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STORMWATER MANAGEMENT REPORT

Proposed Residential Apartment Development
23 Griffith Place
Seven Hills QLD 4170

Document Control Record

Prepared by:	Royce Brinosa	Graduate Civil Engineer
Reviewed by:	Matthew Hendle	Senior Civil Engineer
Approved by:	Matthew Hendle	Senior Civil Engineer RPEQ 19730
Signed:		
Job No:	BR242141	

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van der Meer Consulting (QLD)
ABN 63 609 812 615

Level 3, 51 Alfred Street,
FORTITUDE VALLEY, QLD 4006
Telephone: +61 7 3021 6600

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1. Introduction

van der Meer Consulting has been commissioned by Heran Building Group Pty Ltd to prepare a Stormwater Management Plan (SWMP) Report as part of the DA submission for the proposed residential apartment development at 23 Griffith Place, Seven Hills (9SP267627).

The scope of this report includes a comprehensive assessment of the stormwater management requirements for the proposed development, against Brisbane City Council's City Plan 2000. This report will provide a detailed assessment and solution for a compliant stormwater management system.

The following information and documents were utilised in this investigation:

- Brisbane City Council City Plan – 2000
- Brisbane City Council Open Data Portal
- Unity Water Open Data Portal
- Queensland Urban Drainage Manual (QUDM) 2017
- State Planning Policy 2017
- Australian & Rainfall Runoff 2019
- Dial Before You Dig
- Architectural Plan (Refer *Appendix A*)
- Site Survey (Refer *Appendix B*)



Figure 1.1: Site Locality

Source: NearMap 2025

2. Background Information

2.1 Existing development and Land Use

The subject site is located on lot 9 SP267627, hereinafter referred to as Lot 9. The site is located within Brisbane City Council's "Community Use Areas" zone and occupies a total area of 12,658m^2. It is bounded by Griffith Place to the north, aged care buildings to the east and south, and residential dwellings to the west. The entire site is broken up into three proposed lots, 1 & 2 is the Precinct H apartment development and Lot 3 is the townhouse development currently in construction phase, (Refer to BR242141_23_Griffith_Pl_For Approval SWMP_C for Lot 3 development). Proposed lots are shown in Figure 2.2.



Figure 2.1: Proposed Lot Layout

Source: Chalmers Partners Architect

2.2 Proposed Development

The proposed development involves a MCU (residential development), with two apartment buildings. Lots 1 & 2 are the proposed development sites.



Figure 2.2: Proposed Architectural Plan

Source: Chalmers Partners Architect

2.3 Site Topography

The existing site falls from RL29.06mAHD on the northwestern boundary to RL21.00mAHD on the southeastern boundary at an average slope of 4.62%. The site predominantly discharges into an existing surface inlet pit located on the south-east of the boundary.



Figure 2.3: Site Survey (0.25m Intervals)

Source: Orion Spatial Solutions

2.4 Local Hydrology and Catchments

The subject site is situated within the upper half of the Perrin Catchment. This catchment predominantly encompasses urban residential areas, alongside community and commercial facilities. The stormwater catchments are depicted in Figure 2.4 below.



Figure 2.4: Brisbane City Council Stormwater Catchment Overlay

Source: Brisbane City Council Open Data 2025

The subject site is situated approximately 400 metres from the nearest local tributary (Perrin Creek Tributary). The local tributary commences at 25 Uranus Avenue (412RP43483), and spans approximately 2.8 kilometres before discharging into Perrin Creek. The subject site, local tributary and Perrin are depicted in Figure 2.5 below.

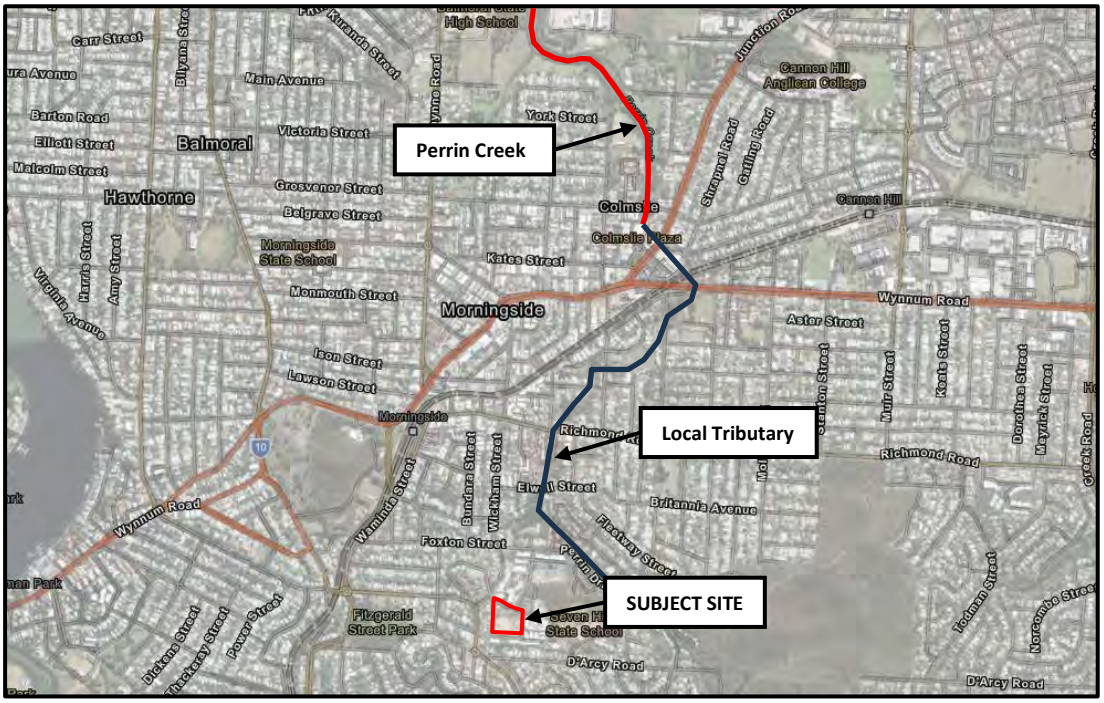


Figure 2.5: Local Tributary Overview

Source: Brisbane City Council Open Data 2025

2.5 Existing Site-specific Discharge

The existing site currently discharges to the existing surface inlet pit located on the southeastern boundary, identified as Line 1 in Figure 2.6 below.

2.6 Existing Drainage Infrastructure

There are several Council owned stormwater infrastructure assets immediately available to the development, the nearest being:

2.6.1 Existing Stormwater Line 1

- DN375 PP under roads Stormwater Main and field inlet pit located on the eastern side of the site.

2.6.2 Existing Stormwater Line 2

- Discharges into DN525 PP Stormwater Main located on south-west of the site.

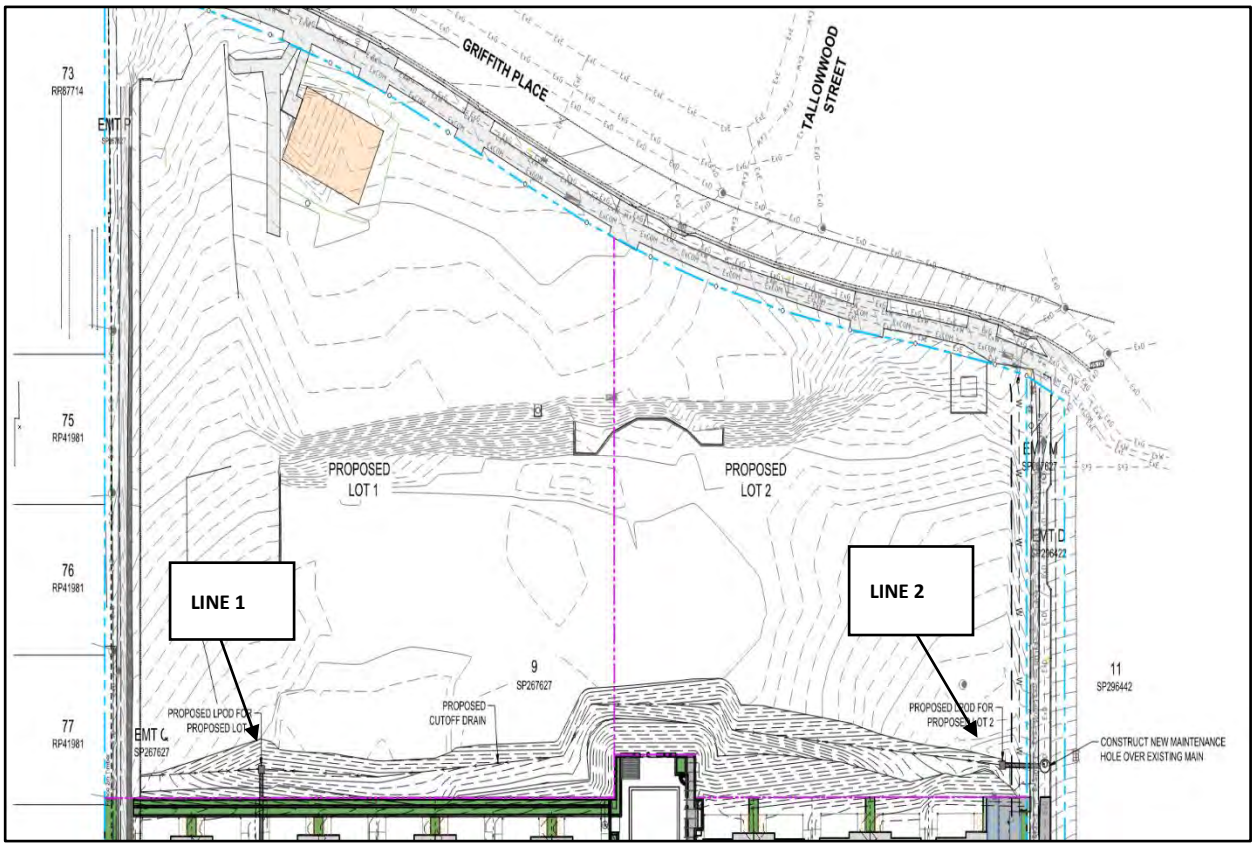


Figure 2.6 – Stormwater Infrastructure

Source: BR242141 Drawing No. SK13

3. Stormwater Quantity Strategy

3.1 Water Quantity Guidelines:

The following guidelines will be followed as part of this stormwater strategy for the water quantity:

- Brisbane City Council City Plan – 2000 (Superseded Edition)
- Brisbane City Council City Plan SC6.16 – Stormwater Drainage
- Brisbane City Council City Stormwater Management Code – 2003
- State Planning Policy 2017
- QUDM 2017
- Australian & Rainfall Runoff 2019

3.2 Nominated Lawful Point of Discharge

The nominated lawful point of discharge for lot 1 is a proposed stormwater main located at the south-west of the site connecting to the LPOD of lot 3. Lot 2's proposed LPOD is located on the south-east of the site.

Refer to *Appendix C* for the civil drawings indicating the connection location.

3.3 Nominated Stormwater Management Strategy

The main objective for stormwater management is to minimise the impacts on downstream properties and waterways.

Stormwater runoff from the proposed development will discharge into the existing stormwater main within EMT D SP296422 (0SP308027).

The proposed stormwater infrastructure and pre/post-development stormwater catchment plans are shown in Appendix C.

3.4 Existing/Proposed Stormwater Quantity

The following calculations are based on using the Rational Method calculation to determine pre-development flows (refer to Appendix C for calculation sheets). The IFD data has been obtained from The Bureau of Metrology.

For the existing case scenario, the stormwater catchments have been split into the following:

- EX1 (Existing dwelling Area) – 12,658 m2 (68.9% impervious)

Table 3.1 – Pre-development flow

Catchment	TOC (Mins)	Storm Event (AEP) Q1	Q2	Q5	Q10	Q20	Q50	Q100
EX	16.1	0.187	0.223	0.333	0.409	0.490	0.623	0.718
Total		0.187	0.223	0.333	0.409	0.490	0.623	0.718

- C1 (Approved Townhouse Area) – 5,262 m2 (96.5% impervious)
- C2 (Proposed Apartment Area) – 7,397 m2 (74.5% Assumed % impervious)

The total post development fraction impervious is 83.6%.

Table 3.2 – Post-development flow [Unmitigated]

Catchment	TOC (Mins)	Storm Event (AEP) Q1	Q2	Q5	Q10	Q20	Q50	Q100
C1	7	0.115	0.137	0.205	0.253	0.304	0.383	0.425
C2	7	0.149	0.178	0.266	0.329	0.395	0.504	0.582
Total		0.264	0.315	0.471	0.582	0.699	0.887	1.007

A comparison of the pre-development and post-development flow rates for each storm event is shown in Table 3.2 below:

Table 3.3 – Difference in Peak Discharge Rates

Catchment	Storm Event (AEP)						
	Q1	Q2	Q5	Q10	Q20	Q50	Q100
Pre-development	0.187	0.223	0.333	0.409	0.490	0.623	0.718
Post-development (Unmitigated)	0.264	0.315	0.471	0.582	0.699	0.887	1.007
Total	(+) 0.077	(+) 0.092	(+) 0.138	(+) 0.073	(+) 0.209	(+) 0.264	(+) 0.289

The analysis confirms that the proposed development will have more peak discharge rates, when compared to pre-development site conditions. On this basis, on-site detention is proposed as part of this development.

3.5 Stormwater Detention Requirements

As part of Council's stormwater requirements, the stormwater strategy is to achieve a non-worsening outcome to adjacent, upstream, and downstream properties. Given the proposed development flow rates, stormwater detention is required to limit flows to pre-development flow rates.

An on-site detention tank has been proposed to limit discharges to pre-developed conditions or better. This detention tank will be installed on Lot 2 and will detain the entirety of Lot 2. Whilst Lot 1 will discharge into the existing stormwater line on Lot 3. DRAINS runoff-routing model was used to estimate the runoff from the existing and developed site and any on-site requirements. Separate models were developed for existing and developed conditions to reflect the changes in catchment associated with the development.

Time of Concentration values calculated in the Rational Method calculations were adopted. The 39%, 10%, 5%, 2% and 1% AEP design storm events were analysed for all standard durations ranging from 5 minutes to 120 minutes.
The critical duration for the combined peak site discharge was determined to be the 10-minute storm and 5-minute storm for the pre-development and post-development scenarios respectively. The combined peak discharge rate for the site calculated by the DRAINS model shown below for scenarios.

3.6 Stormwater Detention Modelling

The model configurations under existing and developed conditions are show on the next pages in *Figures 3.6* to *Figure 3-9.*

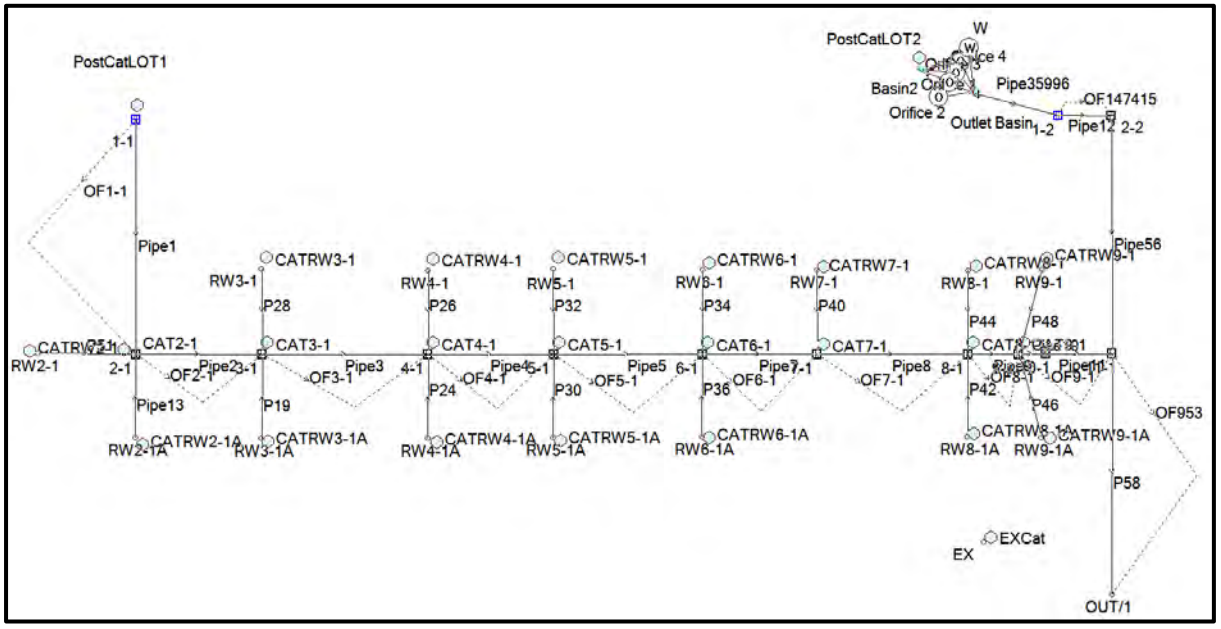


Figure 3.6 – DRAINS Model setup

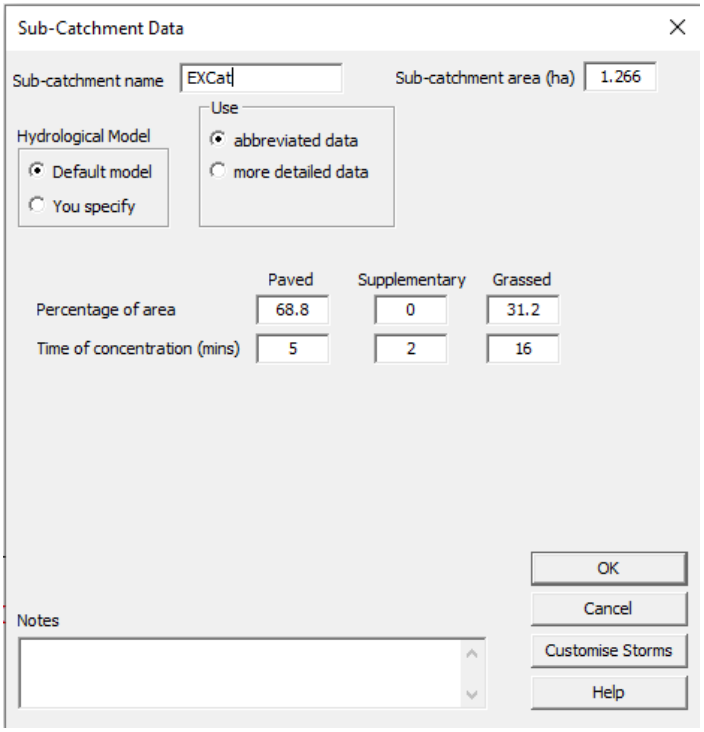


Figure 3.7 – Pre-development catchment parameters

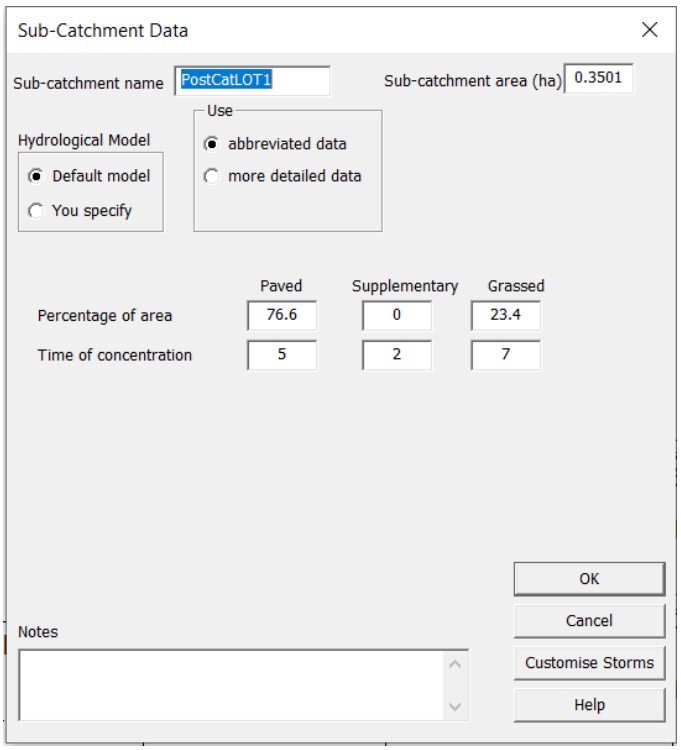


Figure 3.8 – Post-development lot 1 catchment parameters

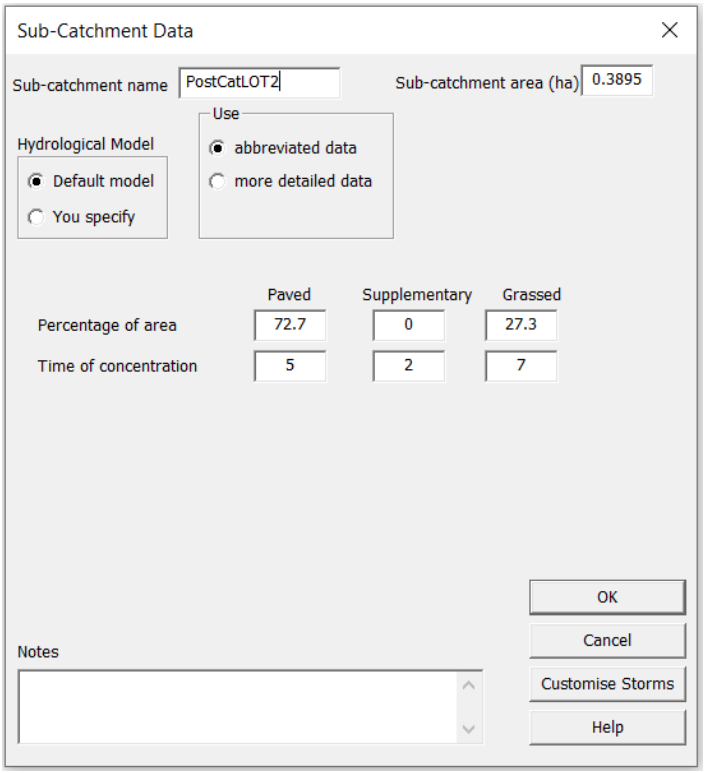


Figure 3.9 – Post-development lot 2 catchment parameters

3.7 Detention Volumes

The following detention storage parameters were adopted to achieve the target mitigated pre-development flow rates.

Table 3.3 – Detention Tank Parameter

Catchment	*Storm Event (AEP)*
Detention System Storage	53.4m^2 (57.4 m^2 including filter area) @ 1.8m depth
Orifice Arrangement	Orifice 1: Invert = 20.8m, ⌀ = 230mm Orifice 2: Invert = 21.67m, ⌀ = 150mm Orifice 3: Invert = 21.89m, ⌀ = 90mm Orifice 4: Invert = 22.02m, ⌀ = 190mm
Weir Arrangement	Invert = 22.3m, Crest length = 1m
Max. Water level for 1% AEP	RL 22.29m AHD (No flow entering)
Minimum Storage Required	79.346 m^3
Tank volume (DRAINS)	103 m^3 (Including filter area)
Main Control Outlet	375mm dia. Outlet pipe

A comparison of the pre-development and mitigated flow rates based on the above arrangement are shown in *Table 3.4* below.

Table 3.4 – Difference in peak discharge rate (DRAINS Model)

Condition	Storm Event (AEP)					
	50%	20%	10%	5%	2%	1%
Pre – development (m3/s)	0.331	0.43	0.506	0.593	0.705	0.791
Post – development [mitigated] (m3/s)	0.315	0.403	0.477	0.559	0.659	0.729
Difference	(-) 0.016	(-) 0.032	(-) 0.029	(-) 0.034	(-) 0.046	(-) 0.062

The analysis confirms that the proposed development [mitigated] will not result in any worsening of peak discharge rates when compared to pre-development site conditions. On this basis the proposed detention tank has been designed to suit the development site.

4. Construction Phase Stormwater Quality Strategy

4.1 Erosion and Sediment Control Measures

During construction, it shall be the responsibility of the Principal Contractor to ensure that the development complies with the relevant erosion and sediment control objectives, as outlined in the State Planning Policy and the Brisbane City Council City Plan.

This section of the report provides suggested inclusions in an erosion and sediment control plan for the proposed development site. This plan includes recommendations for monitoring & reporting responsibilities and the construction of site-specific sedimentation and erosion control measures. Detailed drawings specifying the proposed erosion and sediment control measures are to be provided at the Operational Works stage of the development.

All works must be carried out in accordance with the Erosion and Sediment Control (ESC) measures for each stage of the project. The following ESC measures will be deemed an acceptable solution by minimising ground disturbance and ensure water quality in accordance with 'Soil and Sediment Control – Engineering Guidelines for Queensland Construction Sites 1996'. This will be done by:

4.1.1 Pre-construction

Prior to construction, the following sediment and erosion control measures will be implemented to meet the acceptable outcomes of the SPP:

- Set out transport routes to ensure minimal vegetation disturbance and concentrate pollutants (hydrocarbons and contaminants);
- Erosion shakedown points shall be established at all vehicular access points, with shakedown areas regularly swept clean and sediment removed;
- Install sediment fences around the proposed bulk earthworks site;
- Install dust control fences adjacent to the proposed bulk earthworks site.

4.1.2 During construction

- Clean stormwater runoff from upstream allotments is to be directed away from the development site using earth bunds or cut-off drains, as deemed appropriate by a suitable supervisor;
- The prevention of sediment runoff towards other allotments via the effective implementation of silt fences, sediment basins or other mitigation devices as deemed appropriate by a suitable supervisor;
- Sediment runoff shall also be prevented from entering the Council stormwater drainage system via the implementation of control measures such as gully pit sediment barriers;
- Maintain vegetation in a healthy state during construction process
- Grass filter strips to be placed along all road verges;
- Re-vegetation of all disturbed areas within two weeks of completion;

- All sediment control structures to be maintained in an effective manner and inspected after each storm event. No structure is to accumulate sediment above 40% of its capacity;
- Dust producing areas to be swept to remove silt/dust and wetting of roads is only permitted where sweeping has failed;
- At least one bin or littler trap is to be provided for waste material.

4.1.3 Post-development – maintenance period

- Silt fences and water quality devices are to remain in place during the maintenance period and regularly inspected following storm events, or any other event that may result in degradation.
- Where required, silt fences are to be cleared of sediment when fence is 25% full
- Regular water quality samples must be taken where required and must satisfy relevant water quality measures.
- Water quality data must be stored on site, included by not limited to: rainfall dates, dates of testing and water release, any rectification work required.

4.1.4 Spoil and Stockpile Management Measures

It shall be the responsibility of the Principal Contractor to ensure the following spoil and stockpile management measures are implemented on site:

Where the stockpiling of spoil and excess earthworks is necessary on the development site, stockpiles shall be established as far away as possible from stormwater inlets and pipelines to reduce the likelihood of sediment runoff;

Stockpiles are to be established within a designated zone of fill material and should be surrounded with appropriate erosion and sediment control measures.

Earthwork areas are to be protected against wind and water erosion. Stockpiles and construction material are not permitted to be stored within the road reserves.

4.1.5 Training Requirements

It shall be the responsibility of the Principal Contractor to ensure the following training protocols are implemented on the development site:

Site induction courses shall include details of an environmental management reporting system, through which personnel will be able to report perceived erosion and sediment control issues on site.

4.1.6 Erosion Hazard Assessment

The average slope across the development site is estimated to be 3-5%. The estimate duration of soil disturbance will likely be less than a month to allow for stripping, excavation of services and creation of the unit pads, considering the development type and average construction times.

There are currently no off-site sediment control measures serving the development site and surrounding properties shows it is unlikely that stormwater from upstream catchments will discharge into the development area.

As such, the erosion risks for the site do not propose a significant risk to the surrounding area or infrastructure and a detailed erosion and sediment control plan will not be required for this development.

A copy of the BCC Erosion Hazard Assessment prepared for the site is attached in Appendix F. The site has been identified as a medium-risk site.

4.1.7 Performance objectives

Construction phase erosion and sediment control measures must achieve the following water quality objectives (WQO's) for a site runoff up to the design event as per the Brisbane City Council City Stormwater Management Code (2003). Table 4.1 summarises the pollutants and the criteria required to be achieved.

Table 4.1 Pollutants Criteria

Pollutant	Criteria
Total Suspended Solids	<50mg/L
Turbidity	Turbidity not >10% receiving waters turbidity
pH	6.5 – 8.5
Hydrocarbons	No releases of oils or visible sheen to released waters
Litter	No litter or gross pollutants
Pollutant	Criteria

4.1.8 Monitoring and Maintenance

The following monitoring and maintenance procedures will be undertaken by the land developer during all phases of the project:

- Earthworks and site cleaning are undertaken in accordance with the Erosion and Sediment Control plans.
- Self-auditing program must be developed.
- Any worn, damaged, or defective materials are to be immediately rectified to prevent uncontrolled discharge from the site
- Monitoring frequencies to be undertaken as per 4.1.10 Monitoring Frequency

Self-audits, original test results and weekly sheet shall be kept on-site and available for council officers. Non-complying test results must be reported to council immediately.

4.1.9 Self-auditing requirements

The self-auditing program will be performed at least once a week, immediately before site closure and following rainfall events that cause runoff. These self-audits must be undertaken systematically and record:

- Installation/removal of any erosion and sediment control measures
- Condition of each device employed.
- Circumstances contributing to damage of any measure.
- Storage capacity available in pollution control structures (e.g. portable toilets, pollutant traps etc)
- Time, date, volume, and type of additional flocculants
- Maintenance or repair requirements for each measure

4.1.10 Monitoring frequency

Stormwater monitoring shall take place at the following intervals when surface water leaves the site:

Table 4.2 Monitoring Frequency

Parameter	Frequency
TSS, NFR	Monthly or during discharge event (>25mm in any 24-hour period)
pH	In acid sulphate soils risk area, daily or during controlled discharge event
Total P, Total N	3 monthly

5. Operational Phase Stormwater Quality Strategy

5.1 Water Quality Guidelines:

The following guidelines will be followed as part of this stormwater strategy for the water quality:

- Brisbane City Council City Plan – 2000 (Superseded Edition)
- Brisbane City Council City Plan SC6.16 – Stormwater Drainage
- Brisbane City Council City Stormwater Management Code – 2003
- Brisbane City Council City Management of Urban Stormwater Quality PSP
- State Planning Policy 2017
- MUSIC Modelling Guidelines November 2018 (Water by Design)
- Water by Design Construction & Establishment Guidelines: Swales, Bioretention Systems and Wetlands

The State Planning Policy (2017) states that for receiving waters, a development application must achieve the relevant stormwater management design objectives if the development falls into one or more of the following triggers:

1. Material change of use for an urban purpose that involves premises 2500m^2 or greater in size and;
    a. will result in six or more dwellings; or
    b. will result in an impervious area greater than 25 per cent of the net developable area; or
2. Reconfiguring a lot for an urban purpose that involves premises 2500m^2 or greater in size and will result in six or more lots; or
3. Operational works for an urban purpose that involves disturbing a land area 2500m^2 or greater in size

As the development falls into category 1a & 1b from the above, stormwater quality management is required in accordance with the water quality objectives listed in the next section.

5.2 Water Quality Objectives

The SPP (2017) states a solution is deemed to comply with *water sensitive urban design* when the target pollutant reductions outlined below are met:

Table 5.1 – Water Quality Objectives

Pollutant	Reduction Target
Total Suspended Solids (kg/yr)	80%
Total Phosphorus (kg/yr)	60%
Total Nitrogen (kg/yr)	45%
Gross Pollutants (kg/yr)	90%

5.3 Water Quality Strategy

The proposed treatment strategy to achieve the SPP (2017) water quality objectives will incorporate the following:

- **StormFilter Chamber (Ocean Protect)** – 4m^2 proposed treatment chamber to be fitted into the detention tank.
- **690 NPSORB StormFilter (Ocean Protect)** – Seven StormFilters to be fitted in the chamber to treat the water quality.
- **ENVIRO Treatment Chamber** – One existing ENVIRO G60 treatment chamber fitted to the existing stormwater line in Lot 3 as part of the previous approval A006915062.

5.4 MUSIC Modelling

The effectiveness of the proposed water quality measures has been assessed using numerical modelling. Water quality modelling has been conducted using the latest version of MUSIC (Model for Urban Stormwater Improvement Conceptualisation).

The model includes rainfall data from station 40063 (BCC Central – Brisbane Regional Office) with 6-minute time step from 01/01/1980 to 31/12/1989 as well as pollutant loads and catchment properties from Water by Design's 'MUSIC Modelling Guidelines' (2018).

5.4.1 Design Parameters for the Stormwater Quality Improvement System

The following tables outline the parameters that were used for the purposes of MUSIC modelling based on the Water by Design MUSIC Modelling Guideline (2018).

Table 5.2 - MUSIC Source Node Parameters (Urban Residential Parameters)

Rainfall Runoff Parameters	Values
Rainfall Threshold (mm/day)	1.00
Soil Storage Capacity (mm)	500
Initial Storage (% of capacity)	10
Field Capacity (mm)	200
Infiltration Capacity Coefficient – a	211
Infiltration Capacity Exponent – b	5.0
Initial Depth (mm)	50
Daily Recharge rate (%)	28
Daily Baseflow Rate (%)	27
Daily Deep Seepage (%)	0

Table 5.3 - MUSIC Pollutant Concentration Parameters (Urban Residential Parameters)

		TSS		TP		TN	
		Base Flow	Storm Flow	Base Flow	Storm Flow	Base Flow	Storm Flow
Roof	Mean (Log mg/L)	0	1.30	0	-0.89	0	0.26
	Std Dev (Log mg/L)	0	0.39	0	0.31	0	0.23
Road	Mean (Log mg/L)	1.00	2.43	-0.97	-0.30	0.20	0.26
	Std Dev (Log mg/L)	0.34	0.39	0.31	0.31	0.20	0.23
Ground	Mean (Log mg/L)	1.00	2.18	-0.97	-0.47	0.20	0.26
	Std Dev (Log mg/L)	0.34	0.39	0.31	0.31	0.20	0.23

5.4.2 Catchments

The catchment areas noted in Table 5.7 have been utilised for each of the nodes.

Table 5.3 – Catchment Areas for MUSIC Modelling

Input Node	Lot 1		Lot 2		Lot 3
	Area	Imperv	Area	Imperv	Area
Roof	1446 m^2	100%	2063 m^2	100%	3330 m^2
Ground	1689 m^2	42%	1801 m^2	79%	960 m^2
Road	357 m^2	100%	18 m^2	100%	1050 m^2
Total	**3492 m^2**	**72%**	**3882 m^2**	**90%**	**5340 m^2**

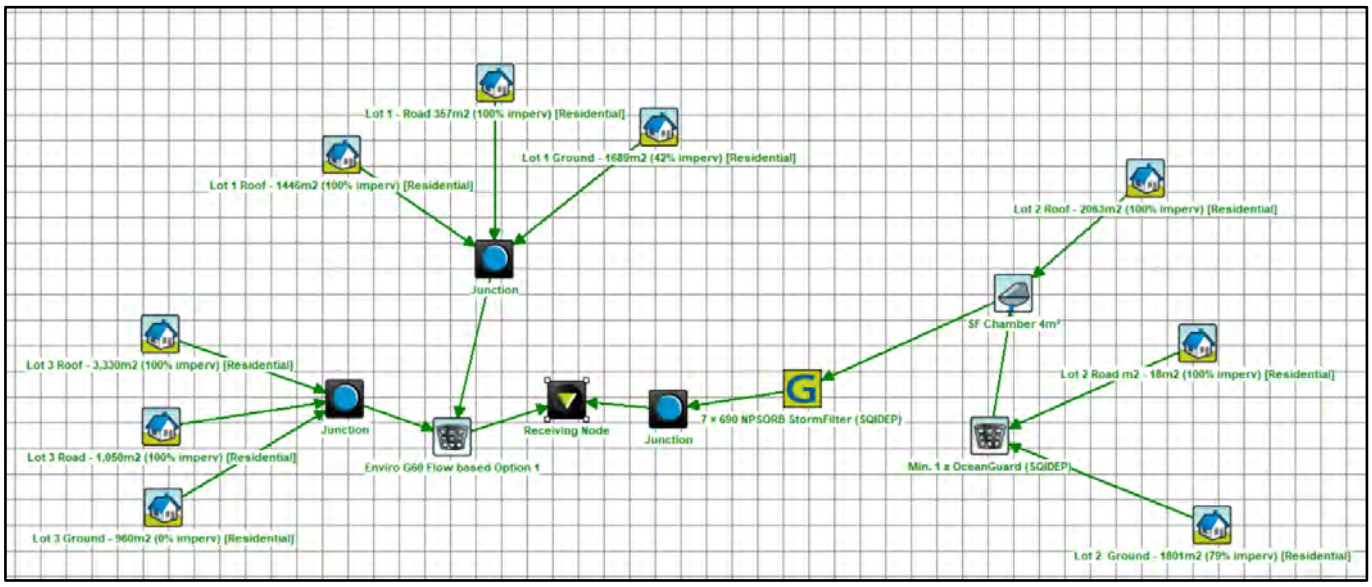


Figure 5.1: MUSIC Model Catchment Plan

5.4.3 Results

The following figures show the results from the MUSIC modelling which has been undertaken to demonstrate that the water quality objectives outlined have been achieved. Refer to Figure 5.1 above for further clarity regarding the stormwater strategy.

Treatment Train Effectiveness - Receiving Node

	Sources	Residual Load	% Reduction
Flow (ML/yr)	11.8	11.8	0
Total Suspended Solids (kg/yr)	1460	291	80.1
Total Phosphorus (kg/yr)	3.45	0.775	77.6
Total Nitrogen (kg/yr)	24.6	11.3	53.9
Gross Pollutants (kg/yr)	274	0.904	99.7

Figure 5.2 – Treatment Results

The proposed water quality measures achieve the reduction targets for all key stormwater pollutants, satisfying the State Planning Policy requirements.

6. Conclusion

This Stormwater Management Report has assessed the pre-development conditions and proposed a stormwater management strategy as part of the proposed development at 23 Griffith Place, Seven Hills (9SP267627).

The stormwater quality/quantity strategy will include the implementation of the following:

- The nominated lawful point of discharge for Lot 1 is a proposed stormwater main located south-west of the site connecting to the LPOD of Lot 3. Lot 2's proposed LPOD is located on the south-east of the site.
- Stormwater quantity measures are necessary as the proposed development will result in worsening of peak discharge rates when compared to pre-development site conditions. A Stormwater detention tank is proposed within Lot 2 to detain all the roof water and runoff in this Lot.
- Stormwater quality treatment is deemed necessary given the MCU is greater than 2500m^2 and will result in an impervious area greater than 25 per cent of the net developable area.
- Stormwater quality treatment for the proposed townhouse development will include the following:
    - x1 StormFilter 4m^2 [SQIDEP]
    - x7 690 NPSORB StormFilter [SQIDEP] (to treat Lot 2 ONLY)
    - x2 OceanGuard [SQIDEP] (to treat Lot 2 ONLY)
    - x1 ENVIRO G60 treatment chamber fitted to stormwater in Lot 3 (Existing as part of the previous approval A006915062) (to treat Lot 1 & 3 ONLY)

By implementing the above, the requirements outlined by the State Planning Policy 2017 can be achieved.

Appendix A – Proposed Architectural Plan



1 SITE PLAN
1 : 250

GENERAL NOTES

1. CONFIRM ALL DIMENSIONS AND EXISTING INFRASTRUCTURE ON SITE PRIOR TO CONSTRUCTION.
2. ALL WORK IS TO COMPLY WITH IN ALL RESPECTS TO THE RELEVANT AUSTRALIAN BUILDING STANDARDS AND LOCAL COUNCIL LAWS / REGULATIONS.
3. ANY DISCREPANICES (ON DRAWING OR ON SITE) TO BE REPORTED TO CHALMERS PARTNERS PRIOR TO CONSTRUCTION.
4. FIGURED DIMENSIONS TO BE TAKEN IN PREFERENCE TO SCALED DRAWINGS.
5. DOCUMENTS TO BE READ IN CONJUNCTION WITH CONSULTANTS AND RELEVANT DOCUMENTATION.

KEYPLAN LEGEND

REV	DESCRIPTION	DATE
E	ISSUED FOR APPROVAL	261029
D	ISSUED FOR FINAL APPROVAL	261014
C	ISSUED FOR COORDINATION	261006
B	ISSUED FOR COORDINATION	260907
A	ISSUED FOR REVIEW	260619

PROJECT NAME / ADDRESS
CLEARVIEW - PRECINCT H

CLIENT
HERAN BUILDING GROUP

LONGLAND PLACE, LEVEL 2/76 SKYRING TERRACE,
NEWSTEAD, QLD 4006

CHALMERS PARTNERS ARCHITECTS
27-9, NIHONBASHI HAKOZAKICHO, CHUO-KU, TOKYO

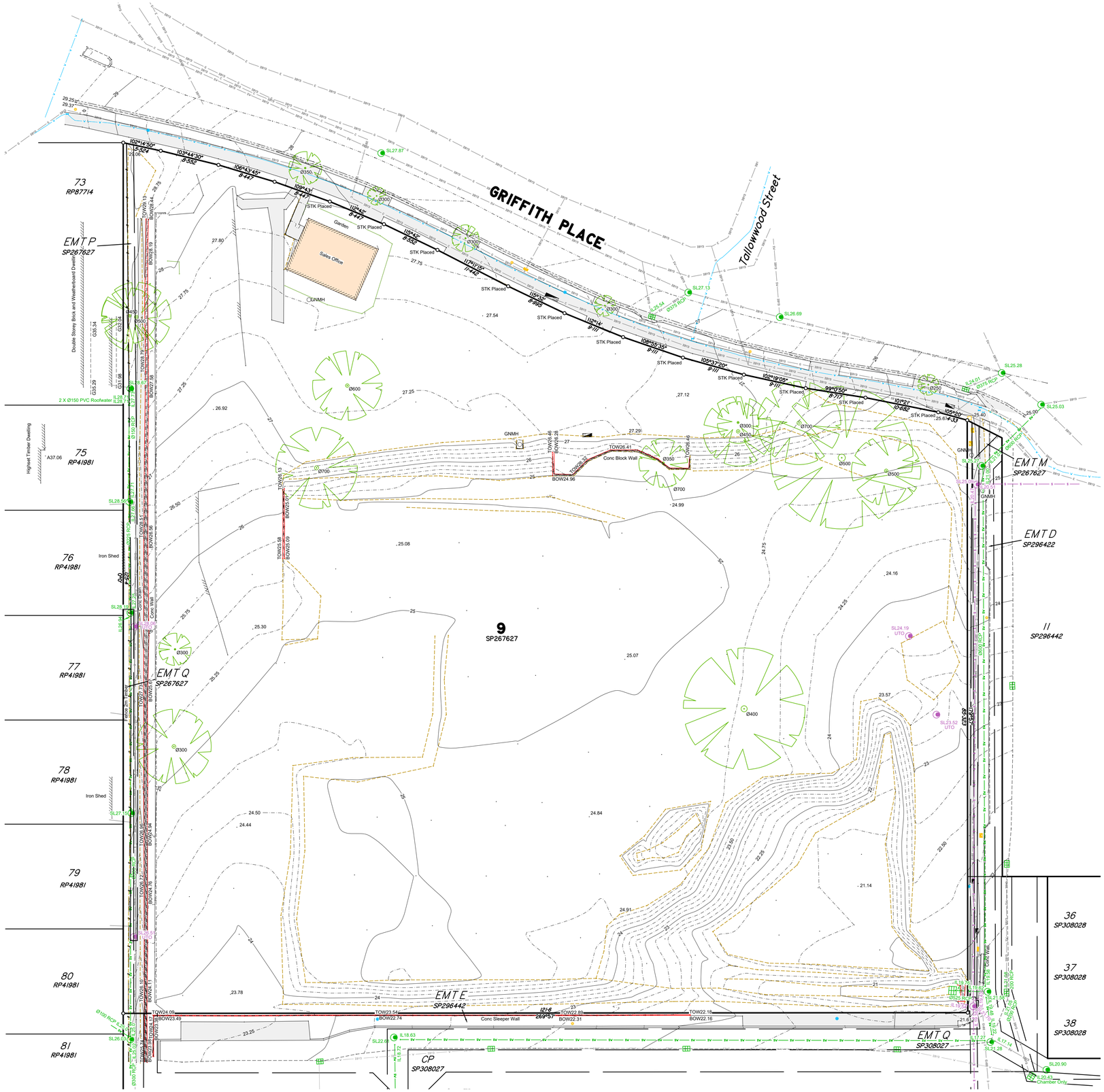
DO NOT SCALE FROM DRAWINGS. USE DIMENSIONS INDICATED, ALL DIMENSIONS ARE IN MILLIMETRES. REPORT ANY DISCREPANCIES TO CPA BEFORE THE COMMENCEMENT OF WORK.
Original sheet size A1 (841x594)

DRAWING TITLE
SITE PLAN

TRUE NORTH

PROJECT #	2026002
DATE	261029
SCALE @ A1	1 : 250 @ A1
DRAWN Author	CHKD Approver
DRAWING #	REVISION
DA. 0.102	E

Appendix B – Site Survey Plan



Legend

Buildings
- GS.05 Gutter
- ES.05 Eave
- FLS.05 Floor Level
- RS.05 Ridge
- AS.05 Apex

Comms
- Pole
- Pillar
- Marker
- Pit

Electrical
- Power Pole
- Light Pole
- Meter
- Marker
- Pillar
- Pit

Fencing
- Fence Post
- Fence Line
- Gate
- Guard Rail
- Hand Rail

Gas
- Marker
- Valve
- Manhole

General
- Temporary Bench Mark
- Bollard
- GNIO Inspection
- GNMH Manhole
- Face of Building
- Door / Opening
- Mail Box

Roofwater
- RWO Inspection
- Kerb Adaptor
- Lid
- Lid & Chamber

Stormwater
- SWO Inspection
- Gully Trap
- Field Inlet
- Lid
- Lid & Chamber

Sewer
- SO Inspection
- Lid
- Lid & Chamber

Surface
- Hardstand (Conc / Bit / Pavers)
- Building
- Change of Grade
- Drain centre
- Top of Bank

Water
- Marker
- Meter
- Tap
- Valve
- Fire Hydrant

Vegetation
- Tree
- Tree Inlet Drip line

Abbreviations
- TOW Top of Wall
- BOW Bottom of Wall
- UTO Unable to Open

DBYD Records
- UGAG : Under Ground/Above Ground
- C — 3919 — Communications — CuG
- E — 3919 — Electricity — EUG
- G — 3919 — Gas — GUG
- S — 3919 — Sewer — S
- SV — 3919 — Stormwater — SV
- V — 3919 — Water — V
- Roofwater — RV

Located by Survey

Notes

This plan may not be copied unless this note is included.

Underground Services
- Services have been compiled from Wolters As Constructed Survey supplied by Heran. Wolters As Constructed Survey has been layered with Wolters Prefix in layer name.
- DBYD records have been plotted where no As Constructed data provided.
- Private Services within common property of adjoining townhouse developments has not been provided as part of As Constructed information. DBYD records do not show privatelly owned services within common property.
- No underground service location was undertaken as part of field survey.

DWG info:
3D TIN frozen in layer "TIN GROUND".

For further information on any point in this survey, double click the point cross.

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GOLD COAST (07) 5619 5190
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The boundaries shown on this plan have been compiled from survey records and are for plotting purposes only. Boundary corners have not been marked on site and are subject to final survey.

Only visible features of underground services were located. Positions plotted are indicative only and as such should not be relied upon for detailed engineering design and construction. Contact relevant authorities before any excavation.

This plan may not be copied unless this note is included.

Locality:	Seven Hills
Local Government:	Brisbane City
RP Description:	Lot 9 on SP267627
Date of Survey:	27/02/25
Level Datum:	AHD (dwr)
Level Origin:	Clearview Stage 7
Horizontal Datum:	Local
Horizontal Origin:	SP267627
Contour Interval:	0.25m

Scale: 0 3 6 9m
1 : 300@A1 (Before Reduction)
@A1

Client: Heran Building Group

Detail Survey of Precinct H Clearview Urban Village

Sheet 1 of 1

Drawn:	TC
Surveyed:	TC
Checked:	JM
Approved:	
Drawing Number:	S-2019-047-A

Appendix C – Civil Plans

RESIDENTIAL APARTMENTS - PRECINCT H

23 GRIFFITH PLACE, SEVEN HILLS QLD 4170



LOCALITY PLAN
SCALE 1:1000

DRAWING LIST

DWG. NO	DWG. TITLE
SK00	COVER SHEET AND DRAWING INDEX
SK01	BULK EARTHWORKS LAYOUT PLAN
SK02	BULK EARTHWORKS SECTIONS
SK03	STORMWATER LAYOUT PLAN
SK04	STORMWATER PRE - CATCHMENT PLAN
SK05	STORMWATER POST- CATCHMENT PLAN
SK06	SERVICES LAYOUT PLAN

REVISIONS:

No.	REVISION DESCRIPTION	DRAWN	DATE
B	FOR APPROVAL	JP	03.11.26
A	FOR APPROVAL	MA	14.08.26

SCALE BAR
0 10 20 30 40 50m 100m
SCALE 1:1000

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van der Meer Consulting
van der meer
LEVEL 3, 51 ALFRED STREET
FORTITUDE VALLEY QLD 4006
Telephone +61 7 3021 6600
www.vandermeer.com.au
van der Meer (QLD) Pty Ltd
A.B.N. 63 609 812 615

CLIENT
HERAN BUILDING GROUP

ARCHITECT
CHALMERS PARTNERS ACHITECTS
LEVEL 2/76 SKYRING TERRACE, NEWSTEAD QLD 4006

PROJECT TITLE
RESIDENTIAL APARTMENTS - PRECINCT H
23 GRIFFITH PLACE
SEVEN HILLS QLD 4170

DRAWING TITLE
COVER SHEET AND DRAWING INDEX

DRAWING STATUS
FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

PROJECT LEADER	DESIGNER	SIGNATURE	
MH	JP		
DRAFTSPERSON	SCALE		SHEET SIZE
JP	1:1000		A1
JOB No.		DRAWING No.	REVISION
BR242141		SK00	B



BULK EARTHWORKS LAYOUT PLAN
SCALE 1:250

ALL ENVIRONMENTAL MEASURES INCLUDING VEGETATION PROTECTION AND EROSION AND SEDIMENT CONTROL SHALL BE IN PLACE PRIOR TO THE COMMENCEMENT OF ANY WORK

THIS DEVELOPMENT MAY REQUIRE THE IMPLEMENTATION OF SOIL RETENTION METHODS DURING CONSTRUCTION. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THESE WORKS ARE CERTIFIED BY A SUITABLY QUALIFIED RPEQ AND INSTALLED PRIOR TO COMMENCING FILLING AND EXCAVATION WORKS AS INDICATED ON THIS PLAN

THE CONTRACTOR IS TO PRODUCE A MANAGEMENT PLAN FOR CONTROL OF DUST AND AIR EMISSIONS DURING WORKS.

NO DUST IS TO EXTEND BEYOND THE SITE BOUNDARY INCLUDING VEHICLES ENTERING AND LEAVING THE SITE.

ANY DAMAGE TO EXISTING ROADWAYS WILL BE RECTIFIED BY THE CONTRACTOR AT HIS EXPENSE.

LEGEND

- EXISTING LOT BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- XX.XX EXISTING CONTOUR (0.5m)
- EXISTING CONTOUR (0.1m)
- PROPOSED EARTHWORKS CONTOURS MAJOR
- PROPOSED EARTHWORKS CONTOURS MINOR
- PROPOSED RETAINING WALL
- Ex W EXISTING WATER
- Ex SW EXISTING STORMWATER
- Ex S EXISTING SEWER
- ExD EXISTING STORMWATER
- ExCOM EXISTING COMMUNICATIONS
- ExE EXISTING ELECTRICAL

EARTHWORKS CUT AND FILL TABLE

COLOR	MIN ELEVATION (m)	MAX ELEVATION (m)
	-12.000	-8.000
	-8.000	-4.000
	-4.000	-2.000
	-2.000	-1.000
	-1.000	-0.500
	-0.500	-0.050
	-0.050	0.050
	0.050	0.500
	0.500	1.000
	1.000	2.000
	2.000	4.000

BULK EARTHWORKS QUANTITES

TOTAL CUT VOLUME: 26481m^3
TOTAL FILL VOLUME: 325m^3
TOTAL EXPORT VOLUME: 26156m^3

TOPSOIL STRIP (100mm): 593m^3

EARTHWORKS LEVELS BASED ON A NOMINAL 250mm GROUND SLAB THICKNESS

NOTE

1. TEMPORARY BATTERS ARE NOT SHOWN FOR CLARITY
2. REFER TO CIVIL SPECIFICATIONS ON DRAWING C001 FOR SUBGRADE PREPARATION REQUIREMENTS
3. THIS PLAN IS TO BE READ IN CONJUNCTION WITH;
   - THE GEOTECHNICAL REPORT
   - GENERAL PROJECT NOTES ON C001
   - RELEVENT COUNCIL SPECIFICATIONS
4. THESE VOLUMES DO NOT INCLUDE THE FOLLOWING
   - BULKING
   - TRENCHING
   - RETAINING WALL (INCLUDING BACKFILLING)
   - FOOTINGS
   - DETAILED EXCAVATION
5. EXISTING UNCONTROLLED FILL TO BE MANAGED IN ACCORDANCE WITH GEOTECHNICAL ENGINEER RECOMMENDATIONS

NOTE: SURVEY

1. ALL EXISTING SERVICES HAVE BEEN LOCATED USING DBYD AND COUNCIL MAPPING SERVICES ONLY - CONTRACTOR TO CONFIRM ALL EXISTING SERVICE LOCATIONS PRIOR TO COMMENCEMENT OF WORKS
2. SURVEY PROVIDED DOES NOT COVER ENTIRE SITE AREA - CONTRACTOR TO VERIFY ANY MISSING LEVELS PRIOR TO ANY COMMENCEMENT OF WORK
3. STORMWATER INFRASTRUCTURE LOCATED WITHIN SITE AND EXTERNAL TO SITE WERE NOT CAPTURED IN DETAILED SITE SURVEY. INFORMATION SHOWN IS INDICATIVE ONLY AND BASED ON SITE MEASUREMENTS CAPTURED BY CONTRACTOR. CONTRACTOR TO CONFIRM LOCATION AND LEVELS ON SITE PRIOR TO CONSTRUCTION FOR STORMWATER ASSETS. IF IN DOUBT ASK.

REFER STRUCTURAL ENGINEER FOR DETAILS OF TEMPORARY SOIL RETENTION METHOD

ANY DAMAGE TO EXISTING ROADWAYS WILL BE RECTIFIED BY THE CONTRACTOR AT HIS EXPENSE.

CONTRACTOR TO CONFIRM LOCATION OF ALL SERVICES TRAVERSING OR ADJACENT TO THE DEVELOPMENT SITE PRIOR TO UNDERTAKING WORKS.

REFER STRUCTURAL DRAWINGS PREPARED BY STRUCTURAL ENGINEER FOR FOOTING SLAB AND WALL DETAILS.

REVISIONS:

No.	REVISION DESCRIPTION	DRAWN	DATE
B	FOR APPROVAL	JP	03.11.26
A	FOR APPROVAL	MA	14.08.26

SCALE BAR
0 1 2 3 4 5 10m 15 20m
SCALE 1:250

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van der Meer Consulting
van der meer
LEVEL 3, 51 ALFRED STREET
FORTITUDE VALLEY QLD 4006
Telephone +61 7 3021 6600
www.vandermeer.com.au
van der Meer (QLD) Pty Ltd
A.B.N. 63 609 812 615

CLIENT
HERAN BUILDING GROUP

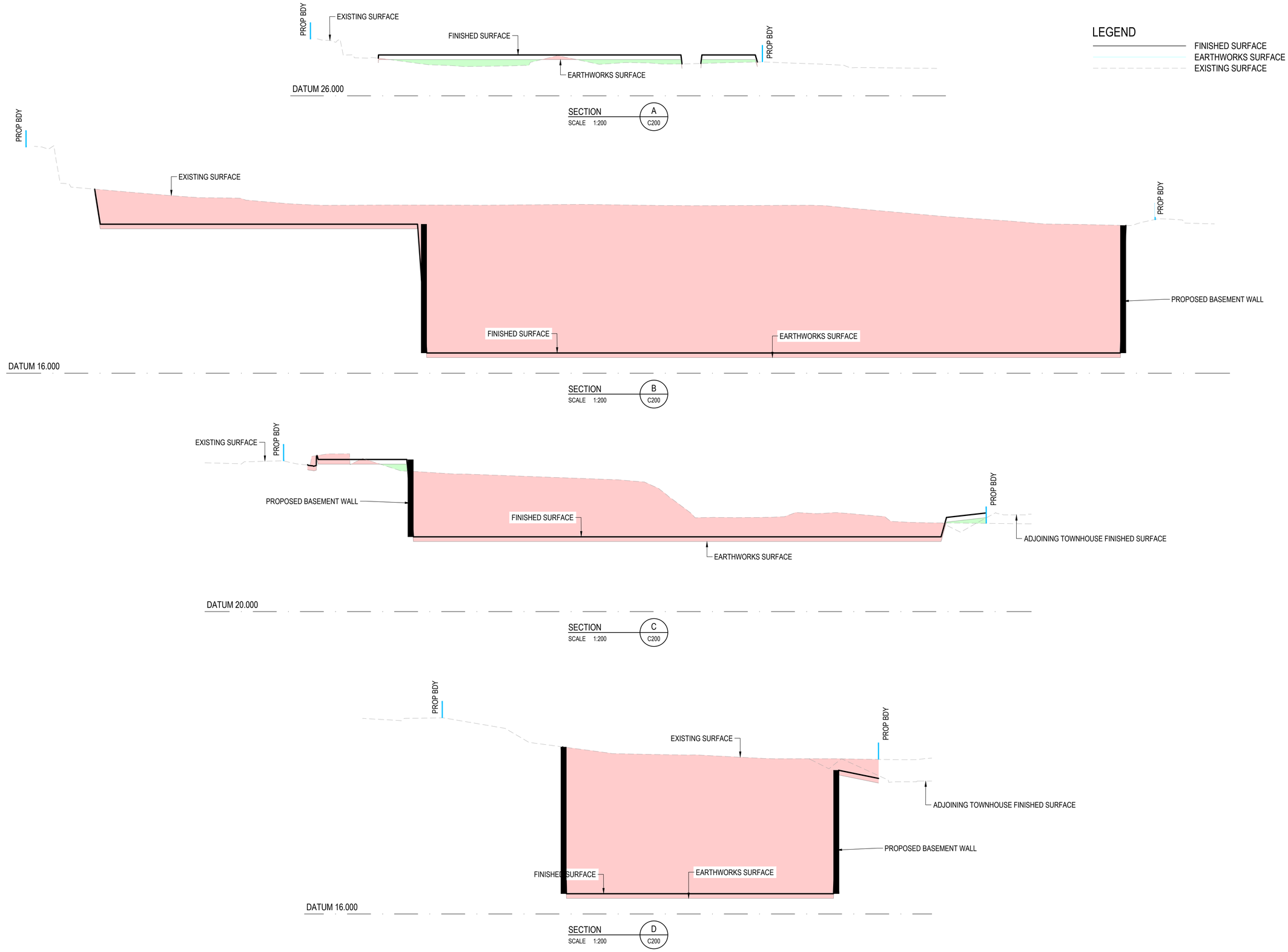
ARCHITECT
CHALMERS PARTNERS ACHITECTS
LEVEL 2/76 SKYRING TERRACE, NEWSTEAD QLD 4006

PROJECT TITLE
RESIDENTIAL APARTMENTS - PRECINCT H
23 GRIFFITH PLACE
SEVEN HILLS QLD 4170

DRAWING TITLE
BULK EARTHWORKS
LAYOUT PLAN

DRAWING STATUS
FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

PROJECT LEADER	DESIGNER	SIGNATURE	
MH	JP		
DRAFTSPERSON	SCALE		SHEET SIZE
JP	1:250		A1
JOB No.		DRAWING No.	REVISION
BR242141		SK01	B



REVISIONS:

No.	REVISION DESCRIPTION	DRAWN	DATE
B	FOR APPROVAL	JP	03.11.26
A	FOR APPROVAL	MA	14.08.26

SCALE BAR

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van der Meer Consulting
van der meer
LEVEL 3, 51 ALFRED STREET
FORTITUDE VALLEY QLD 4006
Telephone +61 7 3021 6600
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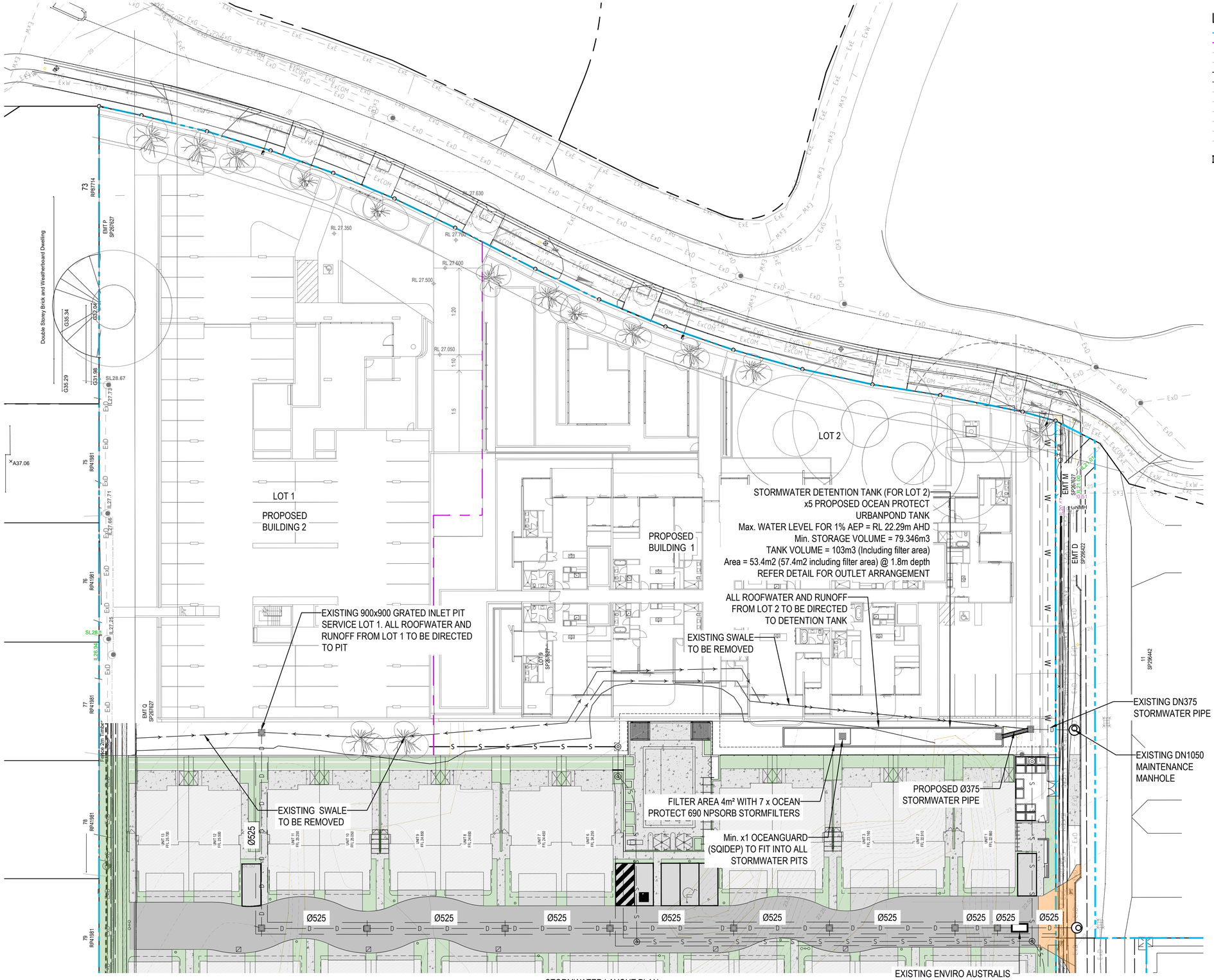
PROJECT TITLE
RESIDENTIAL APARTMENTS - PRECINCT H
23 GRIFFITH PLACE
SEVEN HILLS QLD 4170

DRAWING TITLE
BULK EARTHWORKS
SECTIONS

DRAWING STATUS
FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

PROJECT LEADER	DESIGNER	SIGNATURE	
MH	JP		
DRAFTSPERSON	SCALE		SHEET SIZE
JP			A1
JOB No.		DRAWING No.	REVISION
BR242141		SK02	B



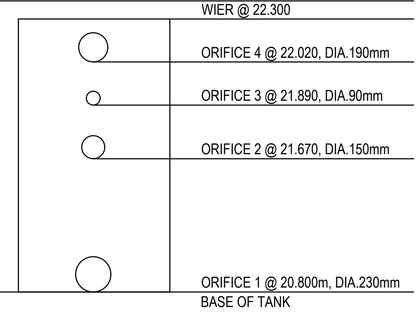
STORMWATER LAYOUT PLAN
SCALE 1:250

LEGEND

- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- EXISTING CONTOUR (0.5m)
- EXISTING CONTOUR (0.1m)
- PROPOSED CONTOUR (1.0m)
- PROPOSED CONTOUR (0.1m)
- EXISTING SEWER
- EXISTING COMMUNICATIONS
- EXISTING ELECTRICAL
- EXISTING GAS
- EXISTING STORMWATER
- EXISTING WATER
- EXISTING STORMWATER LINE
- EXISTING STORMWATER STRUCTURE ID
- EXISTING STORMWATER INLET
- EXISTING ROAD
- EXISTING FOOTPATH
- EXISTING DWELLING
- EXISTING STORMWATER MANHOLE
- PROPOSED GROUND LEVEL RL 28.200
- PROPOSED LOWER GROUND LEVEL 24.030
- PROPOSED BASEMENT LEVEL RL 20.560
- PROPOSED RAMP

PROPOSED LOWER GROUND LEVEL 24.03

TOP OF TANK IL = 22.600
WIER @ 22.300



ORIFICE DETAIL
SCALE 1:20

REVISIONS:

No.	REVISION DESCRIPTION	DRAWN	DATE
B	FOR APPROVAL	JP	03.11.26
A	FOR APPROVAL	MA	14.08.26

SCALE BAR
0 1 2 3 4 5 10m 15 20m
SCALE 1:250

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van der meer
LEVEL 3, 51 ALFRED STREET
FORTITUDE VALLEY QLD 4006
Telephone +61 7 3021 6600
www.vandermeer.com.au
van der Meer (QLD) Pty Ltd
A.B.N. 63 609 812 615

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HERAN BUILDING GROUP

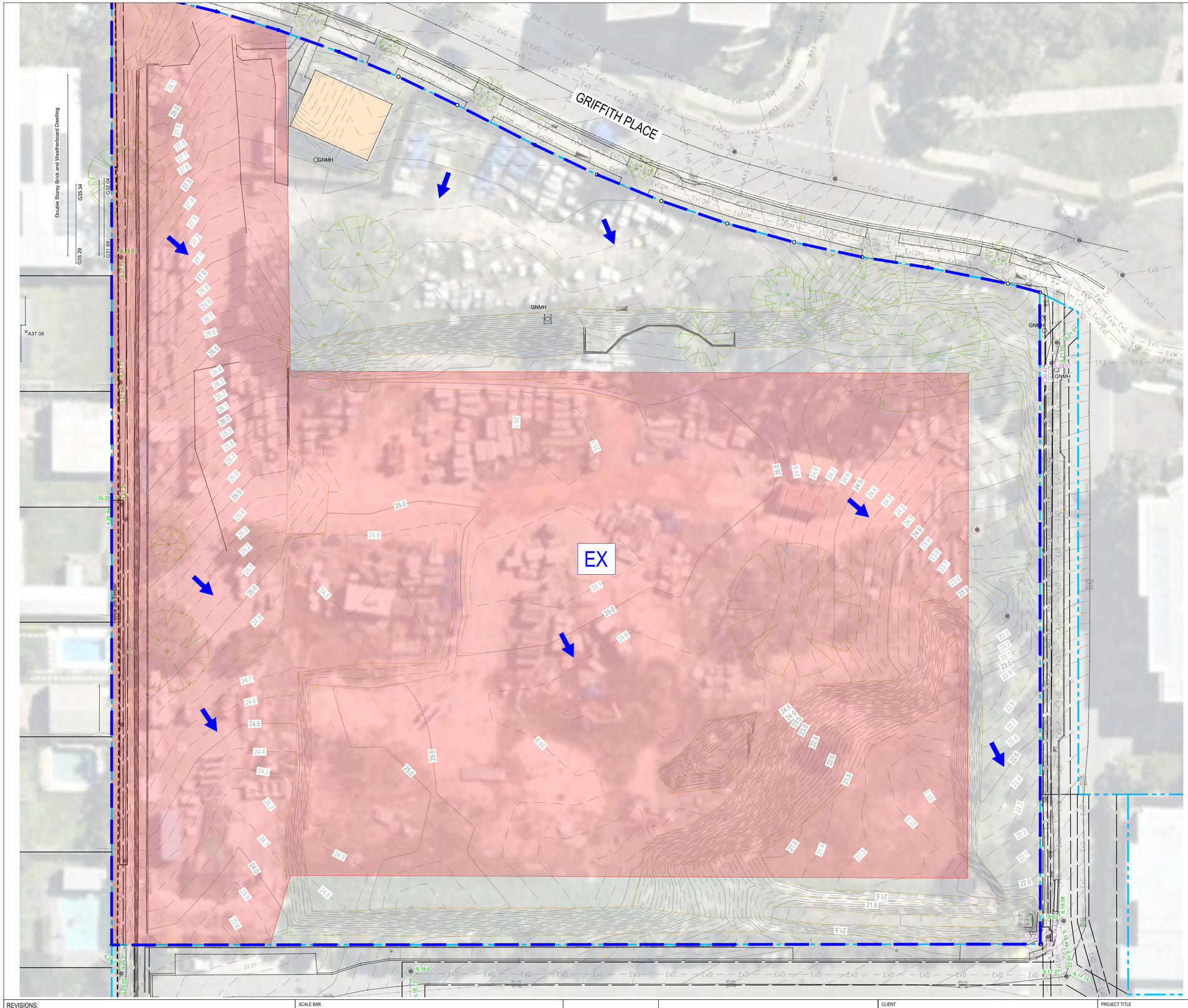
ARCHITECT
CHALMERS PARTNERS ACHITECTS
LEVEL 2/76 SKYRING TERRACE, NEWSTEAD QLD 4006

PROJECT TITLE
RESIDENTIAL APARTMENTS - PRECINCT H
23 GRIFFITH PLACE
SEVEN HILLS QLD 4170

DRAWING TITLE
STORMWATER LAYOUT PLAN

DRAWING STATUS
FOR INFORMATION
NOT TO BE USED FOR CONSTRUCTION

PROJECT LEADER	DESIGNER	SIGNATURE	
MH	JP		
DRAFTSPERSON	SCALE		SHEET SIZE
JP	1:250		A1
JOB No.		DRAWING No.	REVISION
BR242141		SK03	B



LEGEND

- EXISTING PROPERTY BOUNDARY
- PROPOSED STORMWATER CATCHMENT
- OVERLAND FLOW DIRECTION
- PROPOSED CONTOUR (1.0m)
- PROPOSED CONTOUR (0.1m)
- ExS — EXISTING SEWER
- ExCOM — EXISTING COMMUNICATIONS
- ExE — EXISTING ELECTRICAL
- ExG — EXISTING GAS
- ExD — EXISTING STORMWATER
- ExW — EXISTING WATER
- IMPERVIOUS AREA

CATCHMENT TABLE

CATCHMENT	AREA (ha)	FRACTION IMPERVIOUS
EX	1.264	68.88%

WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

REVISIONS:

No.	REVISION DESCRIPTION	DRAWN	DATE
B	FOR APPROVAL	JP	03.11.26
A	FOR APPROVAL	MA	14.08.26

SCALE BAR

0 1 2 3 4 5 10m 15 20m

SCALE 1:250

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van der Meer Consulting
van der meer
LEVEL 3, 51 ALFRED STREET
FORTITUDE VALLEY QLD 4006
Telephone +61 7 3021 6600
www.vandermeer.com.au
van der Meer (QLD) Pty Ltd
A.B.N. 63 609 812 615

CLIENT: HERAN BUILDING GROUP

ARCHITECT: CHALMERS PARTNERS ACHITECTS
LEVEL 2/76 SKYRING TERRACE, NEWSTEAD QLD 4006

PROJECT TITLE: RESIDENTIAL APARTMENTS - PRECINCT H
23 GRIFFITH PLACE
SEVEN HILLS QLD 4170

DRAWING TITLE: PRE- CATCHMENT PLAN
STORMWATER

DRAWING STATUS: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

PROJECT LEADER	DESIGNER	SIGNATURE	
MH	JP		
DRAFTSPERSON	SCALE		SHEET SIZE
JP	1:250		A1
JOB No.		DRAWING No.	REVISION
BR242141		SK04	B

LEGEND

- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- PROPOSED STORMWATER CATCHMENT
- OVERLAND FLOW DIRECTION
- PROPOSED CONTOUR (1.0m)
- PROPOSED CONTOUR (0.1m)
- EXISTING SEWER
- EXISTING COMMUNICATIONS
- EXISTING ELECTRICAL
- EXISTING GAS
- EXISTING STORMWATER
- EXISTING WATER
- PROPOSED ROAD
- PROPOSED FOOTPATH
- PROPOSED DWELLING

CATCHMENT TABLE

CATCHMENT	AREA (ha)
1/1	0.3473
2/1	0.0156
3/1	0.0118
4/1	0.0157
5/1	0.0116
6/1	0.0204
7/1	0.0109
8/1	0.0146
9/1	0.0136
1/2	0.3901
RW2/1	0.0280
RW3/1	0.0274
RW4/1	0.0265
RW5/1	0.0263
RW6/1	0.0191
RW7/1	0.0254
RW8/1	0.0261
RW9/1	0.0194
RW2/1A	0.0388
RW3/1A	0.0260
RW4/1A	0.0257
RW5/1A	0.0257
RW7/1A	0.0260
RW8/1A	0.0256
RW9/1A	0.0294

WARNING

BEWARE OF UNDERGROUND SERVICES

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No.	REVISION DESCRIPTION	DRAWN	DATE
B	FOR APPROVAL	JP	03.11.26
A	FOR APPROVAL	MA	14.08.26

SCALE BAR: 0 1 2 3 4 5 10m 15 20m — SCALE 1:250

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van der Meer Consulting
van der meer
LEVEL 3, 51 ALFRED STREET
FORTITUDE VALLEY QLD 4006
Telephone +61 7 3021 6600
www.vandermeer.com.au
van der Meer (QLD) Pty Ltd
A.B.N. 63 609 812 615

CLIENT: HERAN BUILDING GROUP

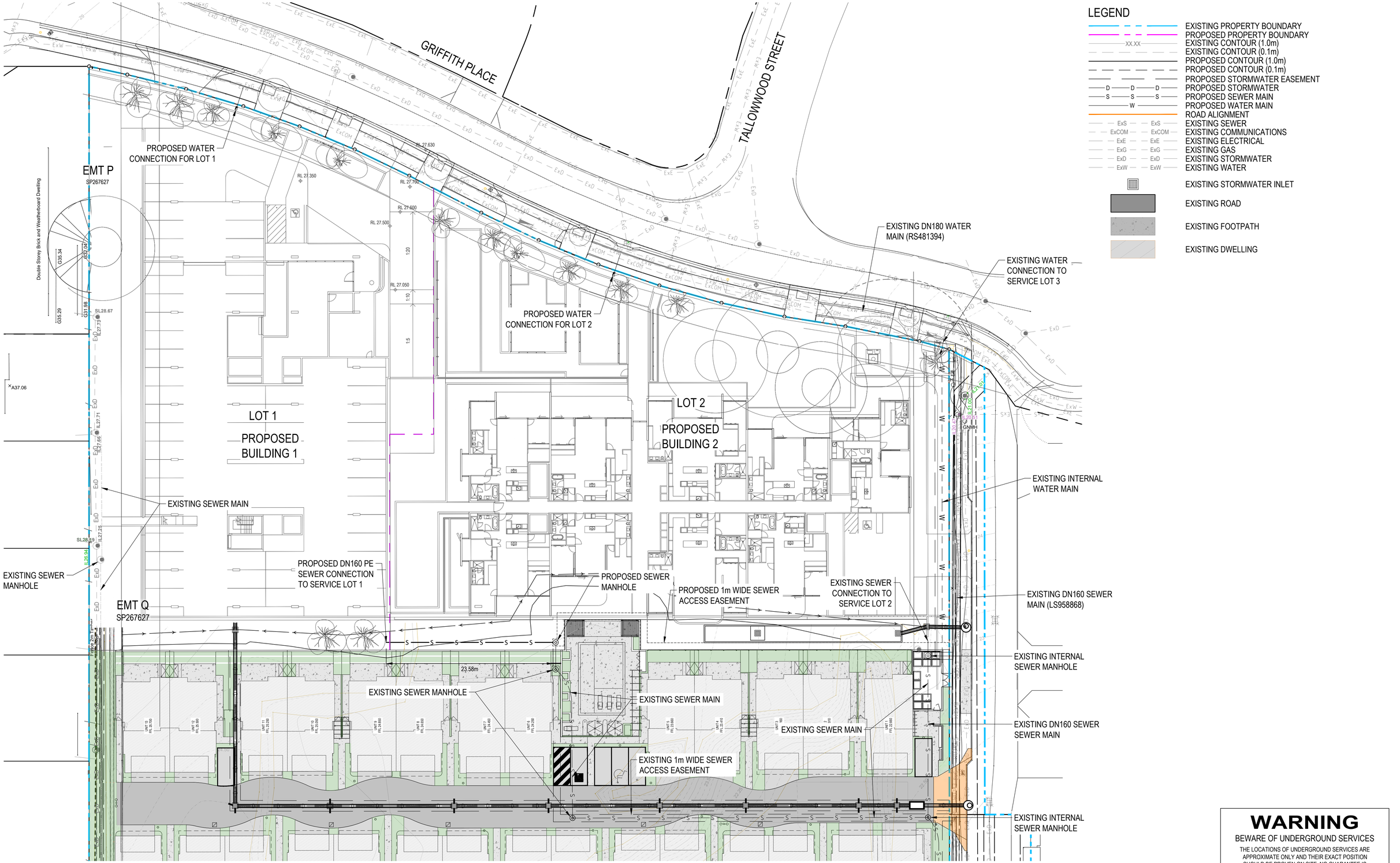
ARCHITECT: CHALMERS PARTNERS ACHITECTS
LEVEL 2/76 SKYRING TERRACE, NEWSTEAD QLD 4006

PROJECT TITLE: RESIDENTIAL APARTMENTS - PRECINCT H
23 GRIFFITH PLACE
SEVEN HILLS QLD 4170

DRAWING TITLE: STORMWATER POST-CATCHMENT PLAN

DRAWING STATUS: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

PROJECT LEADER	DESIGNER	SIGNATURE	
MH	JP		
DRAFTSPERSON	SCALE		SHEET SIZE
JP	1:250		A1
JOB No.		DRAWING No.	REVISION
BR242141		SK05	B



SERVICES LAYOUT PLAN
SCALE 1:250

WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

REVISIONS:

No.	REVISION DESCRIPTION	DRAWN	DATE
B	FOR APPROVAL	JP	03.11.26
A	FOR APPROVAL	MA	14.08.26

SCALE BAR
0 1 2 3 4 5 10m 15 20m
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PROJECT TITLE
RESIDENTIAL APARTMENTS - PRECINCT H
23 GRIFFITH PLACE
SEVEN HILLS QLD 4170

DRAWING TITLE
SERVICES LAYOUT PLAN

DRAWING STATUS
FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

PROJECT LEADER	DESIGNER	SIGNATURE	
MH	JP		
DRAFTSPERSON	SCALE		SHEET SIZE
JP	1:250		A1
JOB No.		DRAWING No.	REVISION
BR242141		SK06	B

Appendix D – Rational Method Calculation Sheets

Rational Method Calculation

PROJECT NAME	23 Griffith Place, Seven Hills
PROJECT NUMBER	BR242141

CATCHMENT DATA	
Name	Ex/1 Flows (L/s)
Area (ha)	1.2636
Time of Concentration (min)	7
Fraction Impervious	0.6888
Coefficient of Runoff C10	0.83

RATIONAL METHOD CALCULATIONS							
AEP	63%	50%	20%	10%	5%	2%	1%
Coefficient of Runoff	0.660	0.701	0.784	0.825	0.866	0.949	0.990
Rainfall Intensity (mm/hr)	109.85	123.31	165.43	193.92	221.72	258.31	286.23
Peak Runoff (m^3/s)	0.254	0.304	0.455	0.562	0.674	0.860	0.995

CATCHMENT DATA	
Name	Townhouses Catchment Flows (L/s)
Area (ha)	0.5262
Time of Concentration (min)	7
Fraction Impervious	0.965
Coefficient of Runoff C10	0.90

RATIONAL METHOD CALCULATIONS							
AEP	63%	50%	20%	10%	5%	2%	1%
Coefficient of Runoff	0.720	0.765	0.855	0.900	0.945	1.000	1.000
Rainfall Intensity (mm/hr)	109.85	123.31	165.43	193.92	221.72	258.31	286.23
Peak Runoff (m^3/s)	0.116	0.138	0.207	0.255	0.306	0.378	0.418

CATCHMENT DATA	
Name	Apartment Catchment Flows (L/s)
Area (ha)	0.7374
Time of Concentration (min)	7
Fraction Impervious	0.475
Coefficient of Runoff C10	0.78

RATIONAL METHOD CALCULATIONS							
AEP	63%	50%	20%	10%	5%	2%	1%
Coefficient of Runoff	0.624	0.663	0.741	0.780	0.819	0.897	0.936
Rainfall Intensity (mm/hr)	109.85	123.31	165.43	193.92	221.72	258.31	286.23
Peak Runoff (m^3/s)	0.140	0.167	0.251	0.310	0.372	0.475	0.549

Appendix E – Enviro Treatment Device Brochure

ENVIRO

G SERIES



RESIDENTIAL



- Design service life of **100 years** for fixed parts + 25 years for servicable parts
- Made using 'green concrete' **reducing carbon emission by more than 80%** when compared to other materials
- Internal components manufactured from **high grade stainless steel**, complying with International Corrosion Standards. No welding necessary
- The safest solution with **no confined space entry** required
- Installation is simple and prompt without the need for site closure + with minimal disruption
- Enviro systems are self ballasting + are fully structural

Speak to one of Enviro's friendly Engineers today

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Digin +61 419 785 289

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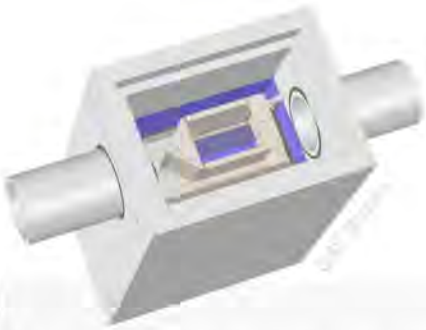
GOOD DESIGN AWARD® WINNER

ENVIRO

G SERIES





"Enviro systems ensure the highest compliance at the lowest cost."

Enviro systems are:

- *45% lower cost to install*
- *87% lower cost to maintain*
- *77% lower cost to own over 25 years*

compared to alternative systems.

*The Enviro G Series is an in-line single chamber EPS designed to remove broad spectrum pollutants that are transported by stormwater run-off in **low impact catchments**, which are typically residential developments.*

*The G Series is a **low-cost single chamber device** with separate storage zone that replaces the need for a treatment train.*

Enviro's 'green concrete' chambers *cut carbon emissions* by **over 80%** compared to traditional materials and are **indefinitely recyclable.**

In recent years, Enviro has *reduced CO2 emissions* by **300 tonnes** and *removed* 10 tonnes of plastic from the waste stream.

Re-Poly

We support the ndis

Performance testing verifies pollutant removal rates:

Pollutants Reduction Claim	% Reduction (minimum requirement)	% Reduction (as tested)
Total Suspended Solids (TSS)	85%	94%
Total Phosphorous (TP)	60%	97%
Total Nitrogen (TN)	45%	85%
Oils	-	95%*
Gross Pollutants	90%	100%

*based on dual chamber capture of buyont materials incl. oils.

Hydraulic Resistance K Factor = 0.425
Inlet to outlet differential = 25mm

Model	Pipe Size	Treated Flow + Storage Capacity	Plan Dimensions (External length + width)	Depth Below Invert	Mass	Excavation Volume
Enviro G30	Nominally 300mm ID can be used for 375mm ID subject to gradient + velocity	22 litres/sec 0.25 m3	1.2m x 0.9m	1.2m	2.6 tonnes	1.7 m3
Enviro G45	450mm ID	66 litres/sec 0.52 m3	1.5m x 1.2m	1.4m	4.6 tonnes	3.3 m3
Enviro G60	600mm ID	142 litres/sec 0.87 m3	2.2m x 1.2m	1.8m	7.5 tonnes	6.2 m3
Enviro G75	750mm ID	258 litres/sec 3.2 m3	2.85m x 1.95m	2.2m	13.3 tonnes	15.9 m3
Enviro G90	Nominally 900mm ID can be used for 1050mm pipe size subject to gradient + velocity	419 litres/sec 3.3 m3	3.6m x 1.95m	2.0m	15.8 tonnes	18.3 m3
Enviro G120	1200mm ID	902 litres/sec 3.0 m3	3.6m x 2.1m	1.8m	16.3 tonnes	10.3 m3

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Appendix F – Ocean Protect Brochure

UrbanPond **Proposal**

oceanprotect.com.au

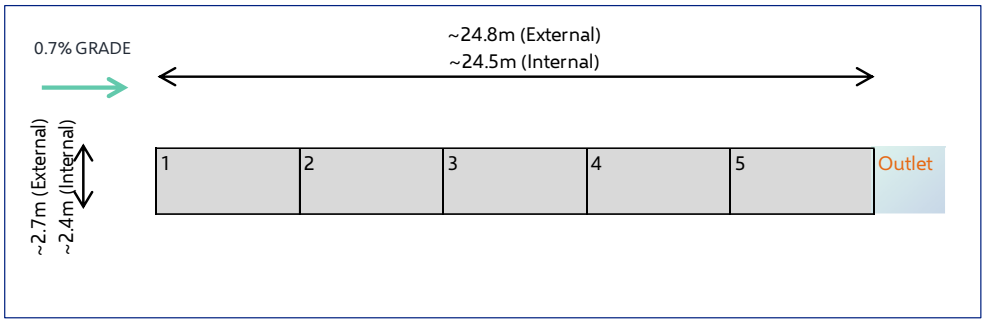
28064 - 23 Griffith Place, Seven Hills

System: 1 *Revision: A*

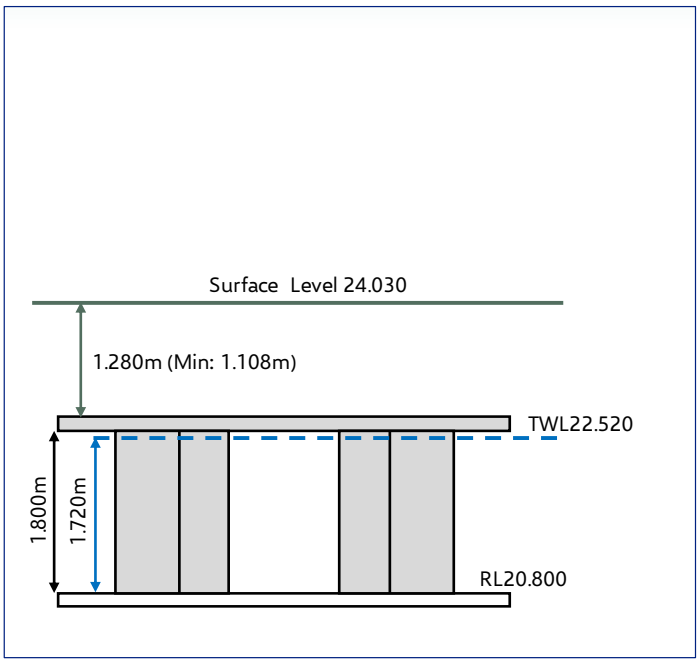
103kL Gross Volume, 93.8kL Effective Volume, 1.8m Internal Height

Indicative only, layout & details to be confirmed, refer to attached drawing.

Please refer to specification drawing set (UrbanPond-OP-SD) or site specific production drawings by Ocean Protect for more details.



PLAN VIEW



SECTION VIEW (TYPICAL)

DETENTION PROPERTIES	
Outlet Level	IL20.800
Surface Level	RL24.030
Top Water Level	RL22.520
EDD	1.720m
Earth Cover	1.28m (Min 1.108m)
Internal Height	1.800m
Top Leg Height	1.800m
Base Type	Precast Slab
Grade	0.7%
Storage Required	93.0kL
Gross Volume	103.0kL
Effective Volume	93.8kL
Void/Space ratio	0.970
Internal Dimensions	24.5m × 2.4m
External Dimensions	24.8m × 2.7m

COMPONENTS	no.**	Weight (t)*
Top Piece	5	6.6
Base Slab	5	4.4
Length Wall	10	3.8
Width Wall	0	-
Corner Wall	2	2
Total	22	97

** Tank weights may vary based on on site specific design. ** Wall pieces are interchangeable and may vary based on site specific design.*

NOT FOR CONSTRUCTION

PRE-CAST CONCRETE STORMWATER DETENTION CHAMBER SYSTEM URBANPOND

MINIMUM BEARING CAPACITY -150kPa (SERVICEABILTY LIMIT STATE)

GENERAL NOTES:

- OCEAN PROTECT TO PROVIDE URBANPOND UNITS, END WALL PANELS, AND JOINT TAPE.
- TYPICAL Ø600mm OR 900X900 ACCESS OPENING TO BE LOCATED IN THE CENTRE OF EITHER LEG, UNLESS NOTED OTHERWISE. ACCESS LIDS SHALL BE CLASS D.
- OCEAN PROTECT DOES NOT PROVIDE RISERS UNLESS DETAILED IN THE QUOTATION. ALL ACCESS COVERS SUPPLIED LOOSE TO BE PLACED, BOXED UP AND BEDDED INTO FINISHED LEVEL BY OTHERS.
- MANHOLE RISERS, COVERS AND FRAMES TO BE INSTALLED BY OTHERS ACCORDING TO APPROVED LAYOUT PLANS
- SITE-SPECIFIC PRODUCTION DRAWING WILL BE PROVIDED ON PLACEMENT OF ORDER.
- ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.
- DRAWING NOT TO SCALE.

INSTALLATION NOTES:

- TANK TO BE INSTALLED WITH FULL PERIMETER BURIED EQUALLY - WALLS TO BE EVENLY LOADED ON ALL FOUR SIDES
- TANK SYSTEM TO BE INSTALLED WITH MAXIMUM 2 PERCENT FALLS TO FLOOR, WALLS AND ROOF SLAB
- TANKS SHALL BE PLACED ON STABLE GROUND WITH A MINIMUM SOIL BEARING CAPACITY OF 150 kPa UNDER NORMAL SERVICE CONDITIONS
- BACKFILLING MUST OCCUR AROUND TANK TO SUPPORT STRUCTURE BEFORE FILL OVER URBANPOND IS PLACED.
- TANK HAS INSUFFICIENT MASS TO OVERCOME BUOYANCY. SITES WITH HIGH GROUNDWATER LEVELS SITES WILL REQUIRE SITE-SPECIFIC ANTI-FLOAT MEASURES. IT IS NOT THE RESPONSIBILITY OF OCEAN PROTECT TO DETERMINE IF A SITES GROUND WATER LEVEL REQUIRES ADDITIONAL ANTI-FLOAT MEASURES. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY THE ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE ALL EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING DETAIL PROVIDED SEPARATELY).
- CONTRACTOR TO INSTALL AND LEVEL THE STRUCTURE AND APPLY SEALANT TO ALL JOINTS.
- JOINTS ON INSIDE BASE AND WALLS TO BE SEALED WITH BACKING ROD AND SEALANT. IF A HIGHER STANDARD OF SEALING IS REQUIRED PLEASE TALK TO OCEAN PROTECT.
- WALLS AND LID JOINTS TO BE COVERED EXTERNALLY WITH 150mm WIDE BITUMEN TAPE.
- TANKS SHALL BE LIMITED TO CONSTRUCTION TRAFFIC ONLY UNTIL THE CONCRETE HAS ATTAINED FULL 28-DAY STRENGTH PRIOR TO INSTALLATION AND BACK-FILLING.

FOUNDATION REQUIREMENTS & BACKFILLING

- SPECIAL CARE SHOULD BE TAKEN WHEN BACKFILLING AND COMPACTING IN THE VICINITY OF THE TAPE SEAL TO PREVENT DAMAGE OR DISPLACEMENT OF THE SEAL
- BACKFILLING MUST OCCUR BEFORE PLACING FILL ON THE UNIT TO SUPPORT THE WALLS OF THE SYSTEM. WARNING: DO NOT ALLOW THE TANK TO FILL WITH WATER PRIOR TO COMPLETION OF BACKFILL AS THIS CAN DISPLACE THE WALL PANELS.
- DO NOT ALLOW WATER TO FLOW AROUND THE URBANPOND PRIOR TO BACKFILL AS THIS COULD COMPROMISE THE INSTALLATION.
- THE INVERT LEVEL OF THE TANK IS GOVERNED BY THE SUBGRADE PREPARATION. ENSURING THAT THE FINISHED FLOOR LEVEL OF THE TANK INVERT IS IN ACCORDANCE WITH THE HYDRAULIC ENGINEERS DESIGN IS THE RESPONSIBILITY OF OTHERS.
- TANK SUBGRADE PREPARATION BY OTHERS IN ACCORDANCE WITH OCEAN PROTECT STANDARD SPECIFICATIONS. BEDDING TO BE 5-10mm GRAVEL / SAND.
- FOUNDATION FALL AND GRADING IN ACCORDANCE WITH DESIGN ENGINEERS REQUIREMENTS, NOT EXCEEDING 1:50 BY OTHERS. I.E. IF FALL IS REQUIRED TO BASE OF URBANPOND, THIS MUST BE ACHIEVED BY GRADING THE SUB-GRADE BY OTHERS.
- BACKFILL AROUND THE URBANPOND STRUCTURE WITH EITHER A WELL-DRAINING GRANULAR MATERIAL

HYDROSTATIC ACTIONS AND WATER TIGHTNESS:

- URBANPOND SYSTEMS ARE SUPPLIED IN STORMWATER DETENTION (SHORT RESIDENCE TIME) AND RETENTION (LONG RESIDENCE TIME) CONFIGURATIONS.
- ONSITE STORMWATER DETENTION (OSD) TANKS THAT ARE:
  1. BELOW GROUND AND BACKFILLED.
  2. NOT DESIGNED TO HOLD WATER FOR EXTENDED DURATIONS.
  3. DRAIN BETWEEN STORM EVENTS.

  ARE TYPICALLY SEALED WITH HIGH PERFORMANCE SEALANT APPLIED INTERNALLY TO ABUTTING PRECAST CONCRETE COMPONENTS. THIS STANDARD OF SEALING IS TYPICALLY CONSIDERED APPROPRIATE FOR MOST GRAVITY DRAINING OSD APPLICATIONS.

- URBAN POND CAN BE USED FOR WATER RETENTION HOWEVER WATERPROOFING AND JOINT SEALING TO BE DESIGNED AND INSTALLED BY OTHERS.

DESIGN PARAMETERS APPLIED IN DESIGN REFERENCE:

- AS NZS 1170.0 - 2002 STRUCTURAL DESIGN ACTIONS - GENERAL PRINCIPLES
- AS NZS 1170.1 - 2002 STRUCTURAL DESIGN ACTIONS - PERMANENT, IMPOSED AND OTHER ACTIONS
- AS 3600-2018 CONCRETE STRUCTURES
- AS 3735-2001- CONCRETE STRUCTURES RETAINING LIQUIDS
- AS 3996-2019 ACCESS COVERS AND GRATES
- AS 5100.2-2017 - BRIDGE DESIGN - DESIGN LOADS
- AS 5100.5-2017 - BRIDGE DESIGN - CONCRETE
- AS 4678-2002 - EARTH-RETAINING STRUCTURES

DESIGN FOR DURABILITY - DESIGN LIFE = 50 YEARS

- CLASS B2 EXPOSURE MINIMUM EXTERNAL FACES - 30mm COVER TO REINFORCING - REPETITIVE PROCEDURES INTENSE COMPACTION AND RIGID FORMWORK - AS 3735-2001- CONCRETE STRUCTURES RETAINING LIQUIDS
- APPROVED MIX DESIGN - S50 MPa / MAX. 20mm AGGREGATES
- CURE CONTINUOUSLY FOR 7 DAYS
- COMPLIANT CEMENT MATERIAL PROPORTIONS IN ACCORDANCE WITH AS5100.5 TABLE 4.4.1(B)
- TANK SITES LIMITED TO SITES WITH ACCELERATION COEFFICIENTS OF 0.08, AND SOIL PROFILES CLASSIFIED AS ROCK MATERIALS OR SOILS WITH NOT MORE THAN 30 M OF MEDIUM DENSE TO VERY DENSE COARSE SANDS AND GRAVELS, FIRM STIFF HARD CLAYS OR CONTROLLED FILL. OTHERWISE, TANK DESIGN SHALL REQUIRE A SITE-SPECIFIC STRUCTURAL DESIGN.

ULTIMATE LIMIT STATE DESIGN LOAD:

- CLASS D ACCESS COVER TO AS3996 2019 = 240kN
- W80 WHEEL LOADING TO AS5100.2 = 201.6kN CONCENTRATED LOAD
- HORIZONTAL EARTH PRESSURES:

  - KO = 0.5 AND ULS = 1.5 FOR EARTH PRESSURE AND 1.8 FOR SURCHARGE PRESSURES
- ALLOWANCE FOR SUPPORTING AND PLACING FILL OVER UNITS DEPTH RANGE 200mm TO 2400mm

LAST MODIFIED: 08-10-24

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URBANPOND
TITLE SHEET
SPECIFICATION DRAWING

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1
SD

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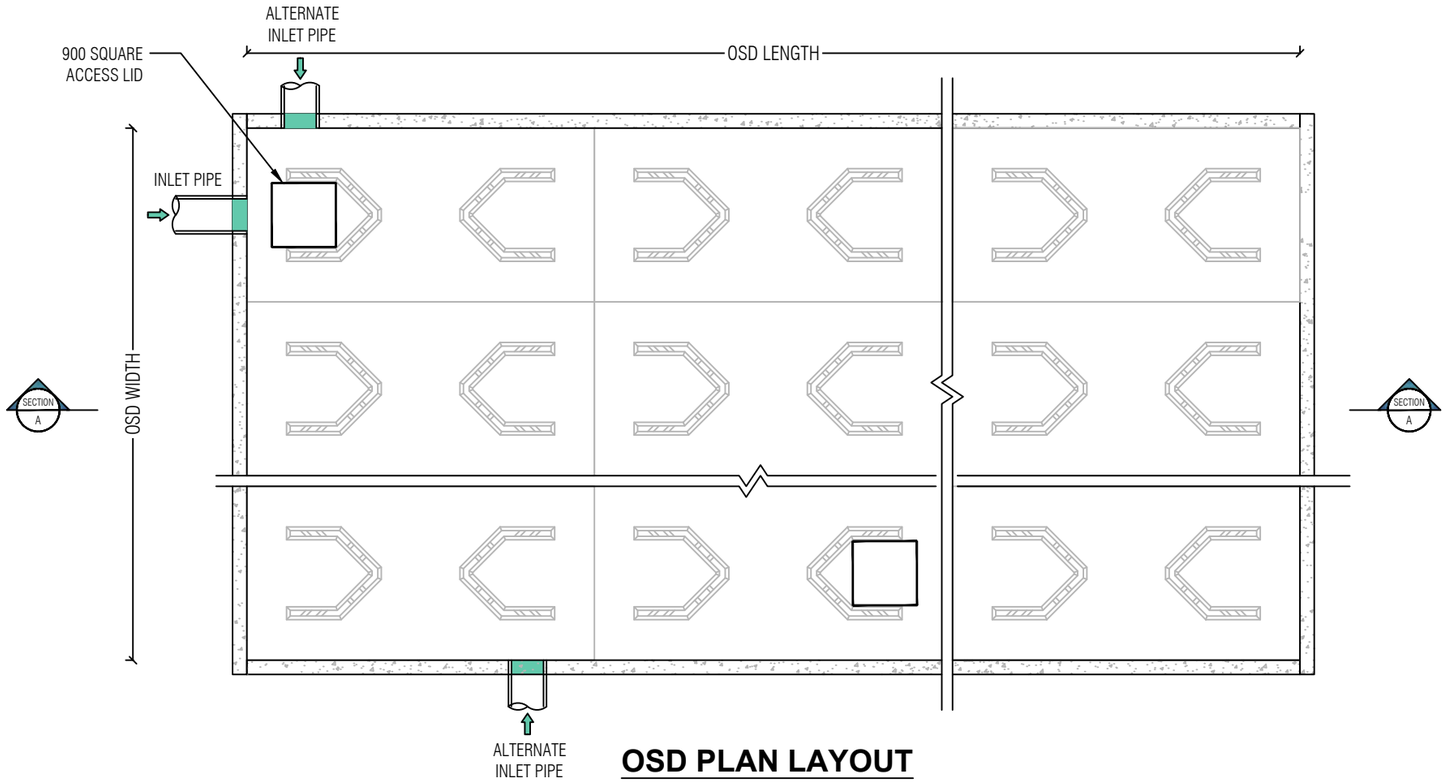
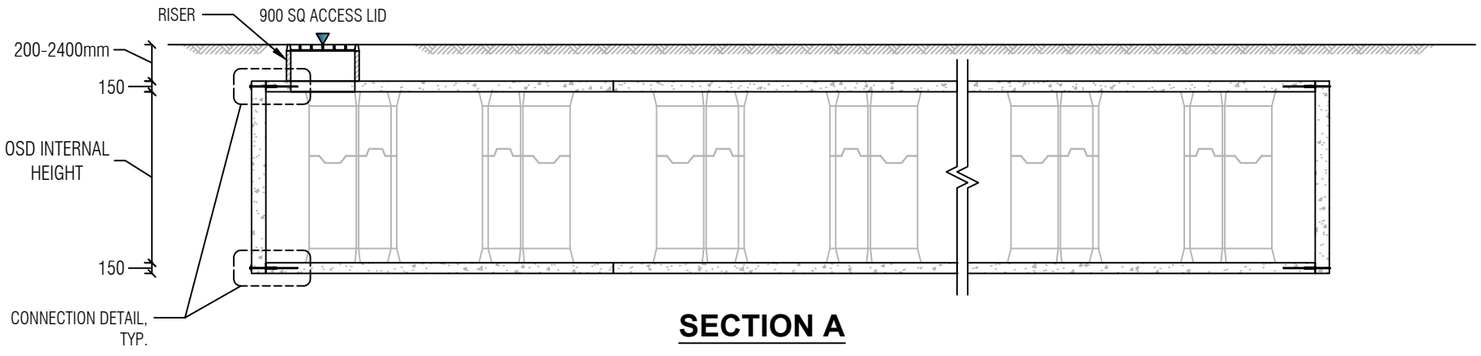
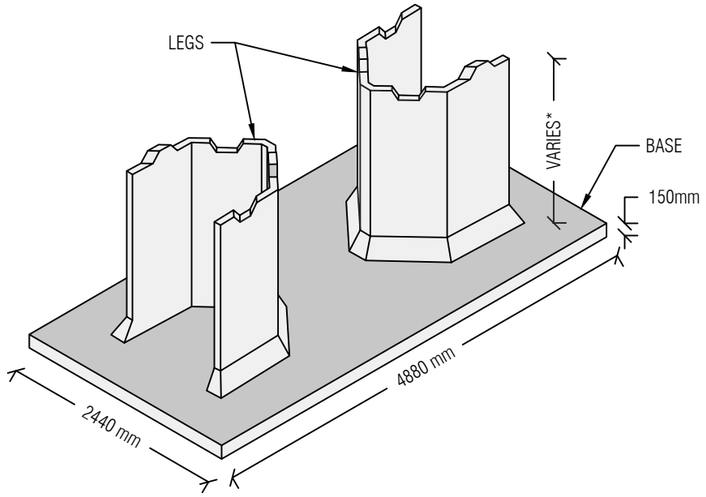


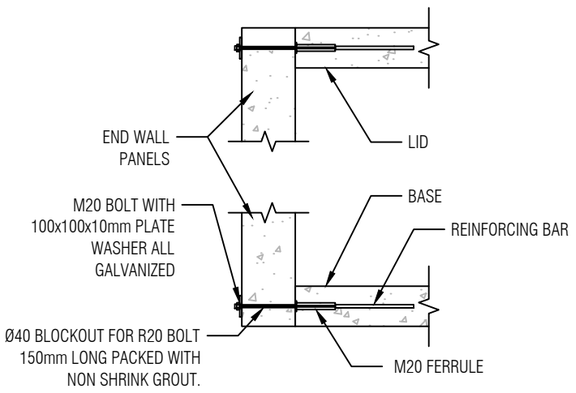
OSD PLAN LAYOUT



SECTION A



ISOMETRIC VIEW



CONNECTION DETAIL, TYP.

* TYPICAL OSD INTERNAL HEIGHT RANGES FROM 600mm to 3600mm WITH 100mm INCREMENTS.
FOR CUSTOM DESIGNS, PLEASE CONTACT OCEAN PROTECT.

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GENERAL ARRANGEMENT
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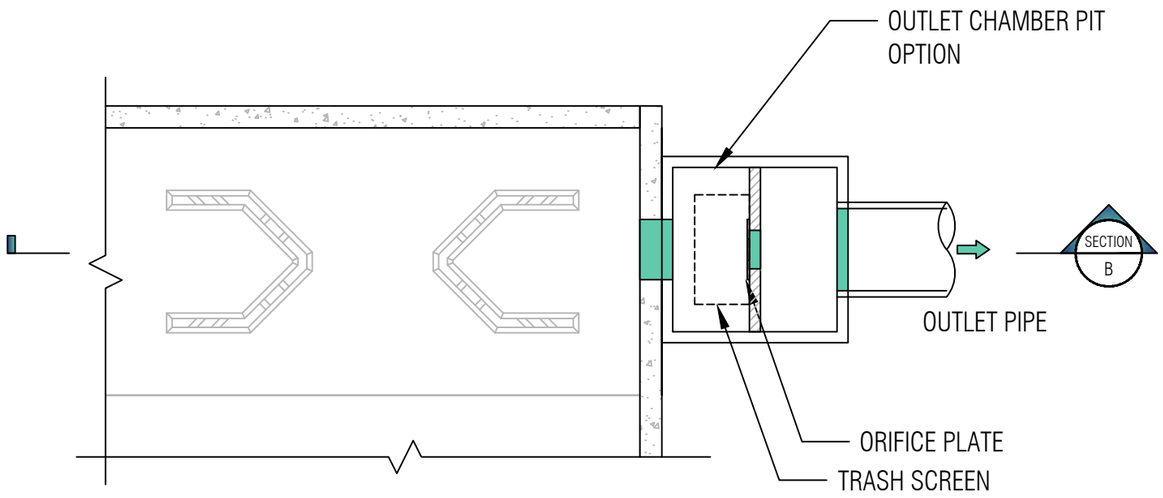
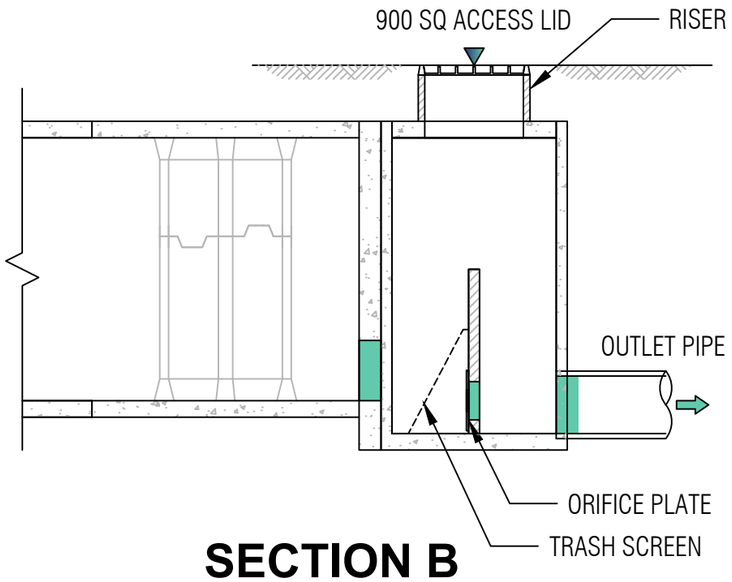
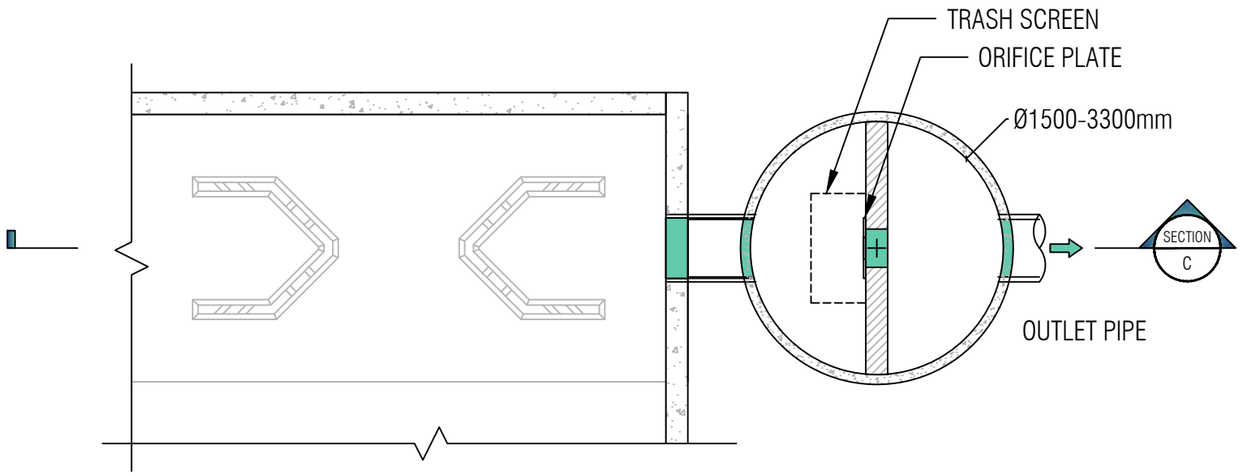


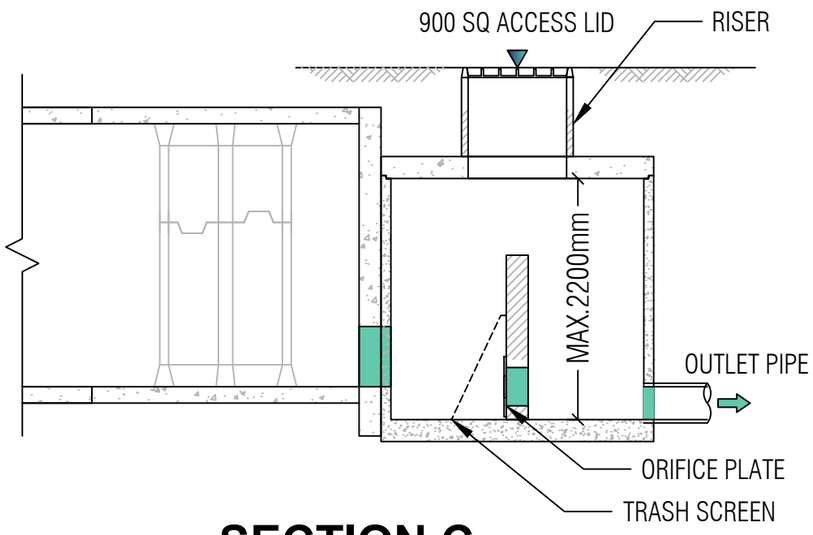
OUTLET CHAMBER TANK OPTION 1



SECTION B TANK OPTION 1



OUTLET CHAMBER MANHOLE OPTION 2



SECTION C MANHOLE OPTION 2

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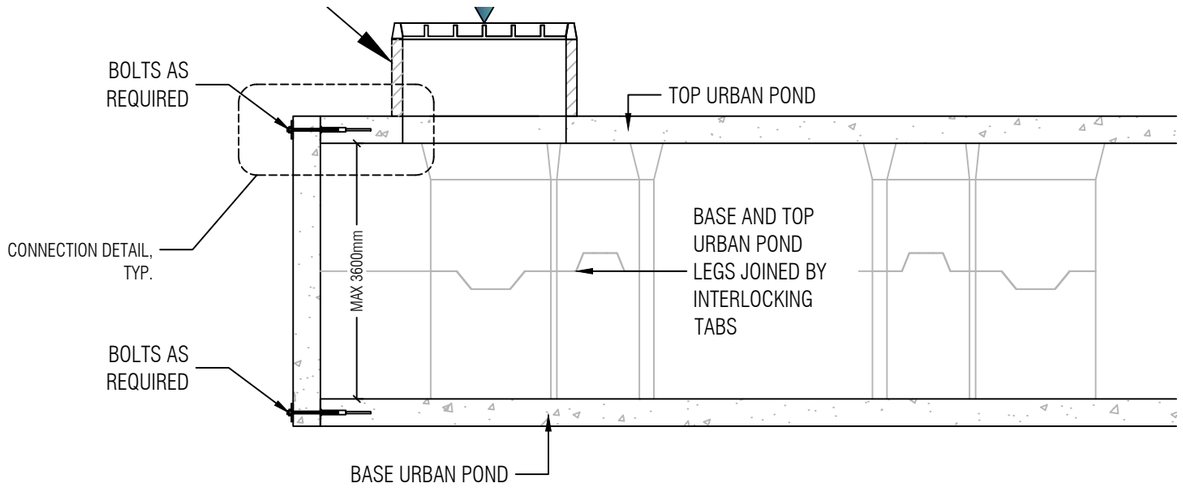
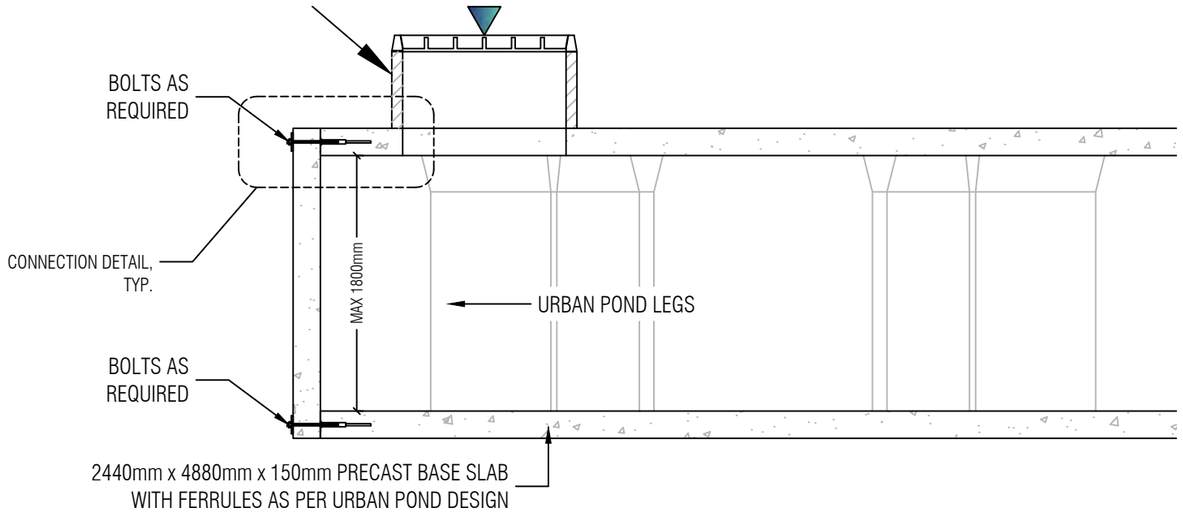
OPTION 1



OPTION 1

- URBANPOND TOP AND BOTTOM WITH INTERLOCKING LEGS
- EACH WALL TO BE FASTENED AT TOP AND BOTTOM TO URBAN POND TOP AND BASE PIECE. 2 TOP AND 2 BOTTOM

OPTION 2



OPTION 2

- URBANPOND TOP WITH LEGS DOWN
- LEG CONNECTION TABS REMOVED (FLAT END LEGS)
- LEGS SITTING PRECAST 2440x4880x150 BASE SLAB WITH FERRULES AS PER URBAN POND DESIGN
- EACH WALL TO BE FASTENED AT TOP AND BOTTOM TO URBAN POND TOP PIECE AND BASE SLAB. 2 TOP AND 2 BOTTOM

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UrbanPond™

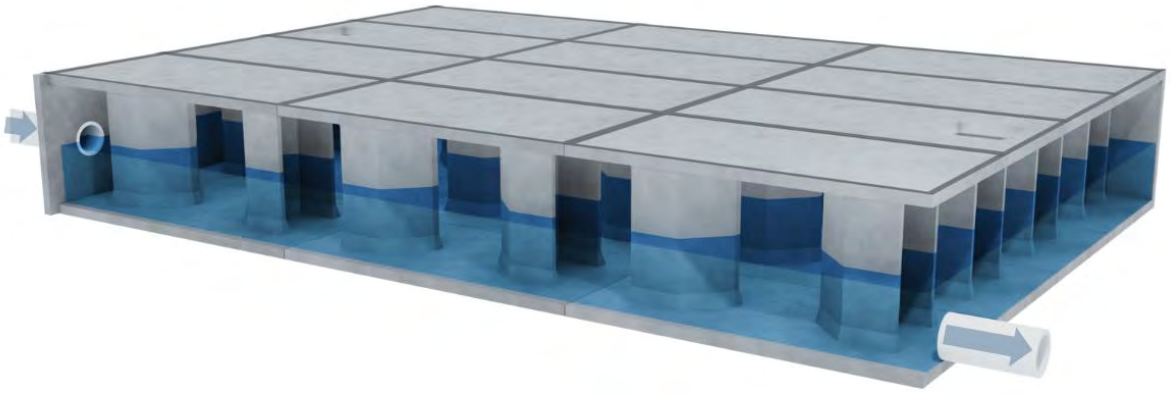
Precast Concrete Modular Detention

UrbanPond™ is a modular precast concrete underground storage that can be placed under roadways, parking lots and landscape areas in various shapes, sizes, and depths, taking zero land-space.

The Ocean Protect UrbanPond™ is a trafficable precast concrete below ground storage system for detention and retention purposes, replacing above ground basins. It has a high void ratio to maximise volume, and its robust precast form allows systems to be buried deeper without the need for specialised backfill, increased wall thicknesses, or extra reinforcement.

How does it work?

As storms occur, generated runoff is collected and diverted via the pit and pipe network to the UrbanPond™ system. Inlets are accommodated around the system, leading to a traditional below ground detention tank. The internal modular design has a leg configuration that provides channel-less water distribution for stormwater flowing throughout the system. Combinations of inlet and outlet structures are incorporated for associated componentry. The system is installed with a grade on the base, stormwater will make its way through the system towards an outlet chamber with orifice controls. Maintenance is simple and, if required, GPT's and filtration systems can easily be configured to work in conjunction with UrbanPond™.



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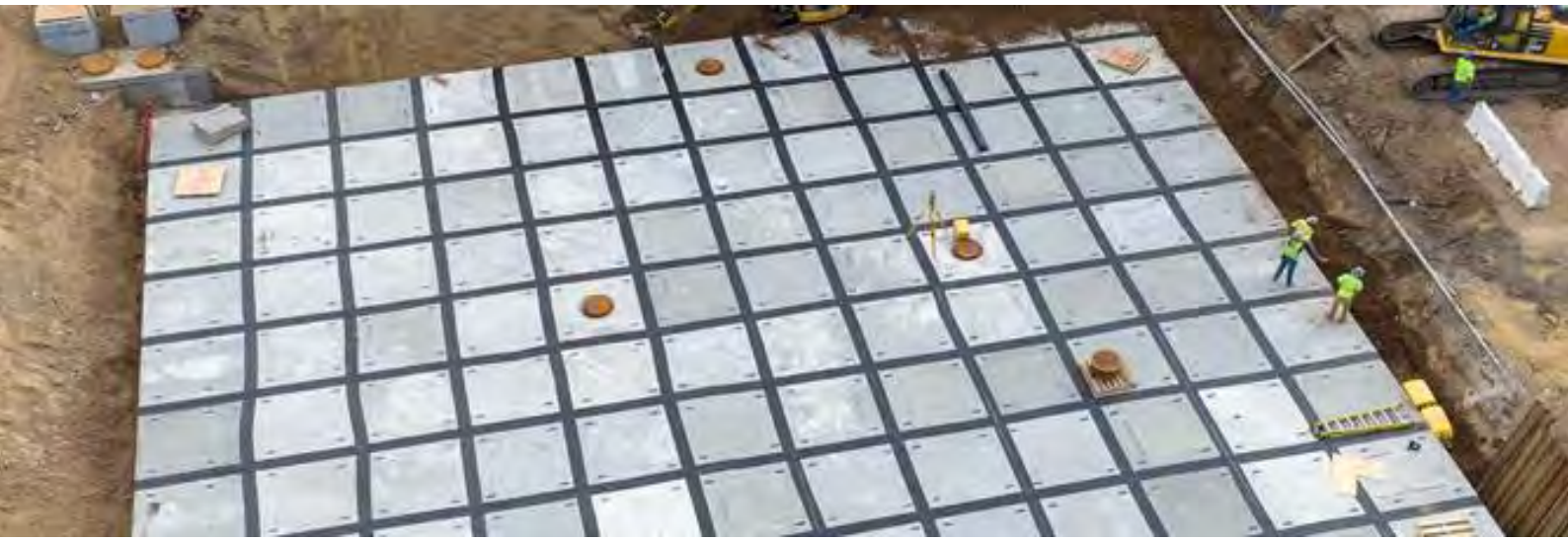

Features

- Incremental change in height from 0.6m to 3.6m internal
- Installed on up to 2% grade
- Keyed joint between top and bottom segments
- Large volume installed per module
- Lightweight design
- Fully trafficable 0.2 – 2m fill
- No in-situ concrete required
- Optional inlet and outlet chambers easily configured and connected

Benefits

- Design flexibility while maximising storage space
- Flexibility of multiple configurations, double or single precast modules (alternative option of cast in-situ base for single)
- Supply only and installation option available on request
- Up to 40% less crane lifts compared with alternatives
- Fully engineered unique thin wall design
- Suits many sites and maximises depth
- Quick and simple installation
- Filtration systems, like StormFilter®, are easily integrated
- Unmatched quality and identical segments every time

Configurations and Applications

UrbanPond™ can be used in a number of applications including detention, treatment train design options and infiltration solution options.

The standard module dimensions of 4.88m x 2.44m are combined for simple design versatility and efficiency. Each segment will provide 11.48m³ of volume per 1m clear internal height. Sizing and arrangement is easily determined using the Ocean Protect UrbanPond™ calculator. Please contact Ocean Protect for complimentary designs and advice.

Maintenance

All stormwater systems require routine maintenance. The UrbanPond™ system is designed to be maintained from the finished surface via a vacuum truck. Access points can be strategically placed throughout the system to facilitate maintenance. Modules can be modified to act as clear wells or pretreatment chambers for capturing trash, debris and sediment. The large void space and option to include access covers in each module, offers the opportunity to satisfy most if not all Council requirements. Ocean Protect can provide flexible options and contract terms.

OCEAN PROTECT

StormFilter®

Technical Design Guide



Stopping Pollution Entering Waterways

11/24



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Introduction

The Ocean Protect StormFilter® is a below ground stormwater treatment device comprised of one or more structures that house rechargeable, media-filled cartridges that trap particulates and adsorb pollutants from stormwater runoff such as total suspended solids, hydrocarbons, nutrients, metals, and other common pollutants.

With media options to target multiple or specific pollutants, multiple system configurations, and field and laboratory performance verified by the most stringent stormwater technology evaluation organisations, the StormFilter® provides engineers with the most flexible and reliable manufactured treatment technology available.

Operational Overview

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.

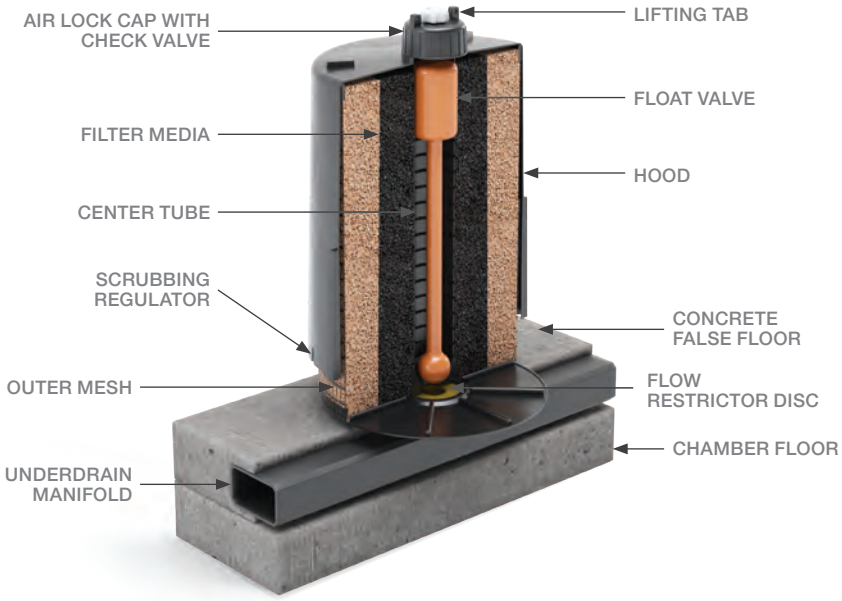


Figure 1: StormFilter® components

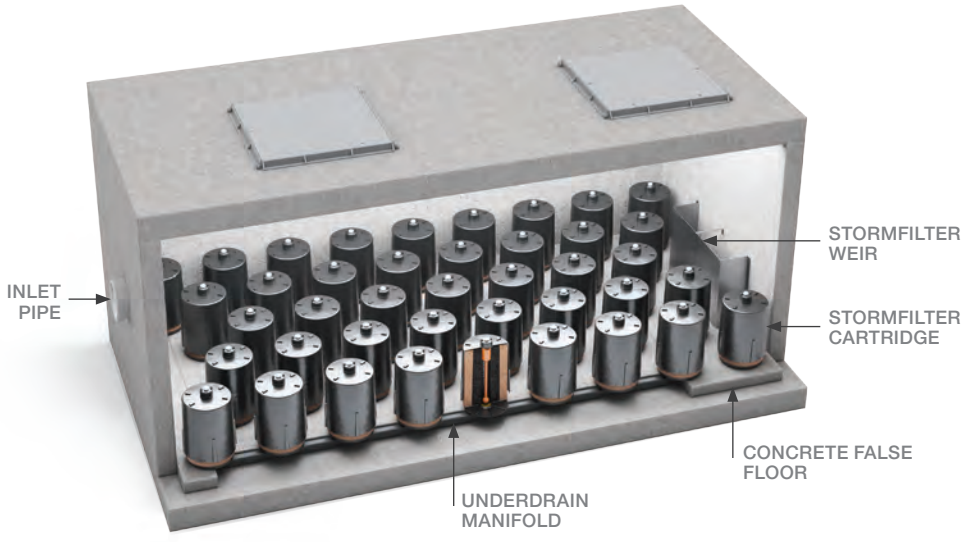


Figure 2: Example conceptual diagram of a StormFilter® system

Features

Media Options

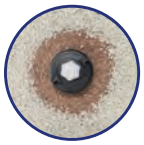
The StormFilter® system has the ability to operate with a variety of media options. These options are designed to target site or regulatory specific requirements. The current range of options is as follows:

- PSorb™
- NPSorb
- ZPG™

PhosphoSorb™ (PSorb) and NPSorb media are the most advanced option available and suited to most urban applications. Produced locally in Australia by Ocean Protect, PSorb and NPSorb achieves the optimum combination of pollutant removal and cost-effective treatment.

PSorb and NPSorb are lightweight Perlite-based media coated in activated alumina. The process of coating the perlite media significantly increases surface area, improving performance and efficiency. PSorb and NPSorb media also improves longevity and service life, and reduces OH&S risk by significantly reducing cartridge weight, particularly when compared to alternative options from other suppliers.

The other media utilised by Ocean Protect is our ZPG™ media. It consists of Perlite, Zeolite and Granular Activated Carbon and was Ocean Protect's original regulatory approved media.



ZPG™: Specifically configured media arrangement with perlite used as an outer protective layer, Zeolite and Granular Activated Carbon (GAC) at the centre for ion exchange.



PSorb: A lightweight media matrix consisting of a perlite base, featuring a high surface area of activated alumina that offers excellent adsorptive properties for enhanced ion exchange capability.



NPSorb: A PSorb variant utilising perlite with a high alumina surface area. The revised proportions of zeolite and GAC in the centre provide an additional stage of stormwater polishing.

Figure 3: StormFilter® media overview

Cartridge Options

The StormFilter® cartridge is available in three size options 310, 460 and 690 (Refer *Table 1*). The 690 StormFilter® cartridge delivers most cost effective solution within these options. It has the highest flow rate and the largest filtration surface area and sediment capacity, however it requires a greater head loss and physical height to achieve this. In comparison, the 460 and 310 cartridge options are best utilised when either physical height or head loss are a limiting factor.

The physical height of the cartridge must not be confused with the cartridge naming convention. Refer to *Table 1* for the physical cartridge height when needing to utilise the StormFilter® cartridges in a shallow height unit.

The flow rate through each cartridge media option is controlled by a flow restrictor disc (orifice) that is located at the base of each cartridge. Reducing the flow rate across the uniform media depth increases pollutant removal and the Mass Load Capacity of each cartridge.

Cartridge Name / Siphon Height (mm)	690	460	310
Physical Height (mm)	840	600	600
Typical Weir Height from outlet (mm)	920	690	540
PSorb (MCC) treatment flow rate (L/s)*	0.90	0.46	0.39
PSorb (SQIDEP) treatment flow rate (L/s)*	1.26	0.86	0.60
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** Treatment flow rate varies, depending on media and performance monitoring study site(s).*

Table 1: StormFilter® cartridge details

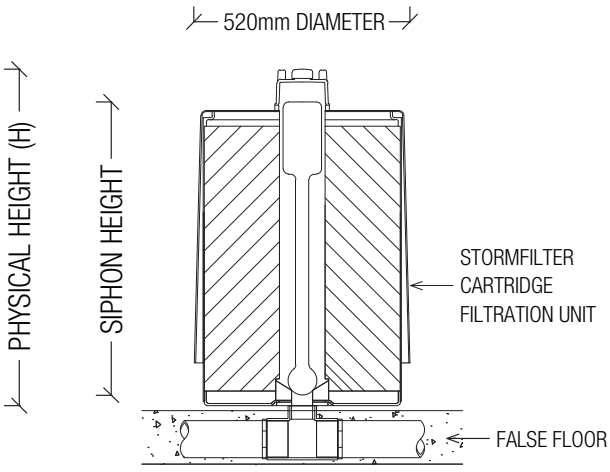

Figure 4: StormFilter® cartridge dimensions

Configurations

The StormFilter® cartridge system can be housed in a variety of ways such that it suits the site specific requirements for flow rate, hydraulics, accessibility and footprint restrictions. The standard configurations offered by Ocean Protect include pre-cast concrete tanks, detention and above ground pre-fabricated tanks.

Pre-cast concrete StormFilter® systems can house the cartridges within manholes, pits or vaults. These systems are simple to install, as they arrive on site after being manufactured offsite to suit site specific requirements (pipe size, inlet/outlet orientation, levels etc.).



Figure 5: Pre-cast concrete manholes

Alternatively, insitu or modular precast detention tanks constructed for water quantity requirements, can incorporate the StormFilter® system into the design. Typically a separated water quality chamber (cartridge bay area) is constructed inside the larger tank. With this approach, Ocean Protect performs the installation of the underdrain pipework manifold within the chamber, including the encasement of it in a concrete false floor.

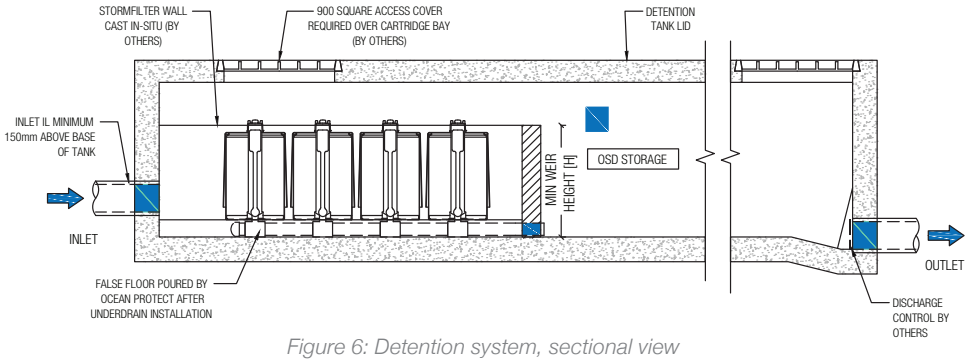

Figure 6: Detention system, sectional view

Above ground pre-fabricated tanks are also available, and are ideal for utilisation when treating downpipe flows. Often utilised when space is limited (boundary to boundary) they are available in both aluminium and HDPE and are custom built to suit the site specific requirements.



Figure 7: Aluminium StormFilter® tank

Performance and Select Approvals

While laboratory testing provides a means to generate hydraulic and basic performance data, all filtration devices should also be complemented with long-term field data evaluations. As a minimum, field studies should generally comply with a recognised field testing protocol, for example, the Technology Acceptance Reciprocity Partnership (TARP) or the Technology Assessment Protocol – Ecology (TAPE) in the USA.

To be considered valid, all field monitoring programs should be peer reviewed by a reputable third party and replicate local pollutant concentrations including soluble fractions of nutrients together with rainfall. Ocean Protect has undertaken such field testing both locally in Australia and overseas. Further information on these studies is available in *A review of the application of StormFilter® in Australia*.

Over 27,000 StormFilter® systems have been installed within Australia – and approximately 220,000 globally. These assets have been successfully installed in a variety of applications to meet regulatory requirements set by authorities throughout Australia. Specifically, StormFilter® has been accepted by some of the most stringent stormwater quality regulators around the globe including:

- Stormwater Australia Quality Improvement Device Evaluation Protocol (SQIDEP) verification
- Brisbane City Council
- Gold Coast City Council
- Blacktown City Council
- Hobsons Bay City Council
- City of Port Adelaide Enfield
- City of Hobart
- Washington State Department of Ecology (TAPE) GULD – Basic, Phosphorus
- New Jersey Department of Environmental Protection (NJ DEP)
- North Carolina Department of Environmental Quality (NC DEQ)
- Maine Department of Environmental Protection (ME DEP)

Please contact your Ocean Protect representative to obtain the StormFilter® approval status in your area.

Maintenance

All stormwater quality improvement devices require routine maintenance. The question is how often and how much it will cost. Proper evaluation of long-term maintenance costs should be a consideration when selecting a treatment device. The StormFilter® has been optimized to reduce long-term maintenance costs with proven, repeatable performance in the laboratory and in the field.

Reduce life cycle costs

StormFilter® has been designed for predictable maintenance intervals ranging from 1 to 3 years, resulting in fewer maintenance events and reduced life-cycle costs compared to other filtration devices.

Easy to maintain

All StormFilter® structures provide access for inspection, media replacement, and washing of the structure. Visual indicators for maintenance are observable from the surface. Our cartridge replacement program provides refurbished cartridges that are shipped to your site ready to install. Ocean Protect arranges for empty cartridges to be picked up and shipped back, reducing cartridge costs and environmental impact.

Maintenance support

Ocean Protect provides flexible options and contract terms. For further information please refer to the *StormFilter® Operations and Maintenance Manual.*

Design Basics

The design requirements of any StormFilter® system is detailed in 3 typical steps:

1. Hydraulic Design
2. Water Quality Design
3. Mass Load Design

1 Hydraulic Design

All StormFilters must be designed to ensure that the hydraulic requirements of the system are met without adversely impacting the upstream hydraulics (limiting the likelihood of localised flooding). *Table 1* (page 5) details the head loss for each cartridge size option. **The designer must initially select a cartridge option and ensure the corresponding head loss can be catered for.**

For a StormFilter® system, **head loss does not have to equal head drop.** If the head loss is not able to be fully achieved through a differential of height between the inlet and outlet pipes, then a **minimum head drop of 100mm** is required across the system with the balance of the head loss being impacted upstream. The minimum head drop is required to ensure that all inlet pipes enter the chamber above the concrete false floor.

StormFilter® cartridges have a unique backflush mechanism that is passively activated at the end of each storm peak to increase the longevity of each cartridge. Consequently, captured pollutants are stored within the system and in order to minimise scour peak flows into the cartridge bay need to be limited. Specifically when **peak flows surpass 80-100L/s StormFilter® systems need to be arranged off-line** with a flow diversion used to split flows.

It is also necessary to consider the impacts that tail water/submergence has on all stormwater treatment devices. In order to maintain an effective driving head for the StormFilter® system, the weir height may need adjustment. Please be aware that permanent submergence will reduce driving head and, if it occurs for a prolonged period, blind all stormwater treatment devices using media, In the case of the StormFilter® system, regardless of the storm intensity/duration the system will always drain relatively dry down.

For any hydraulic queries or circumstances that seem a bit different (including designing for low flow diversions, tidal scenarios, and weir height adjustment), please contact Ocean Protect.

2 Water Quality Design

Ocean Protect recommends and uses the widely endorsed Model for Urban Stormwater Improvement Conceptualisation (MUSIC), which makes it easy for correctly sizing an appropriate StormFilter® system for your site.

A complimentary design service which includes MUSIC modelling is provided by the Ocean Protect engineering team. Simply email your project details to **design@oceanprotect.com.au** or alternatively you can always call one of our engineers for a discussion or to arrange a meeting. The team will provide you with an efficient design containing details of the devices required to meet your water quality objectives together with budget estimates, product drawings and the MUSIC (.sqz) file.

Alternatively, please contact Ocean Protect for MUSIC treatment nodes and product specific design calculators.

When designing/modelling a StormFilter® system for water quality purposes in MUSIC, two (2) treatment nodes are typically utilised in series. These are the detention/sedimentation node located immediately upstream of a generic treatment node.

For the detention node, there are a number of parameters that need to be entered to ensure the node is representative of its effectiveness within the treatment train: surface area, extended detention depth, k-values, equivalent pipe diameter etc. For guidance on all of these variables, refer to the StormFilter® design calculator (available from Ocean Protect) or contact Ocean Protect.

For the StormFilter® system, the generic treatment node is utilised with relevant removal efficiencies inserted. These parameters can vary based on the jurisdiction (authority) of your project, relevant details can be obtained from Ocean Protect. The high-flow bypass figure is adjusted within the node to represent the treatable flow rate required to obtain water quality targets. Once finalised, this figure can be divided by the relevant cartridge flow rate to obtain the number of cartridges.

All details such as drawings, specifications and maintenance manuals can also be downloaded for integration into your project's documentation. Additionally, the Ocean Protect team is available to review your model and provide additional assistance and guidance on the configuration of the StormFilter® system(s) for your project.

3 Mass Load Design

At the completion of your water quality design process (as above), it is necessary that maintenance frequency is considered in order to prevent excessive ongoing maintenance requirements. Ocean Protect recommends a minimum maintenance frequency of 12 months.

All filtration devices occlude overtime, and consequently they have a maximum sediment capacity (TSS load). By analysing the mean annual load figures for the StormFilter® generic treatment node, the total annual retained TSS can be determined. To determine the minimum cartridge quantity required by mass load design, the annual retained TSS should be divided by the relevant cartridge sediment capacity. The Ocean Protect team can provide assistance and details on this process.

In determining the final cartridge quantity for your project, you must utilise the largest number of cartridges obtained from undertaking Water Quality and Mass Load design steps.

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

Call 1300 354 722

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