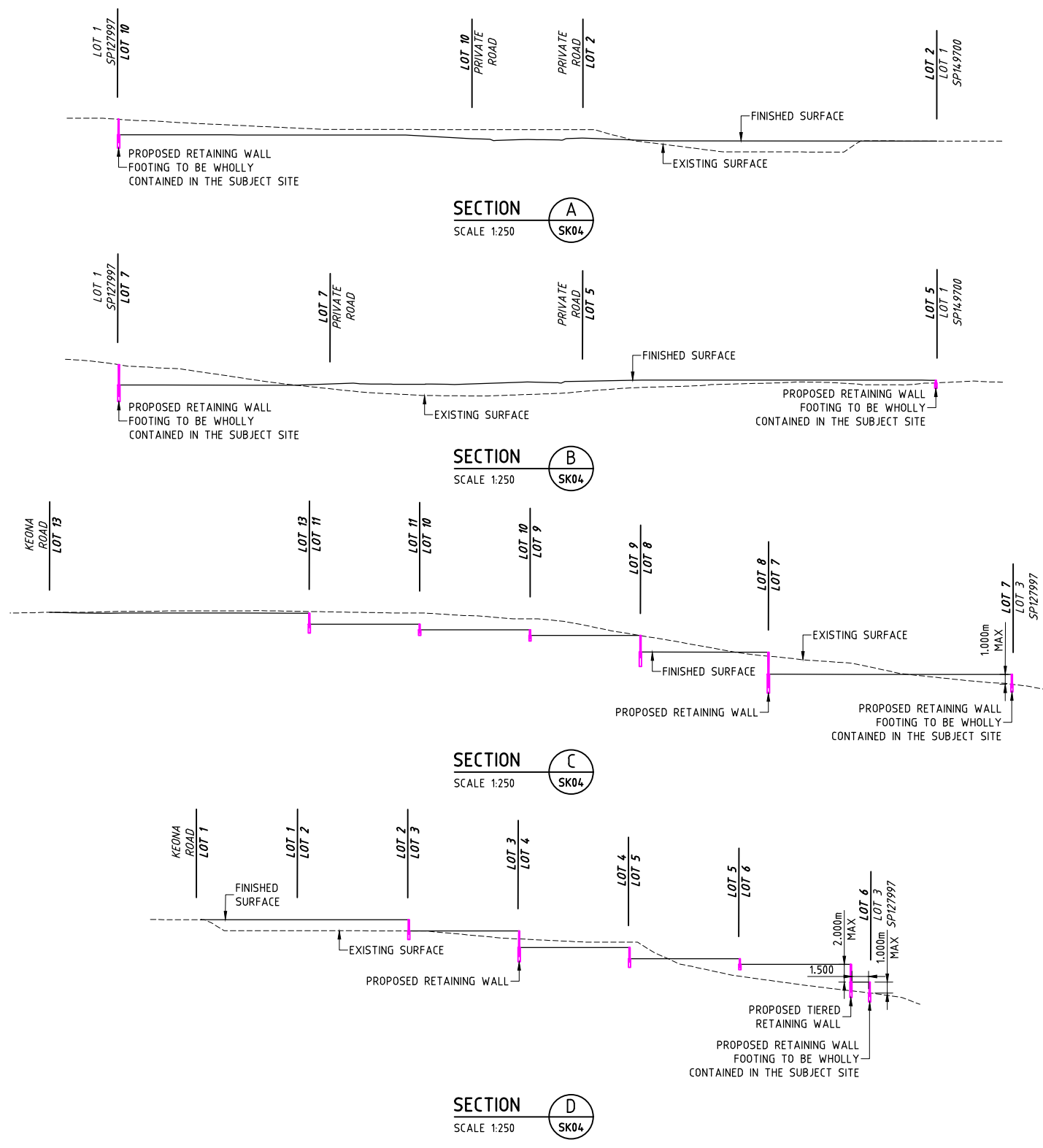
TOTAL CUT	-1700m ³
TOTAL FILL	+2700m ³
BALANCE	+1000m ³

PLAN
SCALE 1:250

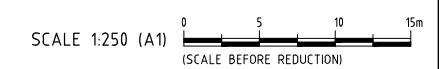
THIS DESIGN HAS BEEN PREPARED BASED ON SERVICE AUTHORITY AS CONSTRUCTED INFORMATION. NO POT HOLING HAS BEEN UNDERTAKEN TO VERIFY EXISTING SERVICE LOCATIONS AND DEPTHS. IT IS THE CONTRACTORS RESPONSIBILITY TO UNDERTAKE POT HOLING TO VERIFY THE DESIGN.




<p>HCE Engineers Pty Ltd ABN 42 664 382 610 mail@hce-engineers.com.au 07 3829 1399</p>	PROJECT	TITLE	CLIENT	NOT FOR CONSTRUCTION. CONCEPT ONLY.	REVISION	AMENDMENT	DATE	DO NOT SCALE. CONFIRM ALL DIMENSIONS ON SITE. Copyright ©						
		86 KEONA ROAD, MCDOWALL QLD 4053 LOT 2 SP 127997	CONCEPT EARTHWORKS PLAN		RIVER QUARTER NO. 3 DEVELOPMENT CO. PTY LTD	A	REPORT ISSUE	09/04/26	Designed	MB	Drawn	JA	Date	24/02/26
						B	COMMENTS ADDRESSED	10/04/26	Approval No.	----	Scale	AS SHOWN	Rev.	C
					C	RFI RESPONSE	03/06/26	Drawing No.	26038-SK04					



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 <p>HCE Engineers Pty Ltd ABN 42 664 382 610 mail@hce-engineers.com.au 07 3829 1399</p>	PROJECT	TITLE	CLIENT	NOT FOR CONSTRUCTION. CONCEPT ONLY.	REVISION	AMENDMENT	DATE	DO NOT SCALE. CONFIRM ALL DIMENSIONS ON SITE. Copyright ©		
	86 KEONA ROAD, MCDOWALL QLD 4053 LOT 2 SP 127997	CONCEPT EARTHWORKS SECTIONS	RIVER QUARTER NO. 3 DEVELOPMENT CO. PTY LTD		A B	REPORT ISSUE RFI RESPONSE	09/04/26 03/06/26	Designed MB	Drawn JA	Date 24/02/26
								Approval No.	-----	Rev. B
								Drawing No.	26038-SK05	

Appendix A – Rational Method Calculations

RATIONAL METHOD CALCULATIONS - EXISTING SITE

Job Reference	26038
Site Address	86 Keona Road, McDowall
Council	Brisbane City Council

Number of Sub-Catchments	1
Minor Storm Event	Q2 (As per QUDM Table 7.02.1)
Major Storm Event	Q100 (As per QUDM Table 7.02.1)

Subcatchment Summary Table				
Number	Catchment Name	Catchment Description	C₁₀	tc
1	Ex Site	Low density residential area (excluding roads) Average lot ≥ 750m ²	0.76	10

Catchment Calculations (Major and Minor Storm ARI's)							
Number	Area	C2	I2	Q2	C100	I100	Q100
	<i>ha</i>		<i>mm/hr</i>	<i>m³/s</i>		<i>mm/hr</i>	<i>m³/s</i>
1	0.542	0.65	116	0.113	0.91	253	0.347

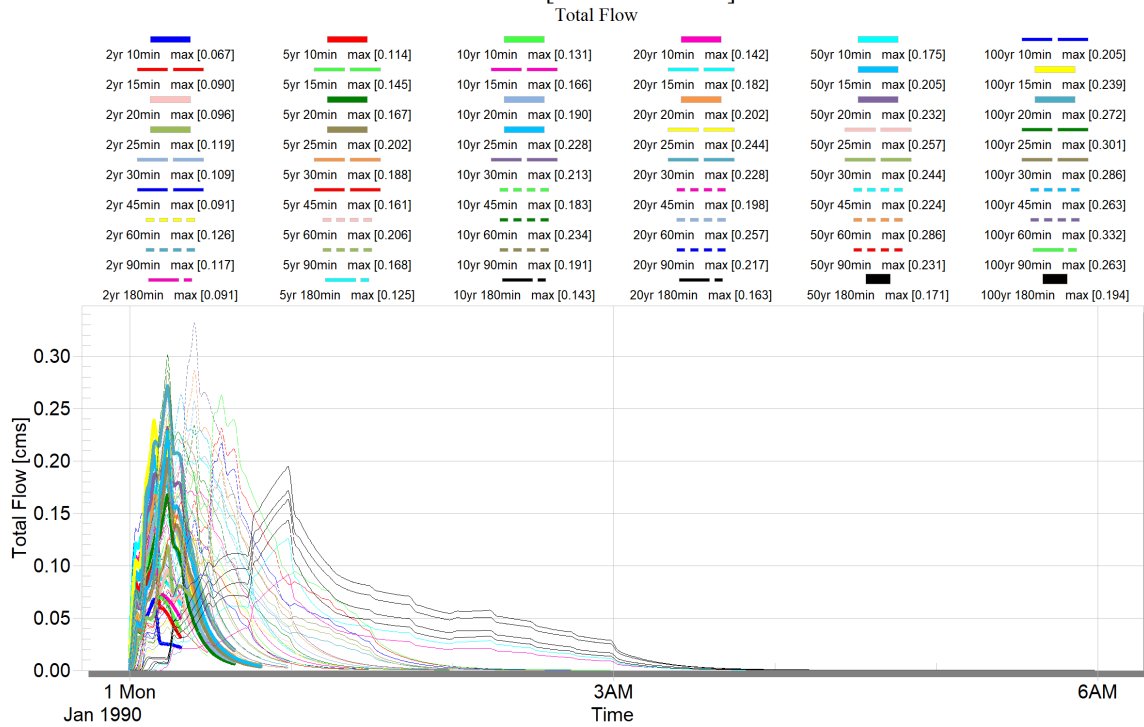
Total Runoff	Minor	0.113 m ³ /s
	Major	0.347 m ³ /s
Total Area		0.542 ha

Overland Flow Calculations	
<i>Trunk SW Infrastructure</i>	
Pipe Diameter	N/A m
Number of Pipes	0
Grade	0 m/m
mannings	0
Pipe Capacity	m ³ /s
Pipe Velocity	m/s
Capacity @ 3m/s	m ³ /s
Overland Flow	m ³ /s

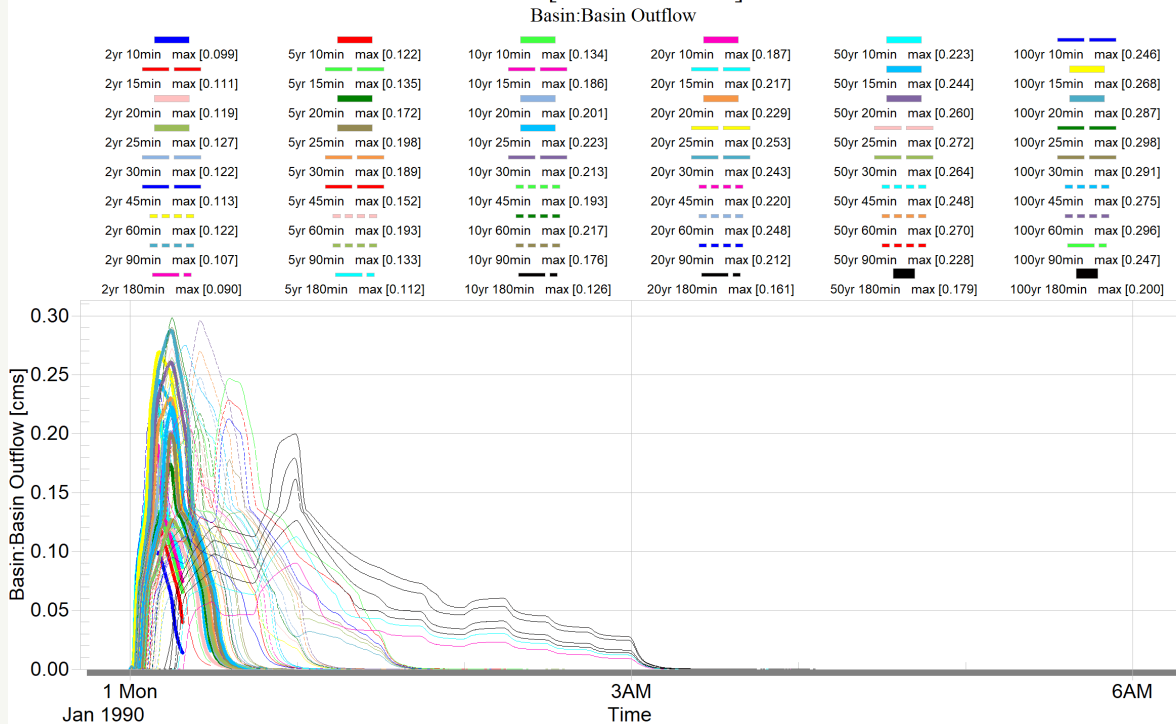
All Storm ARI's		
ARI	Peak Discharge	
3 Month	0.041	m ³ /s
1	0.082	m ³ /s
2	0.113	m ³ /s
5	0.160	m ³ /s
10	0.191	m ³ /s
20	0.231	m ³ /s
50	0.298	m ³ /s
100	0.347	m ³ /s

Appendix B – XP RAFTS Outputs

Existing Discharge Site Ex [ALL STORMS]

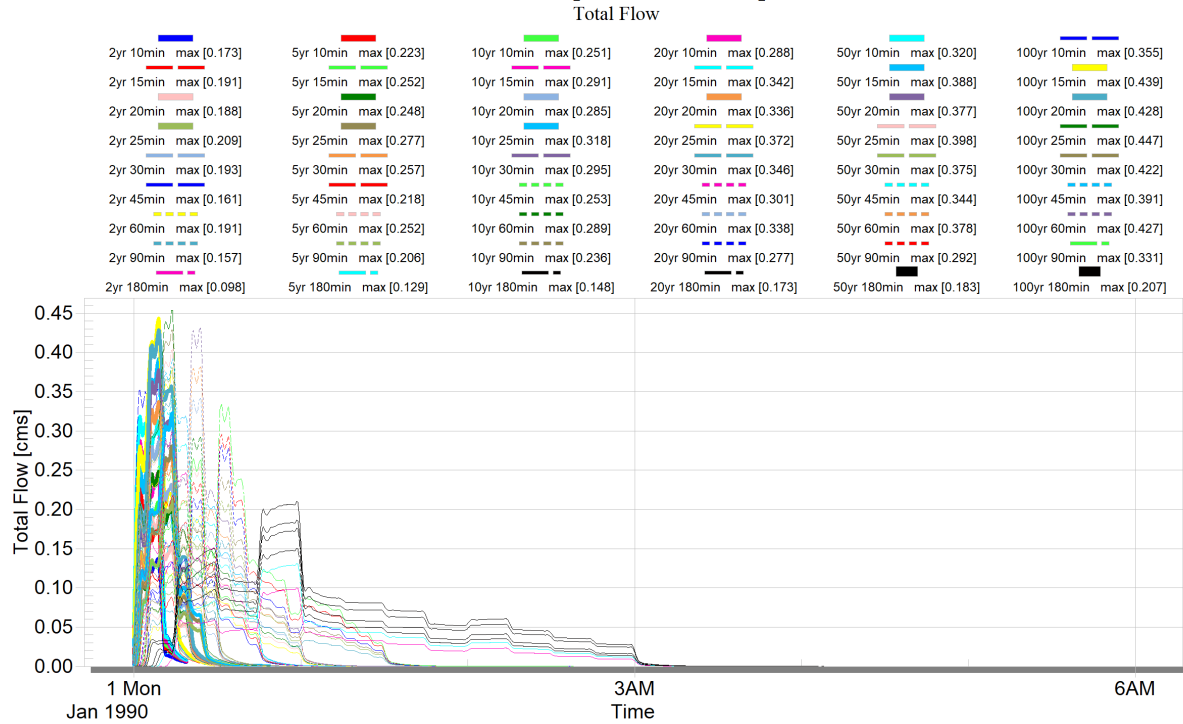


Developed Mitigated Discharge + Detention Tank Outflow Tank [ALL STORMS]



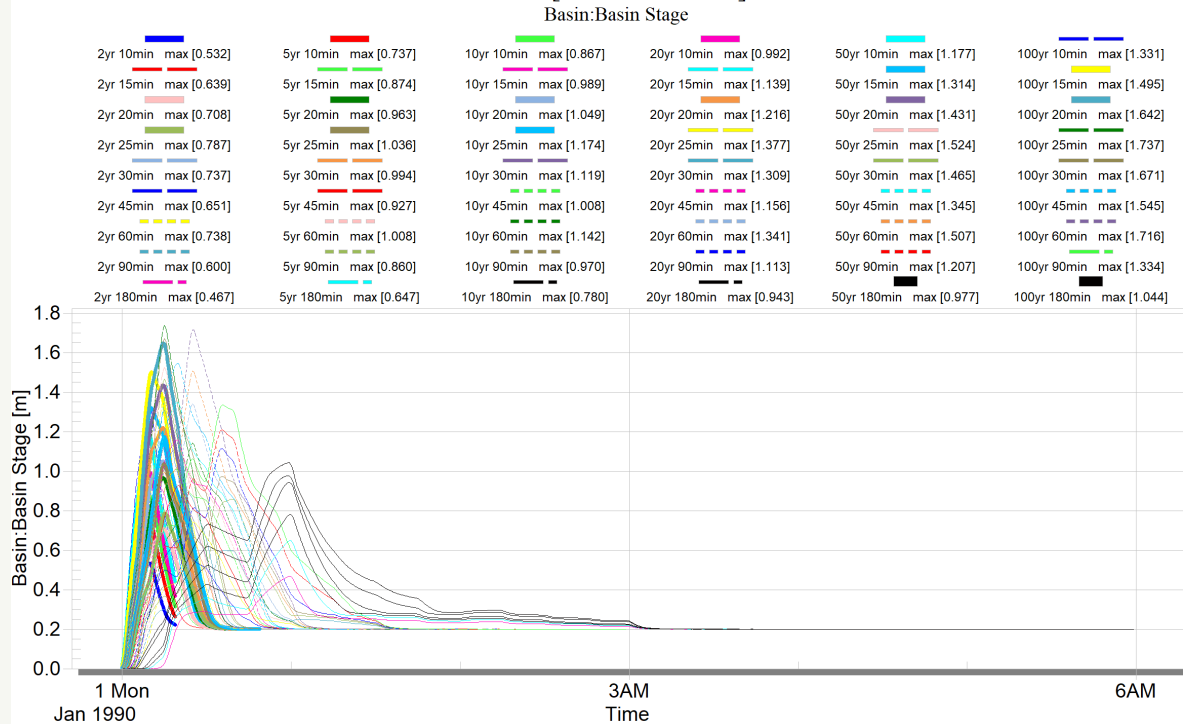
Flow Into Detention Tank

Dev Site [ALL STORMS]



Detention Tank Stage

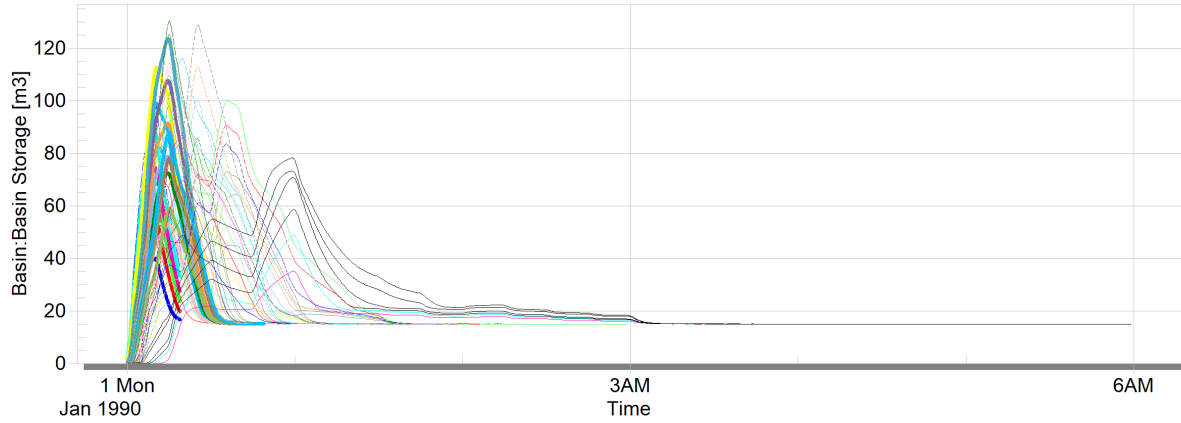
Tank [ALL STORMS]



Detention Tank Storage Tank [ALL STORMS]

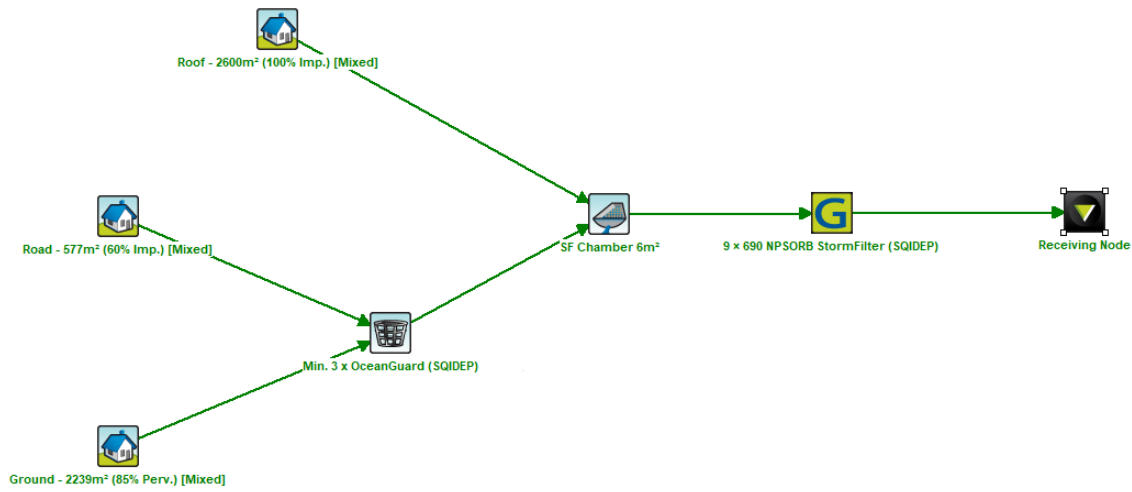
Basin:Basin Storage

2yr 10min max [39.870]	5yr 10min max [55.307]	10yr 10min max [65.050]	20yr 10min max [74.374]	50yr 10min max [88.297]	100yr 10min max [99.790]
2yr 15min max [47.957]	5yr 15min max [65.536]	10yr 15min max [74.204]	20yr 15min max [85.430]	50yr 15min max [98.552]	100yr 15min max [112.091]
2yr 20min max [53.073]	5yr 20min max [72.233]	10yr 20min max [78.664]	20yr 20min max [91.222]	50yr 20min max [107.300]	100yr 20min max [123.182]
2yr 25min max [59.033]	5yr 25min max [77.701]	10yr 25min max [88.064]	20yr 25min max [103.284]	50yr 25min max [114.321]	100yr 25min max [130.305]
2yr 30min max [55.255]	5yr 30min max [74.579]	10yr 30min max [83.906]	20yr 30min max [98.140]	50yr 30min max [109.895]	100yr 30min max [125.314]
2yr 45min max [48.836]	5yr 45min max [69.532]	10yr 45min max [75.572]	20yr 45min max [86.702]	50yr 45min max [100.852]	100yr 45min max [115.844]
2yr 60min max [55.343]	5yr 60min max [75.567]	10yr 60min max [85.650]	20yr 60min max [100.544]	50yr 60min max [113.016]	100yr 60min max [128.736]
2yr 90min max [44.981]	5yr 90min max [64.463]	10yr 90min max [72.771]	20yr 90min max [83.505]	50yr 90min max [90.547]	100yr 90min max [100.043]
2yr 180min max [35.048]	5yr 180min max [48.517]	10yr 180min max [58.481]	20yr 180min max [70.755]	50yr 180min max [73.287]	100yr 180min max [78.295]



Appendix C – MUSIC Modelling Results

Model:



Results:

Treatment Train Effectiveness - Receiving Node

	Sources	Residual Load	% Reduction
Flow (ML/yr)	4.1	4.1	0
Total Suspended Solids (kg/yr)	413	80.7	80.5
Total Phosphorus (kg/yr)	1.05	0.282	73.3
Total Nitrogen (kg/yr)	8.55	3.74	56.2
Gross Pollutants (kg/yr)	93.5	0	100

Link to MUSIC file:

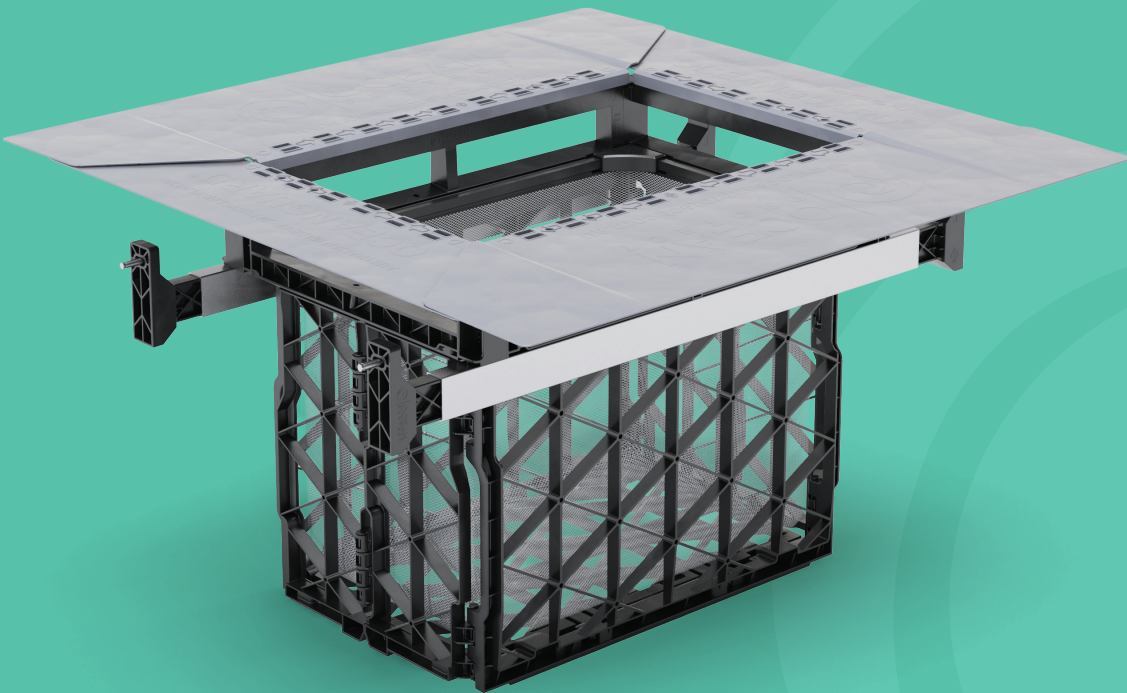
<https://files.hce-engineers.com.au/12dSynergy/Publishing/e70758dc-aa2a-451b-bb22-150e2509986e>

Appendix D – Maintenance Guidelines

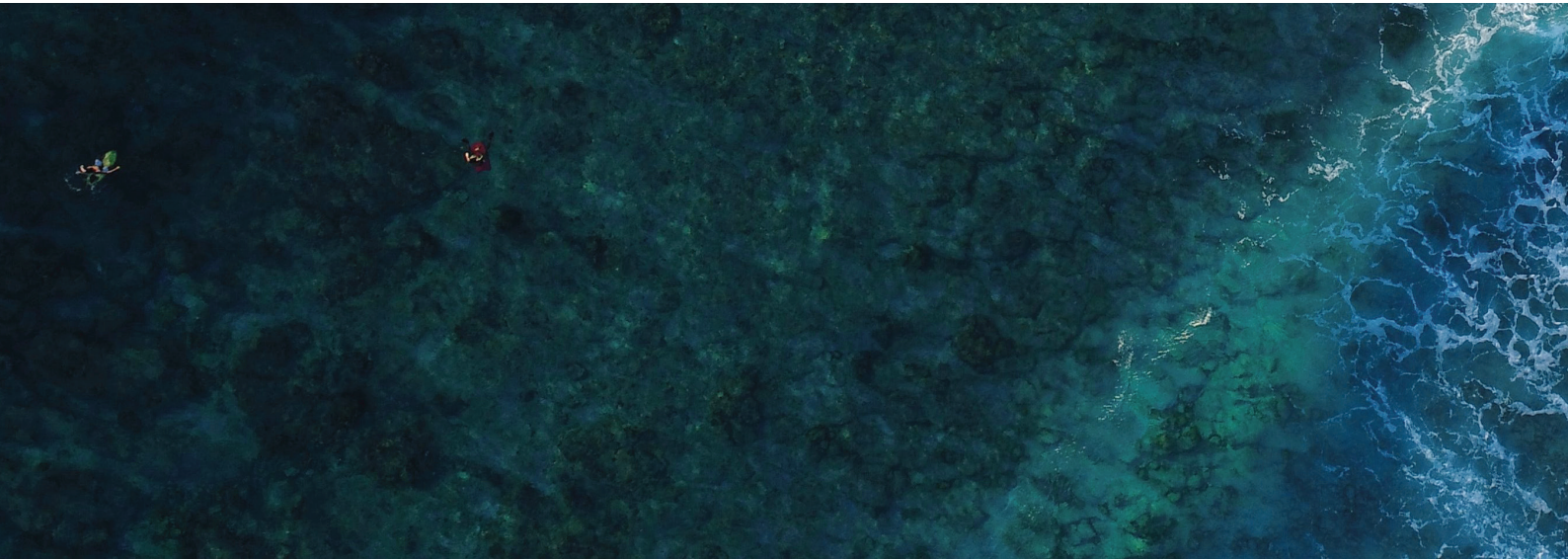


OceanGuard®

Operations & Maintenance Manual



Stopping Pollution Entering Waterways



www.oceanprotect.com.au

Introduction	3
Health and Safety	4
How does it work?	5
Maintenance Procedures	6
Maintenance Services	7



Introduction

The primary purpose of stormwater treatment devices is to capture and prevent pollutants from entering waterways, maintenance is a critical component of ensuring the ongoing effectiveness of this process. The specific requirements and frequency for maintenance depends on the treatment device and pollutant load characteristics of each site. This manual has been designed to provide details on the cleaning and maintenance processes for the OceanGuard® as recommended by the manufacturer (Ocean Protect).

The OceanGuard® technology is a gully pit basket designed to fit within new and existing gully pits to remove pollution from stormwater runoff. The system has a choice of filtration liners, designed to remove gross pollutants, solids, and other attached pollutants as either a standalone technology or as part of a 'treatment train' (e.g. with StormFilter®, Jellyfish® or biofiltration). OceanGuards are highly effective, easy to install and simple to maintain.

Stormwater professionals should note that Ocean Protect is not permitted to supply OceanGuard® technologies to provide pre-treatment to proprietary stormwater treatment assets that are not provided by Ocean Protect.

Why do I need to perform maintenance?

Adhering to the inspection and maintenance schedule of any stormwater treatment device is essential to ensuring that it functions properly throughout its design life.

During each inspection and clean, details of the mass, volume and type of material that has been collected by the device should be recorded. This data will assist with the revision of future management plans and help determine maintenance interval frequency. It is also essential that qualified and experienced personnel carry out all maintenance (including inspections, recording and reporting) in a systematic manner.

Maintenance of your stormwater management system is essential to ensuring ongoing at-source control of stormwater pollution. Maintenance also helps prevent structural failures (e.g. prevents blocked outlets) and aesthetic failures (e.g. debris build up), but most importantly ensures the long term effective operation of the OceanGuard®.

Health and Safety

Access to pits containing an OceanGuard® typically requires removing (heavy) access covers/grates, but typically it is not necessary to enter into a confined space. Pollutants collected by the OceanGuard® will vary depending on the nature of your site. There is potential for these materials to be harmful. For example, sediments may contain heavy metals, carcinogenic substances or sharp objects such as broken glass and syringes. For these reasons, there should be no primary contact with the waste collect and all aspects of maintaining and cleaning your OceanGuard® require careful adherence to Occupational Health and Safety (OH&S) guidelines.

It is important to note that the same level of care needs to be taken to ensure the safety of non-work personnel, as a result it may be necessary to employ traffic/pedestrian control measures when the device is situated in, or near areas with high vehicular/pedestrian activity.

Personnel health and safety

Whilst performing maintenance on the OceanGuard®, precautions should be taken in order to minimise (or when possible prevent) contact with sediment and other captured pollutants by maintenance personnel. In order to achieve this the following personal protective equipment (PPE) is recommended:

- Puncture resistant gloves
- Steel capped safety boots
- Long sleeve clothing, overalls or similar skin protection
- Eye protection
- High visibility clothing or vest

During maintenance activities it may be necessary to implement traffic control measures. Ocean Protect recommend that a separate site specific traffic control plan is implemented as required to meet the relevant governing authority guidelines.

The OceanGuard® is designed to be maintained from surface level, without the need to enter the pit. However depending on the installation configuration, location and site specific maintenance requirements it may be necessary to enter a confined space occasionally. It is recommended that all maintenance personnel evaluate their own needs for confined space entry and compliance with relevant industry regulations and guidelines. Ocean Protect maintenance personnel are fully trained and carry certification for confined space entry.

How does it work?

OceanGuard® is designed to intercept stormwater as it enters the stormwater pits throughout a site. The OceanGuard® has diversion panels that sit flush with the pit walls, this ensures that as stormwater enters at the top of the pit it is directed to the middle of the insert where the Filtration bag is situated. The filtration bag allows for screening to occur removing 100% of pollutants greater than the opening of the filtration material (200micron, 1600micron bags available).

During larger rain events the large flows overflow slots in the flow diverter of the OceanGuard® ensure that the conveyance of stormwater is not impeded thus eliminating the potential for surface flooding. As the flow subsides, the captured pollutants are held in the OceanGuard® filtration bag. The waste then starts to dry which reduces the magnitude of organic material decomposition transitioning between maintenance intervals.

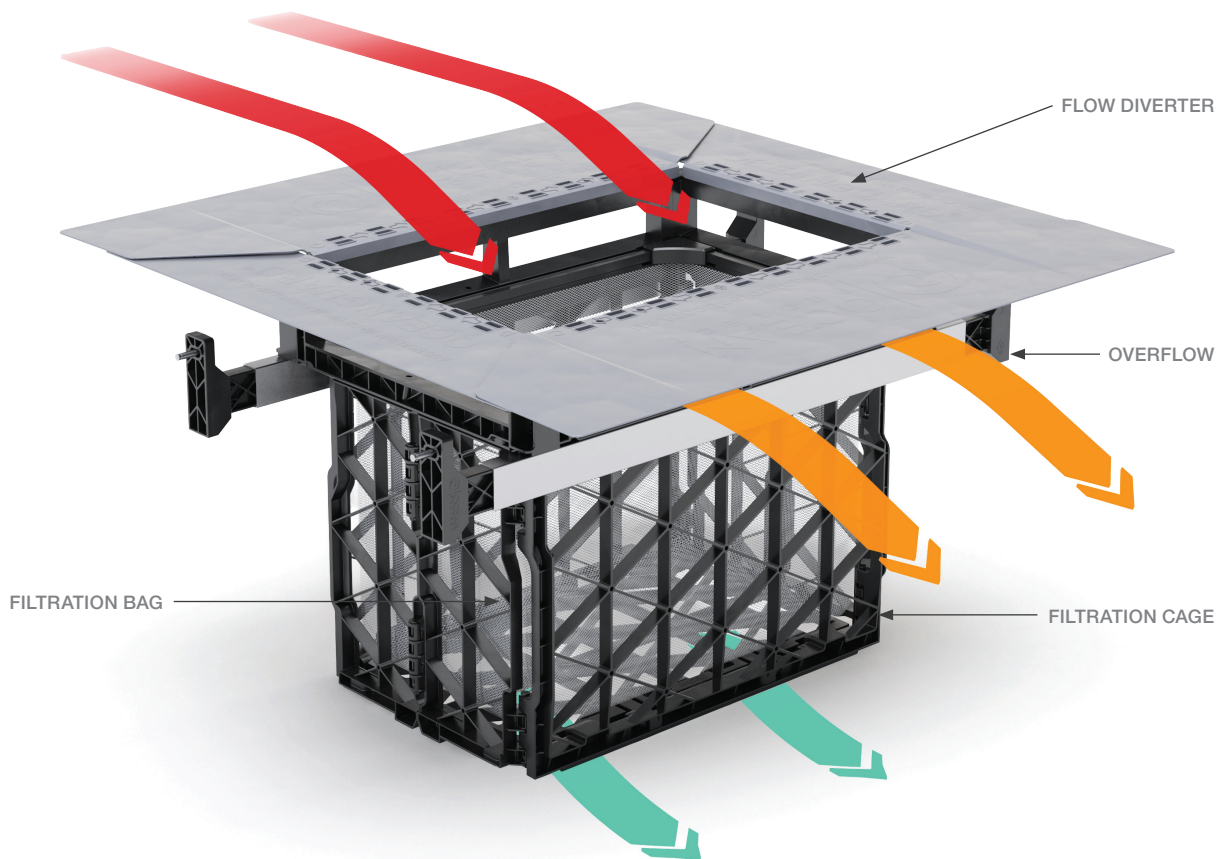


Figure 1: OceanGuard® components

Maintenance Procedures

To ensure that each OceanGuard® achieves optimal performance, it is advisable that regular maintenance is performed. The OceanGuard® requires 1-6 minor services annually (3 to 4 typical). Pending the outcome of these inspections, additional maintenance servicing may be required.

Primary types of maintenance

The table below outlines the primary types of maintenance activities that typically take place as part of an ongoing maintenance schedule for the OceanGuard®.

Service Type	Description of Typical Activities	Frequency
Minor Service	Filter bag inspection and evaluation Removal of capture pollutants Disposal of material	1-6 Times Annually
Major Service	Filter Bag Replacement Support frame rectification	As required

Maintenance requirements and frequencies are dependent on the pollutant load characteristics of each site. The frequencies provided in this document represent what the manufacturer considers to be best practice to ensure the continuing operation of the device is in line with the original design specification.

Minor Service

This service is designed to return the OceanGuard® back to optimal operating performance. This type of service can be undertaken either by hand or with the assistance of a Vacuum unit.

Hand Maintenance

- 1 Establish a safe working area around the OceanGuard®
- 2 Remove access cover/grate
- 3 Use two lifting hooks to remove the filtration bag
- 4 Empty the contents of the filtration bag into a disposal container
- 5 Inspect and evaluate the filtration bag
- 6 Inspect and evaluate remaining OceanGuard® components (i.e. flow diverter, filtration cage and supporting frame)
- 7 Rejuvenate filtration bag by removing pollutant build up with a stiff brush, additionally the filtration bag can be washed using high pressure water
- 8 Re-install filtration bag and replace access cover/grate

Vacuum Maintenance

- 1 Establish a safe working area around the OceanGuard®
- 2 Remove access cover/grate
- 3 Vacuum captured pollutants from the filtration bag
- 4 Remove filtration bag
- 5 Inspect and evaluate the filtration bag
- 6 Inspect and evaluate remaining OceanGuard® components (i.e. flow diverter, filtration cage and supporting frame)
- 7 Rejuvenate filtration bag by removing pollutant build up with a stiff brush, additionally the filtration bag can be washed using high pressure water
- 8 Re-install filtration bag and replace access cover/grate

Major Service (Filter Bag Replacement)

For the OceanGuard®, a major service is a reactionary process based on the outcomes from the minor service.

Trigger Event from Minor Service	Maintenance Action
Filtration bag inspection reveals damage	Replace the filtration bag ^[1]
Component inspection reveals damage	Perform rectification works and if necessary replace components ^[1]

^[1] Replacement filtration bags and components are available for purchase from Ocean Protect

Additional Types of Maintenance

Occasionally, events on site can make it necessary to perform additional maintenance to ensure the continuing performance of the device.

Hazardous Material Spill

If there is a spill event on site, all OceanGuard® pits that potentially received flow should be inspected and cleaned. Specifically, all captured pollutants from within the filtration bag should be removed and disposed in accordance with any additional requirements that may relate to the type of spill event. All filtration bags should be rejuvenated (replaced if required) and re-installed.

Blockages

The OceanGuard's internal high flow bypass functionality is designed to minimise the potential of blockages/flooding and this configuration has been field proven for over twenty years. Flooding caused by an OceanGuard® style of pit basket is extremely rare and in the unlikely event that flooding occurs around the stormwater pit the following steps should be undertaken to assist in diagnosing the issue and implementing the appropriate response.

- 1 Inspect the OceanGuard® flow diverter, ensuring that they are free of debris and pollutants
- 2 Perform a minor service on the OceanGuard®
- 3 Remove the OceanGuard® to access the pit and inspect both the inlet and outlet pipes, ensuring they are free of debris and pollutants

Major Storms and Flooding

In addition to the scheduled activities, it is important to inspect the condition of the OceanGuard® after a major storm event. The inspection should focus on checking for damage and higher than normal sediment accumulation that may result from localised erosion. Where necessary damaged components should be replaced and accumulated pollutants disposed.

Disposal of Waste Materials


The accumulated pollutants found in the OceanGuard® must be handled and disposed of in a manner that is in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. If the filtration bag has been contaminated with any unusual substance, there may be additional special handling and disposal methods required to comply with relevant government/authority/industry regulations.

Maintenance Services

With over a decade and a half of maintenance experience Ocean Protect has developed a systematic approach to inspecting, cleaning and maintaining a wide variety of stormwater treatment devices. Our fully trained and professional staff are familiar with the characteristics of each type of system, and the processes required to ensure its optimal performance.

Ocean Protect has several stormwater maintenance service options available to help ensure that your stormwater device functions properly throughout its design life. In the case of our OceanGuard®, we offer long term pay-as-you-go contracts, pre-paid once off servicing and replacement filter bags.

**For more information please visit
www.oceanprotect.com.au**



Ocean Protect supplies and maintains a complete range of filtration, hydrodynamic separation, screening and oil/water separation technologies.

Call 1300 354 722

www.oceanprotect.com.au

StormFilter[®]

Operations & Maintenance Manual



Stopping Pollution Entering Waterways



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Introduction	3
Health and Safety	4
How does it work?	5
Maintenance Procedures	6
Maintenance Services	8



Introduction

The primary purpose of stormwater treatment devices is to capture and prevent pollutants from entering waterways, maintenance is a critical component of ensuring the ongoing effectiveness of this process. The specific requirements and frequency for maintenance depends on the treatment device and pollutant load characteristics of each site. This manual has been designed to provide details on the cleaning and maintenance processes for the StormFilter®, as recommended by us.

The StormFilter® is designed and sized to meet stringent regulatory requirements. It removes the most challenging target pollutants (including total suspended solids, soluble heavy metals, oil, particulate and soluble nutrients) using a variety of media. For more than two decades, StormFilter® has helped clients meet their regulatory needs and, through ongoing product enhancements, the design continues to be refined for ease of use and improved performance.

Why do I need to perform maintenance?

Adhering to the inspection and maintenance schedule of any stormwater treatment device is essential to ensuring that it functions properly throughout its design life.

During each inspection and clean, details of the mass, volume and type of material that has been collected by the device should be recorded. This data will assist with the revision of future management plans and help determine maintenance interval frequency. It is also essential that qualified and experienced personnel carry out all maintenance (including inspections, recording and reporting) in a systematic manner.

Maintenance of your stormwater management system is essential to ensuring ongoing at-source control of stormwater pollution. Maintenance also helps prevent structural failures (e.g. prevents blocked outlets) and aesthetic failures (e.g. debris build up), but most of all ensures the long term effective operation of the StormFilter®.

Health and Safety

Access to a StormFilter® system requires removing access covers/grates, and it is necessary to enter a confined space. Pollutants collected by the StormFilter® will vary depending on the nature of your site. There is potential for these materials to be harmful. For example, sediments may contain heavy metals, carcinogenic substances or objects such as broken glass and syringes. For these reasons, all aspects of maintaining and cleaning your StormFilter® require careful adherence to Occupational Health and Safety (OH&S) guidelines.

It is important to note that the same level of care needs to be taken to ensure the safety of non-work personnel. As a result, it may be necessary to employ traffic/pedestrian control measures when the device is situated in, or near areas with high vehicular/pedestrian activity.

Personnel health and safety

Whilst performing maintenance on the StormFilter®, precautions should be taken in order to minimise (or, if possible, prevent) contact with sediment and other captured pollutants by maintenance personnel. The following personal protective equipment (PPE) is subsequently recommended (but not limited to):

- Puncture resistant gloves
- Steel capped safety boots
- Long sleeve clothing, overalls or similar skin protection
- Eye protection
- High visibility clothing or vest

During maintenance activities, it may be necessary to implement traffic control measures. Ocean Protect recommend that a separate site-specific traffic control plan is implemented as required to meet the relevant governing authority guidelines.

Whilst some aspects of StormFilter® maintenance can be performed from surface level, there will be a need to enter the StormFilter® system (confined space) during a major service. It is recommended that all maintenance personnel evaluate their own needs for confined space entry and compliance with relevant industry regulations and guidelines. Ocean Protect maintenance personnel are fully trained and carry certification for confined space entry applications.

How does it work?

During a storm, runoff percolates through the filtration media and starts filling the cartridge central tube. The air inside the hood is purged through a one-way check valve as the water rises. When water reaches the top of the float, buoyant forces pull the float free and allow filtered water to exit the cartridge.

A siphon is established within each cartridge that draws water uniformly across the full height of the media profile ensuring even distribution of pollutants and prolonged media longevity.

As the storm subsides and the water level in the structure starts falling, a hanging water column remains under the cartridge hood until the water level reaches the scrubbing regulators at the bottom of the hood. Air then rushes through the regulators breaking the siphon and creating air bubbles that agitate the surface of the filter media causing accumulated sediment to settle on the treatment chamber floor. This unique surface-cleaning mechanism helps prevent surface blinding and further extends cartridge life.

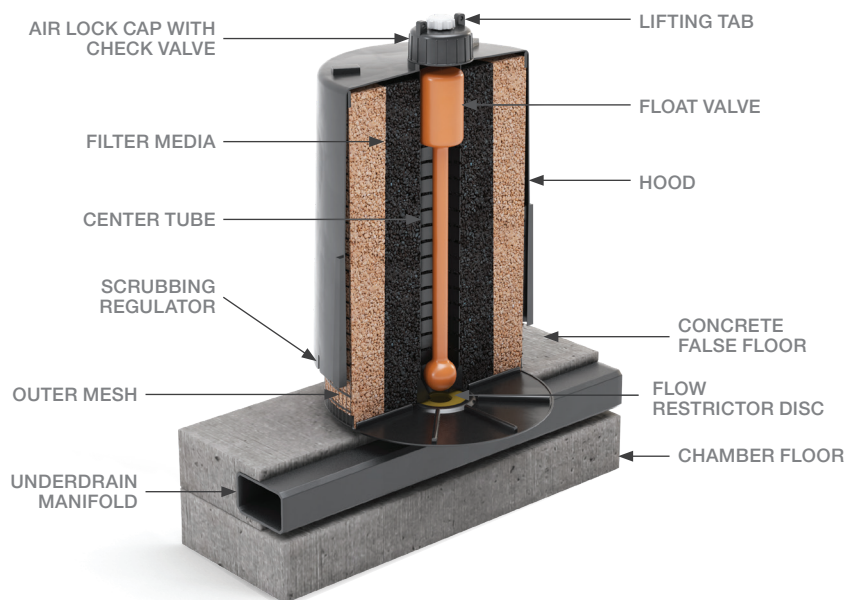


Figure 1: StormFilter® components

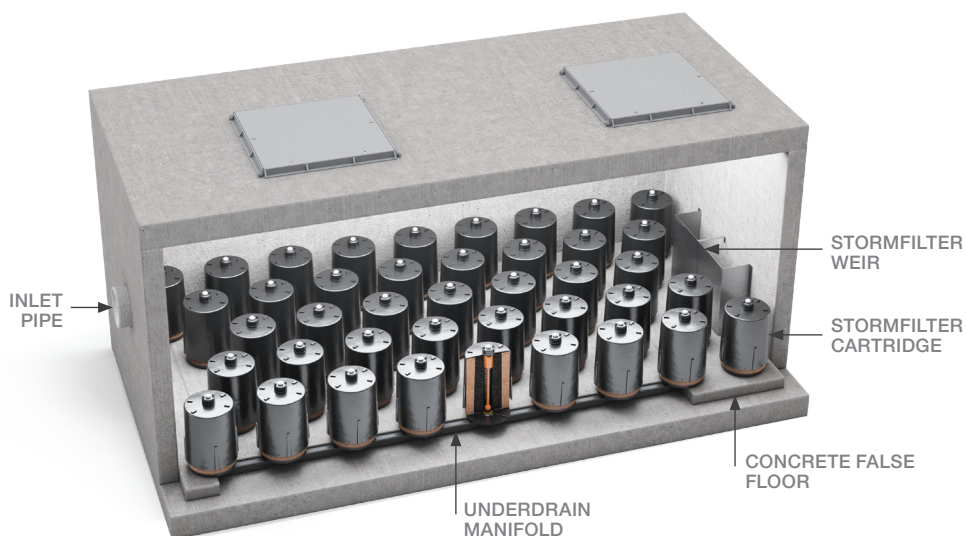


Figure 2: Example conceptual diagram of a StormFilter® system

Maintenance Procedures

To ensure optimal performance, it is advisable that regular maintenance is performed. Typically, the StormFilter® requires an inspection every 6 months with a minor service at 12 months. Additionally, as the StormFilter® cartridges capture pollutants the media will eventually become occluded and require replacement (expected media life is 1-3 years).

Primary types of maintenance

The table below outlines the primary types of maintenance activities that typically take place as part of an ongoing maintenance schedule for the StormFilter®.

Service Type	Description of Typical Activities	Frequency
Inspection	Visual Inspection of cartridges & chamber Remove larger gross pollutants Perform minimal rectification works (if required)	Every 6 Months
Minor Service	Evaluation of cartridges and media Removal of accumulated sediment (if required) Wash-down of StormFilter® chamber (if required)	Every 12 Months
Major Service	Replacement of StormFilter® cartridge media	As required

Maintenance requirements and frequencies are dependent on the pollutant load characteristics of each site. The frequencies provided in this document represent what the manufacturer considers to be best practice to ensure the continuing operation of the device is in line with the original design specification.

Inspection

The purpose of the inspecting the StormFilter® system is to assess the condition of the StormFilter® chamber and cartridges. When inspecting the chamber, particular attention should be taken to ensure all cartridges are firmly connected to the connectors. It is also an optimal opportunity to remove larger gross pollutants and inspect the outlet side of the StormFilter® weir.

Minor Service

This service is designed to ensure the ongoing operational effectiveness of the StormFilter® system, whilst assessing the condition of the cartridge media.

- 1 Establish a safe working area around the access point(s)
- 2 Remove access cover(s)
- 3 Evaluate StormFilter® cartridge media (if exhausted schedule major service within 6 months)
- 4 Measure and record the level of accumulated sediment in the chamber (if sediment depth is less than 100 mm skip to step 9)
- 5 Remove StormFilter® cartridges from the chamber
- 6 Use vacuum unit to removed accumulated sediment and pollutants in the chamber
- 7 Use high pressure water to clean StormFilter® chamber
- 8 Re-install StormFilter® cartridges
- 9 Replace access cover(s)

Major Service (Filter Cartridge Replacement)

For the StormFilter® system a major service is reactionary process based on the outcomes from the minor service, specifically the evaluation of the cartridge media.

Trigger Event	Maintenance Action
Cartridge media is exhausted ^[1]	Replace StormFilter® cartridge media ^[2]

^[1] Multiple assessment methods are available, contact Ocean Protect for assistance

^[2] Replacement filter media and components are available for purchase from Ocean Protect

This service is designed to return the StormFilter® device back to optimal operating performance.

- 1 Establish a safe working area around the access point(s)
- 2 Remove access cover(s)
- 3 By first removing the head cap, remove each individual cartridge hood to allow access to the exhausted media
- 4 Utilise a vacuum unit to remove exhausted media from each cartridge
- 5 Use vacuum unit to remove accumulated sediment and pollutants in the chamber
- 6 Use high pressure water to clean StormFilter® chamber
- 7 Inspect each empty StormFilter® cartridges for any damage, rectify damage as required
- 8 Re-fill each cartridge with media in line with project specifications
- 9 Re-install replenished StormFilter® cartridges
- 10 Replace access cover(s)

Additional Types of Maintenance

Occasionally, events on site can make it necessary to perform additional maintenance to ensure the continuing performance of the device.

Hazardous Material Spill

If there is a spill event on site, the StormFilter® unit should be inspected and cleaned. Specifically, all captured pollutants and liquids from within the unit should be removed and disposed in accordance with any additional requirements that may relate to the type of spill event. Additionally, it will be necessary to inspect the filter cartridges and assess them for contamination – and, depending on the type of spill event, it may be necessary to replace the filtration media.

Blockages

In the unlikely event that flooding occurs upstream of the StormFilter® system, the following steps should be undertaken to assist in diagnosing the issue and determining the appropriate response.

- 1 Inspect the upstream diversion structure (if applicable) ensuring that it is free of debris and pollutants
- 2 Inspect the StormFilter® unit checking the underdrain manifold as well as both the inlet and outlet pipes for obstructions (e.g. pollutant build-up, blockage), which if present, should be removed

Major Storms and Flooding

In addition to the scheduled activities, it is important to inspect the condition of the StormFilter® after a major storm event. The focus is to inspect for damage and abnormally high sediment accumulation that may result from localised erosion. Where necessary damaged components should be replaced and accumulated pollutants should be removed and disposed

Disposal of Waste Materials


The accumulated pollutants found in the StormFilter® must be handled and disposed of in a manner that is in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. If the filter media has been contaminated with any unusual substance, there may be additional special handling and disposal methods required to comply with relevant government/authority/industry regulations.

Maintenance Services

With over a decade and a half of maintenance experience, Ocean Protect has developed a systematic approach to inspecting, cleaning and maintaining a wide variety of stormwater treatment devices. Our fully trained and professional staff are familiar with the characteristics of each type of system, and the processes required to ensure its optimal performance.

Ocean Protect has several stormwater maintenance service options available to help ensure that your stormwater device functions properly throughout its design life. In the case of StormFilter®, we offer long term pay-as-you-go contracts, pre-paid once off servicing and replacement media for cartridges.

**For more information please visit
www.oceanprotect.com.au**



Ocean Protect supplies and maintains a complete range of filtration, hydrodynamic separation, screening and oil/water separation technologies.

Call 1300 354 722

www.oceanprotect.com.au

Appendix E – Council Flood Report


THE PURPOSE OF THIS REPORT IS FOR BUILDING AND DEVELOPMENT

Brisbane City Council's FloodWise Property Report provides technical flood planning information including estimated flood levels, habitable floor level requirements and more. This report uses the adopted flood planning information in Brisbane City Plan 2014, that guides how land in Brisbane is used and developed for the future. Find out more about [planning and building](#). To understand how to be resilient and prepare for floods, visit Council's [Be Prepared](#) webpage. Find more information about [how to read a FloodWise Property Report](#).

This property has no flood levels

Brisbane City Council has not assigned flood level information for this property however it may be affected by one or more flood or property development flags. Please refer to the Flood Planning and Development Information below for details. The property may have 0.2% AEP flood level which will appear on the Flood Planning Information table if applicable. For professional advice or detailed assessment of a property contact a Registered Professional Engineer of Queensland.

Visit the [Be Prepared](#) page to find more information on how to prepare your home or business for potential flooding.

 **Combined** 1% AEP for river, creek and storm tide flood extent (if applicable) from the adopted Brisbane City Plan 2014. Read more about [Brisbane City Plan 2014](#).



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Are you resilient and ready for flood?

- Sign up to the Brisbane Severe Weather Alert at brisbane.qld.gov.au/beprepared
- Visit bom.gov.au for the latest weather updates.
- Have an evacuation plan, emergency kit and important phone numbers ready.
- Observe where water flows from and to during heavy rain.
- Consider how flood-resilient building techniques will have you home faster and with less damage.

Life threatening emergencies
000 Police/fire/ambulance
(mobiles **000** and **112**)

State Emergency Service (SES) **132 500**
Energex **13 19 62**
Brisbane City Council **3403 8888**

Technical Summary

This section of the FloodWise Property Report contains more detailed flood information for this property so **surveyors, builders, certifiers, architects, and engineers can plan and build** in accordance with Council's planning scheme.

Find more information about [planning and building](#) in Brisbane or talk to a Development Services Planning Information Officer via Council's Contact Centre on (07) 3403 8888.

Flood Planning and Development Information

This section of the FloodWise Property Report contains information about Council's planning scheme overlays. Overlays identify areas within the planning scheme that reflect distinct themes that may include constrained land and/or areas sensitive to the effects of development.

Flood overlay code

The Flood overlay code of Council's planning scheme uses the following information to provide guidelines when developing properties. The table below summarises the flood planning areas (FPAs) that apply to this property. Development guidelines for the FPAs are explained in [Council's planning scheme](#).

Flood planning areas (FPA)		
River	Creek / waterway	Overland flow
		Not Applicable

To find more information about Council's flood planning areas (FPAs) for Brisbane River and Creek/waterway flooding to guide future building and development in flood prone areas, please review [Council's Flood Planning Provisions](#).

Coastal hazard overlay code

The Coastal hazard overlay code of Council's planning scheme uses the following information to provide guidelines when conducting new developments. The table below summarises the coastal hazard categories that apply to this property. Development guidelines for the following Coastal hazard overlay sub-categories are explained in Council's [planning scheme](#).

Coastal hazard overlay sub-categories
There are currently no Coastal hazard overlay sub-categories that apply to this property.

Note: Where land is identified within one or more flood planning areas on the Flood overlay or is identified within one of the Storm tide inundation area sub-categories on the Coastal hazard overlay, the assessment criteria that provides the highest level of protection from any source of flooding applies.

Property development flags

Large allotment - This property is either a Large Allotment of over 1000 square metres or is located within a Large Allotment. Flood levels may vary significantly across allotments of this size. Further investigations may be warranted in determining the variation in flood levels and the minimum habitable floor level across the site.

For more information or advice, please consult a Registered Professional Engineer of Queensland (RPEQ).

Useful Flood Information Definitions

Australian Height Datum (AHD) - The reference level for defining ground levels in Australia. The level of 0.0m AHD is approximately mean sea level.

Annual Exceedance Probability (AEP) - The probability of a flood event of a given size occurring in any one year, usually expressed as a percentage annual chance.

- **0.2% AEP** - A flood event of this size is considered rare but may still occur. A flood of size or larger has a 1 in 500 chance or a 0.2% probability of occurring in any year.
- **1% AEP** - A flood of this size or larger has a 1 in 100 chance or a 1% probability of occurring in any year.
- **2% AEP** - A flood of this size or larger has a 1 in 50 chance or a 2% probability of occurring in any year.
- **5% AEP** - A flood of this size or larger has a 1 in 20 chance or a 5% probability of occurring in any year.
- **20% AEP** - A flood of this size or larger has a 1 in 5 chance or a 20% probability of occurring in any year.

Data quality

- **Data Quality Code A** - Level data based on recent surveyor report or approved as-constructed drawings.
- **Data Quality Code B** - Level data based on ground-based mobile survey or similar.
- **Data Quality Code C** - Level data derived from Airborne Laser Scanning or LiDAR information.

Defined Flood Level (DFL) - The DFL is used for commercial and industrial development. The Defined flood level (DFL) for Brisbane River flooding is a level of 3.7m AHD at the Brisbane City Gauge based on a flow of 6,800 m/s. DFL is only applicable for non-residential uses affected by Brisbane River flooding.

Flood planning area (FPA) - Council has developed five Flood planning areas (FPAs) as part of Brisbane City Plan 2014 Flood overlay mapping for Brisbane River, Creek/waterway flooding and Overland flow to guide future building and development in flood prone areas. Storm tide flooding is mapped separately. The FPAs are designed to recognise the flood hazard for different flooding types. Flood hazard is a combination of frequency of flooding, the flood depth, and the speed at which the water is travelling. [Find more information here.](#)

Maximum and minimum ground level - Highest and lowest ground levels on the property based on available ground level information. A Registered Surveyor can confirm exact ground levels.

Minimum habitable floor level (dwelling house) - The minimum level in metres AHD at which habitable areas of development (generally including bedrooms, living rooms, kitchen, study, family, and rumpus rooms) must be constructed as required by the Brisbane City Plan 2014.

Indicative existing floor level - The approximate level in metres AHD of the lowest habitable floor in the existing building (excluding apartments). The data is sourced from a range of sources with varying accuracy levels.

Property - A property will contain 1 or more lots. The multiple lot warning is shown if you have selected a property that contains multiple lots.

Residential flood level (RFL) - This flood level for the Brisbane River equates to the 1% annual exceedance probability (AEP) flood level.

To learn more, visit [Brisbane City Council's Flood Information Hub](#)

Brisbane City Council's Online Flood Tools

Council provides several online flood tools:

- to guide planning and development
- to help residents and businesses understand their flood risk and prepare for flooding.

Council's online flood tools for planning and development purposes include:

- **FloodWise Property Report**
- **Flood Overlay Code**

For more information on Council's planning scheme and online flood tools for planning and development:

- phone (07) 3403 8888 and ask to talk to a Development Services Planning Information Officer

- visit brisbane.qld.gov.au/planning-building

Council's Planning Scheme - The Brisbane City Plan 2014 (planning scheme) has been prepared in accordance with the Sustainable Planning Act as a framework for managing development in a way that advances the purpose of the Act. In seeking to achieve this purpose, the planning scheme sets out the Council's intention for future development in the planning scheme area, over the next 20 years.

Disclaimer

1. Defined flood levels and residential flood levels, minimum habitable floor levels and indicative existing floor levels are determined from the best available information to Council at the date of issue. These levels, for a particular property, may change if more detailed information becomes available or changes are made in the method of calculating levels.
2. Council makes no warranty or representation regarding the accuracy or completeness of a FloodWise Property Report. Council disdaims any responsibility or liability in relation to the use or reliance by any person on a FloodWise Property Report.



Planning to build or renovate?

For information, guidelines, tools and resources to help you track, plan or apply for your development visit brisbane.qld.gov.au/planning-building

You can also find the Brisbane City Plan 2014 and Neighbourhood Plans as well as other information and training videos to help, with your building and development plans.