INFRASTRUCTURE REPORT

Westhaven Residential Development
Fast Track Substantive Application

Carter Group Limited



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QUALITY ASSURANCE

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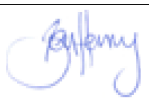
VERSION HISTORY

	Ben Henry	Version 1 – Consent Issue		02/11/2026

STATEMENT OF EXPERTISE

Ben Henry, BEng (Hons) Civil, CPEng (No. 1019139), IntPE, APEC Engineer, is a Chartered Professional Civil Engineer with 16 years' experience in civil infrastructure and land development. His CPEng practice area is Water Engineering, with experience spanning the investigation, design and delivery of stormwater, wastewater, water supply, roading, earthworks and utility infrastructure, including work for local authorities and private land developers.

Chris Sexton, BE (Hons) Natural Resource Engineering, CPEng (No. 1032521), IntPE, APEC Engineer, is a Chartered Professional Engineer with 10 years' experience in civil infrastructure and land development. His CPEng practice field is Water Engineering, with experience spanning the design and delivery of water supply, stormwater and wastewater infrastructure for residential subdivisions, large-scale master-planned developments and industrial developments, including consenting, construction and contract management.

STATEMENT OF GENERAL REPORTING POLICIES

1) Our responsibility in connection with this report is limited to the person or party to whom the report is addressed and we disclaim all responsibility to any other party without reference to us.
2) This report has been prepared for the purpose stated in the report and may be relied upon for that purpose only. Assumptions made in the preparation of the report are as expressly stated in the report or set out below.
3) Where information has been supplied to us for the purpose of the report by another party, this information is believed to be reliable but we can accept no responsibility if this should prove not to be so.

1 Introduction

1.1 Purpose

Inovo Projects Ltd has been engaged by Carter Group Limited to prepare this Infrastructure Report in support of a substantive application for approvals under the Fast-track Approvals Act 2024 ('the Act' or 'FTAA'). Approvals are sought to facilitate the Rolleston West Residential Development (or otherwise known as 'Westhaven'). The project is a listed project within Schedule 2 of the FTAA.

The application provides for approximately 4,134 residential lots across the Holmes, Brookside, Skellerup, and Skellerup South Blocks, comprising 3,978 medium density lots and 5 high density lots, together with three commercial superlots. The development also includes 31 reserve lots and 21 road lots, along with associated service infrastructure to vest. The Holmes Block provides for 1,060 residential lots, comprising 1,058 medium density lots and 2 high density lots (anticipated to provide 48 residential units), as well as one commercial superlot. The Brookside, Skellerup, and Skellerup South Blocks, forming part of Westhaven Central and Westhaven South, provide for 2,923 residential lots, comprising 2,920 medium density lots and 3 high density lots (anticipated to provide 108 residential units), as well as two commercial superlots.

This report provides an assessment of the infrastructure required to support the wider Westhaven development, including roading, earthworks, stormwater, wastewater, potable water supply, utilities, and associated authority approvals. The purpose of this report is to provide information on the following:

- Existing infrastructure surrounding the site
- Proposed infrastructure for the development
- Proposed earthworks
- Erosion and sediment control
- Roading and access
- Stormwater management
- Wastewater reticulation and disposal
- Water supply
- Utility services

Detailed engineering design of infrastructure will be provided as part of the Engineering Approval process.

The legal descriptions and zoning of the Westhaven landholdings are addressed in Section 3.2.

Stage 1 of Westhaven, located within the Skellerup Block, is currently in the construction phase, with works having commenced in the southern portion, known as Stage 1A. The Stage 1 subdivision can be seen in Figure 1. This Stage 1 portion is excluded from the Fast track application. The wider Westhaven development area will be developed progressively, including the balance of the Skellerup Block outside Stage 1. For clarity in this report, the balance of the Skellerup Block outside Stage 1 is referred to as Skellerup West. Stage 1 and Skellerup West remain subsets of Skellerup Block.

This assessment has been prepared in accordance with the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023. The authors have complied with that Code in preparing this report and confirm that the opinions expressed are within their respective areas of expertise, except where reliance has been placed on information or opinions provided by others.

2 Design Management

2.1.1 Developer

Name	Carter Group Limited
Address	Level 7, The Crossing Carpark 166 Cashel Street Christchurch 8011
Email	Tim Carter [redacted]

2.2 External Design Consultants

External consultants have been engaged by the client to prepare specialist assessments and design inputs that inform this Infrastructure Report and are coordinated with the civil infrastructure concept design:

DCM Urban	Urban Design and Landscape
CMW Geosciences	Geotechnical Investigation
Pattle Delamore Partners (PDP)	Flood Assessment, Groundwater Assessment, Dewatering Assessment
Novo Group	Traffic Assessment, Planning
Stantec	Aquatic Ecology

2.3 Base Data and Assumptions

The following data has been referenced to base the design of the subdivision on:

- Existing Selwyn District Council (SDC) infrastructure information from SDC 5-Waters GIS
  - Location of existing 3 water networks.
- CORDE/Selwyn Water Limited (SWL) Dunns Crossing Road Trunk Main Design Plans
  - Location and size of water supply new trunk main in Dunns Crossing Road.
  - Details related to connection point to new trunk main.
- Topographical survey carried out by Inovo Projects Ltd
  - Existing heights of the surrounding features of the site.
  - Topographical survey of existing site drainage features.
- LiDAR Topographical data from Land Information New Zealand
  - Existing ground level heights.
- Environment Canterbury (ECAN) Well search
  - Ground water levels and averages of the site and its surroundings.
- SDC Flood Model Results hosted by ECan
  - Canterbury Maps Flood Model Results.

2.4 Accompanying Reports

- Geotechnical Investigation carried out by CMW Geosciences.
- Detailed Site Investigation (DSI) Report completed by EHS Support.
- Integrated Traffic Assessment carried out by Novo Group
- Flood Assessment and Groundwater Assessment carried out by Pattle Delamore Partners

2.5 Design Standards

The hierarchy of design standards below have generally been used throughout the design process:

- Selwyn District Council Engineering Code of Practice.
- Christchurch City Council Wastewater Pumpstation Design Standard.
- Christchurch City Council Waterways, Wetland and Drainage Guide (CCC WWDG).

- Christchurch City Council Infrastructure Design Standard (IDS).
- NZS 4404:2010 Land Development and Subdivision Infrastructure.

2.6 Design Methodology

2.6.1 Design Criteria

The intent is to produce a set of preliminary design documentation describing the works required to an adequate level of detail to facilitate the approval of the fast-track consent being sought. The information supplied in this report and the associated drawings describe the construction and infrastructure works necessary to provide all necessary services to the proposed subdivision.

2.6.2 Design Review

Inovo uses an internal peer review held at the end of each design stage.

2.6.3 Design Records

Minutes of meetings, records of calculations, and electronic models are held on file at Inovo.

3 Site Overview

3.1 Site Description

The site ('Westhaven') is located in west Rolleston and comprises four land areas referred to in this report as the Holmes Block, Brookside Block, Skellerup Block, and Skellerup South Block. For reference, Scheme Plan naming conventions used in the substantive application are provided in Appendix 6. The site has an approximate area of 263ha, and the site extent is depicted in Figure 1 below.

The Holmes Block forms the northern part of Westhaven and is physically separate from the other three blocks. It is bounded by Dunns Crossing Road to the east, Burnham School Road to the south, private land to the west, and State Highway 1 (SH1) to the north.

Brookside, Skellerup, and Skellerup South form the southern part of Westhaven. These three blocks adjoin each other in sequence, with Brookside adjoining Skellerup to the north, and Skellerup adjoining Skellerup South to the south. Dunns Crossing Road forms the eastern frontage to these blocks, while Edwards Road, Brookside Road, Selwyn Road, and adjoining private land define the remaining external boundaries.

Stage 1 of Westhaven is located within the Skellerup Block and is currently under construction; this stage does not form a part of the substantive application. The balance of the Skellerup block outside of Stage 1 is included as part of this application.

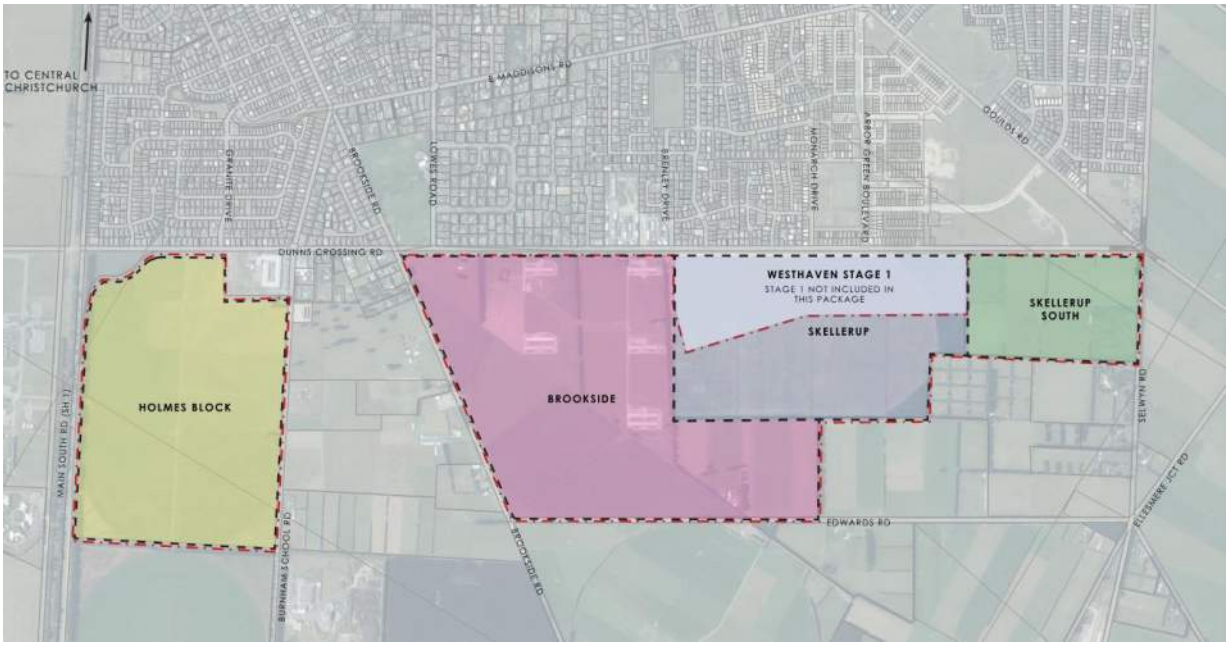


Figure 1 - Site Extent

For a description of Topography refer to Section 3.3.

The development area interfaces with established and emerging urban development to the east, with rural land remaining around other parts of the wider site. The development extent, staging, and block interfaces are shown on the Engineering Plans included in Appendix 1.

3.2 Legal Description & Zoning

The site comprises the land parcels listed in Table 1. The parcel locations and block extents are shown on the Engineering Plans included in Appendix 1.

Table 1 – Legal descriptions

Block	Legal description
Holmes Block	Section 1 SO 608925

Brookside Block	Lot 2 DP 72132; Lot 1 DP 72132; Lot 3 DP 20007; Lot 4 DP 20007; Lot 1 DP 82068
Skellerup Block	Part RS 31356; Part Section 4 RES 1342; Part RS 31354
Skellerup South Block	RS 23614; RS 25807

The current and proposed planning status of the land is addressed in the planning assessment supporting the substantive application.

3.3 Topography

The site is generally flat to gently undulating in topography, with an overall fall broadly to the south and south-east. Available contour information indicates a relatively consistent slope across the wider development area in the order of 1:175.

Shallow depressions and localised undulations are present in parts of the site, generally associated with historic overland flow paths. These features will be considered as part of the earthworks design, stormwater management strategy, flood modelling, and overland flow path assessment for the wider development.

A continuous water race alignment associated with the Paparua Water Race scheme passes through or adjacent to parts of the wider Westhaven landholdings. Refer section 6.2 Water Races and Figure 2 – Existing Water Race as well as the Aquatic Ecology Assessment prepared by Jarred Arthur (Stantec) for further detail on this. 6.2Water RacesFigure 2 - Existing Water Race

3.4 Geology and Soils

CMW Geosciences completed a geotechnical investigation and geohazard assessment for the development, reported in *Fast-track Substantive Application - Geotechnical Report, Dunns Crossing Road WESTHAVEN RESIDENTIAL DEVELOPMENT*, reference CHC2026-0005AC, Revision 1, dated 22 October 2026.

Published geological mapping indicates that the site is underlain by Late Pleistocene River alluvium comprising a variable mixture of gravel, sand, silt and clay. The investigations generally encountered between 0.15 m and 0.60 m of topsoil over medium-dense to very-dense sandy gravel. Isolated paleochannels contain loose or low-strength sandy silt and silty sand, locally extending to approximately 1 m below ground level.

CMW considers the site suitable for the proposed subdivision development, subject to the geotechnical recommendations provided in its report. The site is assessed as Site Subsoil Class D and generally suitable for TC1 foundation types, subject to site-specific confirmation.

3.5 Groundwater and Bores

3.5.1 Bores

Environment Canterbury records identify existing irrigation, domestic and stockwater bores within the Westhaven landholdings. Four groundwater monitoring bores were also installed within the southern Westhaven landholdings in April 2026.

The groundwater investigation undertaken by Pattle Delamore Partners Limited (PDP) used measurements from these monitoring bores and other on-site and nearby bores, together with long-term Environment Canterbury monitoring data. Bore details and monitoring results are provided in the *Westhaven Residential Development Fast-track Substantive Application – Groundwater Level Assessment* prepared by Pattle Delamore Partners Limited (PDP), reference C057550002R002, dated 22 October 2026.

Nearby active domestic-supply wells and the implications for stormwater disposal are addressed in the *Westhaven Stormwater Management Plan*, reference 16521-ENG-RESWMGMT-01.

3.5.2 Groundwater

Groundwater modelling and reporting has been completed by Pattle Delamore Partners Limited (PDP). This reporting is attached as part of this application – see *Westhaven Residential Development Fast-track Substantive Application – Groundwater Level Assessment* prepared by Pattle Delamore Partners Limited (PDP), reference C057550002R002, dated 22 October 2026.

The results indicate that highest predicted groundwater level is at the southernmost corner of site near Selwyn Road at depth of approximately 1.5m below existing ground level. The depth to groundwater is shown to increase towards the north and west. See extract from PDP report showing depth from existing ground to highest groundwater.

The shallow predicted groundwater in southern Skellerup South is the principal groundwater constraint affecting stormwater disposal. The resulting stormwater strategy and required separation between disposal devices and groundwater are addressed in Section 4 of the *Westhaven Stormwater Management Plan*, reference 16521-ENG-RESWMGMT-01.

3.6 Existing Infrastructure (Site)

Existing infrastructure within the site is generally limited to private rural servicing infrastructure associated with the current and former land use. Public water and wastewater infrastructure is generally located within the adjoining road corridors and will inform the concept servicing strategy for each block.

3.6.1 Holmes Block

Existing site infrastructure
The Holmes Block currently features a pump shed at bore M36/8063 along Burnham School Road, irrigation lines to a pair of centre pivot irrigators, and stock water troughs.

Adjacent wastewater infrastructure:
An existing DN300 uPVC wastewater rising main is located in Burnham School Road, within the northern berm. An existing DN225 uPVC wastewater gravity main is located in Dunns Crossing Road, within the northern footpath.

Adjacent water supply infrastructure
An existing OD110 PE80 water supply main is located in Burnham School Road, within the southern berm. An existing DN150 uPVC / PVCM water supply main is located in the northern berm along Dunns Crossing Road, this crosses Main South Road and extends to the intersection of Burnham School Road. A new OD630 PE100 water supply main was installed in 2025 along Dunns Crossing Road. This main runs along the shoulder of the northern traffic lane of Dunns Crossing Road past the Lowes Road intersection, where it transitions to an OD450 PE100 pipe. The OD450 PE100 main continues along the northern shoulder of Dunns Crossing Road to near 1 Pierre Avenue, outside the Brookside Block, where it connects into the existing DN150 PVCM water supply network.

3.6.2 Brookside Block

Existing site infrastructure
The Brookside Block currently features a pump shed at bore M36/7225 along Brookside Road, an irrigation line to a single centre pivot irrigator, and stock water troughs.

Adjacent wastewater infrastructure
An existing OD630 PE100 wastewater rising main is located in Edwards Road and is indicated as running generally along the road centreline. An existing DN175 uPVC wastewater gravity main is located on the north-eastern side of Dunns Crossing Road opposite the north-eastern part of the Brookside Block, before diverting into the existing subdivision at 234 Dunns Crossing Road.

Adjacent water supply infrastructure
Existing water supply infrastructure includes a DN100 PVCO water main in the northern berm of Brookside Road, a OD63 PE80 water supply submain in the southern berm of Brookside Road extending northward from 324 Brookside Road and crossing Dunns Crossing Road, and a OD75 PE80 water supply main extending south from the DN100 PVCO main along Edwards Road, within the northern berm, toward Selwyn Road. An existing DN150 PVCM water supply main also extends along the northern side of Dunns Crossing Road from the Brookside Road intersection to outside 110 Dunns Crossing Road.

3.6.3 Skellerup Block / Stage 1 of Westhaven

Existing site infrastructure
Prior to Stage 1 development works, the Skellerup Block included private rural servicing infrastructure, including irrigation bores, a pump shed, centre pivot irrigation, K-line irrigation, and stock water troughs. The centre pivot infrastructure has since been removed. Stage 1 of Westhaven is now under construction within the Skellerup Block and includes new water supply infrastructure that has been designed with consideration of later stages of Westhaven.

Adjacent water supply infrastructure
Adjacent public water supply infrastructure to the Skellerup Block has been considered through the Stage 1 design. Existing and recently installed water supply infrastructure is located along Dunns Crossing Road, with the Stage 1 water supply design connecting to the OD450 PE trunk main at Dunns Crossing Road / Pierre Avenue and at the Arbor Green Boulevard/Dunns Crossing Road intersection with the existing DN200 PVC mains.

Adjacent wastewater infrastructure
Stage 1 wastewater connects to the existing wastewater network at Dunns Crossing Road / Jed Way and discharges to the Westwood Pump Station catchment. This wastewater arrangement is specific to Stage 1 and will not form the wastewater servicing interface for later stages of Westhaven.

Adjacent stormwater infrastructure
Stage 1 stormwater is managed independently by soakage and overland flow design and will not form the stormwater servicing interface for later stages of Westhaven via this fast-track application.

3.6.4 Skellerup South Block

Existing site infrastructure
No centre pivots, irrigation bore, or irrigation pumps have been identified within the Skellerup South Block.

Adjacent wastewater infrastructure
An existing OD630 PE100 wastewater rising main is located in Selwyn Road, within the southern berm.

Adjacent water supply infrastructure
No existing water supply main has been identified along the portion of Selwyn Road directly fronting the Skellerup South Block. An existing DN200 PVC water main is located further east in Selwyn Road, east of the Goulds Road intersection.

3.7 Neighbouring Developments

Farringdon - Arbor Green has been developed to the east of the site between Dunns Crossing Road and Goulds Road. This development was consented as part of the Covid 19 fast-track consent process and consists of a mixture of residential allotment typologies, along with a commercial area and a school site that is a primary school.

3.8 Proposed Development

The proposed development comprises residential allotments, three commercial superlots, reserves, a connected road network, and associated water, wastewater, stormwater, power and telecommunications infrastructure. Development will proceed progressively in stages.

The Fast-track application currently provides for approximately 4,134 residential allotments across the Holmes Block and the southern Westhaven landholdings, excluding Stage 1 of Westhaven.

Stage 1 occupies the eastern part of the Skellerup Block and is already consented and under construction. It is excluded from the Fast-track application but remains part of the wider Westhaven development. The balance of the Skellerup Block outside Stage 1 is referred to as Skellerup West.

The Holmes Block forms the northern development area and provides for approximately 1,060 residential allotments, comprising 1,058 medium-density lots and 2 high-density lots (anticipated to provide 48 residential units), together with one commercial superlot.

The southern Westhaven landholdings comprise the Brookside Block, Skellerup West and Skellerup South Block. Together, these areas provide for approximately 2,923 residential allotments, comprising 2,920 medium-density lots and 3 high-density lots (anticipated to provide 108 residential units), together with two commercial superlots.

The proposed layout is shown on the application plans and concept infrastructure drawings accompanying the application. Refer to the proposed Site Drawings in Appendix 1.

4 Earthworks

4.1 Underlying Soil Conditions

As per Section 3.4.

4.2 Bulk Earthworks

Earthworks will be required to support the subdivision and residential development of the site. The earthworks will generally include:

- levelling of parts of the site, including engineered filling within existing overland flow channels and secondary flow paths;
- formation of new secondary overland flow paths;
- earthworks for the proposed road layout, including stormwater overland flow corridors; and
- formation of residential allotments to provide positive drainage toward road frontages.

As set out in further detail in Section 3.3 above, the topography of the site is generally flat to gently undulating. The approximate elevation change across each block is summarised as follows:

- Holmes Block: approximately 4.5 m across the site;
- Brookside Block: approximately 5.4 m from Brookside Road to the Skellerup Block boundary, with a further approximately 1.9 m along the Edwards Road frontage;
- Skellerup West: approximately 7.3 m across the site; and
- Skellerup South Block: approximately 3.8 m across the site.

The earthworks design methodology will seek to minimise the extent of cut and fill while creating practical residential building platforms, road corridors, drainage paths, and infrastructure corridors. Finished lot levels will be designed so that residential allotments drain toward road frontages at a minimum gradient of 1 in 500 where practicable.

Earthworks and finished lot levels are developed in conjunction with the flood modelling and stormwater design to confirm that future building platforms are located above the 1-in-200-year flood level, while maintaining appropriate secondary overland flow paths through the development.

Bulk earthworks quantities are confirmed through the concept earthworks model. The currently anticipated earthworks quantities are summarised in Table 2.

Table 2 – Anticipated bulk earthworks quantities

Block / area	Approximate cut volume	Approximate fill volume	Maximum cut depth	Maximum fill depth
Holmes	104,000 m^3	206,000 m^3	1.0 m	1.4 m
Brookside, Skellerup West and South	386,490 m^3	243,300m^3	1.49 m	1.22 m

The above quantities exclude service trenching.

Earthworks will generally operate on a cut-to-fill basis, with suitable site-won material reused as engineered fill where practicable. Fill placed in excess of 300 mm depth will be constructed in accordance with NZS 4431:2022, Engineered fill construction for lightweight structures.

The suitability of site-won material for reuse as structural engineered fill will be confirmed through geotechnical assessment and construction-phase testing. If insufficient suitable material is available on site, imported fill may be required to make up any shortfall. Imported granular material will be used for road pavement construction where required.

4.3 Soil Contamination

EHS Support New Zealand Ltd prepared the *Detailed Site Investigation: Westhaven Residential Development Fast track Substantive Application*, reference NZL.07950, dated 23 October 2026. The investigation covered the Holmes Block and the Brookside Block, including 243 Dunns Crossing Road, 152 Edwards Road and Lot 1 DP 82068.

The investigation identified localised contamination at 243 Dunns Crossing Road and 152 Edwards Road, together with one isolated exceedance within the Holmes Block. No HAIL activities were identified over Lot 1 DP 82068. Test results identified localised concentrations of arsenic, cadmium, lead, total petroleum hydrocarbons and asbestos exceeded the applicable soil contaminant standards for residential land use. Heavy-metal concentrations above background levels were also identified in shallow soils associated with waste and offal pits, a burn pile and existing buildings.

The identified HAIL activities and contaminant concentrations mean that consent is required under the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 for subdivision, change of land use and the disturbance or removal of contaminated soil. Regional consents may also be required for construction-phase stormwater discharges and dewatering, and for operational discharges depending on the final contamination-management approach.

A Remediation Action Plan will be prepared before earthworks commence to define the required contamination-management and remediation measures. This will include the management of affected soil where proposed stormwater soakage infrastructure coincides with contaminated areas. The identified contamination is localised and will be addressed through targeted remediation. A Site Validation Report will be prepared following completion of the remediation works.

4.4 Erosion & Sediment Control

In accordance with industry best practice and Resource Consent requirements, implementation of erosion and sediment controls during the earthworks operation will be undertaken during the construction works.

All bulk earthworks operations will be carried out in accordance with the principles outlined on the Environment Canterbury's Erosion Sediment Control Toolbox to minimise the adverse effects of erosion and sedimentation during construction.

Earthworks undertaken in accordance with these guidelines will act to minimise and/or mitigate any adverse environmental effects of sediment discharge during the works through appropriate use and design of erosion and sediment control techniques and measures.

The proposed erosion and sediment control methodology is detailed in the following sections. It is noted that the methodology may be subject to change depending on the Contractor's construction operation and phasing, which will be discussed with Council at the time of works.

4.5 Monitoring and Maintenance

Monitoring of the erosion and sediment control measures will be undertaken by the Contractor with compliance monitoring undertaken by the Environment Canterbury representative. It is expected that monitoring will also be undertaken by the Consultant project manager.

5 Roading

5.1 Road Layout

The Westhaven development will include a hierarchy of collector, local roads and laneways consistent with the proposed outline development plan and the wider Rolleston transport network.

The southern Westhaven landholdings, comprising Brookside, Skellerup, and Skellerup South, will include a primary north-south collector spine road linking Selwyn Road to Brookside Road. Stage 1 of Westhaven includes an extension of Arbor Green Boulevard through to this collector spine road, providing connectivity between Dunns Crossing Road, Stage 1, and the wider Westhaven road network.

A network of local roads will extend from the collector road network and will be designed to provide efficient access through the development. These roads will connect to, or align with, existing and proposed intersections along Dunns Crossing Road, Brookside Road, Edwards Road, and Selwyn Road where appropriate.

The primary collector spine road through the southern Westhaven area is proposed to be constructed as a dual-carriageway boulevard-style road, providing a higher-order movement corridor through the development and supporting vehicle, pedestrian, and cycle connectivity.

The Holmes Block will be accessed from Dunns Crossing Road via a new road connection located opposite Granite Drive. This road will function as a collector boulevard and will provide the principal east-west movement route into the Holmes subdivision. Within the Holmes Block, the collector boulevard will form a looped road arrangement, providing access to a connected local road network, with north-south local roads linking to east-west local road connections throughout the subdivision.

Additional access to the Holmes Block will be provided from Burnham School Road, including two boulevard-width road connections. These connections will provide additional access, distribute traffic movements, and support staged development for the Holmes subdivision.

A new commercial block is proposed in the northeastern part of the Holmes Block and will have access from the southern arm of the new State Highway 1 (SH1) roundabout at Dunns Crossing Road. Furthermore, a slip lane in from and out to the southbound lane of SH1 is also proposed. Additional internal access between the commercial area and the Holmes residential subdivision will be provided from the southern and south-western boundaries of the commercial block.

5.2 Road Cross Sections

Standard “SDC Low Profile” or “CCC Standard” kerb and channel will be used in all roads in the subdivision, with cutdowns where appropriate for pedestrian crossings and ROW’s.

Concrete footpaths are proposed in the roading network in accordance with SDC Engineering Code of Practice and in keeping with other recent subdivisions in Rolleston. Footpath layout and links to green spaces will be discussed further with SDC at the engineering approval stage.

5.3 Pavement Design

Detailed pavement design will be undertaken for each development stage in accordance with the SDC Engineering Code of Practice and the recommendations of the geotechnical assessment. *Fast-track Substantive Application - Geotechnical Report, Dunns Crossing Road WESTHAVEN RESIDENTIAL DEVELOPMENT*, reference CHC2026-0005AC, Revision 1, dated 22 October 2026, assesses the wider Westhaven development. For the preliminary design of pavements founded on natural sandy and gravelly soils, the report recommends an assumed subgrade CBR of 5%. The SDC Engineering Code of Practice requires the subgrade foundation to achieve a minimum CBR of 8% for roads and 5% for private rights of way.

The pavement design strategy adopted for Stage 1A will be applied during the detailed design of the wider development, subject to the geotechnical recommendations, confirmation of stage-specific ground conditions, road classification and anticipated traffic loading. Construction observations from Stage 1A indicate that the road corridors have been stripped and predominantly comprise well-graded sandy gravels, with only minor localised areas requiring remediation.

Where comparable in-situ sandy gravels are confirmed during future works, the pavement design may omit or reduce the imported AP65 subbase layer, consistent with the Stage 1A approach. This will be subject to proof rolling and subgrade testing confirming that the material is uniform, free draining and provides firm bearing, together with acceptance by the Engineer and Council. Where the required performance criteria are not achieved, unsuitable material will be undercut or otherwise improved, and imported subbase material provided as required.

5.4 Road Stormwater Drainage

Stormwater runoff within road corridors will be conveyed via kerb and channel into appropriately spaced sumps or roadside swales. All sumps will feature submerged outlets and will connect into hydrodynamic separators before discharging into soakpits sized for the 10% AEP 1 hour storm. The road corridor will be used as overland flow paths to direct stormwater runoff when the drainage network is at full capacity.

Roads will all be graded at a minimum 1:350 grade to ensure that stormwater will be conveyed to roadside sumps without flat spots

6 Stormwater

6.1 Existing Stormwater Management

Discharge of stormwater to ground is common practice in the Rolleston area due to free-draining nature of the underlying gravels. As such, Rolleston has little stormwater reticulation network as most stormwater is discharged directly to ground via soakage pits and basins. Recent subdivisions to the east of the proposed rezoning such as Farringdon and Arbor Green have utilised soakage to ground for stormwater management.

6.2 Water Races

The Paparua Water Race scheme passes through or adjacent to parts of the Westhaven landholdings. It comprises the Main South Water Race through the Holmes Block, the Edwards Water Race through the Brookside Block, and the Selwyn Water Race through the Skellerup South Block. The existing alignment is shown in Figure 2.

Approximately 1 km of the Main South Water Race within proximity of the Holmes Block is proposed to be retained, including the realignment of approximately 500 m of its upper reach located within the Holmes Block to accommodate the proposed development. Approximately 2.8 km of the downstream terminal reach associated with the southern Westhaven landholdings is proposed to be closed and infilled.

The closure of the race is a matter for Selwyn District Council as the water-race asset owner and will be resolved directly with Council under its water-race closure process. Any closure and termination arrangements agreed with Council will be incorporated into the detailed design. Once Council approval has been obtained, the Brookside reach of the Paparua Water Race will be closed at the upstream fork before any works commence within or immediately adjacent to the downstream channel. This will ensure that the channel is dry during construction.

Further information on the existing alignment, proposed works and associated stormwater management requirements is provided in the Westhaven Stormwater Management Plan, reference 16521-ENG-RESWMGMT-01, and the specialist ecology assessments (by Stantec) accompanying the Fast-track application.

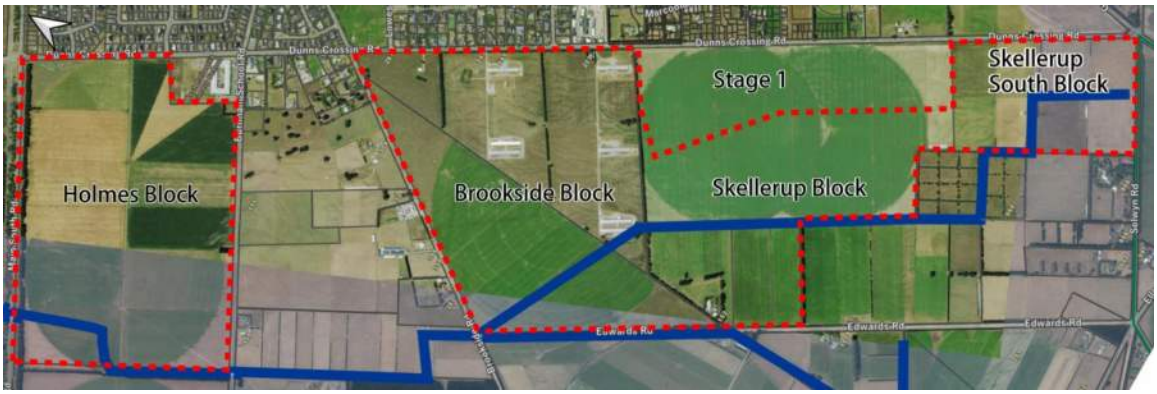


Figure 2 - Existing Water Race

6.3 Flood Management

Westhaven is subject to overland flow from the upstream catchment, generally moving through the site from north to south along existing channels and local depressions. Pattle Delamore Partners Limited (PDP) has assessed pre- and post-development flood behaviour using Selwyn District Council's district-wide flood model, with the 0.5% AEP event as the primary assessment event. The assessment has informed the proposed site levels, overland flow paths and measures to manage flood effects on neighbouring land.

Flood management will be provided through an integrated primary and secondary drainage system. The primary system will manage runoff through lot-level soakage, road drainage, public reticulation and public soakage infrastructure. When the primary system capacity is exceeded, or an inlet or pipe is obstructed, excess runoff will be conveyed along defined secondary overland flow paths within roads, reserves and other public corridors.

Finished lot levels and road grading will direct runoff away from building platforms while maintaining the continuity of existing catchment flow paths. Minimum finished floor levels will incorporate the Council-required freeboard above the modelled 0.5% AEP flood level, including the applicable climate-change allowance. Final earthworks levels, minimum finished floor levels and the capacity and continuity of the primary and secondary drainage systems will be confirmed through detailed design and the Engineering Approval process.

The Westhaven stormwater and flood-management system will operate independently of the proposed upstream stormwater basins associated with the Dunns Crossing Road and State Highway 1 roundabout.

Further detail is provided in the *Westhaven Residential Development, Rolleston – Flood Assessment*, prepared by PDP, reference C057550005R001, dated October 2026, and *the Westhaven Stormwater Management Plan*, reference 16521-ENG-RESWMGMT-01[A], dated 1 November 2026.

6.4 Proposed Stormwater Management

Stormwater management will be based primarily on disposal to ground, reflecting the generally free-draining gravel conditions across Westhaven. Infiltration testing undertaken for Stage 1 and across the wider development indicates that the assessed locations are generally suitable for soakage-based disposal.

Across all development areas, roof and private hardstand runoff will be retained and disposed of within individual lots for storms up to and including the 10% AEP one-hour event. Runoff from roads, reserves and other public areas, together with overflow from lot-level systems during larger events, will receive the required treatment before being conveyed to public soakage infrastructure. The public system will be designed so that post-development peak discharge from the development does not exceed the pre-development discharge rate for events up to and including the 1% AEP critical-duration event.

Within the Skellerup South Block, the higher predicted groundwater levels require modified soakage arrangements. Lot-level soak pits and shallow, elongated and more frequent roadside soak pits will be used to provide the required capacity while maintaining at least 1 m of unsaturated ground between the base of each disposal device and the adopted design groundwater level.

Detailed design will confirm location-specific infiltration rates, design safety factors, device dimensions and locations, groundwater separation, treatment requirements and maintenance access. Construction verification will confirm that each disposal device is founded within suitable free-draining material.

Further information, including the infiltration testing, concept design assumptions, treatment measures and groundwater-protection requirements, is provided in the *Westhaven Stormwater Management Plan*, reference 16521-ENG-RESWMGMT-01[A], dated 1 November 2026.

6.5 Environment Canterbury Consents

6.5.1 Proposed Fast Track Area

The discharge of stormwater to ground from the wider Westhaven development, excluding Stage 1, is subject to section 15 of the Resource Management Act 1991 and the Canterbury Land and Water Regional Plan. The necessary resource consents will be sought as approvals under the Fast-track Approvals Act 2024 through the substantive application. As the proposed discharges do not comply with all applicable permitted activity requirements, the approvals sought will include:

- discharge to ground of construction-phase stormwater runoff; and
- discharge to ground of operational-phase stormwater runoff from the proposed stormwater system, including lot-level and public soakage devices.

Stage 1 is excluded from the Fast-track application and is separately authorised under CRC263616 and CRC270049 for construction-phase and operational stormwater discharges respectively. The same core management principles will inform the wider Westhaven approvals, with block-specific modifications incorporated where required.

At completion of the subdivision works, the public stormwater network will vest in Selwyn District Council where required. The consent-holder responsibilities associated with the public system are proposed to transfer to Council or otherwise be addressed under the applicable Council consent framework.

Further information on the consenting framework and the associated treatment, groundwater-protection, inspection and maintenance measures is provided in the Westhaven Stormwater Management Plan, reference 16521-ENG-RESWMGMT-01[A], dated 1 November 2026.

6.5.2 Rolleston Global Regional Consents

SDC holds a stormwater discharge consent (reference: CRC132527) from ECan for the Rolleston Stormwater Management Area. This is the existing Rolleston-specific consent framework for SDC stormwater assets, including road drainage and stormwater discharge-to-ground systems within the Rolleston network.

SDC has also obtained a district-wide consent for reticulated stormwater systems across 21 townships (reference CRC167468). CRC167468 provides a broader consent framework for SDC-owned stormwater networks and is relevant to future public stormwater assets within Westhaven once those assets are vested in Council.

7 Wastewater

7.1 Servicing Strategy

The wider Westhaven development will require new wastewater reticulation to service future residential and commercial development. The wastewater strategy is based on two separate wastewater catchments:

- Holmes Block; and
- the southern Westhaven blocks, comprising Brookside, Skellerup West and Skellerup South.

The Holmes Block is physically separate from the southern Westhaven blocks and will be serviced independently. The southern Westhaven blocks adjoin each other and will be serviced as a separate wastewater catchment.

For this concept-level assessment, the existing neighbouring gravity wastewater network along Dunns Crossing Road is not relied on to service the wider Westhaven development beyond the approved Stage 1 arrangement. The Stage 1 wastewater capacity assessment and Selwyn Water Limited correspondence identified the available Westwood Pump Station catchment capacity as limited to the approved Stage 1 loading, with 727 Residential Connection Equivalent (RCE) confirmed as the connection limit for that catchment. The wastewater servicing arrangement for Stage 1 which connects to the existing wastewater network at Dunns Crossing Road / Jed Way and discharges to the Westwood Pump Station catchment has been approved. That arrangement is specific to Stage 1 and does not form the wastewater servicing interface for the balance of Westhaven via this fast-track application.

For the Holmes Block, the capacity of the neighbouring wastewater network along the Dunns Crossing Road frontage has not been confirmed at this stage and, for concept design purposes, is assumed not to be available to service the Holmes Block. The servicing strategy therefore treats the Holmes Block and the southern Westhaven blocks as separate self-contained gravity wastewater catchments draining to dedicated wastewater pump stations.

7.2 Existing Wastewater Infrastructure

7.2.1 Holmes Block

The Holmes Block is not currently serviced by a public gravity wastewater reticulation network within the site boundaries.

The surrounding wastewater infrastructure comprises both rising main and gravity sewer assets. A DN300 uPVC wastewater rising main is located within the northern berm of Burnham School Road. This rising main conveys wastewater from the Brookside Road/Burnham School Road Wastewater Pump Station (WWPS) directly to the Pines Wastewater Treatment Plant (WWTP). At this stage, no connection to this rising main has been assumed for the Holmes Block, and no assessment of its available hydraulic capacity has been undertaken.

A DN225 gravity sewer is also located along the north-eastern side of Dunns Crossing Road. This sewer is of sufficient depth to potentially provide gravity wastewater servicing to parts of the Holmes Block. It is understood that this gravity main receives wastewater flows from the West Melton catchment and the Runners Road WWPS upstream of State Highway 1.

No assessment has been undertaken at this stage to determine the available capacity within the existing DN225 gravity sewer or the downstream Brookside Road/Burnham School Road WWPS. Accordingly, the ability of the existing network to accommodate additional wastewater flows from the Holmes Block remains to be confirmed through further investigation and engagement with Selwyn Water.

7.2.2 Southern Westhaven Blocks

The Southern Westhaven Blocks are not currently serviced by a public gravity wastewater reticulation network within the site boundaries.

Existing wastewater infrastructure is located within the adjoining road corridors. An existing OD630 PE100 wastewater rising main is located within Edwards Road and generally follows the road centreline. A DN175 uPVC gravity sewer is located on the north-eastern side of Dunns Crossing Road opposite the north-eastern portion of the Brookside Block, before diverting into the existing subdivision at 234 Dunns

Crossing Road. A second OD630 PE100 wastewater rising main is located within the southern berm of Selwyn Road.

The existing OD630 PE100 rising mains form part of the Eastern Selwyn Sewerage Scheme (ESSS) trunk wastewater network and convey flows from multiple catchments throughout the district. These assets provide strategic bulk conveyance infrastructure and are not intended to accept direct local reticulation connections. Accordingly, no connection to these rising mains has been assumed as part of this assessment.

Future wastewater infrastructure upgrades are also proposed within the wider catchment. This includes additional gravity wastewater reticulation to be constructed in the southern section of Dunns Crossing Road as part of the Arbor Green development, together with a proposed OD800 PE wastewater rising main between the Edwards Road Wastewater Pump Station (WWPS) and the Pines WWTP. While these works will enhance the strategic wastewater network, they have not been relied upon for servicing of the Southern Westhaven Blocks.

It is understood that the proposed gravity reticulation associated with the Arbor Green development will ultimately discharge to the Westwood WWPS. Based on current information, the Westwood WWPS does not have sufficient available capacity to accommodate development beyond that already provided for within the Arbor Green development and Stage 1 of the Westhaven development, which is currently under construction. As such, the future reticulation network is not considered a viable servicing solution for the Southern Westhaven Blocks without further network upgrades and confirmation of downstream capacity.

7.3 Wastewater Loading

Wastewater design flows are calculated in accordance with the SDC Engineering Code of Practice.

For this concept-level assessment, each medium-density residential lot has been treated as one RCE. The comprehensive development residential lot numbers are indicative yield estimates derived from the area allocated to comprehensive residential development, based on an average lot area of approximately 180 m². The high-density yield is area-derived and does not assume a specific built form.

Commercial flows have been estimated using the SDC area-based allowance of 1 L/s per hectare of commercial land. For catchment planning and pump station capacity assessment, commercial flows have been converted to Residential Connection Equivalents using 0.00687 L/s per RCE.

No future densification factor has been applied in the concept loading table. The indicative residential yield has been derived from relatively small residential lots, generally in the order of 390 m² to 408 m². The loading in Table 3 is therefore presented as a base concept loading. Any additional allowance required by Selwyn District Council or Selwyn Water Limited will be confirmed during later design stages.

Table 3 – Indicative wastewater loading by catchment

Wastewater catchment	Medium-density residential lots	Comprehensive Development residential lots	Residential RCE	Commercial area	Commercial flow allowance	Commercial RCE
Holmes Block	1,058	2	1,106	57,229 m² (5.723 ha)	5.72 L/s	833
Southern Westhaven blocks	2,920	3	3,028	16,819 m² (1.682 ha)	1.68 L/s	245

The supporting wastewater calculation spreadsheets are included in Appendix 4. These provide the concept-level residential RCE totals, commercial flow allowances, RCE conversions, and design flow estimates for the Holmes Block and southern Westhaven blocks.

The southern Westhaven residential yield excludes Stage 1 of Westhaven. Stage 1 retains its approved wastewater servicing arrangement via Dunns Crossing Road / Jed Way to the Westwood Pump Station catchment.

The above RCE values are indicative and are provided for concept-level pump station and downstream capacity assessment. Final design flows will be confirmed during detailed design based on the final subdivision layout, lot yield, land use schedule, staging, commercial areas, peaking factors, infiltration allowance, and any specific Selwyn Water Limited requirements.

7.3.1 Westhaven WWPS Basis of Design

The design loading for the Westhaven WWPS serving the southern Westhaven blocks is set out in the *WWPS Basis of Design – Westhaven WWPS*, reference 16521-EN-RE-WWPS-BoD-01, Version 1, dated 2 November 2026. The Basis of Design adopts an ultimate catchment comprising 3,028 residential allotments and 1.68 ha of commercial land. Its maximum residential design flows also include a future densification factor of 1.2, separate from the base residential loading presented in Table 3.

The current Fast-track proposal comprises 3,028 residential allotments and two commercial lots with a combined area of 16,819 m² (1.682 ha), as set out in Table 3. The residential yield stated in this Infrastructure Report is the current proposal for submission.

Detailed design will confirm pump duties and shared rising-main hydraulics, including simultaneous operation with Westwood WWPS. It will also verify performance under initial and ultimate loading conditions, including low-flow operation, pump cycling, wastewater retention times, self-cleansing velocities, odour and hydrogen sulphide risks, and emergency-storage requirements.

The Basis of Design adopts a storm peak factor of 1.6. The applicability of this factor will be reviewed against the PDP groundwater assessment and confirmed with SWL during detailed design.

7.4 Proposed Gravity Reticulation

The Holmes Block and the southern Westhaven blocks will each be serviced by new gravity wastewater reticulation designed to convey flows to their respective wastewater pump stations.

The internal gravity networks will generally follow the proposed road corridors and will be designed to utilise the natural southward fall across each catchment identified in 3.3 Topography. The existing topography assists in achieving a predominantly gravity-based reticulated wastewater system and reduces the need for intermediate pumping within the catchments. Pipe sizes, grades, manhole locations and cover depths will be confirmed through detailed design. The networks will be designed to provide gravity service to future lots where practicable, with localised constraints to be addressed through road levels, lot grading, pipe depths and pump station wet well levels.

The gravity reticulation will be designed in accordance with the SDC Engineering Code of Practice, including requirements for:

- design flow build-up by catchment;
- minimum pipe sizes and gradients;
- pipe capacity under peak wet weather flow;
- no surcharge under design peak flow conditions;
- self-cleansing performance;
- manhole spacing, levels and benching;
- cover, bedding and pipe materials; and
- staging interfaces.

Where larger trunk gravity mains are required to convey flows from future stages, interim low-flow operation and self-cleansing performance will be considered. Temporary operational measures, such as flushing, may be required until upstream catchments are sufficiently developed.

7.5 Self-Cleansing Performance

The proposed gravity wastewater network has been designed in accordance with the minimum pipe grades specified in Table 2 of the SDC ECOP. All DN150 wastewater pipes have been graded to meet or exceed these minimum requirements and, as such, no additional self-cleansing assessment has been undertaken for DN150 reticulation.

For wastewater pipes DN225 and larger, self-cleansing performance has been assessed in accordance with the Christchurch City Council Infrastructure Design Standard (CCC IDS) methodology. While the SDC ECOP does not include specific self-cleansing flow (SCF) assessment criteria, the CCC IDS methodology provides an accepted approach for assessing the ability of larger diameter gravity wastewater pipes to achieve adequate cleansing velocities under low-flow conditions.

The assessment indicates that all wastewater pipes DN225 and larger satisfy the CCC IDS self-cleansing flow requirements, based on the scheme plan revision assessed. This demonstrates that the larger diameter sections of the network can achieve adequate cleansing velocities under normal operating conditions and are unlikely to be susceptible to sediment accumulation.

Accordingly, the proposed gravity wastewater network is considered suitable from a self-cleansing perspective, with DN150 reticulation designed in accordance with the minimum grade requirements of the SDC ECOP and all DN225 and larger pipes shown to be capable of complying with the self-cleansing requirements of the CCC IDS. The supporting self-cleansing flow calculations and velocity assessments are included in Appendix 4.

It should be noted that the self-cleansing flow calculations were undertaken on an earlier revision of the scheme plan to demonstrate that a gravity wastewater network can feasibly service the development. The scheme plan has since been updated as the design has progressed, but the calculations have not yet been revised to reflect these changes. The calculations nonetheless confirm that a compliant wastewater network can be achieved for the site. They will be updated during detailed design to confirm that self-cleansing flows are achieved throughout the network and that pipe sizes are appropriate for their upstream contributing catchments.

7.6 Pump Station and Rising Main Strategy

Land will be set aside within each relevant subdivision area for the Holmes WWPS and Westhaven WWPS. The required land area is expected to be equivalent to approximately one to two residential lots for each pump station, subject to confirmation of pump station layout, wet well size, emergency storage, access, setbacks, odour management, landscaping, and operation and maintenance requirements. Currently, the Westhaven WWPS is located on Lot 7803 on Selwyn Road, which is 2000 m2. The Holmes Block WWPS is located on Lot 3806 on Burnham School Road, which is 1047 m2.

The proposed Holmes WWPS and Westhaven WWPS will each discharge via new rising mains. These rising mains are intended to ultimately convey wastewater flows towards the Pines WWTP, with the final receiving point and discharge arrangement to be confirmed with SDC and SWL during the next phase of design.

7.6.1 Holmes Wastewater Pump Station

A new Holmes Wastewater Pump Station (Holmes WWPS) is proposed to service the Holmes Block. The pump station is proposed to be located within the subdivision on the eastern side of the new westernmost boulevard intersection / entrance from Burnham School Road (currently shown as Lot 3806).

A new rising main is proposed from the Holmes Wastewater Pump Station to convey wastewater flows towards the Pines WWTP. The proposed rising main would be installed in the berm generally heading west and following the existing rising main alignment along Burnham School Road. The final alignment, pipe diameter, pressure class, easement requirements, corridor constraints, receiving point, and discharge arrangement will be confirmed with SDC and SWL during the next phase of design.

The new Holmes WWPS will adopt the general design criteria and performance requirements set out in the *WWPS Basis of Design – Westhaven WWPS*, referenced in Section 7.3.1. These will be applied to the Holmes catchment loading in Table 3, with the design adapted to local site conditions and the proposed discharge arrangement. Pump duties, wet well sizing, emergency storage and resilience, rising main

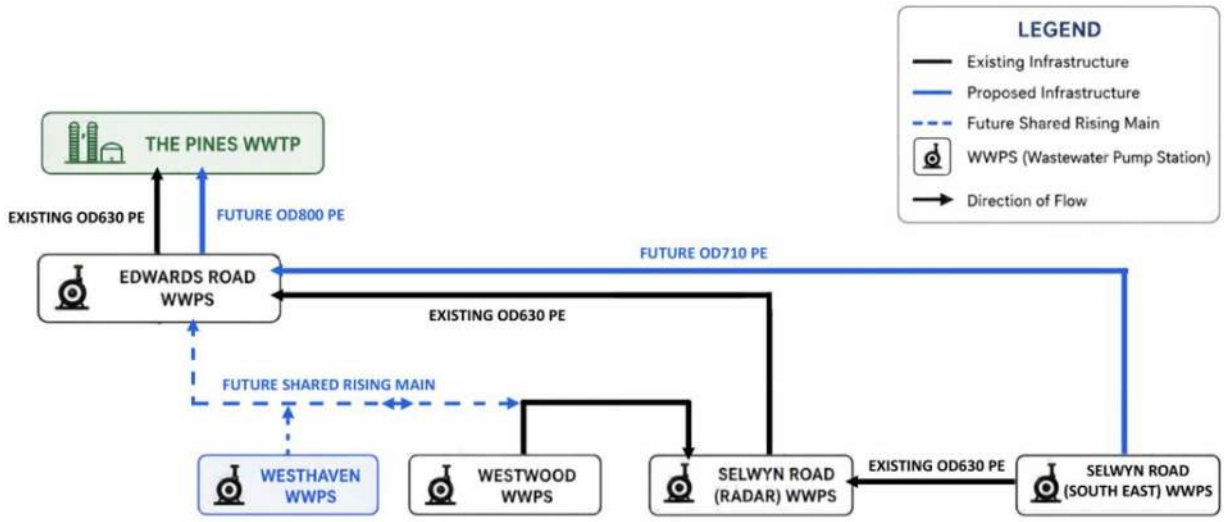
hydraulics, odour control and operational requirements will be confirmed through detailed design and Engineering Approval.

7.6.2 Westhaven Wastewater Pump Station

A new Westhaven Wastewater Pump Station (Westhaven WWPS) is proposed to service the southern Westhaven blocks. The pump station is proposed to be located within the subdivision on the western side of the new intersection / entrance to the Skellerup South Block from Selwyn Road (currently shown as Lot 7803).

The Westhaven WWPS will collect wastewater flows from Brookside, Skellerup West and Skellerup South only. Stage 1 of Westhaven retains its approved wastewater servicing arrangement.

The Westhaven WWPS is proposed to discharge to the new Edwards Road WWPS that is due for completion in mid 2027. It is proposed that the Westhaven WWPS will discharge via a new rising main that will be shared with Westwood WWPS. This will allow for operational flexibility for both pump stations to discharge to Edwards Road directly, along with resilience where Westhaven can discharge back towards the Selwyn Road (Radar) WWPS if needed. This has been discussed with Selwyn Water.



The proposed configuration provides several network benefits including:

- Increased resilience through the provision of alternative pumping routes.
- Reduced reliance on a single rising main alignment.
- Improved operational flexibility during maintenance activities.
- Removal of the Westwood catchment from the Radar WWPS catchment under normal operating conditions.
- Increased available capacity within the Radar WWPS catchment for future Selwyn network growth.

The detailed design shall confirm the hydraulic performance of all operating scenarios and demonstrate the proposed network configuration can accommodate both normal and contingency operating conditions.

The proposed rising main would be installed in the northern berm of Selwyn Road, generally following the alignment of the existing OD630 rising main corridor. The indicative route is west along Selwyn Road, north along Edwards Road to discharge into the Edwards Road WWPS. The final alignment, pipe diameter, pressure class, easement requirements, corridor constraints, receiving point, and discharge arrangement will be confirmed with SDC and SWL during the next phase of design.

7.7 Downstream Network and Treatment Capacity Context

Selwyn District Council is progressing wider Eastern Selwyn Sewerage Scheme (ESSS) upgrades to address existing network constraints and provide for growth in Rolleston, Lincoln, Prebbleton, Darfield,

West Melton and the surrounding catchments. These works include the Edwards Road Wastewater Pump Station, which is currently being developed as a terminal pump station for the Rolleston, Lincoln and Prebbleton networks. The Edwards Road WWPS is understood to include allowance for future catchment connections, including Westhaven, and its commissioning is expected to provide additional capacity within the Selwyn Road / Radar Pump Station catchment.

Council is also updating its wastewater master plan to confirm the staging of infrastructure and the integration of the Selwyn Road, Westwood, Edwards Road and future Westhaven catchments within the wider ESSS. The proposed Holmes WWPS and Westhaven WWPS discharge arrangements will need to be confirmed through that master planning process, including confirmation of receiving infrastructure, staging, operational requirements and treatment capacity.

The Pines WWTP is also subject to planned upgrades. Current programme information identifies inlet works and septage receival upgrades, followed by further treatment and sludge digestion improvements to increase plant capacity, with later tertiary and solids treatment upgrades planned to support the long-term capacity target. The ability for the Holmes WWPS and Westhaven WWPS to discharge towards the Pines WWTP will be subject to confirmation of treatment capacity, pump station staging, rising main hydraulics and approval by SDC and SWL. Overall, it is understood through discussions with SWL that there is (or will be) capacity for Westhaven at the Pines WWTP with further details to be confirmed with SWL with regard to timing of stages and proposed upgrades at the Pines WWTP.

7.8 Pump Station Design Requirements

The Holmes WWPS and Westhaven WWPS will be designed during later design stages in accordance with SDC and SWL requirements. Design matters will include ultimate and interim catchment flows, wet well sizing, pump duty and standby capacity, emergency storage and resilience, odour and septicity management, access for operation and maintenance, telemetry and controls, rising main sizing, surge and transient effects, and confirmation of the downstream receiving arrangement.

7.8.1 Staged Pumping Arrangements

The Westhaven WWPS is proposed to adopt an ultimate triplex arrangement comprising duty, assist and standby pumps. Initial development stages may be served by a smaller duplex pump arrangement, with pumps upgraded as the contributing catchment develops. The wet well, pipework, electrical infrastructure and control systems will accommodate the ultimate arrangement and staged pump upgrades.

7.8.2 Emergency Storage and Resilience

The Westhaven WWPS Basis of Design proposes approximately 60 m^3 of dedicated local emergency storage, excluding wet well and reticulation storage, supplemented by downstream storage at Edwards Road WWPS and network resilience measures. These measures include alternative discharge routing, mobile generator connection facilities and provision for temporary bypass pumping.

This arrangement represents a proposed departure from the SDC ECOP emergency-storage requirements. Detailed design will confirm the storage volumes, available downstream capacity and operation during equipment failure, power outages and network outages. The proposed departure will be subject to SWL acceptance.

Emergency storage and resilience provisions for the Holmes WWPS will be determined for its catchment loading, site conditions and discharge arrangement.

7.9 Detailed Design and Engineering Approval

The wastewater servicing strategy has been developed to meet SWL wastewater design requirements at a concept level and to support the substantive Fast-track application. The strategy will be confirmed and refined through subsequent design stages, including detailed design and Engineering Approval.

Further design will confirm the internal wastewater sub-catchments, staging interfaces, final design flows, gravity network long sections, pump station footprints, wet well levels, rising main alignments, pressure classes, receiving infrastructure, and treatment capacity requirements.

The wastewater design will be coordinated with the road layout, earthworks design, stormwater design, utility corridors and subdivision staging. The final servicing strategy will be subject to SDC and SWL review and acceptance.

8 Potable Water

8.1 Existing Reticulation

The Rolleston township reticulated water supply extends along Dunns Crossing Road, adjacent to the eastern boundary of the Westhaven development. This section of the network has recently been upgraded with new trunk mains that will form the primary supply to the development.

A new OD630 polyethylene (PE) trunk main has been installed in Dunns Crossing Road along the frontage of the Holmes Block. It steps down to an OD450 PE main between Brookside Road and Pierre Avenue. A new OD355 PE watermain branches from this trunk main and extends along Dunns Crossing Road from Pierre Avenue to Jed Way.

A DN200 uPVC watermain is also present on the opposite (eastern) side of Dunns Crossing Road. It serves the Arbor Green development and extends from Lucius Way at its southern end to Pierre Avenue at its northern end.

Other existing public water reticulation adjacent to the development site includes:

- a Ø110mm PE80 watermain on the opposite side of Burnham School Road, adjacent to the south-eastern boundary of the Holmes Block;
- a Ø100mm PVC-O watermain on the opposite side of Brookside Road, adjacent to the north-western boundary of the Brookside Block; and
- a Ø50mm PVC-U rider main on the near side of Brookside Road, adjacent to the north-western boundary of the Brookside Block. It changes to Ø63mm PE-MD approximately 150m south of the Dunns Crossing Road intersection.

The new trunk mains in Dunns Crossing Road provides capacity well beyond that of the smaller local mains. They are therefore expected to be the principal connection points for the development. The smaller mains in Burnham School Road and Brookside Road may provide supplementary connections to improve network resilience, subject to confirmation through modelling and detailed design.

8.2 Water Supply Modelling

One Water Modelling Limited has carried out hydraulic modelling of the water supply to the development using Autodesk InfoWorks WS Pro, based on Selwyn Water Limited's (SWL) Rolleston water supply model. The model was updated to reflect recently installed infrastructure, including:

- trunk-main upgrades in Dunns Crossing Road;
- reticulation installed within Stage 1 of Westhaven; and
- infrastructure installed as part of the Arbor Green development on the opposite side of Dunns Crossing Road.

The proposed subdivision layout was then added to the updated model. The modelling parameters, including demand allowances, peaking factors and minimum service pressures, were established with SWL for the assessment.

The modelling assessed the revised Westhaven water supply master plan within the Rolleston ultimate growth model and considered the effect of full Westhaven demand on existing sources. The ultimate growth model assumes that the necessary future sources and trunk mains have been provided.

The review concludes that the revised internal network is hydraulically sound, with refinements to pipe sizing and connection arrangements to balance pressure, head loss, velocity, firefighting supply and resilience.

The modelling confirms that residential firefighting demands can be met across the site in accordance with the New Zealand Fire Service Firefighting Water Supplies Code of Practice, SNZ PAS 4509:2008, under the modelled ultimate-network conditions. Commercial firefighting requirements will be confirmed through detailed design as the proposed uses and building designs are established.

Existing Rolleston sources cannot support full Westhaven demand under peak conditions. Planned additional wells at Izone and Helpet will provide interim capacity, with further source, storage and transfer-pumping investment required to support full development. The minimum-pressure shortfall identified in the Holmes Block relates to Izone transfer-pump capacity rather than the proposed internal pipe sizing. These findings will inform the staged servicing assessments and infrastructure delivery described in Section 8.4.

The modelling results, revised pipe sizing and recommended connection arrangements are presented in One Water Modelling Limited's *Westhaven Pipe Capacity Review* (project reference SWL004, dated 12 October 2026). The report is included in Appendix 3.

8.3 Existing Water Supply Wells

A new Council water supply bore has been drilled at 28 McLenaghan Drive. It is intended to provide additional supply capacity to the south-western parts of the Rolleston network. The existing irrigation bores on the site are too shallow to be suitable for community drinking water supply. They will be decommissioned as part of the subdivision works in accordance with Environment Canterbury requirements, and the associated water permits transferred or surrendered.

8.4 Detailed Design and Engineering Approval

The water supply servicing strategy has been developed at a concept level to meet Selwyn District Council and Selwyn Water design requirements and to support the Fast-Track consent application alongside Selwyn Water Ltd. The internal reticulation will be designed in accordance with the Selwyn District Council Engineering Code of Practice. Pipe sizing and connection points will be consistent with the OneWater Modelling outcomes. The strategy will be confirmed and refined through subsequent design stages, including detailed design and Engineering Approval.

Water demand will increase progressively as Westhaven is developed in stages. During detailed design and Engineering Approval, the demand and available servicing capacity for each stage will be confirmed with SWL, taking account of other committed growth in the Rolleston network. Any source, storage, pumping or trunk-main upgrades required to service a stage will be coordinated with its delivery and completed before that stage is connected.

One Water's recommendation to investigate a 2–3 ML reservoir and associated pumping at Holmes Block will be progressed with SWL during the next design phase. The preferred servicing solution, capacity, location and timing will be confirmed through that work. Opportunities for shared infrastructure and cost sharing with SWL and other developers may be explored where the works provide wider network benefits.

9 Power / Telecommunication

9.1 Existing Power Network

Existing 11 kV underground cables are located on the eastern side of Dunns Crossing Road and were installed as part of the Arbor Green development.

Existing overhead High Voltage (HV) lines run along the western side of Dunns Crossing Road adjoining the Westhaven frontage. These lines are understood to currently operate at 33 kV but are rated for 66 kV. Also, there are 11kV lines located just below the 33kV lines. They connect to Orion's new Burnham School Road zone substation, located near the Burnham School Road / Dunns Crossing Road intersection. The overhead 33kV (rated for 66kV) lines are to remain along Dunns Crossing Road with individual relocation of poles potentially required depending on final roading intersection locations. This will be managed via approvals from Orion and SDC. Furthermore, it is planned to underground the 11kV lines as part of the subdivision works.

Existing overhead Low Voltage (LV) lines run along Selwyn Road (only a small portion near Dunns Crossing Road), Edwards Road (from approximately 152 Edwards Road to the south), Brookside Road (southern side/development side) and Burnham School Road (southern side). These existing overhead LV lines are anticipated to be underground once development progresses where these lines are along the immediate frontage of the particular development stage. These will be coordinated with Orion.

Orion has confirmed that capacity is available within its network to service up to 5,300 dwellings. The required connections will be made available through alterations to the Orion network, including the planned network upgrades associated with the new Burnham School Road zone substation, new cabling, and any alternative feed arrangements required to meet Orion's network security requirements.

Refer to Appendix 6 for a record of Capacity Certificates.

9.2 Internal Power Network

Power will be provided to all allotments to utility company and industry standards. All network and reticulation cabling will be installed underground. Transformer kiosk sites will be located on separate titled lots at locations approved by Orion.

9.3 Lighting

Street lighting will be provided to roading and reserves in accordance with SDC engineering standards. The applicant will provide a streetlight plan consistent with other development in Rolleston at the detailed design phase.

9.4 Telecommunications

Telecommunications will be provided to all sites in the form of fibre optic network installed to utility company and industry standards. The existing fibre network in Dunns Crossing Road can be extended to the subject sites and distributed to individual allotments. All network and reticulation cabling will be installed underground.

Tuatahi Fibre have confirmed that a network distribution hub will be provided on Brookside Road and will provide sufficient capacity to service the entire development.

Refer to Appendix 6 for a record of Capacity Certificates.

10 Conclusion

Westhaven is suitable for the proposed residential development from a civil infrastructure perspective, subject to the design, mitigation and servicing requirements set out in this report. The required roading, stormwater, wastewater, potable water, power and telecommunications infrastructure can be provided through new works and upgrades to existing networks.

The principal requirements include managing flood flows and shallow groundwater (within the south near Selwyn Road), remediating localised soil contamination, and confirming the final wastewater servicing arrangements, including downstream network and treatment capacity. The final infrastructure arrangements will be confirmed through detailed design, coordination with SDC and SWL, and Engineering Approval. Development staging will be coordinated with infrastructure delivery and confirmation of adequate servicing capacity.

With the mitigation measures and servicing requirements identified in this report implemented, no adverse civil infrastructure impacts have been identified that would be sufficiently significant to be out of proportion to the project's regional or national benefits for the purposes of section 85(3) of the Fast-track Approvals Act 2024.

Appendix 1 Engineering Drawings

Provided as a separate volume.

Appendix 2 Stormwater Management Report

STORMWATER MANAGEMENT PLAN

Westhaven Residential Development

Carter Group Ltd.

Version A



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Appendix 1 Site Infiltration Testing Report
Appendix 2 Stormwater Runoff Calculations

QUALITY ASSURANCE

PREPARED BY	Marlon Silva	Senior Civil Engineer		21/10/2026
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VERSION HISTORY

A	Marlon Silva		01/11/2026	Consent Issue

STATEMENT OF EXPERTISE

Marlon Silva, BSc (Civil Engineering), CPEng (No. 1158665), is a Chartered Professional Engineer with 13 years' experience in civil engineering in New Zealand and internationally. His CPEng practice field is Civil Engineering, with experience spanning the design and delivery of stormwater, wastewater, water supply, roading, earthworks and other civil infrastructure, particularly for residential subdivisions and land development. His experience includes civil design leadership, design review, hydrological and flood modelling, and coordination with councils, clients and other engineering disciplines.

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STATEMENT OF GENERAL REPORTING POLICIES

1) Our responsibility in connection with this report is limited to the person or party to whom the report is addressed and we disclaim all responsibility to any other party without reference to us.
2) This report has been prepared for the purpose stated in the report and may be relied upon for that purpose only. Assumptions made in the preparation of the report are as expressly stated in the report or set out below.
3) Where information has been supplied to us for the purpose of the report by another party, this information is believed to be reliable but we can accept no responsibility if this should prove not to be so.

1 Introduction

1.1 Purpose

Inovo Projects Ltd has been engaged by Carter Group Limited to prepare this Stormwater Management Plan in support of a substantive application for approvals under the Fast-track Approvals Act 2024 ('the Act' or 'FTAA'). Approvals are sought to facilitate the Rolleston West Residential Development (or otherwise known as 'Westhaven'). The project is a listed project within Schedule 2 of the FTAA.

The application provides for approximately 4,134 residential lots across the Holmes, Brookside, Skellerup, and Skellerup South Blocks, comprising 3,978 medium density lots and 5 high density lots, together with three commercial superlots. The development also includes 31 reserve lots and 21 road lots, along with associated service infrastructure to vest. The Holmes Block provides for 1,060 residential lots, comprising 1,058 medium density lots and 2 high density lots (anticipated to provide 48 residential units, as well as one commercial superlot. The Brookside, Skellerup, and Skellerup South Blocks, forming part of Westhaven Central and Westhaven South, provide for 2,923 residential lots, comprising 2,920 medium density lots and 3 high density lots (anticipated to provide 108 residential units), as well as two commercial superlots.

This report provides an assessment of the stormwater infrastructure required to support the wider Westhaven Residential Development. Detailed engineering design of infrastructure will be provided as part of the Engineering Approval process.

This assessment has been prepared in accordance with the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023. The authors have complied with that Code in preparing this report and confirm that the opinions expressed are within their respective areas of expertise, except where reliance has been placed on information or opinions provided by others.

2 Site Overview

2.1 Site Description

The site ('Westhaven') is located in west Rolleston and comprises four land areas referred to in this report as the Holmes Block, Brookside Block, Skellerup Block, and Skellerup South Block. For reference, Scheme Plan naming conventions used in the substantive application are provided in the Infrastructure Report. The site has an approximate area of 263ha, and the site extent is depicted in Figure 1 - Site Extent below.

The Holmes Block forms the northern part of Westhaven and is physically separate from the other three blocks. It is bounded by Dunns Crossing Road to the east, Burnham School Road to the south, private land to the west, and State Highway 1 (SH1) to the north.

Brookside, Skellerup, and Skellerup South form the southern part of Westhaven. These three blocks adjoin each other in sequence, with Brookside adjoining Skellerup to the north, and Skellerup adjoining Skellerup South to the south. Dunns Crossing Road forms the eastern frontage to these blocks, while Edwards Road, Brookside Road, Selwyn Road, and adjoining private land define the remaining external boundaries.

Stage 1 of Westhaven (RC265048) is located within the Skellerup Block and is currently under construction (as is shown by the lots and roads within the green block in Figure 1); this stage does not form a part of the substantive application. Skellerup West is the balance of the Skellerup Block (green block) outside Stage 1.

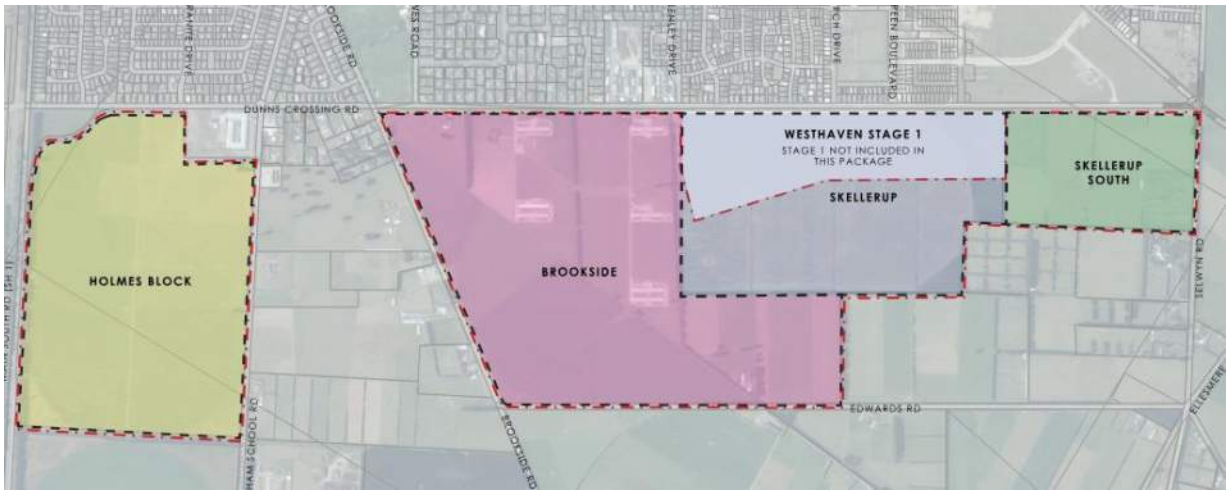


Figure 1 - Site Extent

The site is generally flat to gently undulating and is located approximately 2 km south-west of the Rolleston township centre. Existing land use within and around the development area comprises a mix of recently developed urban land, land currently under development, and rural land.

The development area interfaces with established and emerging urban development to the east, with rural land remaining around other parts of the wider site.

2.2 Neighbouring Developments

Farringdon - Arbor Green has been developed to the east of the site between Dunns Crossing Road and Goulds Road. This development was consented as part of the Covid 19 fast-track consent process and consists of a mixture of residential allotment typologies, along with a commercial area and a school site that is proposed to be a primary school.

2.3 Soil Contamination

EHS Support New Zealand Ltd prepared the *Detailed Site Investigation: Westhaven Residential Development Fast track Substantive Application*, reference NZL.07950, dated 23 October 2026. The investigation covered the Holmes Block and the Brookside Block, including 243 Dunns Crossing Road, 152 Edwards Road and Lot 1 DP 82068.

The investigation identified localised contamination at 243 Dunns Crossing Road and 152 Edwards Road, together with one isolated exceedance within the Holmes Block. No HAIL activities were identified over Lot 1 DP 82068. Test results identified localised concentrations of arsenic, cadmium, lead, total petroleum hydrocarbons and asbestos exceeded the applicable soil contaminant standards for residential land use. Heavy-metal concentrations above background levels were also identified in shallow soils associated with waste and offal pits, a burn pile and existing buildings.

The identified HAIL activities and contaminant concentrations mean that consent is required under the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 for subdivision, change of land use and the disturbance or removal of contaminated soil. Regional consents may also be required for construction-phase stormwater discharges and dewatering, and for operational discharges depending on the final contamination-management approach.

A Remedial Action Plan will be prepared before earthworks commence to define the required contamination-management and remediation measures. This will include the management of affected soil where proposed stormwater soakage infrastructure coincides with contaminated areas. The identified contamination is localised and will be addressed through targeted remediation. A Site Validation Report will be prepared following completion of the remediation works.

2.4 Geology and Soil Conditions

CMW Geosciences completed a geotechnical investigation and geohazard assessment for the development, reported in *Fast-track Substantive Application - Geotechnical Report, Dunns Crossing Road WESTHAVEN RESIDENTIAL DEVELOPMENT*, reference CHC2026-0005AC, Revision 1, dated 22 October 2026.

Published geological mapping indicates that the site is underlain by Late Pleistocene River alluvium comprising a variable mixture of gravel, sand, silt and clay. The investigations generally encountered between 0.15 m and 0.60 m of topsoil over medium-dense to very-dense sandy gravel. Isolated paleochannels contain loose or low-strength sandy silt and silty sand, locally extending to approximately 1 m below ground level.

CMW considers the site suitable for the proposed subdivision development, subject to the geotechnical recommendations provided in its report. The site is assessed as Site Subsoil Class D and generally suitable for TC1 foundation types, subject to site-specific confirmation.

2.5 Infiltration Testing

Stage 1 (RC265048) soakage testing was carried out during the design process and construction phase has confirmed good drainage characteristics within Stage 1 (RC265048) of Westhaven.

Separate infiltration testing has since been carried out for the Holmes Block and the southern Westhaven landholdings. This testing indicates that the assessed test locations are suitable for infiltration-based stormwater disposal, with most test pits exceeding the project-specific target rate of 3 m/hr, informed by the adjacent Stage 1 (RC265048) works.

The test results confirm local variability in infiltration performance, with deeper excavation required at some locations to encounter more permeable material. This variability is typical of alluvial gravel environments and will be allowed for in design, and more specific location testing will be carried out once the layout and sizing for the soak pits have been identified in the detailed design phase. Where soakage is found to be below the project adopted target rate, soakage still remains achievable subject to appropriate device sizing and storage allowance.

Detailed design will confirm adopted infiltration rates, founding depths, storage requirements, and appropriate safety factors for each stormwater management area. Where lower infiltration rates are confirmed, soakage devices will be sized accordingly or supplemented by alternative stormwater measures where required.

Refer to Appendix 1 for the Site Infiltration Testing Report.

2.6 Groundwater

2.6.1 Active Drinking Water Wells

Refer to Table 1 for drinking water wells within 50m surrounding the development (Figure 2). Wells and associated data sourced from Environment Canterbury Well Database.

Table 1 - Nearby Active Drinking Wells

Well Number	Use	Depth (of well meters)	Distance to Boundary
M36/7538	Domestic supply	41	42
M36/3946	Domestic supply	24	30
M36/7360	Domestic supply	152	29

During the detailed design of the development, special attention will be given to maintain adequate separation between groundwater discharges and the above well locations.

The development is not located within or in proximity of a Community Drinking Water Supply Protection Zone.



Figure 2 - Nearby Active Drinking Wells

2.6.2 Groundwater Modelling

Groundwater modelling and reporting has been completed by Pattle Delamore Partners Limited (PDP). This reporting is attached as part of this application – see *Westhaven Residential Development Fast-track Substantive Application – Groundwater Level Assessment* prepared by Pattle Delamore Partners Limited (PDP), reference C057550002R002, dated 22 October 2026.

The results indicate that highest predicted groundwater level is at the southernmost corner of site near Selwyn Road at depth of approximately 1.5m below existing ground level. The depth to groundwater is shown to increase towards the north and west. See extract from PDP report showing depth from existing ground to highest groundwater.

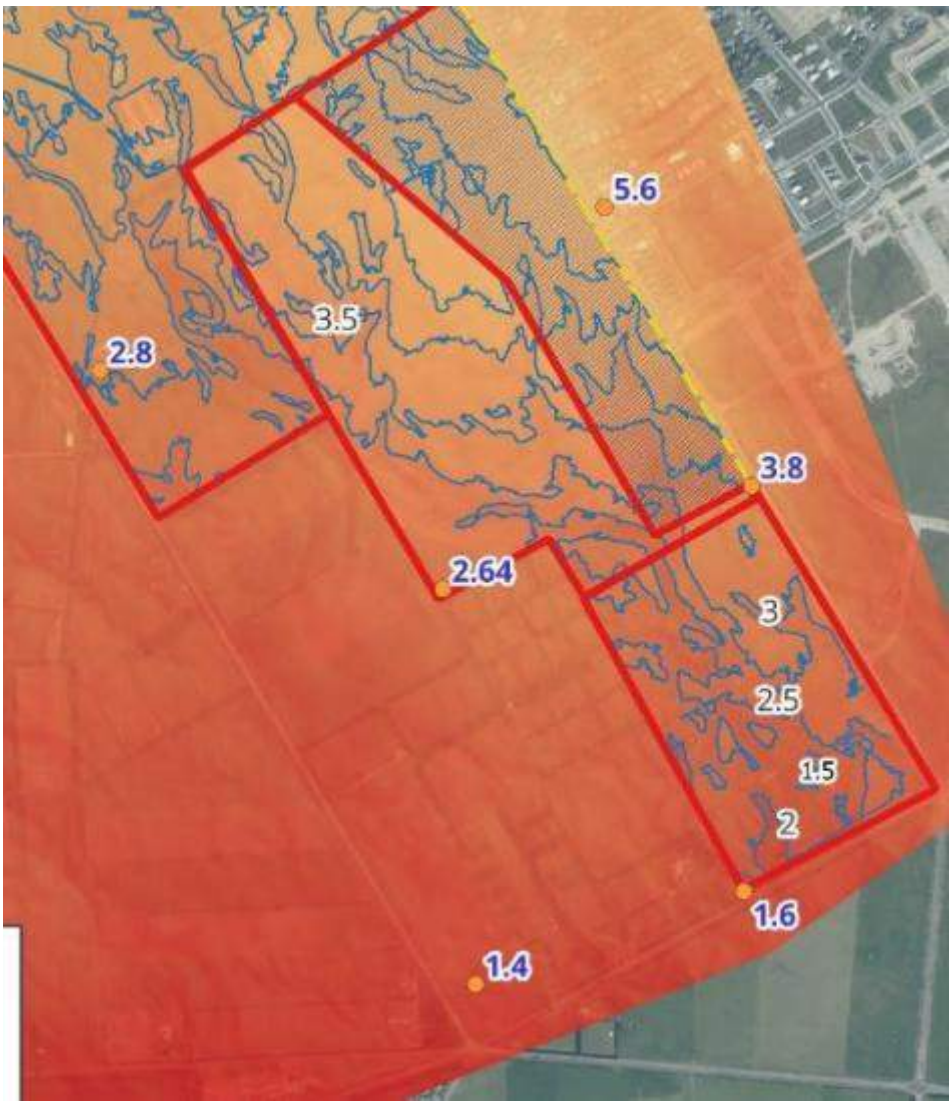


Figure 3 - Latest PDP Groundwater Modelling: Depth to Highest Groundwater (m)

3 Existing Stormwater Management

Discharge of stormwater to ground is common practice in the Rolleston area due to free-draining nature of the underlying gravels. As such, Rolleston has little stormwater reticulation network as most stormwater is discharged directly to ground via soakage pits and swales. Recent subdivisions to the north and east such as Farringdon & Arbor Green have utilised soakage to ground for stormwater management.

3.1 Water Races

A continuous water race alignment associated with the Paparua Water Race scheme passes through or adjacent to parts of the wider Westhaven landholdings. The channel is identified by different local section names as it passes through the development area: Main South Water Race through Holmes, Edwards Water Race through Brookside, and Selwyn Water Race through Skellerup South.

Within the Holmes Block, the Main South Water Race crosses the western side of the block, entering near the north-western corner and exiting the western boundary approximately midway along the site.

Within the southern Westhaven landholdings, the Edwards Water Race enters the Brookside Block at the north-western corner and traverses the block toward the Skellerup Block. The channel then continues through adjoining private land along the south-western side of the Skellerup Block before reaching the Skellerup South Block as the Selwyn Water Race. Within Skellerup South, the channel initially follows part of the western boundary before turning into the block, passing the existing internal pond, then continuing south through the central part of the block. The mapped Paparua Water Race scheme alignment terminates within Skellerup South and does not extend to Selwyn Road.

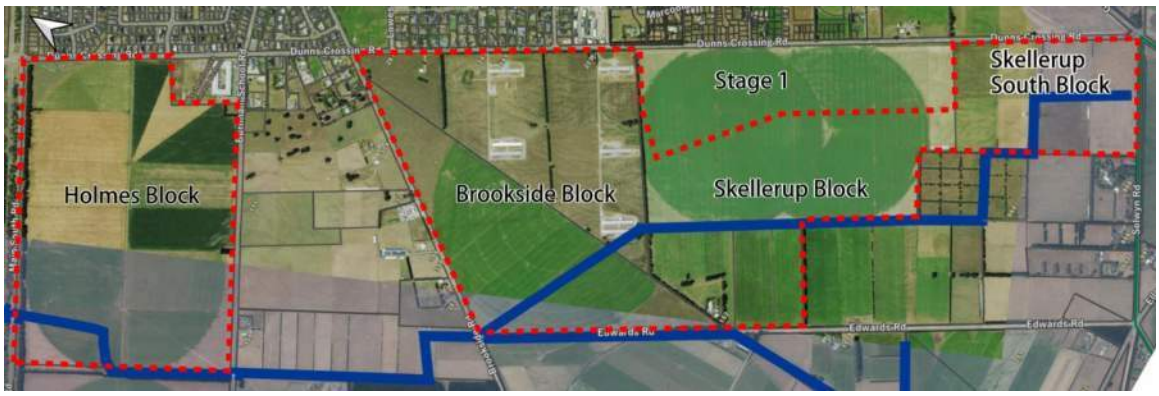


Figure 4 - Existing Water Race

3.1.1 Proposed Water Race Realignment and Closure

Approximately 1 km of the Main South Water Race within proximity of the Holmes Block is proposed to be retained, including the realignment of approximately 500 m of its upper reach located within the Holmes Block to accommodate the proposed development. Approximately 2.8 km of the downstream terminal reach within the southern Westhaven landholdings (Brookside Block) is proposed to be closed and infilled. The proposed closure would also discontinue flow through the intervening section of water race that crosses the adjoining property before re-entering the Westhaven landholdings at Skellerup South.

The Aquatic Ecology Assessment, prepared by Stantec, addresses the aquatic ecological values of the water race and the effects and associated management requirements arising from its proposed realignment and closure. The assessment records no known users of the terminal reach.

The closure of the race is a matter for Selwyn District Council as the water-race asset owner and will be resolved directly with Council under its water-race closure process. Any closure and termination arrangements agreed with Council will be incorporated into the detailed design. Once Council approval has been obtained, the Brookside reach of the Paparua Water Race will be closed at the upstream fork

before any works commence within or immediately adjacent to the downstream channel. This will ensure that the channel is dry during construction.

The Assessment of Ecological Effects on Wetland and Terrestrial Values, prepared by PDP, addresses the potential effects of the proposed works on wetland and terrestrial ecological values. Refer to these specialist reports for the detailed ecological assessments and recommended management measures.

3.2 Flood Risk

The Westhaven landholdings are subject to overland flooding from the upstream catchment, with flows generally passing through the site from north to south along existing channels and local depressions.

PDP has assessed pre- and post-development flood behaviour using Selwyn District Council's district-wide flood model, with the 0.5% AEP event as the primary assessment event. The assessment has informed the civil design, including site levels, overland flow paths and measures to manage flood effects on neighbouring land.

Further detail is provided in *Westhaven Residential Development, Rolleston – Flood Assessment*, prepared by Pattle Delamore Partners Limited (PDP), reference C057550005R001, dated October 2026.

4 Proposed Stormwater Management

This section outlines the proposed subdivision stormwater management and mitigation strategy in accordance with the Selwyn District Council Engineering Code of Practice (SDC ECOP) and Christchurch City Council Waterways, Wetlands and Drainage Guide (CCC WWDG) and the New Zealand Building Code (NZBC) (where applied to lot soakage). Key elements include:

- Primary piped reticulation and stormwater capture
- Soakage design
- Lot level stormwater requirements
- Secondary overland flow paths (OLFPs)

Provided groundwater reporting indicates that the application site has suitable separation between ground level and groundwater for discharge to ground by soakage-based stormwater disposal systems.

At the southern-most end of site where groundwater is highest, soakpits may need to be more frequent or modified to be larger and elongated to maintain a minimum vertical separation of 1m is between the base of the stormwater disposal devices and the highest predicted groundwater level. This will only be for a relatively small area of site where highest groundwater is less than 2.3m below finished ground level.

4.1 General Design Requirements

4.1.1 Lot Level Stormwater Management (Private Responsibility)

In all development areas, including the Skellerup South Block, allotments will be required to control their stormwater runoff and to contain it within the site for all stormwater events up to and including the 1 hour, 10% AEP rainfall event, in accordance with the New Zealand Building Code. This is expected to be achieved by:

- Roof water directed to soak pits, designed per *Verification Method E1/VM1 NZBC Clause E1 Surface Water,*
- Driveway / hardstand areas runoff to be captured via strip drains at driveways in accordance with SDC standards
- Landscape / garden areas soak into ground.

To model the effects of the lot level soak pits in our stormwater calculations, they will be sized to fully retain and dispose of runoff from the 10% AEP, 1-hour storm event. As a result, no runoff from residential lots is discharged to the public stormwater system for events up to and including this design storm. This approach also provides effective mitigation for longer-duration, lower-intensity rainfall events, such as the 2% AEP, 48-hour storm, where infiltration capacity is not exceeded. For the Skellerup South Block lot soak pits (1.0 m effective depth, 6.0 m^2 base area), the concept calculations confirm that the 2% AEP, 48-hour storm produces no overflow from the lot soak pits.

The responsibility for construction, operation, and ongoing maintenance of lot-level soakage systems rests with individual property owners and is typically addressed through the building consent process.

4.1.2 Public Stormwater System (Council-Vested Infrastructure)

The public stormwater system will be designed to manage runoff generated from roads, reserves, and other public impervious areas, as well as overflow from residential lots during larger storm events once on-site soakage capacity is exceeded.

This system comprises public sumps, pipelines and communal soakage infrastructure, together with any treatment or containment measures required by the applicable stormwater discharge consent. These components collectively provide for the conveyance, treatment and disposal of stormwater during higher-intensity and extreme rainfall events. The public system will be sized so that post-development peak discharge from the whole site, including overflow from residential lots, does not

exceed the pre-development discharge rate for storm events up to and including the 1% AEP critical-duration event.

Upon vesting, the public stormwater network will become the responsibility of Selwyn District Council for ongoing operation and maintenance.

4.2 Proposed Stormwater Reticulation Design

4.2.1 Stormwater Runoff

Stormwater runoff for the proposed subdivision has been assessed using the flood modelling carried out by PDP and used to inform the surface design through an iterative process. The individual sub-catchments are then delineated based on the proposed post-development land contours.

The Rational Method can then be used in the Detailed Design phase for the individual sub-catchments. A composite runoff coefficient for each catchment, accounting for the proportion of impervious and pervious surfaces within the contributing areas will then be calculated. Runoff coefficients will be adopted in accordance with the Christchurch City Council Waterways, Wetlands and Drainage Guide (CCC WWDG), which provides a widely accepted basis for stormwater design in the Selwyn District.

4.2.1.1 Holmes, Brookside and Skellerup West

Available infiltration testing and groundwater information indicate that conditions across site are broadly comparable with surrounding areas. These areas will therefore adopt the same general stormwater management approach described in Sections 4.1.1 and 4.1.2. The Skellerup South Block adopts the same lot and public soak pit principles but with modified roadside soak pit geometry, and is addressed separately in the next section due to its higher predicted groundwater levels.

For Stage 1 (RC265048), a representative residential soak pit was sized to retain and dispose of runoff from the 10% AEP, 1-hour storm event, assuming 80% impervious coverage and 20% landscaping. The required storage was then scaled in proportion to individual lot area. For modelling purposes, residential lots were therefore assumed to make no effective contribution to the public stormwater system during this event or during longer-duration, lower-intensity events, such as the 2% AEP, 48-hour event, where infiltration capacity is not exceeded. For the Skellerup South Block lot soak pits (1.0 m effective depth, 6.0 m^2 base area), the concept calculations confirm that the 2% AEP, 48-hour storm produces no overflow from the lot soak pits. For larger events, the public reticulation and communal soakage systems will accommodate progressive overflow from the lot-level systems and limit whole-site post-development peak discharges to pre-development rates for events up to and including the 1% AEP critical-duration event.

The Stage 1 (RC265048) stormwater calculations are included in Appendix 2 and demonstrate the methodology proposed for these areas. Stage-specific calculations will be completed during detailed design to confirm the adopted infiltration rates, lot-level soakage volumes, public reticulation capacity and communal soakage requirements using the final subdivision layout and earthworks design.

4.2.1.2 Skellerup South Block

Due to the predicted shallower groundwater conditions, conventional deep soak pits cannot achieve the required groundwater separation within part of the Skellerup South Block. Stormwater in this area will instead be disposed of to ground through lot-level soak pits and a network of relatively shallow and more frequent roadside soak pits, arranged as follows:

- Lot soak pits: private lot soak pits will be sized to retain and dispose of runoff from the lots for storms up to and including the 10% AEP event, consistent with Section 4.1.1. For concept design, lot soak pits are assumed to have a 1.0m effective depth and a 6.0 m^2 base area, which maintains the minimum 1.0m separation from the highest groundwater level. The 1.0 m deep lot soak pits apply only within the Skellerup South Block; lot soak pits in the other development areas follow the Stage 1 (RC265048) design.
    - Roadside soak pits: runoff from roads, berms, footpaths and reserves, together with overflow from the lot soak pits in storms larger than the lot soak pit design event, will be collected by

sumps and conveyed to a network of roadside soak pits. The roadside soak pits will be designed to manage all storm events up to and including the 1% AEP event, such that post-development discharge from the area does not exceed pre-development levels.

The earthworks design for this area will be raised so that the minimum depth to the predicted highest groundwater level beneath the road sides is not less than approximately 2.3m below finished ground level. Allowing for approximately 0.3m of cover over the pits and a minimum 1.0m separation between the base of the pits and the highest groundwater level, the roadside soak pits will be relatively shallow, with an effective infiltration depth of approximately 1.0m. Because only the base area of each pit is relied on for infiltration, the required capacity will be provided by increasing pit length rather than depth, within fixed pit widths and a practical maximum pit length of 30m. Pit lengths, locations and spacing will be confirmed during detailed design alongside the road layout, vehicle crossings and services, and the pits will be positioned to remain accessible for inspection and maintenance.

Concept calculations for the roadside soak pits have been prepared using the same methodology as Stage 1 (RC265048), adopting a design infiltration rate of 1,000 mm/hr, a 38% void ratio for clean cobble fill, roadside soak pits with a 1.0 m effective depth, and lot soak pits with a 1.0 m effective depth and 6.0 m^2 base area sized for the 10% AEP event. Detailed calculations will be completed during the next phase of design to confirm the design runoff from the catchment and the sizing of the roadside soak pits using the final subdivision layout and groundwater levels. Residential allotments will be modelled assuming 80% impervious coverage, with the remaining 20% comprising landscaped areas.

4.2.2 Discharge to Ground via Soak Pits

The site infiltration testing results are summarised in Section 2.5, with the Site Infiltration Testing Report included in Appendix 1. For concept design, a safety factor of three has been applied to the project target infiltration rate of 3,000 mm/hr, giving an adopted design rate of 1,000 mm/hr. Location-specific design rates will be confirmed during detailed design as outlined in Section 2.5. Available storage within the soakage devices will be calculated using clean 100 mm to 150 mm cobbles with an adopted void space of 38%.

Soakage devices must extend into the free-draining sandy gravel layers. A suitably qualified engineer will verify the founding material during construction, supported by on-site infiltration testing where required. At completion, a construction review statement will confirm that the devices were constructed in accordance with the design basis.

Effects of stormwater discharge on underlying groundwater are expected to be minimal where suitable treatment, attenuation and groundwater separation are provided. Stage 1 (RC265048) is subject to separate regional stormwater discharge consents and is excluded from the Fast-track application. Construction- and operational-phase stormwater discharge consents for the balance of the Westhaven development will be sought through the Fast-track application.

The proposed discharge-to-ground methodology is generally consistent with the approach adopted for Stage 1 (RC265048) and was discussed with Environment Canterbury during pre-application consultation. No concerns with the general approach were raised at that stage. Any consents associated with public stormwater systems that are to vest in Council will be transferred to Selwyn District Council as required.

4.2.3 Sump Sizing

All sumps will comprise double-sump arrangements, with adopted combined inlet capacities of 40 L/s at in-line locations and 80 L/s at valley or sag locations. The two sump chambers will be interconnected by a DN225 pipe, with the downstream chamber incorporating a silt trap below the outlet invert to collect coarse sediment. Final sump locations, spacing and contributing catchments will be confirmed during detailed design.

4.3 Flood Management & Overland Flow

Flood management will be provided through an integrated primary and secondary drainage system. The primary system will manage runoff from frequent rainfall events through lot-level soakage, road drainage, public reticulation, attenuation and communal disposal infrastructure. When the capacity of

the primary system is exceeded, or an inlet or pipe is obstructed, excess runoff will be conveyed along defined secondary overland flow paths within roads, reserves and other public corridors.

Finished lot levels and road grading will direct runoff away from building platforms and towards the defined road reserve, swales and drainage network. Overland flow paths and local low points will be designed to maintain acceptable flow depths and velocities, with erosion, energy-dissipation and scour protection provided where required. Minimum finished floor levels will incorporate the Council-required freeboard above the modelled 0.5% AEP flood level, including the applicable climate-change allowance.

PDP's flood assessment, referenced in Section 3.2, has informed the proposed earthworks, road and reserve levels, overland flow paths and flood mitigation measures. The final design will confirm minimum finished floor levels and the measures required to maintain continuity of existing catchment flow paths and avoid increased flood risk on neighbouring land.

As part of the Engineering Approval process, detailed hydraulic design will confirm the capacity and continuity of the primary and secondary drainage systems, including safe overland flow routes. The Westhaven stormwater and flood-management system will be designed to operate independently of the proposed upstream stormwater basins associated with the Dunns Crossing Road and State Highway 1 roundabout.

5 Stormwater Treatment and Water Quality

5.1 Stormwater Treatment Process

The stormwater strategy for all development areas is based on disposal to ground for events up to the adopted design event. The treatment and disposal arrangements vary according to the local groundwater conditions.

Stormwater runoff from road reserves will be collected by public sumps fitted with macro-pollutant traps (MPTs), which will provide primary treatment by capturing gross pollutants and coarse sediment. Submerged or trapped sump outlets, including provision for hydrocarbon containment, will be provided where required by the applicable stormwater discharge consent. The final sump configuration and containment requirements will be confirmed during detailed design.

Within all development areas, including the Skellerup South Block, stormwater will be disposed to ground through distributed lot-level and public soakage pits. Road runoff will be conveyed to the public soakage pits following the required upstream treatment. The soakage pits will primarily provide temporary storage and disposal to the underlying gravels, with further informal attenuation occurring within the soakage system and unsaturated ground beneath the devices, as described in Section 5.4.

Within the Skellerup South Block, where groundwater is shallower, the public soakage pits will be relatively shallow, elongated roadside pits sized to maintain the minimum 1.0 m separation from groundwater, as described in Section 4.2.1. Runoff from roads and other public areas, together with overflow from the lot soak pits in larger storms, will be collected by sumps fitted with macro-pollutant traps before discharge to the roadside soak pits.

5.2 Stormwater Contaminants Overview

The proposed development will change the existing rural land to predominantly residential urban land use, together with associated roads, reserves and commercial areas. Stormwater runoff is expected to contain contaminants typical of urban catchments, including suspended sediment, organic matter, metals, hydrocarbons, litter and pathogens. Potential sources include vehicles and road surfaces, building materials, landscaped areas and animal activity. The potential contaminants and their principal sources are summarised in Table 3 below.

Table 2 - Stormwater Contaminants Overview

Suspended Sediments	63 μ m or smaller in grain size derived from soil, organic particles, and breakdown products of the built environment entrained in stormwater flow. Larger soil particles above silt sized are also contaminants but typically exhibit different physical characteristics and settle much more quickly and therefore cause less environmental damage.
Oxygen-demanding substances	Such as soil organic matter and plant detritus which reduce the oxygen content of water when they are broken down by chemical action and by bacteria. Chemical oxygen demand (COD), total organic carbon (TOC) and biochemical oxygen demand (BOD) are three measures of the consumption of oxygen in water.
Metals	In trace quantities such as zinc, lead, copper and chromium (mostly associated with vehicles and roads) that are carried in stormwater in both solid and dissolved forms. Elevated levels of metals cause public health issues and organisms avoid the affected habitat area (leading to a reduction in the number and diversity of fauna). Extreme levels can be carcinogenic and mutagenic. Metals are persistent and do not decompose.
Hydrocarbons and oils	Usually associated with vehicle use. They may be in the form of a free slick, oil droplets, an emulsion or adsorbed to sediments.

Litter	In stormwater (often referred to as "gross pollution") often has a high visual and amenity impact, but only limited effect on public health and ecological standards.
Pathogens	Pathogens comprise a range of organisms such as bacteria, most commonly E-Coli as a result of bird and animal life.

5.3 Expected Contaminant Concentrations

The expected contaminant discharge from modern residential subdivisions has been summarised in Table 4. The information has been sourced from a study titled *"Stormwater Quality – An Analysis of Runoff from Modern Subdivisions and The Implications for Stormwater Treatment" (Modern Subdivisions, Brough et al),* with the values shown being the 75th percentile. The study separates dissolved and particulate copper, lead, and zinc into percentages as per Table 5.

E. coli samples can be highly variable depending on the location of the samples (i.e. distance to parks) and the land use type. The *Modern Subdivisions* study provided a limited analysis of E. coli concentrations, with results showing only very minor differences between pre and post 2000 subdivisions. Reported E. coli concentrations ranged between 2 to 145 MPN/100ml.

It is anticipated that E. coli concentration levels will be at the lower end of the range reported in the *Modern Subdivisions* study due to the site not containing any surface water bodies that would attract bird or animal life. Additionally, there are no nearby surface water bodies that may cause an influx of bird life into the contributing stormwater catchments. Based on this, an E. coli concentration value of 97 cfu/100ml has been used. Note that this value aligns with measurements from pre- 2000 subdivisions within the Christchurch area, as described in *Modern Subdivisions*.

The *Modern Subdivisions* report does not provide a recommended value for hydrocarbon concentrations. Therefore, these values have been sourced from the WWDG Chapter 6 Table 6-3.

Table 3 - Expected Discharge from Modern Residential Subdivisions

Contaminant	Contaminant Concentration (values from *Modern Subdivisions, Brough et al*)
Total Suspended Solids (g/m^3)	70
Particulate Copper (g/m^3)	0.0036
Dissolved Copper (g/m^3)	0.0034
Particulate Zinc (g/m^3)	0.058
Dissolved Zinc (g/m^3)	0.022
Particulate Lead (g/m^3)	0.00384
Dissolved Lead (g/m^3)	0.00016
Total Nitrogen (g/m^3)	1.0
Hydrocarbons (g/m^3)	0.5 [1]
E. coli (MPN/100ml)	97 [2]

[1] *Value referenced from WWDG Chapter 6 Table 6-3*

[2] *Value based on assumptions*

Table 4 - Dissolved vs Particulate Form: Modern Subdivisions

Metal	Particulate	Dissolved
Copper	51%	49%
Lead	96%	4%
Zinc	73%	27%

5.4 Soakage Devices and Groundwater Separation

Runoff from road reserves will receive the applicable upstream treatment described in Section 5.1 before being discharged to the relevant soakage device. The soakage pits provide temporary storage and discharge to the underlying gravels. The aggregate fill provides storage, while the surrounding geotextile may also retain suspended material.

Following discharge from the soakage devices, the unsaturated ground between the base of the device and the groundwater table provides further informal attenuation. The extent of this attenuation will depend on the characteristics of the underlying materials, hydraulic loading and contaminants present.

The Stage 1A (RC265048) Detailed Design Report records that, during the consenting process for the adjacent Arbor Green development, Environment Canterbury stated: *"There are no major concerns regarding the discharge of residential stormwater to ground (construction-phase or operational) and residential subdivision are generally considered low risk catchments. Nonetheless, it is good practice to provide for a sufficiently thick unsaturated zone to provide informal treatment of stormwater."*

Environment Canterbury required a minimum of 1.0 m of unsaturated ground between the base of the soakage devices and the highest expected groundwater level. The proposed stormwater strategy adopts the same minimum separation. Compliance will be confirmed for each stormwater management area during detailed design, having regard to the PDP groundwater assessment and the conditions of the Fast Track stormwater discharge consent.

5.5 Contaminant Removal – Land Use Change

As the land use of the site is changing from stock grazing/rural type activities to residential dwellings, it is expected that the typical sources of nitrogen (farm animals, effluent, nitrogen fertiliser, etc.) will no longer be present in high quantities. As such, nitrogen levels will align with the expected contaminant concentration of 1 g/m^3 as per Table 4. With the primary treatment devices in sumps and treatment through soakage pits, the total nitrogen concentrations in discharged stormwater are expected to be negligible.

5.6 Contaminant Removal – Hydrocarbons & Total Metals.

Total Petroleum Hydrocarbon (TPH) concentrations reported in the Brough et al. study were below detectable levels, indicating that hydrocarbon concentrations are generally low in typical residential stormwater. Potential sources within the development include minor vehicle leakage and accidental spills.

Submerged or trapped sump outlets, including provision for hydrocarbon containment, will be provided with silt traps where required by the applicable stormwater discharge consent. The silt traps will capture gross pollutants and settleable suspended sediment before runoff enters the stormwater reticulation.

A proportion of the hydrocarbons and metals present in road runoff is associated with suspended sediment. Capturing this sediment will therefore reduce particulate-bound hydrocarbons and metals before discharge to ground. Significant accidental spills will require a specific spill response and are not treated as routine stormwater runoff.

5.7 Contaminant Removal – E. coli Attenuation

E. coli, where present in post-development runoff, will be subject to attenuation as stormwater passes through the unsaturated ground beneath the stormwater disposal devices. Attenuation processes include filtration and straining, attachment to soil particles and air–water interfaces, and natural inactivation.

Banasiak et al. (2023)[1] investigated microbial transport through intact Canterbury Plains alluvial gravel under saturated and unsaturated flow conditions. The study found substantially greater E. coli attenuation under unsaturated conditions. These findings provide locally relevant support for maintaining a minimum 1.0 m of unsaturated ground between the base of each stormwater disposal device and the adopted design groundwater level as a measure to reduce microbial transport risk.

The same minimum separation was adopted for Westhaven Stage 1 (RC265048) and is required for the public soakage pits authorised under CRC270049. The wider Westhaven stormwater strategy will apply this established approach. As identified in Section 2.6.1, three active domestic-supply wells are located within 50 m of the development boundary. Detailed design will confirm the locations of stormwater disposal devices relative to these wells and compliance with the applicable stormwater discharge consent conditions.

5.8 Compliance with LWRP Schedule 8 Groundwater Limits

LWRP Rule 5.93 (Condition 3) requires that the discharge will not cause a limit in Schedule 8 to be exceeded. The Schedule 8 groundwater limits are: nitrate-nitrogen maximum less than 11.3 mg/L and annual average less than 5.65 mg/L; E. coli in 95% of samples less than 1 organism/100 mL; and other contaminants of health significance, any sample less than 50% of the Maximum Acceptable Value (MAV) in the New Zealand Drinking-water Standards.

Table 6 compares the Table 4 expected discharge concentrations with these limits. The Table 4 values are applied at the point of discharge, before treatment or attenuation, so the comparison is conservative for every contaminant other than E. coli. Total nitrogen is compared with nitrate-nitrogen, and the copper, lead and zinc values are the sum of the dissolved and particulate fractions.

Table 6 - Comparison of Expected Discharge Concentrations with LWRP Schedule 8 Groundwater Limits

Contaminant	Expected concentration (Table 4)	Schedule 8 groundwater limit	Outcome
Nitrate-nitrogen (as total nitrogen)	1.0 mg/L	Maximum 11.3 mg/L; annual average 5.65 mg/L	Below limits
E. coli	97 organisms/100 mL at the point of discharge	95% of samples less than 1 organism/100 mL in groundwater	Met in groundwater after attenuation
Copper (total)	0.0070 mg/L	Less than 50% of MAV (2 mg/L), i.e. 1 mg/L	Below limit
Lead (total)	0.0040 mg/L	Less than 50% of MAV (0.01 mg/L), i.e. 0.005 mg/L	Below limit
Zinc (total)	0.080 mg/L	No health-based MAV, so no numeric limit	No limit applies

Total lead is closest to its limit (80%) before any treatment. About 96% of lead is particulate (Table 5) and will be captured by the sump silt traps and filtered in the soakage pits and underlying gravels (Sections 5.1 and 5.6). The 97 organisms/100 mL E. coli value applies to runoff, not groundwater, so

[1] Banasiak, L.J. et al. (2023). Microbial and solute transport through intact vadose zone cores of heterogeneous alluvial gravel under variably saturated conditions. Vadose Zone Journal, 22, e20250.

meeting the limit relies on about 99% attenuation in the at least 1.0 m of unsaturated ground beneath the devices (Sections 5.4 and 5.7). Schedule 8 sets no limits for suspended solids or hydrocarbons; hydrocarbons were below detectable levels in the Modern Subdivisions study (Section 5.6).

Conclusion: the Schedule 8 groundwater limits will be met. Expected nitrogen, copper and lead concentrations are below the limits before any treatment, no numeric limit applies to zinc, and E. coli will be attenuated to below the limit by the minimum 1.0 m of unsaturated ground maintained beneath all soakage devices. Condition 3 of Rule 5.93 is therefore met.

6 Consenting

6.1 Legal Framework

Section 15 of the Resource Management Act covers the discharge of contaminants into the environment. These requirements are further articulated and operationalised under the rules in the Canterbury Land and Water Regional Plan (LWRP). As the discharge of stormwater to ground for this site does not comply with some of the rules in the LWRP, discharge consents are being sought from Environment Canterbury.

6.2 Consents Required

This report addresses the stormwater-related consents required for the development. The regional consents sought through the Fast-track application relating to stormwater are:

- discharge of construction-phase stormwater onto or into land (LWRP Rule 5.94B); and
- discharge of operational-phase stormwater from the reticulated stormwater system, including lot-level and public soakage devices, onto or into land (LWRP Rule 5.93).

Other regional consents associated with the development, including earthworks over an unconfined aquifer, construction dewatering and the removal of a natural inland wetland, are identified and assessed in the Assessment of Environmental Effects. At the completion of subdivision construction, the public stormwater network will vest in Selwyn District Council, and the consent holder responsibilities for the public system are proposed to transfer to Council.

6.3 Treatment Targets & Compliance with SDC Global Consent

6.3.1 Existing Rolleston and Stage 1 (RC265048) Consent Framework

Selwyn District Council holds CRC132527 for stormwater discharges within the Rolleston Stormwater Management Area. This provides the relevant Council consent framework for public stormwater assets within Rolleston, including infrastructure that may ultimately vest in Council. The consent arrangements applying to the proposed vested infrastructure will be confirmed with Selwyn District Council and Environment Canterbury through the detailed design and consenting process.

Construction-phase and operational stormwater discharges from Westhaven Stage 1 (RC265048) have been separately authorised under CRC263616 and CRC270049, respectively. The construction-phase consent requires stormwater discharges to be managed in accordance with an approved Erosion and Sediment Control Plan, including appropriate inspection, maintenance and spill-control measures. The operational consent provides for lot-level roof soakage and the collection of runoff from roads and other public impervious areas through sumps and reticulation before discharge to public soakage devices. The consented approach includes site-specific verification of infiltration rates, an appropriate design safety factor, minimum separation from groundwater, primary and secondary drainage capacity, engineering certification, and ongoing inspection and maintenance.

CRC263616 and CRC270049 apply only to Stage 1 (RC265048) and do not authorise stormwater discharges from the wider Westhaven landholdings.

The construction-phase and operational stormwater management frameworks approved for Stage 1 (RC265048) will form the basis for the wider Westhaven Residential Development. The same core principles will be applied where site conditions allow, with block-specific modifications incorporated where required, including the relatively shallow roadside soak pits proposed for the Skellerup South Block. Separate discharge approvals will be obtained through the Fast Track application, and the final requirements will be confirmed through detailed design and the conditions of those consents.

6.3.2 Groundwater Quality Management

The groundwater-quality management approach set out in this Stormwater Management Plan applies the same core principles accepted for Stage 1 (RC265048) under CRC270049. That consent was granted on the basis that the adverse environmental effects of the authorised discharges would be

minor. The consented framework manages groundwater quality through source controls, treatment before discharge, appropriately designed soakage systems, a minimum 1.0 m separation from groundwater, engineering certification, and ongoing inspection and maintenance.

The treatment measures described in Section 5 will reduce gross pollutants, suspended sediment, particulate-bound metals and hydrocarbons before stormwater is discharged to ground.

A minimum of 1.0 m of unsaturated ground will be maintained between the base of each stormwater disposal device and the adopted design groundwater level. This separation provides an additional groundwater-protection measure, including attenuation of potential microbial contaminants as described in Section 5.7.

As identified in Sections 2.6.1 and 5.7, the final disposal-device locations will be established with regard to the nearby domestic-supply wells and available groundwater-flow information. The inspection, maintenance and monitoring provisions set out in section 7 of this Stormwater Management Plan will be implemented to maintain treatment performance and updated where required to reflect the final detailed design and Fast Track consent conditions.

On this basis, the proposed treatment and management framework is considered appropriate to ensure that the effects of residential stormwater discharges on groundwater quality remain minor.

7 Operations and Maintenance

Regular inspection and maintenance of the stormwater network is essential to preserve its conveyance, treatment, storage and infiltration performance. Following vesting, Selwyn District Council will be responsible for operation and maintenance of public sumps, manholes, reticulation and the communal soak pits.

Private lot soakage systems will remain the responsibility of individual property owners. Maintenance records, including inspection dates, identified defects, completed works and disposal receipts, shall be retained. Sediment, litter, hydrocarbons and other material removed from treatment devices shall be disposed of at a facility authorised to receive that material. The minimum maintenance requirements in Table 7 are based on the SDC Stormwater Maintenance Schedule for CRC132527C; the maintenance schedule contained in the proposed Selwyn Global Consent shall also be followed where applicable.

Table 7 - Maintenance Requirements

Sumps and Manholes	
6 monthly	• Removal of hydrocarbons that are visible and form a layer greater than 5mm thick within 10 working days of the maintenance visit
Yearly	• Removal of sediment likely to adversely affect the operation of the system, within 10 working days of the maintenance visit
	• Removal of debris and litter likely to adversely affect the operation of the system within 10 working days of the maintenance visit

7.1 Public Sumps and Manholes

In addition to the frequencies in Table 7, sumps and manholes shall be inspected after significant storm events and whenever reduced performance is observed. Sediment shall be removed before it exceeds 25% of the storage volume below the outlet pipe, and visible hydrocarbon layers greater than 5 mm shall be removed. Submerged outlets, silt traps, macro-pollutant traps, grates, inlet and outlet pipes shall be checked and cleared so that design flow paths remain unobstructed. Defects that could affect hydraulic or treatment performance shall be repaired promptly.

7.2 Public Soak Pits

Roadside soak pits, including their inlet structures, covers, grilles, chambers and distribution pipework, shall be inspected for damage, blockage, sediment and debris. Covers and screens shall be maintained to prevent litter and floating debris entering the soak pits. Perforated distribution pipes shall be cleared where inspection or poor drawdown indicates restricted flow. Persistent ponding or reduced disposal performance after significant storms shall trigger further investigation, cleaning and, where necessary, rehabilitation of the affected soak pit or distribution system.

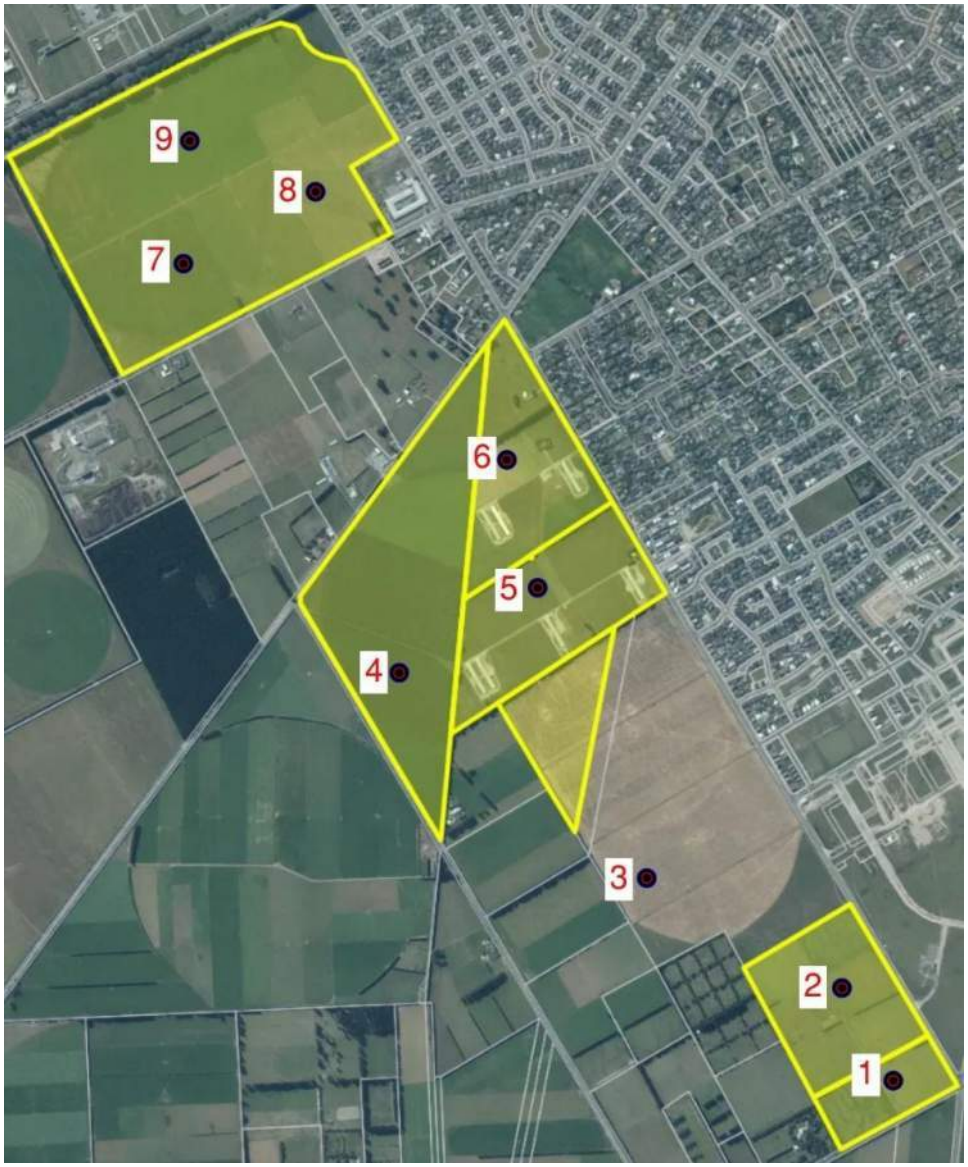
7.3 Kerb, Channel and Network Inspections

Kerb and channel, road drainage inlets and accessible sections of the reticulation network shall be inspected following significant storm events and otherwise as required to maintain function and appearance. Kerb and channel shall be swept regularly, and accumulated sediment, debris and litter shall be removed before it restricts flow or enters downstream treatment devices.

Appendix 1 Site Infiltration Testing Report

INFILTRATION TESTING

WESTHAVEN ROLLESTON



Test Pit Locations

QUALITY ASSURANCE

PREPARED BY	Angus Anderson	Graduate Civil Engineer	12/06/2026
REVIEWED BY	Ben Henry	Senior Civil Engineer	15/06/2026

1. Introduction

This report outlines the methodology and results of infiltration testing conducted across the planned future stages of the Westhaven Rolleston subdivision.

2. Infiltration Testing

Testing methodology

1. Test Pit Excavation
   A test pit was excavated at each proposed location.
   - Dimensions were typically 1.0 m × 1.5 m, with a target depth of 2.5–3.5 m.
   - The excavation was sized and battered as required to ensure stability and minimise the risk of sidewall collapse.
2. Pre-Soaking of Test Pit
   - As no rainfall greater than 5 mm had occurred within the preceding 24 hours, the base of the excavation was pre-soaked with 500 L of water.
   - The purpose of pre-soaking was to simulate antecedent moisture conditions and reduce the influence of soil suction on initial infiltration rates.
3. Soak Period
   - Once the water from the pre-soak had completely infiltrated into the ground, testing commenced.
4. Falling Head Infiltration Test
   - A falling head test was undertaken to determine the infiltration rate at the base of the excavation.
   - The rate of water level drawdown was measured over a period of 2 minutes, with the test pit base area recorded to enable calculation of the infiltration rate.
   - Where ponding could not be maintained due to extremely high soakage rates, the infiltration rate was determined based on the measured inflow rate required to maintain a constant head. For these tests, the pump rate was 41 m^3/hr.
   - Where the target infiltration rate of 3 m/hr was not achieved at the current depth, the excavation was advanced to the maximum target depth and retested. Pre-soaking was not required, as testing continued immediately following further excavation.

Results

TEST PIT 1

- Dimensions (W x L x D): 1.1 x 2.6 x 2.6 m, approximately 200 mm of topsoil.
- A water depth of 200 mm was achieved, which allowed a 1-minute falling head infiltration test to be conducted.
- The infiltration rate was calculated to be 12 m/hr.

TEST PIT 2

- Dimensions (W × L × D): 1.9 × 2.5 × 2.5 m, approximately 250 mm of topsoil.
- A sufficient water level for a falling head infiltration test was not achieved.
- Based on the flow rate from the water cart and the test pit base area, the infiltration rate was calculated to be 8.63 m/hr.

TEST PIT 3

- Dimensions (W × L × D): 1.0 × 2.0 × 2.6 m, approximately 200 mm of topsoil.
- Initial drainage was insufficient, so the excavation was advanced to a depth of 3.5 m.
- A falling head infiltration test was conducted over a 2-minute period, during which the water level dropped by 150 mm.
- The infiltration rate was calculated to be 4.5 m/hr.

TEST PIT 4

- Dimensions (W × L × D): 1.0 × 1.9 × 2.6 m, approximately 300 mm of topsoil.
- Initial drainage was insufficient, so the excavation was advanced to a depth of 3.5 m.
- A falling head infiltration test was conducted over a 2-minute period, during which the water level dropped by 30 mm.
- The infiltration rate was calculated to be 0.9 m/hr.
- It was determined that further excavation was unlikely to achieve an adequate infiltration rate.

TEST PIT 5

- Dimensions (W × L × D): 1.0 × 2.5 × 2.7 m, approximately 150 - 200 mm of topsoil.
- A falling head infiltration test was conducted over a 2-minute period, during which the water level dropped by 200 mm.
- The infiltration rate was calculated to be 6 m/hr.

TEST PIT 6

- Dimensions (W × L × D): 1.0 × 1.6 × 2.8 m, approximately 150 - 200 mm of topsoil.
- A sufficient water level for a falling head infiltration test was not achieved.
- Based on the flow rate from the water cart and the test pit base area, the infiltration rate was calculated to be 25.61 m/hr.

TEST PIT 7

- Dimensions (W × L × D): 1.1 × 2.2 × 3.4 m, approximately 250 mm of topsoil.
- A sufficient water level for a falling head infiltration test was not achieved.
- Based on the flow rate from the water cart and the test pit base area, the infiltration rate was calculated to be 17.74 m/hr.

TEST PIT 8

- Dimensions (W × L × D): 1.0 × 2.3 × 2.9 m, approximately 250 mm of topsoil.
- A falling head infiltration test was conducted over a 2-minute period, during which the water level dropped by 180 mm.
- The infiltration rate was calculated to be 5.4 m/hr.

TEST PIT 9

- Dimensions (W × L × D): 1.0 × 1.9 × 2.6 m, approximately 250 mm of topsoil.
- Initial drainage was insufficient, so the excavation was advanced to a depth of 3.5 m.
- A falling head infiltration test was conducted over a 2-minute period, during which the water level dropped by 160 mm.
- The infiltration rate was calculated to be 4.8 m/hr.

3. Conclusions and recommendations

Infiltration testing indicates that most of the assessed area is suitable for infiltration-based stormwater disposal, with measured infiltration rates generally ranging from 4.5 m/hr to 25.61 m/hr. Most test pits exceeded the project-specific target rate of 3 m/hr informed by adjacent Stage 1 works.

The results confirm local variability in infiltration performance, with deeper excavation required at some locations to encounter more permeable material. This variability is typical of alluvial gravel environments and should be allowed for in detailed design.

Test Pit 4, in Brookside Block, northwest of Stage 1, recorded the lowest measured infiltration rate, at 0.9 m/hr at 3.5 m depth. While this is below the target rate, soakage remains achievable subject to appropriate device sizing and storage allowance. This location should be reviewed further to confirm whether the result is representative or reflects localised ground conditions.

Detailed design should confirm adopted infiltration rates, founding depths, storage requirements, and appropriate safety factors for each stormwater management area. Where lower infiltration rates are confirmed, soakage devices should be sized accordingly or supplemented by alternative stormwater measures where required.

Project: Westhaven		Width of hole (m):	1.8
Client: Westhaven Rolleston Ltd		Length of hole (m):	2.3
Project Number: CHC2026-0005		Depth to gravel (mbgl):	0.4
Date: 18/9/2026		Depth to bottom of hole (mbgl):	2.6
Eng Name: Nathan Cash		Depth to groundwater (m):	4.7

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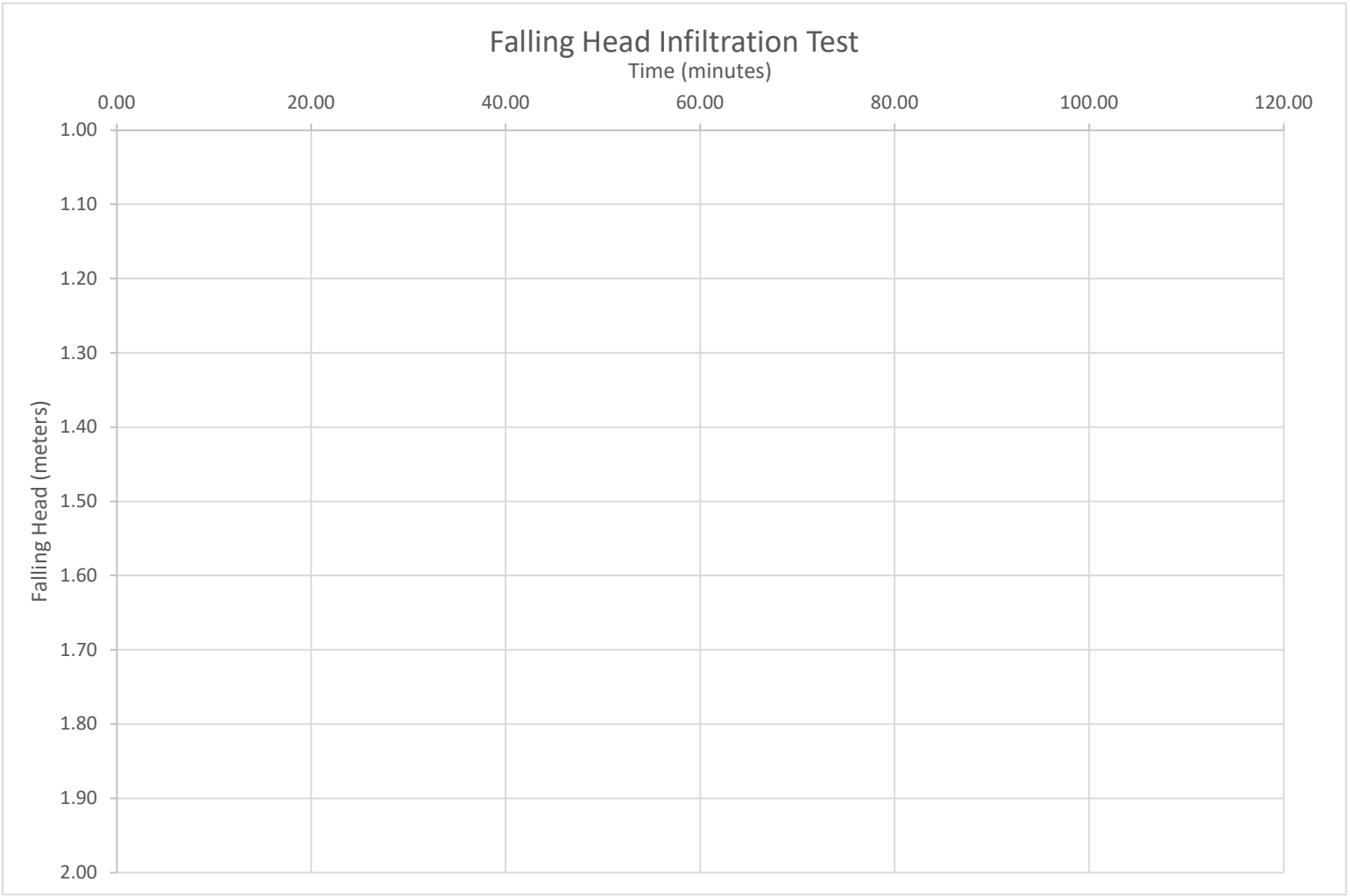
TP-101

Time (minutes)	Time (hours)	depth from top (m)

Unable to fill hole enough to test. Hose rate approximately 250L/minute. Calculated infiltration rate of >6000mm/hour expected

Average expected infiltration rate
6000 mm/hr
1.67E-03 m/s



Project: Westhaven	Width of hole (m):	1.5	
Client: Rolleston West Residential Ltd	Length of hole (m):	2	
Project Number: CHC2026-0005	Depth to gravel (mbgl):	0.4	
Date: 18/9/2026	Depth to bottom of hole (mbgl):	2.9	
Eng Name: Nathan Cash	Depth to groundwater (m):	4.7	

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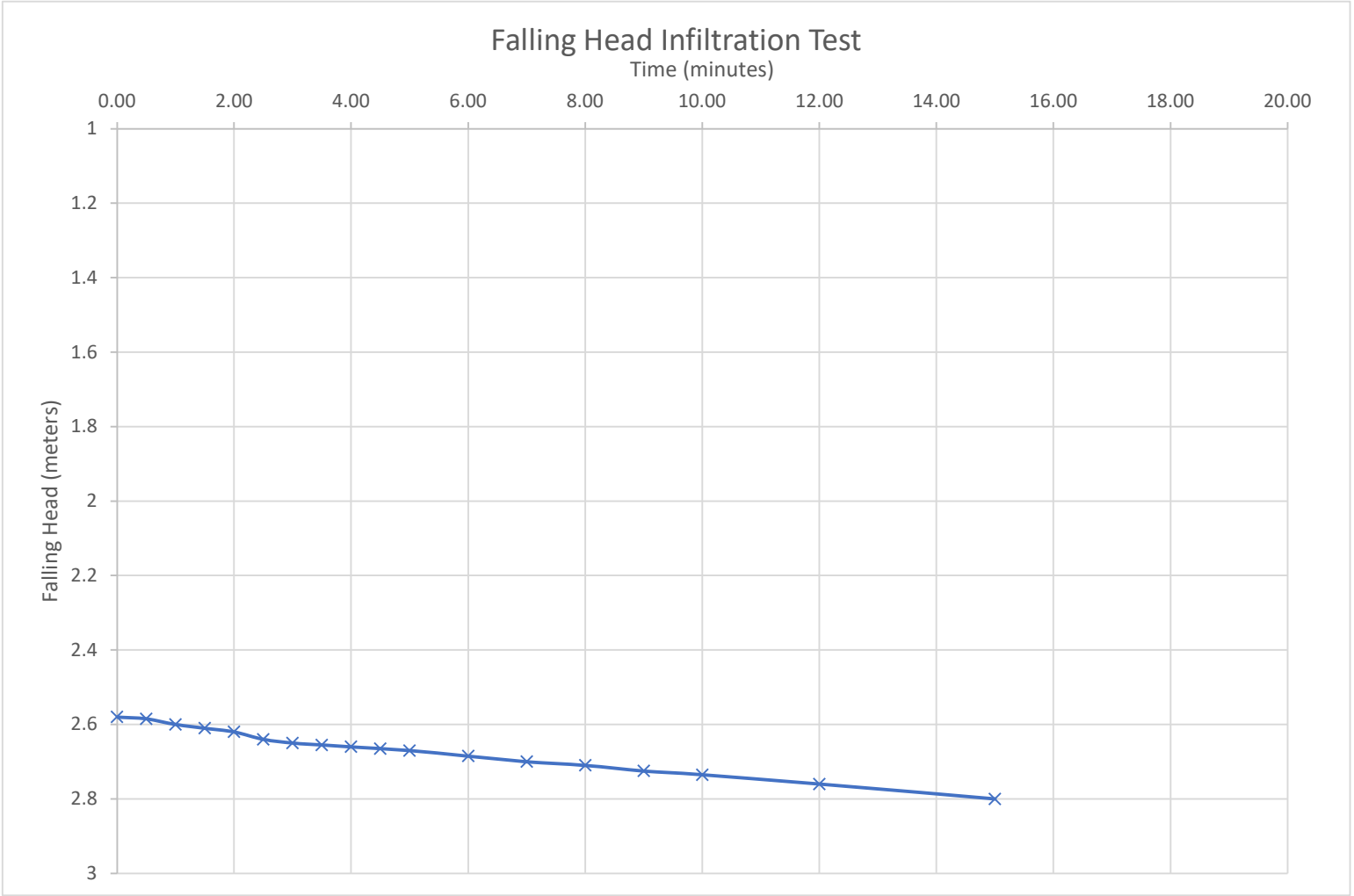
TP-102

Time (minutes)	Time (hours)	depth from top (m)
0.00	0.00	2.58
0.50	0.01	2.585
1.00	0.02	2.6
1.50	0.03	2.61
2.00	0.03	2.62
2.50	0.04	2.64
3.00	0.05	2.65
3.50	0.06	2.655
4.00	0.07	2.66
4.50	0.08	2.665
5.00	0.08	2.67
6.00	0.10	2.685
7.00	0.12	2.7
8.00	0.13	2.71
9.00	0.15	2.725
10.00	0.17	2.735
12.00	0.20	2.76
15.00	0.25	2.8

Average expected infiltration rate
699 mm/hr
1.94E-04 m/s



Project: Westhaven	Width of hole (m):	1.4	
Client: Westhaven Rolleston Ltd	Length of hole (m):	2.8	
Project Number: CHC2026-0005	Depth to gravel (mbgl):	0.25	
Date: 18/9/2026	Depth to bottom of hole (mbgl):	2.9	
Eng Name: Nathan Cash	Depth to groundwater (m):	4.5	

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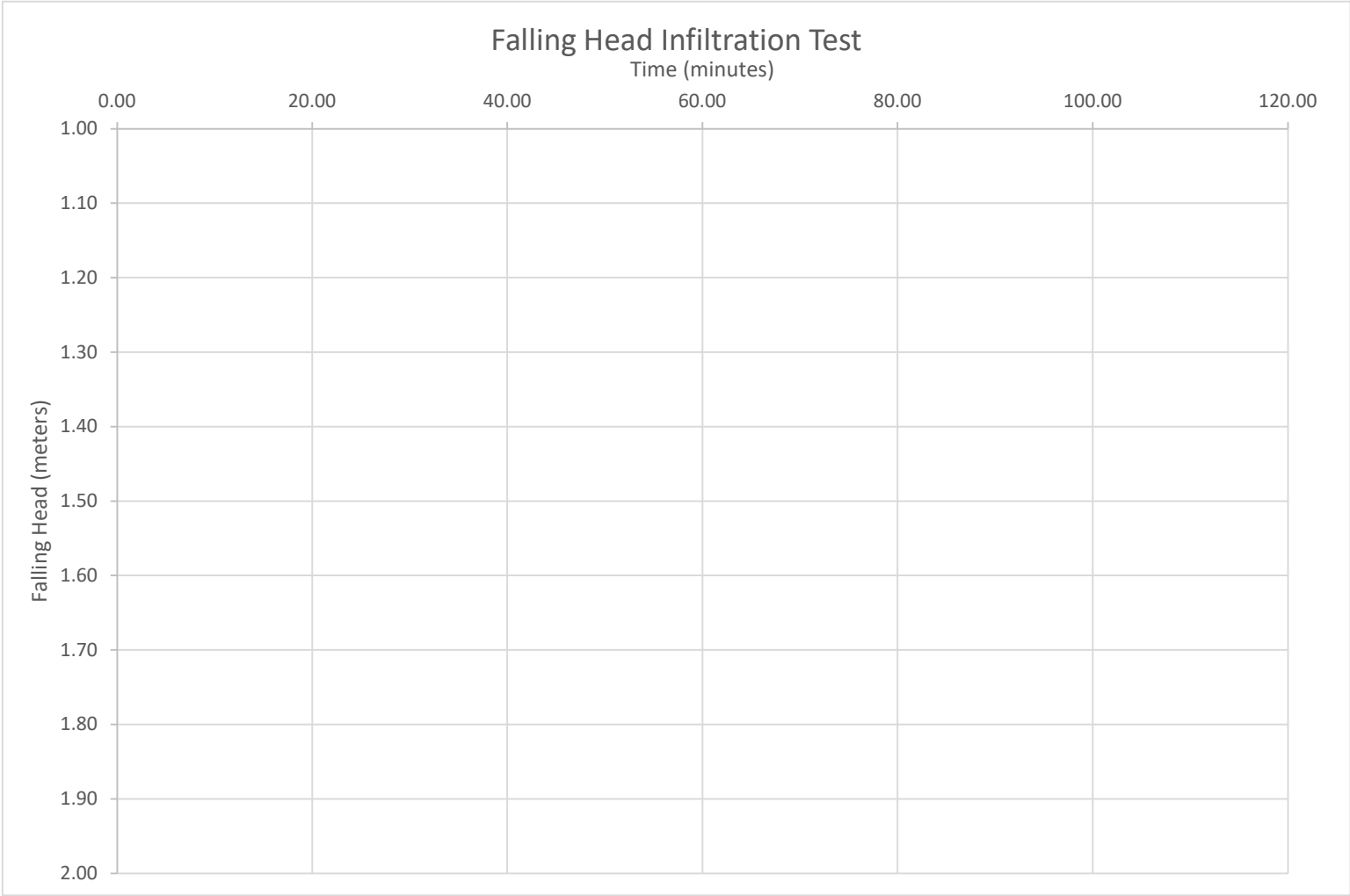
TP-103

Time (minutes)	Time (hours)	depth from top (m)
Unable to fill hole enough to test. Hose rate approximately 250L/minute. Calculated infiltration rate of >6000mm/hour expected		

Average expected infiltration rate	
6000	mm/hr
1.67E-03	m/s



Project: Westhaven		Width of hole (m):	1.7
Client: Westhaven Rolleston Ltd		Length of hole (m):	2.6
Project Number: CHC2026-0005		Depth to gravel (mbgl):	0.3
Date: 18/9/2026		Depth to bottom of hole (mbgl):	2.5
Eng Name: Nathan Cash		Depth to groundwater (m):	4.8

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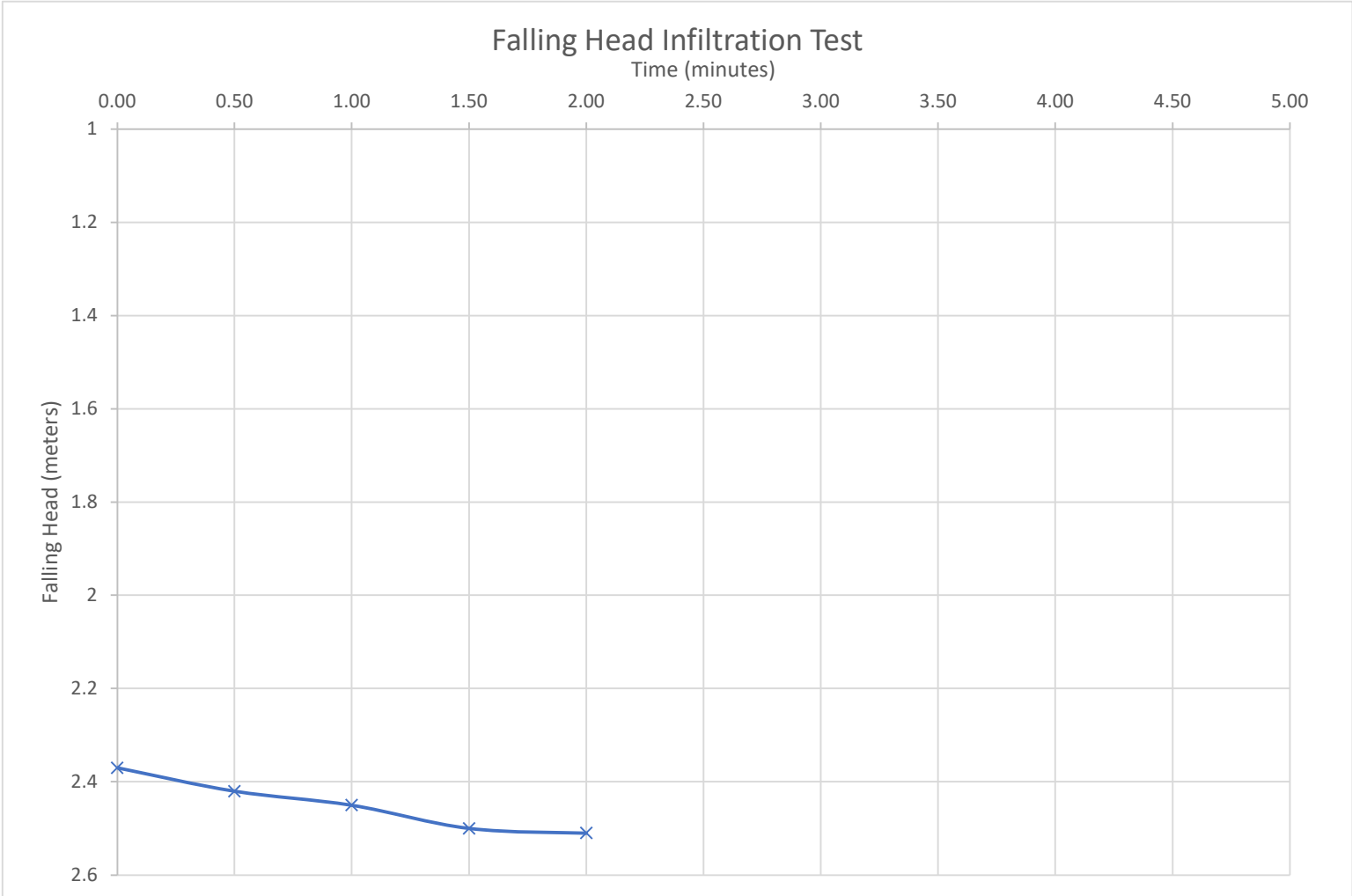
TP-104

Time (minutes)	Time (hours)	depth from top (m)
0.00	0.00	2.37
0.50	0.01	2.42
1.00	0.02	2.45
1.50	0.03	2.5
2.00	0.03	2.51

Average expected infiltration rate
5200 mm/hr
1.44E-03 m/s



Project: Westhaven	Width of hole (m):	1.7	
Client: Westhaven Rolleston Ltd	Length of hole (m):	2.7	
Project Number: CHC2026-0005	Depth to gravel (mbgl):	0.4	
Date: 18/9/2026	Depth to bottom of hole (mbgl):	2.8	
Eng Name: Nathan Cash	Depth to groundwater (m):	4.6	

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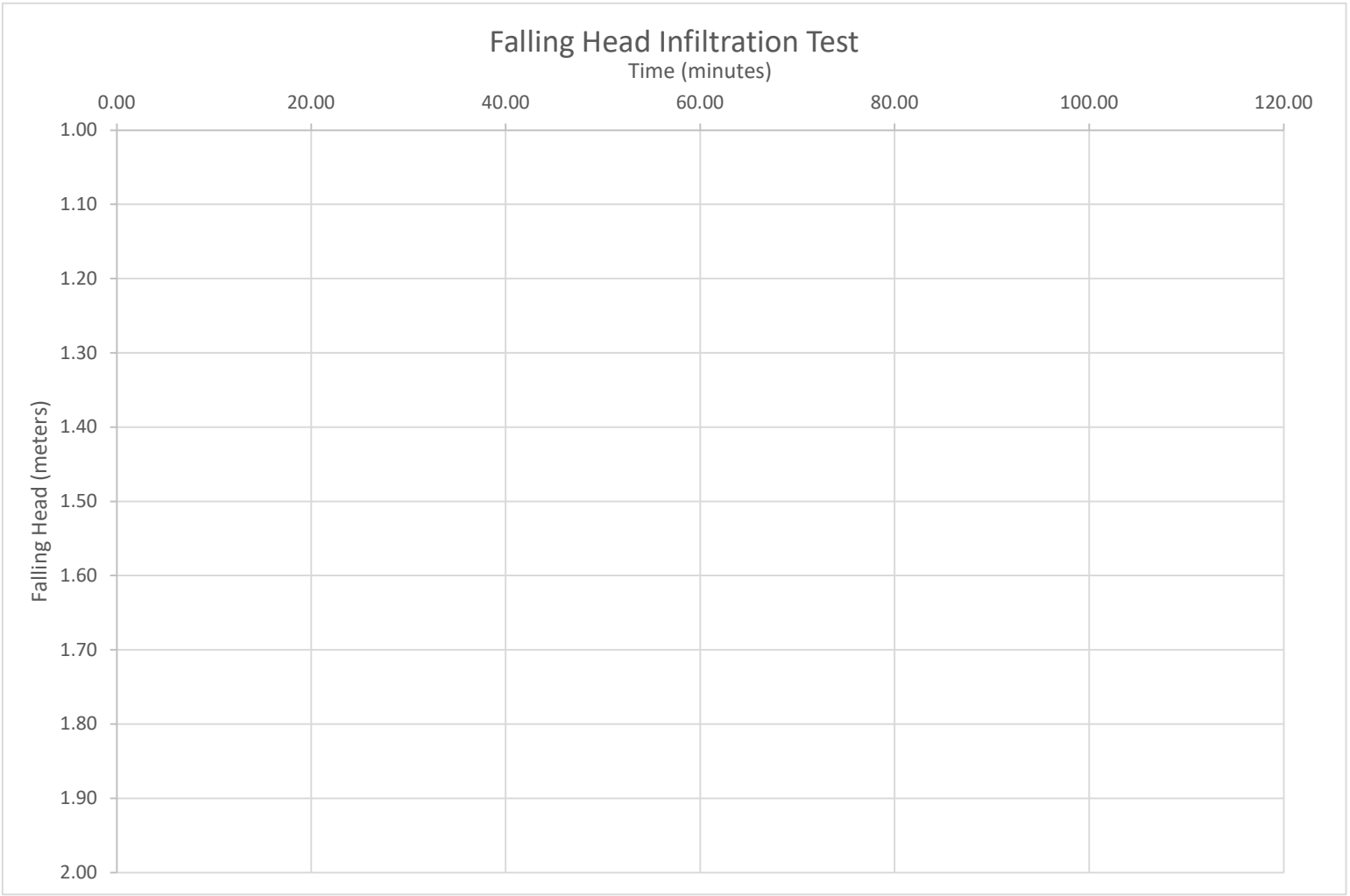
TP-105

Time (minutes)	Time (hours)	depth from top (m)

Unable to fill hole enough to test. Hose rate approximately 250L/minute. Calculated infiltration rate of >6000mm/hour expected

Average expected infiltration rate
6000 mm/hr
1.67E-03 m/s





LEGEND:

- Infiltration Testpit Locations
- CMW BH

Boundary

- SITE BOUNDARY

0 50 100 150 200 250 m

NOTES: 1. BASE MAP ADAPTED FROM LINZ OPEN DATA VIA QGIS

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CLIENT: WESTHAVEN ROLLESTON LTD	DRAWN: PN	PROJECT: CHC2026-0005
PROJECT: WESTHAVEN RESIDENTIAL DEVELOPMENT	CHECKED: HG	DRAWING: 01
	REVISION: 0	SCALE: 1:2000
TITLE: INFILTRATION INVESTIGATION PLAN	DATE: 22/09/2026	SHEET: A3 L

Appendix 2 Stormwater Runoff Calculations

Typical Residential Lot Soakpit

Site Area	350	
% Roof Area	60%	
% Hardstand/Driveway	20%	
Composite C	0.8	
Soakpit Area	4	m^2
Soakpit Depth	2.5	m
Soakpit Volume	10	m^3
% Voids	38%	
Gross Volume	10	m^3
Storage Volume	3.8	m^3
Infiltration Rate	3	m/hr
Safety Factor	0.333333	
Design Rate	1	m/hr

		C×A
Roof C	0.95	199.5
Driveway C	0.85	59.5
Remaining Area C	0.3	21
Total		280

This Sheet calculates the typical runoff/overflow and sizes a typical residential stormwater soak pit. This can then be used to determine the typical overflow/runoff.

TABLE 1: VOLUME DISPOSED BY SOAKAGE (m3)									
	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	0.17	0.33	0.50	1.00	2.00	6.00	12.00	24.00	48.00
Volume	0.7	1.3	2.0	4.0	8.0	24.0	48.0	96.0	192.0

Table 2: Runoff Rate (l/s)									
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.2	3.4	2.7	1.8	1.2	0.7	0.4	0.3	0.2
5%	6.5	4.2	3.3	2.2	1.5	0.8	0.5	0.3	0.2
2%	8.3	5.3	4.2	2.8	1.9	1.0	0.7	0.4	0.3
1%	10.0	6.4	5.0	3.3	2.2	1.2	0.8	0.5	0.3

Table 3: Runoff Volume (m^3)									
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.124	4.054	4.806	6.557	8.967	14.560	19.335	24.884	31.071
5%	3.872	4.988	5.885	7.986	10.873	17.486	23.034	29.390	36.452
2%	4.997	6.408	7.524	10.116	13.675	21.689	28.314	35.914	44.118
1%	6.025	7.631	8.925	11.910	16.029	25.220	32.685	41.159	50.171

TABLE 4: VOLUME OF STORAGE REQUIRED (m^3)									
	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	2.5	2.7	2.8	2.6	1.0	-9.4	-28.7	-71.1	-160.9
5%	3.2	3.7	3.9	4.0	2.9	-6.5	-25.0	-66.6	-155.5
2%	4.3	5.1	5.5	6.1	5.7	-2.3	-19.7	-60.1	-147.9
1%	5.4	6.3	6.9	7.9	8.0	1.2	-15.3	-54.8	-141.8

TABLE 5: VOLUME Disposed to Soakpit and soakage (m3) Per m2 of Lot Area									
	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	0.17	0.33	0.50	1.00	2.00	6.00	12.00	24.00	48.00
10%	0.0089	0.0116	0.0137	0.0187	0.0256	0.0416	0.0552	0.0711	0.0888
5%	0.0111	0.0143	0.0166	0.0223	0.0311	0.0500	0.0658	0.0840	0.1041
2%	0.0128	0.0147	0.0166	0.0223	0.0337	0.0620	0.0809	0.1026	0.1261
1%	0.0128	0.0147	0.0166	0.0223	0.0337	0.0721	0.0934	0.1176	0.1433

TABLE 6: Overflow Rate (l/s)									
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	2.2	1.1	0.0	0.0	0.0	0.0	0.0
2%	7.2	4.2	3.1	1.7	0.8	0.0	0.0	0.0	0.0
1%	8.9	5.2	3.8	2.2	1.1	0.0	0.0	0.0	0.0

TABLE 7: Attenuated Flow Rate (l/s)									
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.2	3.4	2.7	1.8	1.2	0.7	0.4	0.3	0.2
5%	6.5	4.2	1.1	1.1	1.5	0.8	0.5	0.3	0.2
2%	1.1	1.1	1.1	1.1	1.1	1.0	0.7	0.4	0.3
1%	1.1	1.1	1.1	1.1	1.1	1.2	0.8	0.5	0.3

TABLE 8: Attenuated Flow Rate per m2 of lot area (l/s)									
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0149	0.0097	0.0076	0.0052	0.0036	0.0019	0.0013	0.0008	0.0005
5%	0.0184	0.0119	0.0032	0.0032	0.0043	0.0023	0.0015	0.0010	0.0006
2%	0.0032	0.0032	0.0032	0.0032	0.0032	0.0029	0.0019	0.0012	0.0007
1%	0.0032	0.0032	0.0032	0.0032	0.0032	0.0033	0.0022	0.0014	0.0008

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	DunnsRd Soak1 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	4.43	0.8	3.544
Berm	147.72	0.3	44.316
Footpath	57.63	0.8	46.104
Lots	788.98	0.8	631.18
Total	**998.76**		**725.15**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.6	3.6	2.9	1.9	1.3	0.7	0.5	0.3	0.2
5%	6.9	4.4	3.5	2.4	1.6	0.9	0.6	0.4	0.2
2%	8.9	5.7	4.5	3.0	2.0	1.1	0.7	0.4	0.3
1%	10.7	6.8	5.3	3.5	2.4	1.2	0.8	0.5	0.3

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.3	4.3	5.1	7.0	9.6	15.6	20.7	26.6	33.2
5%	4.1	5.3	6.3	8.5	11.6	18.7	24.6	31.5	39.0
2%	5.3	6.9	8.1	10.8	14.6	23.2	30.3	38.4	47.2
1%	6.4	8.2	9.6	12.7	17.2	27.0	35.0	44.0	53.7

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	13.5	8.7	6.9	4.7	3.2	1.7	1.2	0.7	0.5
5%	16.7	10.8	8.5	5.7	3.9	2.1	1.4	0.9	0.5
2%	21.6	13.8	10.8	7.3	4.9	2.6	1.7	1.1	0.7
1%	26.0	16.5	12.8	8.6	5.8	3.0	2.0	1.2	0.8

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.1	10.5	12.4	17.0	23.2	37.7	50.1	64.4	80.5
5%	10.0	12.9	15.2	20.7	28.2	45.3	59.7	76.1	94.4
2%	12.9	16.6	19.5	26.2	35.4	56.2	73.3	93.0	114.3
1%	15.6	19.8	23.1	30.8	41.5	65.3	84.6	106.6	129.9

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.7	7.6	6.0	4.1	2.8	1.5	1.0	0.6	0.4
5%	14.5	9.4	2.5	2.5	3.4	1.8	1.2	0.8	0.5
2%	2.5	2.5	2.5	2.5	2.5	2.3	1.5	0.9	0.6
1%	2.5	2.5	2.5	2.5	2.5	2.6	1.7	1.1	0.7

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.0	9.1	10.8	14.8	20.2	32.8	43.6	56.1	70.0
5%	8.7	11.2	13.1	17.6	24.5	39.4	51.9	66.3	82.2
2%	10.1	11.6	13.1	17.6	26.6	48.9	63.8	81.0	99.5
1%	10.1	11.6	13.1	17.6	26.6	56.9	73.7	92.8	113.1

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.7	1.1	0.9	0.6	0.4	0.2	0.2	0.1	0.1
5%	2.2	1.4	6.0	3.2	0.5	0.3	0.2	0.1	0.1
2%	19.1	11.3	8.3	4.8	2.4	0.3	0.2	0.1	0.1
1%	23.5	14.0	10.3	6.1	3.3	0.4	0.3	0.2	0.1

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	2.5	0.9	0.0	0.0	0.0	0.0	0.0
2%	10.2	5.6	3.8	1.8	0.4	0.0	0.0	0.0	0.0
1%	12.8	7.2	5.0	2.5	0.9	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 12.8l/s based on Table 3 - 10% AEP Post Development Runoff Rate

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	DunnsRd Soak1 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	998.76	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.73		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	1.0	m	A/W
Actual Volume		3.75	m3	
Actual Area		1.50	m2	
Storage Volume		1.43	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.3	0.5	0.8	1.5	3.0	9.0	18.0	36.0	72.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.8	0.9	0.9	0.7	0.0	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	DunnsRd Soak1 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	283.21	0.8	226.57
Berm	26.93	0.3	8.079
Footpath	0	0.8	0
Lots	0	0.8	0
Total	**310.14**		**234.65**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.7	1.1	0.9	0.6	0.4	0.2	0.1	0.1	0.1
5%	2.1	1.4	1.1	0.7	0.5	0.3	0.2	0.1	0.1
2%	2.8	1.8	1.4	0.9	0.6	0.3	0.2	0.1	0.1
1%	3.3	2.1	1.6	1.1	0.7	0.4	0.3	0.2	0.1

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.0	1.3	1.6	2.2	3.0	4.8	6.4	8.3	10.3
5%	1.3	1.7	2.0	2.7	3.6	5.8	7.7	9.8	12.1
2%	1.7	2.1	2.5	3.4	4.5	7.2	9.4	11.9	14.7
1%	2.0	2.5	3.0	4.0	5.3	8.4	10.9	13.7	16.7

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.4	2.8	2.2	1.5	1.0	0.6	0.4	0.2	0.2
5%	5.4	3.5	2.7	1.9	1.3	0.7	0.4	0.3	0.2
2%	7.0	4.5	3.5	2.4	1.6	0.8	0.5	0.3	0.2
1%	8.4	5.3	4.2	2.8	1.9	1.0	0.6	0.4	0.2

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.6	3.4	4.0	5.5	7.5	12.2	16.2	20.9	26.0
5%	3.2	4.2	4.9	6.7	9.1	14.7	19.3	24.6	30.5
2%	4.2	5.4	6.3	8.5	11.5	18.2	23.7	30.1	37.0
1%	5.0	6.4	7.5	10.0	13.4	21.1	27.4	34.5	42.0

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.4	2.8	2.2	1.5	1.0	0.6	0.4	0.2	0.2
5%	5.4	3.5	2.7	1.9	1.3	0.7	0.4	0.3	0.2
2%	7.0	4.5	3.5	2.4	1.6	0.8	0.5	0.3	0.2
1%	8.4	5.3	4.2	2.8	1.9	1.0	0.6	0.4	0.2

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.6	1.7	1.4	0.9	0.6	0.3	0.2	0.1	0.1
5%	3.3	2.1	1.7	1.1	0.8	0.4	0.3	0.2	0.1
2%	4.2	2.7	2.1	1.4	1.0	0.5	0.3	0.2	0.1
1%	5.1	3.2	2.5	1.7	1.1	0.6	0.4	0.2	0.1

Sump inlet capacity to be sized to allow for 5.1l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	DunnsRd Soak1 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	310.14	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	**D**	2.5	**m**	
Width	**W**	1.5	**m**	
Length	**L**	2.5	**m**	A/W
Actual Volume		**9.38**	**m3**	
Actual Area		**3.75**	**m2**	
Storage Volume		**3.56**	**m3**	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	1.0	0.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0
5%	1.3	1.3	1.1	0.3	0.0	0.0	0.0	0.0	0.0
2%	1.9	2.0	1.9	1.4	0.0	0.0	0.0	0.0	0.0
1%	2.4	2.6	2.6	2.3	0.6	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.6	1.3	1.9	3.8	7.5	22.5	45.0	90.0	180.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.5	2.1	1.5	0.0	0.0	0.0	0.0	0.0	0.0
5%	3.5	3.3	2.9	0.8	0.0	0.0	0.0	0.0	0.0
2%	5.0	5.2	5.1	3.6	0.0	0.0	0.0	0.0	0.0
1%	6.4	6.9	6.9	6.0	1.6	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.0	2.1	2.2	1.7	0.0	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	DunnsRd Soak2 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	0	0.8	0
Berm	196.3	0.3	58.89
Footpath	134.63	0.8	107.7
Lots	1711.53	0.8	1369.2
Total	**2042.46**		**1535.8**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.4	7.4	5.8	4.0	2.7	1.5	1.0	0.6	0.4
5%	14.1	9.1	7.2	4.9	3.3	1.8	1.2	0.7	0.5
2%	18.2	11.7	9.1	6.1	4.2	2.2	1.4	0.9	0.6
1%	22.0	13.9	10.9	7.2	4.9	2.6	1.7	1.0	0.6

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.8	8.9	10.5	14.3	19.6	31.9	42.3	54.5	68.0
5%	8.5	10.9	12.9	17.5	23.8	38.3	50.4	64.3	79.8
2%	10.9	14.0	16.5	22.1	29.9	47.5	62.0	78.6	96.5
1%	13.2	16.7	19.5	26.1	35.1	55.2	71.5	90.1	109.8

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	28.6	18.5	14.6	10.0	6.8	3.7	2.5	1.6	1.0
5%	35.4	22.8	17.9	12.2	8.3	4.4	2.9	1.9	1.2
2%	45.7	29.3	22.9	15.4	10.4	5.5	3.6	2.3	1.4
1%	55.1	34.9	27.2	18.1	12.2	6.4	4.2	2.6	1.6

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.1	22.2	26.4	36.0	49.2	79.9	106.1	136.5	170.4
5%	21.2	27.4	32.3	43.8	59.6	95.9	126.3	161.2	199.9
2%	27.4	35.1	41.3	55.5	75.0	119.0	155.3	197.0	242.0
1%	33.0	41.9	49.0	65.3	87.9	138.3	179.3	225.8	275.2

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	25.5	16.5	13.1	8.9	6.1	3.3	2.2	1.4	0.9
5%	31.6	20.3	5.4	5.4	7.4	4.0	2.6	1.7	1.0
2%	5.4	5.4	5.4	5.4	5.4	4.9	3.2	2.0	1.2
1%	5.4	5.4	5.4	5.4	5.4	5.7	3.7	2.3	1.4

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	15.3	19.8	23.5	32.1	43.9	71.2	94.6	121.7	151.9
5%	18.9	24.4	28.4	38.1	53.2	85.5	112.6	143.7	178.3
2%	21.8	25.1	28.4	38.1	57.7	106.1	138.5	175.6	215.7
1%	21.8	25.1	28.4	38.1	57.7	123.3	159.8	201.3	245.3

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.1	2.0	1.6	1.1	0.7	0.4	0.3	0.2	0.1
5%	3.8	2.5	12.5	6.7	0.9	0.5	0.3	0.2	0.1
2%	40.3	23.9	17.5	10.0	5.0	0.6	0.4	0.2	0.2
1%	49.6	29.4	21.8	12.7	6.8	0.7	0.5	0.3	0.2

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	5.3	1.9	0.0	0.0	0.0	0.0	0.0
2%	22.0	12.2	8.3	3.8	0.8	0.0	0.0	0.0	0.0
1%	27.7	15.5	10.9	5.5	1.9	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 27.7l/s based on Table 3 - 10% AEP Post Development Runoff Rate

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	DunnsRd Soak2 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2042.46	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.75		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	1.5	m	A/W
Actual Volume		5.63	m3	
Actual Area		2.25	m2	
Storage Volume		2.14	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.4	0.8	1.1	2.3	4.5	13.5	27.0	54.0	108.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.5	1.7	1.7	1.7	0.8	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	DunnsRd Soak2 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	363.43	0.8	290.74
Berm	126.5	0.3	37.95
Footpath	0	0.8	0
Lots	0	0.8	0
Total	**489.93**		**328.69**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.7	1.8	1.4	1.0	0.7	0.4	0.2	0.2	0.1
5%	3.4	2.2	1.7	1.2	0.8	0.4	0.3	0.2	0.1
2%	4.4	2.8	2.2	1.5	1.0	0.5	0.3	0.2	0.1
1%	5.3	3.3	2.6	1.7	1.2	0.6	0.4	0.3	0.2

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.6	2.1	2.5	3.4	4.7	7.6	10.1	13.1	16.3
5%	2.0	2.6	3.1	4.2	5.7	9.2	12.1	15.4	19.1
2%	2.6	3.4	3.9	5.3	7.2	11.4	14.9	18.9	23.2
1%	3.2	4.0	4.7	6.3	8.4	13.2	17.2	21.6	26.3

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.1	4.0	3.1	2.1	1.5	0.8	0.5	0.3	0.2
5%	7.6	4.9	3.8	2.6	1.8	1.0	0.6	0.4	0.2
2%	9.8	6.3	4.9	3.3	2.2	1.2	0.8	0.5	0.3
1%	11.8	7.5	5.8	3.9	2.6	1.4	0.9	0.6	0.3

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.7	4.8	5.6	7.7	10.5	17.1	22.7	29.2	36.5
5%	4.5	5.9	6.9	9.4	12.8	20.5	27.0	34.5	42.8
2%	5.9	7.5	8.8	11.9	16.1	25.5	33.2	42.2	51.8
1%	7.1	9.0	10.5	14.0	18.8	29.6	38.4	48.3	58.9

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.1	4.0	3.1	2.1	1.5	0.8	0.5	0.3	0.2
5%	7.6	4.9	3.8	2.6	1.8	1.0	0.6	0.4	0.2
2%	9.8	6.3	4.9	3.3	2.2	1.2	0.8	0.5	0.3
1%	11.8	7.5	5.8	3.9	2.6	1.4	0.9	0.6	0.3

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.4	2.2	1.7	1.2	0.8	0.4	0.3	0.2	0.1
5%	4.2	2.7	2.1	1.4	1.0	0.5	0.3	0.2	0.1
2%	5.4	3.5	2.7	1.8	1.2	0.7	0.4	0.3	0.2
1%	6.5	4.1	3.2	2.1	1.4	0.8	0.5	0.3	0.2

Sump inlet capacity to be sized to allow for 6.5l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	DunnsRd Soak2 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	489.93	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.67		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.0	m	A/W
Actual Volume		11.25	m3	
Actual Area		4.50	m2	
Storage Volume		4.28	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	1.3	1.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0
5%	1.8	1.7	1.6	0.7	0.0	0.0	0.0	0.0	0.0
2%	2.5	2.7	2.6	2.1	0.0	0.0	0.0	0.0	0.0
1%	3.2	3.5	3.5	3.2	1.4	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.8	1.5	2.3	4.5	9.0	27.0	54.0	108.0	216.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.4	3.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0
5%	4.6	4.6	4.1	1.8	0.0	0.0	0.0	0.0	0.0
2%	6.6	7.0	6.9	5.4	0.0	0.0	0.0	0.0	0.0
1%	8.3	9.1	9.3	8.5	3.7	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.9	3.3	3.4	3.2	1.5	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	DunnsRd Soak3 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	0	0.8	0
Berm	261	0.3	78.3
Footpath	179.17	0.8	143.34
Lots	2199.82	0.8	1759.9
Total	**2639.99**		**1981.5**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.7	9.6	7.6	5.2	3.5	1.9	1.3	0.8	0.5
5%	18.3	11.8	9.2	6.3	4.3	2.3	1.5	1.0	0.6
2%	23.6	15.1	11.8	7.9	5.4	2.8	1.9	1.2	0.7
1%	28.4	18.0	14.0	9.4	6.3	3.3	2.1	1.3	0.8

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.8	11.5	13.6	18.5	25.4	41.2	54.7	70.4	87.9
5%	11.0	14.1	16.6	22.6	30.8	49.5	65.2	83.1	103.1
2%	14.1	18.1	21.3	28.6	38.7	61.3	80.1	101.6	124.8
1%	17.0	21.6	25.2	33.7	45.3	71.3	92.5	116.4	141.9

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	36.9	23.9	18.9	12.9	8.8	4.8	3.2	2.0	1.3
5%	45.7	29.4	23.1	15.7	10.7	5.7	3.8	2.4	1.5
2%	58.9	37.8	29.6	19.9	13.4	7.1	4.6	2.9	1.8
1%	71.1	45.0	35.1	23.4	15.8	8.3	5.4	3.4	2.1

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	22.1	28.7	34.0	46.4	63.5	103.0	136.8	176.1	219.9
5%	27.4	35.3	41.6	56.5	76.9	123.7	163.0	208.0	258.0
2%	35.4	45.3	53.2	71.6	96.8	153.5	200.4	254.2	312.2
1%	42.6	54.0	63.2	84.3	113.4	178.5	231.3	291.3	355.1

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	32.7	21.2	16.8	11.4	7.8	4.2	2.8	1.8	1.1
5%	40.6	26.1	7.0	7.0	9.5	5.1	3.4	2.1	1.3
2%	7.0	7.0	7.0	7.0	7.0	6.3	4.1	2.6	1.6
1%	7.0	7.0	7.0	7.0	7.0	7.3	4.8	3.0	1.8

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	19.6	25.5	30.2	41.2	56.4	91.5	121.5	156.4	195.3
5%	24.3	31.4	36.5	49.0	68.3	109.9	144.8	184.7	229.1
2%	28.1	32.3	36.5	49.0	74.2	136.3	178.0	225.7	277.3
1%	28.1	32.3	36.5	49.0	74.2	158.5	205.4	258.7	315.3

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.1	2.7	2.1	1.4	1.0	0.5	0.4	0.2	0.1
5%	5.1	3.3	16.2	8.7	1.2	0.6	0.4	0.3	0.2
2%	52.0	30.8	22.6	12.9	6.5	0.8	0.5	0.3	0.2
1%	64.1	38.0	28.1	16.4	8.8	0.9	0.6	0.4	0.2

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	6.9	2.4	0.0	0.0	0.0	0.0	0.0
2%	28.4	15.7	10.8	5.0	1.1	0.0	0.0	0.0	0.0
1%	35.7	20.0	14.1	7.1	2.5	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 35.7l/s based on Table 3 - 10% AEP Post Development Runoff Rate

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	DunnsRd Soak3 - A

Calculations By	Linda Bos	Date	46128	
Reviewed By	Chris Sexton	Date	46129	

Catchment Area	A	2639.99	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.75		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	2.0	m	A/W
Actual Volume		7.50	m3	
Actual Area		3.00	m2	
Storage Volume		2.85	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.5	1.0	1.5	3.0	6.0	18.0	36.0	72.0	144.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.0	2.2	2.3	2.2	1.1	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	DunnsRd Soak3- B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	478.62	0.8	382.9
Berm	172.32	0.3	51.696
Footpath	0	0.8	0
Lots	0	0.8	0
Total	**650.94**		**434.59**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.6	2.4	1.9	1.3	0.9	0.5	0.3	0.2	0.1
5%	4.5	2.9	2.3	1.5	1.1	0.6	0.4	0.2	0.1
2%	5.8	3.7	2.9	2.0	1.3	0.7	0.5	0.3	0.2
1%	7.0	4.4	3.5	2.3	1.6	0.8	0.5	0.3	0.2

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.2	2.8	3.4	4.6	6.3	10.2	13.5	17.4	21.7
5%	2.7	3.5	4.1	5.6	7.6	12.2	16.1	20.5	25.4
2%	3.5	4.5	5.2	7.1	9.5	15.1	19.7	25.0	30.8
1%	4.2	5.3	6.2	8.3	11.2	17.6	22.8	28.7	35.0

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.1	5.2	4.1	2.8	1.9	1.0	0.7	0.4	0.3
5%	10.0	6.5	5.1	3.4	2.3	1.3	0.8	0.5	0.3
2%	12.9	8.3	6.5	4.4	2.9	1.6	1.0	0.6	0.4
1%	15.6	9.9	7.7	5.1	3.5	1.8	1.2	0.7	0.5

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.8	6.3	7.5	10.2	13.9	22.6	30.0	38.6	48.2
5%	6.0	7.7	9.1	12.4	16.9	27.1	35.8	45.6	56.6
2%	7.8	9.9	11.7	15.7	21.2	33.7	43.9	55.7	68.5
1%	9.4	11.8	13.9	18.5	24.9	39.1	50.7	63.9	77.9

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.1	5.2	4.1	2.8	1.9	1.0	0.7	0.4	0.3
5%	10.0	6.5	5.1	3.4	2.3	1.3	0.8	0.5	0.3
2%	12.9	8.3	6.5	4.4	2.9	1.6	1.0	0.6	0.4
1%	15.6	9.9	7.7	5.1	3.5	1.8	1.2	0.7	0.5

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s)
(Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.5	2.9	2.3	1.6	1.1	0.6	0.4	0.2	0.2
5%	5.5	3.6	2.8	1.9	1.3	0.7	0.5	0.3	0.2
2%	7.1	4.6	3.6	2.4	1.6	0.9	0.6	0.4	0.2
1%	8.6	5.4	4.2	2.8	1.9	1.0	0.6	0.4	0.2

Sump inlet capacity to be sized to allow for 8.6l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	DunnsRd Soak3- B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	650.94	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.67		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	4.0	m	A/W
Actual Volume		15.00	m3	
Actual Area		6.00	m2	
Storage Volume		5.70	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	1.7	1.5	1.1	0.0	0.0	0.0	0.0	0.0	0.0
5%	2.3	2.3	2.0	0.8	0.0	0.0	0.0	0.0	0.0
2%	3.3	3.5	3.4	2.6	0.0	0.0	0.0	0.0	0.0
1%	4.1	4.5	4.6	4.2	1.7	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.0	2.0	3.0	6.0	12.0	36.0	72.0	144.0	288.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.4	3.9	2.9	0.0	0.0	0.0	0.0	0.0	0.0
5%	6.1	6.0	5.3	2.2	0.0	0.0	0.0	0.0	0.0
2%	8.6	9.1	9.0	7.0	0.0	0.0	0.0	0.0	0.0
1%	10.9	11.9	12.2	11.0	4.5	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.8	4.3	4.5	4.2	1.9	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	DunnsRd Soak4- A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	0	0.8	0
Berm	267.47	0.3	80.241
Footpath	175.49	0.8	140.39
Lots	2619.94	0.8	2096
Total	**3062.9**		**2316.6**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.1	11.1	8.8	6.0	4.1	2.2	1.5	0.9	0.6
5%	21.2	13.6	10.7	7.3	5.0	2.7	1.7	1.1	0.7
2%	27.3	17.5	13.7	9.2	6.2	3.3	2.2	1.4	0.8
1%	33.0	20.9	16.3	10.9	7.3	3.8	2.5	1.6	1.0

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.3	13.3	15.8	21.5	29.4	47.8	63.5	81.7	102.0
5%	12.7	16.4	19.3	26.2	35.7	57.4	75.6	96.4	119.6
2%	16.4	21.0	24.7	33.2	44.9	71.2	92.9	117.9	144.8
1%	19.8	25.0	29.3	39.1	52.6	82.8	107.3	135.1	164.6

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	43.1	28.0	22.1	15.1	10.3	5.6	3.7	2.4	1.5
5%	53.4	34.4	27.0	18.4	12.5	6.7	4.4	2.8	1.7
2%	68.9	44.2	34.6	23.2	15.7	8.3	5.4	3.4	2.1
1%	83.1	52.6	41.0	27.4	18.4	9.7	6.3	3.9	2.4

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	25.9	33.5	39.8	54.3	74.2	120.5	160.0	205.9	257.1
5%	32.0	41.3	48.7	66.1	90.0	144.7	190.6	243.2	301.6
2%	41.3	53.0	62.3	83.7	113.1	179.4	234.3	297.1	365.0
1%	49.8	63.1	73.8	98.5	132.6	208.7	270.4	340.5	415.1

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	39.0	25.3	20.0	13.6	9.3	5.0	3.4	2.2	1.3
5%	48.3	31.1	8.3	8.3	11.3	6.1	4.0	2.5	1.6
2%	8.3	8.3	8.3	8.3	8.3	7.5	4.9	3.1	1.9
1%	8.3	8.3	8.3	8.3	8.3	8.7	5.7	3.6	2.2

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	23.4	30.3	36.0	49.1	67.1	109.0	144.7	186.3	232.6
5%	29.0	37.3	43.4	58.4	81.4	130.9	172.4	220.0	272.9
2%	33.4	38.4	43.4	58.4	88.3	162.4	211.9	268.8	330.3
1%	33.4	38.4	43.4	58.4	88.3	188.8	244.7	308.1	375.6

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.1	2.7	2.1	1.4	1.0	0.5	0.4	0.2	0.1
5%	5.1	3.3	18.7	10.0	1.2	0.6	0.4	0.3	0.2
2%	60.6	35.9	26.3	14.9	7.4	0.8	0.5	0.3	0.2
1%	74.8	44.3	32.7	19.1	10.1	0.9	0.6	0.4	0.2

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	8.0	2.8	0.0	0.0	0.0	0.0	0.0
2%	33.3	18.3	12.5	5.7	1.2	0.0	0.0	0.0	0.0
1%	41.8	23.4	16.4	8.2	2.8	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 41.8l/s based on Table 3 - 10% AEP Post Development Runoff Rate

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	DunnsRd Soak4- A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	3062.9	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	2.0	m	A/W
Actual Volume		7.50	m3	
Actual Area		3.00	m2	
Storage Volume		2.85	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.5	1.0	1.5	3.0	6.0	18.0	36.0	72.0	144.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.0	2.2	2.3	2.2	1.1	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	DunnsRd Soak4- B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	522.52	0.8	418.02
Berm	123.7	0.3	37.11
Footpath	0	0.8	0
Lots	0	0.8	0
Total	**646.22**		**455.13**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.6	2.3	1.8	1.3	0.9	0.5	0.3	0.2	0.1
5%	4.5	2.9	2.3	1.5	1.0	0.6	0.4	0.2	0.1
2%	5.8	3.7	2.9	1.9	1.3	0.7	0.5	0.3	0.2
1%	7.0	4.4	3.4	2.3	1.5	0.8	0.5	0.3	0.2

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.2	2.8	3.3	4.5	6.2	10.1	13.4	17.2	21.5
5%	2.7	3.5	4.1	5.5	7.5	12.1	15.9	20.3	25.2
2%	3.5	4.4	5.2	7.0	9.5	15.0	19.6	24.9	30.5
1%	4.2	5.3	6.2	8.2	11.1	17.5	22.6	28.5	34.7

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.5	5.5	4.3	3.0	2.0	1.1	0.7	0.5	0.3
5%	10.5	6.8	5.3	3.6	2.5	1.3	0.9	0.6	0.3
2%	13.5	8.7	6.8	4.6	3.1	1.6	1.1	0.7	0.4
1%	16.3	10.3	8.1	5.4	3.6	1.9	1.2	0.8	0.5

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.1	6.6	7.8	10.7	14.6	23.7	31.4	40.4	50.5
5%	6.3	8.1	9.6	13.0	17.7	28.4	37.4	47.8	59.3
2%	8.1	10.4	12.2	16.4	22.2	35.3	46.0	58.4	71.7
1%	9.8	12.4	14.5	19.4	26.1	41.0	53.1	66.9	81.6

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.5	5.5	4.3	3.0	2.0	1.1	0.7	0.5	0.3
5%	10.5	6.8	5.3	3.6	2.5	1.3	0.9	0.6	0.3
2%	13.5	8.7	6.8	4.6	3.1	1.6	1.1	0.7	0.4
1%	16.3	10.3	8.1	5.4	3.6	1.9	1.2	0.8	0.5

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.9	3.2	2.5	1.7	1.2	0.6	0.4	0.3	0.2
5%	6.0	3.9	3.1	2.1	1.4	0.8	0.5	0.3	0.2
2%	7.8	5.0	3.9	2.6	1.8	0.9	0.6	0.4	0.2
1%	9.4	5.9	4.6	3.1	2.1	1.1	0.7	0.4	0.3

Sump inlet capacity to be sized to allow for 9.4l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	DunnsRd Soak4- B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	646.22	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.70		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	4.0	m	A/W
Actual Volume		15.00	m3	
Actual Area		6.00	m2	
Storage Volume		5.70	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	1.9	1.8	1.5	0.1	0.0	0.0	0.0	0.0	0.0
5%	2.6	2.7	2.5	1.5	0.0	0.0	0.0	0.0	0.0
2%	3.7	4.0	4.0	3.4	0.8	0.0	0.0	0.0	0.0
1%	4.6	5.1	5.3	5.1	3.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.0	2.0	3.0	6.0	12.0	36.0	72.0	144.0	288.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.0	4.7	3.9	0.3	0.0	0.0	0.0	0.0	0.0
5%	6.9	7.0	6.6	3.8	0.0	0.0	0.0	0.0	0.0
2%	9.6	10.5	10.6	9.1	2.0	0.0	0.0	0.0	0.0
1%	12.2	13.5	14.0	13.5	7.8	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.1	4.6	4.8	4.7	2.6	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	DunnsRd Soak5 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	411.24	0.8	328.99
Berm	46.55	0.3	13.965
Footpath	0	0.8	0
Lots	0	0.8	0
Total	**457.79**		**342.96**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.6	1.7	1.3	0.9	0.6	0.3	0.2	0.1	0.1
5%	3.2	2.0	1.6	1.1	0.7	0.4	0.3	0.2	0.1
2%	4.1	2.6	2.1	1.4	0.9	0.5	0.3	0.2	0.1
1%	4.9	3.1	2.4	1.6	1.1	0.6	0.4	0.2	0.1

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.5	2.0	2.4	3.2	4.4	7.1	9.5	12.2	15.2
5%	1.9	2.4	2.9	3.9	5.3	8.6	11.3	14.4	17.9
2%	2.5	3.1	3.7	5.0	6.7	10.6	13.9	17.6	21.6
1%	3.0	3.7	4.4	5.8	7.9	12.4	16.0	20.2	24.6

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.4	4.1	3.3	2.2	1.5	0.8	0.5	0.4	0.2
5%	7.9	5.1	4.0	2.7	1.8	1.0	0.7	0.4	0.3
2%	10.2	6.5	5.1	3.4	2.3	1.2	0.8	0.5	0.3
1%	12.3	7.8	6.1	4.1	2.7	1.4	0.9	0.6	0.4

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.8	5.0	5.9	8.0	11.0	17.8	23.7	30.5	38.1
5%	4.7	6.1	7.2	9.8	13.3	21.4	28.2	36.0	44.6
2%	6.1	7.8	9.2	12.4	16.7	26.6	34.7	44.0	54.0
1%	7.4	9.3	10.9	14.6	19.6	30.9	40.0	50.4	61.5

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.4	4.1	3.3	2.2	1.5	0.8	0.5	0.4	0.2
5%	7.9	5.1	4.0	2.7	1.8	1.0	0.7	0.4	0.3
2%	10.2	6.5	5.1	3.4	2.3	1.2	0.8	0.5	0.3
1%	12.3	7.8	6.1	4.1	2.7	1.4	0.9	0.6	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.8	2.5	2.0	1.3	0.9	0.5	0.3	0.2	0.1
5%	4.7	3.1	2.4	1.6	1.1	0.6	0.4	0.2	0.2
2%	6.1	3.9	3.1	2.1	1.4	0.7	0.5	0.3	0.2
1%	7.4	4.7	3.6	2.4	1.6	0.9	0.6	0.3	0.2

Sump inlet capacity to be sized to allow for 7.4l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	DunnsRd Soak5 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	457.79	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.75		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	1.4	1.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0
5%	2.0	1.9	1.7	0.6	0.0	0.0	0.0	0.0	0.0
2%	2.8	3.0	2.9	2.2	0.0	0.0	0.0	0.0	0.0
1%	3.5	3.9	3.9	3.5	1.3	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.7	3.2	2.4	0.0	0.0	0.0	0.0	0.0	0.0
5%	5.2	5.0	4.5	1.6	0.0	0.0	0.0	0.0	0.0
2%	7.4	7.8	7.6	5.7	0.0	0.0	0.0	0.0	0.0
1%	9.3	10.1	10.3	9.2	3.3	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.0	3.2	3.3	2.8	0.5	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	DunnsRd Soak5- A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	2.69	0.3	0.807
Road	0	0.8	0
Berm	216.55	0.3	64.965
Footpath	120.11	0.8	96.088
Lots	52.87	0.8	42.296
Total	**392.22**		**204.16**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.2	1.4	1.1	0.8	0.5	0.3	0.2	0.1	0.1
5%	2.7	1.7	1.4	0.9	0.6	0.3	0.2	0.1	0.1
2%	3.5	2.2	1.8	1.2	0.8	0.4	0.3	0.2	0.1
1%	4.2	2.7	2.1	1.4	0.9	0.5	0.3	0.2	0.1

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.3	1.7	2.0	2.8	3.8	6.1	8.1	10.5	13.1
5%	1.6	2.1	2.5	3.4	4.6	7.3	9.7	12.4	15.3
2%	2.1	2.7	3.2	4.3	5.7	9.1	11.9	15.1	18.5
1%	2.5	3.2	3.8	5.0	6.7	10.6	13.7	17.3	21.1

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.8	2.5	1.9	1.3	0.9	0.5	0.3	0.2	0.1
5%	4.7	3.0	2.4	1.6	1.1	0.6	0.4	0.2	0.2
2%	6.1	3.9	3.0	2.0	1.4	0.7	0.5	0.3	0.2
1%	7.3	4.6	3.6	2.4	1.6	0.9	0.6	0.3	0.2

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.3	3.0	3.5	4.8	6.5	10.6	14.1	18.1	22.7
5%	2.8	3.6	4.3	5.8	7.9	12.7	16.8	21.4	26.6
2%	3.6	4.7	5.5	7.4	10.0	15.8	20.6	26.2	32.2
1%	4.4	5.6	6.5	8.7	11.7	18.4	23.8	30.0	36.6

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.8	0.5	0.4	0.3	0.2	0.1	0.1	0.0	0.0
5%	1.0	0.6	0.2	0.2	0.2	0.1	0.1	0.1	0.0
2%	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0
1%	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.5	0.6	0.7	1.0	1.4	2.2	2.9	3.8	4.7
5%	0.6	0.8	0.9	1.2	1.6	2.6	3.5	4.4	5.5
2%	0.7	0.8	0.9	1.2	1.8	3.3	4.3	5.4	6.7
1%	0.7	0.8	0.9	1.2	1.8	3.8	4.9	6.2	7.6

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.0	2.0	1.5	1.1	0.7	0.4	0.3	0.2	0.1
5%	3.7	2.4	2.2	1.4	0.9	0.5	0.3	0.2	0.1
2%	5.9	3.7	2.9	1.9	1.2	0.6	0.4	0.2	0.1
1%	7.2	4.5	3.4	2.2	1.5	0.7	0.4	0.3	0.2

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.8	0.5	0.4	0.3	0.2	0.1	0.1	0.0	0.0
5%	1.0	0.7	0.8	0.5	0.2	0.1	0.1	0.1	0.0
2%	2.4	1.5	1.1	0.7	0.4	0.2	0.1	0.1	0.0
1%	2.9	1.8	1.4	0.9	0.5	0.2	0.1	0.1	0.0

Sump inlet capacity to be sized to allow for 2.9l/s based on Table 3 - 10% AEP Post Development Runoff Rate

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	DunnsRd Soak5- A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	392.22	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.52		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	1.5	m	A/W
Actual Volume		5.63	m3	
Actual Area		2.25	m2	
Storage Volume		2.14	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.4	0.8	1.1	2.3	4.5	13.5	27.0	54.0	108.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.5	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.8	0.8	0.8	0.3	0.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	1.3	1.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.1	2.2	2.0	0.7	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.4	1.6	1.7	1.5	0.7	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	DunnsRd Soak6 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	2.47	0.3	0.741
Road	0	0.8	0
Berm	240.96	0.3	72.288
Footpath	163.29	0.8	130.63
Lots	44.26	0.8	35.408
Total	**450.98**		**239.07**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.5	1.6	1.3	0.9	0.6	0.3	0.2	0.1	0.1
5%	3.1	2.0	1.6	1.1	0.7	0.4	0.3	0.2	0.1
2%	4.0	2.6	2.0	1.4	0.9	0.5	0.3	0.2	0.1
1%	4.9	3.1	2.4	1.6	1.1	0.6	0.4	0.2	0.1

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.5	2.0	2.3	3.2	4.3	7.0	9.3	12.0	15.0
5%	1.9	2.4	2.8	3.9	5.3	8.4	11.1	14.2	17.6
2%	2.4	3.1	3.6	4.9	6.6	10.5	13.7	17.4	21.3
1%	2.9	3.7	4.3	5.8	7.7	12.2	15.8	19.9	24.2

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.4	2.9	2.3	1.6	1.1	0.6	0.4	0.2	0.2
5%	5.5	3.5	2.8	1.9	1.3	0.7	0.5	0.3	0.2
2%	7.1	4.6	3.6	2.4	1.6	0.9	0.6	0.4	0.2
1%	8.6	5.4	4.2	2.8	1.9	1.0	0.6	0.4	0.2

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.7	3.5	4.1	5.6	7.7	12.4	16.5	21.2	26.5
5%	3.3	4.3	5.0	6.8	9.3	14.9	19.7	25.1	31.1
2%	4.3	5.5	6.4	8.6	11.7	18.5	24.2	30.7	37.7
1%	5.1	6.5	7.6	10.2	13.7	21.5	27.9	35.1	42.8

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.7	0.4	0.3	0.2	0.2	0.1	0.1	0.0	0.0
5%	0.8	0.5	0.1	0.1	0.2	0.1	0.1	0.0	0.0
2%	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
1%	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.4	0.5	0.6	0.8	1.1	1.8	2.4	3.1	3.9
5%	0.5	0.6	0.7	1.0	1.4	2.2	2.9	3.7	4.6
2%	0.6	0.6	0.7	1.0	1.5	2.7	3.6	4.5	5.6
1%	0.6	0.6	0.7	1.0	1.5	3.2	4.1	5.2	6.3

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.8	2.5	1.9	1.3	0.9	0.5	0.3	0.2	0.1
5%	4.7	3.0	2.7	1.8	1.1	0.6	0.4	0.2	0.2
2%	7.0	4.4	3.4	2.3	1.5	0.7	0.5	0.3	0.2
1%	8.4	5.3	4.1	2.7	1.8	0.8	0.6	0.3	0.2

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.3	0.8	0.7	0.4	0.3	0.2	0.1	0.1	0.0
5%	1.6	1.0	1.1	0.7	0.4	0.2	0.1	0.1	0.1
2%	2.9	1.8	1.4	0.9	0.6	0.2	0.2	0.1	0.1
1%	3.6	2.2	1.7	1.1	0.7	0.3	0.2	0.1	0.1

Sump inlet capacity to be sized to allow for 3.6l/s based on Table 3 - 10% AEP Post Development Runoff Rate

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	DunnsRd Soak6 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	450.98	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.53		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	2.0	m	A/W
Actual Volume		7.50	m3	
Actual Area		3.00	m2	
Storage Volume		2.85	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.8	0.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.2	1.2	1.1	0.4	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.5	1.0	1.5	3.0	6.0	18.0	36.0	72.0	144.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	1.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	2.1	1.9	1.5	0.0	0.0	0.0	0.0	0.0	0.0
1%	3.1	3.1	2.8	1.1	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.8	1.9	2.0	1.8	0.5	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	DunnsRd Soak6 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	427.47	0.8	341.98
Berm	59.57	0.3	17.871
Footpath	0	0.8	0
Lots	0	0.8	0
Total	**487.04**		**359.85**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.7	1.8	1.4	1.0	0.6	0.4	0.2	0.2	0.1
5%	3.4	2.2	1.7	1.2	0.8	0.4	0.3	0.2	0.1
2%	4.3	2.8	2.2	1.5	1.0	0.5	0.3	0.2	0.1
1%	5.2	3.3	2.6	1.7	1.2	0.6	0.4	0.2	0.2

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.6	2.1	2.5	3.4	4.7	7.6	10.1	13.0	16.2
5%	2.0	2.6	3.1	4.2	5.7	9.1	12.0	15.3	19.0
2%	2.6	3.3	3.9	5.3	7.1	11.3	14.8	18.7	23.0
1%	3.1	4.0	4.7	6.2	8.4	13.2	17.1	21.5	26.2

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.7	4.3	3.4	2.3	1.6	0.9	0.6	0.4	0.2
5%	8.3	5.3	4.2	2.9	1.9	1.0	0.7	0.4	0.3
2%	10.7	6.9	5.4	3.6	2.4	1.3	0.8	0.5	0.3
1%	12.9	8.2	6.4	4.3	2.9	1.5	1.0	0.6	0.4

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.0	5.2	6.2	8.4	11.5	18.7	24.8	32.0	39.9
5%	5.0	6.4	7.6	10.3	14.0	22.5	29.6	37.8	46.8
2%	6.4	8.2	9.7	13.0	17.6	27.9	36.4	46.2	56.7
1%	7.7	9.8	11.5	15.3	20.6	32.4	42.0	52.9	64.5

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.7	4.3	3.4	2.3	1.6	0.9	0.6	0.4	0.2
5%	8.3	5.3	4.2	2.9	1.9	1.0	0.7	0.4	0.3
2%	10.7	6.9	5.4	3.6	2.4	1.3	0.8	0.5	0.3
1%	12.9	8.2	6.4	4.3	2.9	1.5	1.0	0.6	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.0	2.6	2.0	1.4	1.0	0.5	0.3	0.2	0.1
5%	4.9	3.2	2.5	1.7	1.2	0.6	0.4	0.3	0.2
2%	6.4	4.1	3.2	2.1	1.4	0.8	0.5	0.3	0.2
1%	7.7	4.9	3.8	2.5	1.7	0.9	0.6	0.4	0.2

Sump inlet capacity to be sized to allow for 7.7l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	DunnsRd Soak6 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	487.04	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.74		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	1.5	1.3	1.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	2.1	2.1	1.9	0.8	0.0	0.0	0.0	0.0	0.0
2%	2.9	3.1	3.1	2.5	0.0	0.0	0.0	0.0	0.0
1%	3.7	4.1	4.2	3.8	1.7	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.0	3.5	2.7	0.0	0.0	0.0	0.0	0.0	0.0
5%	5.5	5.4	4.9	2.2	0.0	0.0	0.0	0.0	0.0
2%	7.7	8.3	8.2	6.5	0.0	0.0	0.0	0.0	0.0
1%	9.8	10.7	11.0	10.1	4.6	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.1	3.5	3.6	3.2	1.0	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Future1

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	666.25	0.8	533
Berm	196.4	0.3	58.92
Footpath	187.96	0.8	150.37
Lots	1820.94	0.8	1456.8
Total	**2871.55**		**2199**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	16.0	10.4	8.2	5.6	3.8	2.1	1.4	0.9	0.6
5%	19.9	12.8	10.1	6.8	4.6	2.5	1.6	1.0	0.6
2%	25.6	16.4	12.9	8.6	5.8	3.1	2.0	1.3	0.8
1%	30.9	19.6	15.3	10.2	6.8	3.6	2.3	1.5	0.9

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.6	12.5	14.8	20.2	27.6	44.8	59.5	76.6	95.6
5%	11.9	15.3	18.1	24.6	33.5	53.8	70.9	90.4	112.1
2%	15.4	19.7	23.1	31.1	42.1	66.7	87.1	110.5	135.7
1%	18.5	23.5	27.5	36.6	49.3	77.6	100.6	126.6	154.4

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	40.9	26.5	21.0	14.3	9.8	5.3	3.5	2.3	1.4
5%	50.7	32.6	25.7	17.4	11.9	6.4	4.2	2.7	1.7
2%	65.4	41.9	32.8	22.1	14.9	7.9	5.1	3.3	2.0
1%	78.9	49.9	38.9	26.0	17.5	9.2	5.9	3.7	2.3

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	24.5	31.8	37.7	51.5	70.4	114.4	151.9	195.4	244.0
5%	30.4	39.2	46.2	62.7	85.4	137.3	180.9	230.8	286.3
2%	39.2	50.3	59.1	79.4	107.4	170.3	222.4	282.1	346.5
1%	47.3	59.9	70.1	93.5	125.9	198.1	256.7	323.3	394.0

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	27.1	17.6	13.9	9.5	6.5	3.5	2.3	1.5	0.9
5%	33.6	21.6	5.8	5.8	7.9	4.2	2.8	1.8	1.1
2%	5.8	5.8	5.8	5.8	5.8	5.2	3.4	2.2	1.3
1%	5.8	5.8	5.8	5.8	5.8	6.1	3.9	2.5	1.5

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	16.3	21.1	25.0	34.1	46.7	75.8	100.6	129.5	161.7
5%	20.1	26.0	30.2	40.6	56.6	91.0	119.8	152.9	189.6
2%	23.2	26.7	30.2	40.6	61.4	112.8	147.3	186.8	229.5
1%	23.2	26.7	30.2	40.6	61.4	131.2	170.1	214.1	261.0

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	13.8	9.0	7.1	4.8	3.3	1.8	1.2	0.8	0.5
5%	17.1	11.0	19.9	11.6	4.0	2.1	1.4	0.9	0.6
2%	59.6	36.2	27.0	16.3	9.1	2.7	1.7	1.1	0.7
1%	73.1	44.2	33.2	20.2	11.7	3.1	2.0	1.3	0.8

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s)
(Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	9.8	4.8	0.0	0.0	0.0	0.0	0.0
2%	34.0	19.7	14.2	7.6	3.3	0.0	0.0	0.0	0.0
1%	42.2	24.6	17.9	10.0	4.9	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 42.2l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Future1

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2871.55	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.77		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	6.0	m	A/W
Actual Volume		22.50	m3	
Actual Area		9.00	m2	
Storage Volume		8.55	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.5	3.0	4.5	9.0	18.0	54.0	108.0	216.0	432.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.9	1.3	0.0	0.0	0.0	0.0	0.0	0.0
1%	4.0	6.7	8.0	7.3	0.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	2.4	3.3	0.0	0.0	0.0	0.0	0.0	0.0
1%	10.6	17.8	20.9	19.2	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.8	7.7	8.2	8.4	5.8	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Future2

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	524.59	0.8	419.67
Berm	165.25	0.3	49.575
Footpath	176.26	0.8	141.01
Lots	1772.18	0.8	1417.7
Total	**2638.28**		**2028**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.7	9.5	7.5	5.1	3.5	1.9	1.3	0.8	0.5
5%	18.2	11.7	9.2	6.3	4.3	2.3	1.5	1.0	0.6
2%	23.5	15.1	11.8	7.9	5.4	2.8	1.9	1.2	0.7
1%	28.4	18.0	14.0	9.4	6.3	3.3	2.1	1.3	0.8

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.8	11.5	13.6	18.5	25.3	41.2	54.7	70.3	87.8
5%	10.9	14.1	16.6	22.6	30.7	49.4	65.1	83.1	103.0
2%	14.1	18.1	21.3	28.6	38.7	61.3	80.0	101.5	124.7
1%	17.0	21.6	25.2	33.7	45.3	71.3	92.4	116.3	141.8

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	37.7	24.5	19.3	13.2	9.0	4.9	3.2	2.1	1.3
5%	46.7	30.1	23.7	16.1	10.9	5.9	3.9	2.5	1.5
2%	60.3	38.7	30.3	20.4	13.8	7.3	4.7	3.0	1.8
1%	72.7	46.1	35.9	24.0	16.1	8.5	5.5	3.5	2.1

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	22.6	29.4	34.8	47.5	64.9	105.5	140.0	180.2	225.0
5%	28.0	36.1	42.6	57.8	78.7	126.6	166.8	212.9	264.0
2%	36.2	46.4	54.5	73.3	99.0	157.1	205.1	260.1	319.5
1%	43.6	55.3	64.6	86.3	116.1	182.7	236.7	298.1	363.4

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	26.4	17.1	13.5	9.2	6.3	3.4	2.3	1.5	0.9
5%	32.7	21.0	5.6	5.6	7.6	4.1	2.7	1.7	1.1
2%	5.6	5.6	5.6	5.6	5.6	5.1	3.3	2.1	1.3
1%	5.6	5.6	5.6	5.6	5.6	5.9	3.8	2.4	1.5

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	15.8	20.5	24.3	33.2	45.4	73.7	97.9	126.0	157.3
5%	19.6	25.3	29.4	39.5	55.1	88.5	116.6	148.8	184.6
2%	22.6	26.0	29.4	39.5	59.7	109.8	143.4	181.8	223.4
1%	22.6	26.0	29.4	39.5	59.7	127.7	165.5	208.4	254.0

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.3	7.4	5.8	4.0	2.7	1.5	1.0	0.6	0.4
5%	14.1	9.1	18.1	10.4	3.3	1.8	1.2	0.7	0.5
2%	54.7	33.0	24.6	14.7	8.1	2.2	1.4	0.9	0.6
1%	67.1	40.4	30.3	18.3	10.5	2.5	1.6	1.0	0.6

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	8.8	4.2	0.0	0.0	0.0	0.0	0.0
2%	31.2	18.0	12.8	6.8	2.8	0.0	0.0	0.0	0.0
1%	38.7	22.5	16.3	9.0	4.2	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 38.7l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Future2

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2638.28	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.77		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	5.0	m	A/W
Actual Volume		18.75	m3	
Actual Area		7.50	m2	
Storage Volume		7.13	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.7	5.2	6.3	5.6	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.3	2.5	3.8	7.5	15.0	45.0	90.0	180.0	360.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
1%	7.2	13.7	16.6	14.7	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.6	6.3	6.7	6.8	4.5	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Future3

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	715.09	0.8	572.07
Berm	204.88	0.3	61.464
Footpath	185.06	0.8	148.05
Lots	1832.91	0.8	1466.3
Total	**2937.94**		**2247.9**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	16.4	10.6	8.4	5.7	3.9	2.1	1.4	0.9	0.6
5%	20.3	13.1	10.3	7.0	4.8	2.5	1.7	1.1	0.7
2%	26.2	16.8	13.2	8.8	6.0	3.2	2.1	1.3	0.8
1%	31.6	20.0	15.6	10.4	7.0	3.7	2.4	1.5	0.9

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.8	12.8	15.1	20.6	28.2	45.8	60.9	78.3	97.8
5%	12.2	15.7	18.5	25.1	34.2	55.0	72.5	92.5	114.7
2%	15.7	20.2	23.7	31.8	43.0	68.3	89.1	113.0	138.9
1%	19.0	24.0	28.1	37.5	50.5	79.4	102.9	129.6	157.9

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	41.8	27.1	21.4	14.6	10.0	5.4	3.6	2.3	1.4
5%	51.8	33.4	26.2	17.8	12.1	6.5	4.3	2.7	1.7
2%	66.9	42.9	33.6	22.6	15.2	8.1	5.3	3.3	2.0
1%	80.6	51.1	39.8	26.6	17.9	9.4	6.1	3.8	2.3

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	25.1	32.5	38.6	52.6	72.0	116.9	155.2	199.8	249.4
5%	31.1	40.0	47.2	64.1	87.3	140.4	184.9	235.9	292.6
2%	40.1	51.4	60.4	81.2	109.8	174.1	227.3	288.3	354.2
1%	48.4	61.3	71.7	95.6	128.7	202.5	262.4	330.4	402.8

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	27.3	17.7	14.0	9.5	6.5	3.5	2.3	1.5	0.9
5%	33.8	21.8	5.8	5.8	7.9	4.2	2.8	1.8	1.1
2%	5.8	5.8	5.8	5.8	5.8	5.3	3.4	2.2	1.3
1%	5.8	5.8	5.8	5.8	5.8	6.1	4.0	2.5	1.5

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	16.4	21.2	25.2	34.3	47.0	76.3	101.3	130.3	162.7
5%	20.3	26.1	30.4	40.8	56.9	91.6	120.6	153.9	190.9
2%	23.4	26.9	30.4	40.8	61.8	113.6	148.3	188.1	231.0
1%	23.4	26.9	30.4	40.8	61.8	132.1	171.2	215.5	262.7

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.5	9.4	7.5	5.1	3.5	1.9	1.2	0.8	0.5
5%	18.0	11.6	20.4	12.0	4.2	2.3	1.5	0.9	0.6
2%	61.0	37.1	27.7	16.7	9.4	2.8	1.8	1.2	0.7
1%	74.8	45.2	34.0	20.7	12.1	3.3	2.1	1.3	0.8

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	10.1	5.0	0.0	0.0	0.0	0.0	0.0
2%	34.8	20.2	14.6	7.9	3.5	0.0	0.0	0.0	0.0
1%	43.2	25.2	18.4	10.3	5.0	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 43.2l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Future3

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2937.94	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.77		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	6.5	m	A/W
Actual Volume		24.38	m3	
Actual Area		9.75	m2	
Storage Volume		9.26	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.6	3.3	4.9	9.8	19.5	58.5	117.0	234.0	468.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	1.1	1.5	0.0	0.0	0.0	0.0	0.0	0.0
1%	4.4	7.1	8.3	7.5	0.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	3.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0
1%	11.5	18.7	21.9	19.8	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.1	8.1	8.5	8.6	5.5	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Future4

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	8818.64	0.3	2645.6
Road	659.19	0.8	527.35
Berm	209.66	0.3	62.898
Footpath	223.63	0.8	178.9
Lots	22.76	0.8	18.208
Total	**9933.88**		**3433**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	55.4	36.0	28.4	19.4	13.3	7.2	4.8	3.1	1.9
5%	68.7	44.2	34.8	23.6	16.1	8.6	5.7	3.6	2.2
2%	88.6	56.8	44.5	29.9	20.2	10.7	7.0	4.4	2.7
1%	106.9	67.7	52.8	35.2	23.7	12.4	8.1	5.1	3.1

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	33.3	43.1	51.2	69.8	95.4	155.0	205.8	264.9	330.7
5%	41.2	53.1	62.6	85.0	115.7	186.1	245.2	312.8	388.0
2%	53.2	68.2	80.1	107.7	145.5	230.8	301.4	382.2	469.6
1%	64.1	81.2	95.0	126.8	170.6	268.4	347.9	438.1	534.0

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	63.8	41.4	32.7	22.3	15.3	8.3	5.5	3.5	2.2
5%	79.1	51.0	40.1	27.2	18.5	9.9	6.5	4.2	2.6
2%	102.1	65.5	51.2	34.5	23.3	12.3	8.0	5.1	3.1
1%	123.1	78.0	60.8	40.6	27.3	14.3	9.3	5.8	3.6

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	38.3	49.7	58.9	80.4	109.9	178.5	237.1	305.1	381.0
5%	47.5	61.2	72.1	97.9	133.3	214.4	282.4	360.3	446.9
2%	61.3	78.6	92.2	124.0	167.7	265.9	347.1	440.3	540.9
1%	73.9	93.6	109.4	146.0	196.5	309.2	400.7	504.6	615.1

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0
5%	0.4	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.0
2%	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
1%	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.2	0.3	0.3	0.4	0.6	0.9	1.3	1.6	2.0
5%	0.3	0.3	0.4	0.5	0.7	1.1	1.5	1.9	2.4
2%	0.3	0.3	0.4	0.5	0.8	1.4	1.8	2.3	2.9
1%	0.3	0.3	0.4	0.5	0.8	1.6	2.1	2.7	3.3

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	63.5	41.2	32.6	22.2	15.2	8.2	5.5	3.5	2.2
5%	78.7	50.7	40.0	27.1	18.4	9.9	6.5	4.1	2.6
2%	102.0	65.4	51.2	34.4	23.2	12.2	8.0	5.1	3.1
1%	123.0	77.9	60.7	40.5	27.2	14.2	9.2	5.8	3.5

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.1	5.2	4.1	2.8	1.9	1.0	0.7	0.4	0.3
5%	10.0	6.5	5.2	3.5	2.3	1.3	0.8	0.5	0.3
2%	13.4	8.6	6.7	4.5	3.0	1.6	1.0	0.6	0.4
1%	16.2	10.2	7.9	5.3	3.5	1.8	1.2	0.7	0.5

Sump inlet capacity to be sized to allow for 16.2l/s based on Table 3 - 10% AEP Post Development Runoff Rate

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Future4

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	9933.88	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.35		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	27.5	m	A/W
Actual Volume		103.13	m3	
Actual Area		41.25	m2	
Storage Volume		39.19	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	6.9	13.8	20.6	41.3	82.5	247.5	495.0	990.0	1980.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	31.2	35.7	38.0	38.7	26.9	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Future5

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	479.86	0.8	383.89
Berm	131.37	0.3	39.411
Footpath	121.2	0.8	96.96
Lots	1910.11	0.8	1528.1
Total	**2642.54**		**2048.3**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.7	9.6	7.6	5.2	3.5	1.9	1.3	0.8	0.5
5%	18.3	11.8	9.3	6.3	4.3	2.3	1.5	1.0	0.6
2%	23.6	15.1	11.8	8.0	5.4	2.8	1.9	1.2	0.7
1%	28.4	18.0	14.0	9.4	6.3	3.3	2.1	1.3	0.8

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.8	11.5	13.6	18.6	25.4	41.2	54.7	70.5	88.0
5%	11.0	14.1	16.7	22.6	30.8	49.5	65.2	83.2	103.2
2%	14.1	18.1	21.3	28.6	38.7	61.4	80.2	101.7	124.9
1%	17.1	21.6	25.3	33.7	45.4	71.4	92.5	116.5	142.0

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	38.1	24.7	19.5	13.3	9.1	4.9	3.3	2.1	1.3
5%	47.2	30.4	23.9	16.2	11.0	5.9	3.9	2.5	1.5
2%	60.9	39.1	30.6	20.6	13.9	7.3	4.8	3.0	1.9
1%	73.5	46.5	36.3	24.2	16.3	8.5	5.5	3.5	2.1

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	22.9	29.7	35.2	48.0	65.6	106.5	141.4	182.0	227.3
5%	28.3	36.5	43.0	58.4	79.5	127.9	168.5	215.0	266.7
2%	36.6	46.9	55.0	74.0	100.0	158.7	207.1	262.7	322.7
1%	44.1	55.8	65.3	87.1	117.3	184.5	239.1	301.1	367.0

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	28.4	18.4	14.6	9.9	6.8	3.7	2.4	1.6	1.0
5%	35.2	22.7	6.1	6.1	8.2	4.4	2.9	1.9	1.2
2%	6.1	6.1	6.1	6.1	6.1	5.5	3.6	2.3	1.4
1%	6.1	6.1	6.1	6.1	6.1	6.4	4.1	2.6	1.6

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.1	22.1	26.2	35.8	48.9	79.5	105.5	135.8	169.6
5%	21.1	27.2	31.7	42.6	59.3	95.4	125.7	160.4	198.9
2%	24.4	28.0	31.7	42.6	64.4	118.4	154.5	196.0	240.8
1%	24.4	28.0	31.7	42.6	64.4	137.6	178.4	224.6	273.8

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.7	6.3	5.0	3.4	2.3	1.3	0.8	0.5	0.3
5%	12.0	7.7	17.9	10.2	2.8	1.5	1.0	0.6	0.4
2%	54.9	33.0	24.5	14.5	7.8	1.9	1.2	0.8	0.5
1%	67.4	40.5	30.2	18.1	10.2	2.2	1.4	0.9	0.5

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	8.6	3.9	0.0	0.0	0.0	0.0	0.0
2%	31.3	17.9	12.7	6.5	2.5	0.0	0.0	0.0	0.0
1%	39.0	22.5	16.2	8.8	3.9	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 39l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Future5

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2642.54	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.78		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	4.5	m	A/W
Actual Volume		16.88	m3	
Actual Area		6.75	m2	
Storage Volume		6.41	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.5	4.0	5.0	4.1	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.1	2.3	3.4	6.8	13.5	40.5	81.0	162.0	324.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	4.0	10.4	13.1	10.8	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.7	5.3	5.6	5.4	3.2	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd1 Soak1 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	410.21	0.8	328.17
Berm	3.61	0.3	1.083
Footpath	0	0.8	0
Lots	0	0.8	0
Total	**413.82**		**329.25**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.3	1.5	1.2	0.8	0.6	0.3	0.2	0.1	0.1
5%	2.9	1.8	1.4	1.0	0.7	0.4	0.2	0.2	0.1
2%	3.7	2.4	1.9	1.2	0.8	0.4	0.3	0.2	0.1
1%	4.5	2.8	2.2	1.5	1.0	0.5	0.3	0.2	0.1

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.4	1.8	2.1	2.9	4.0	6.5	8.6	11.0	13.8
5%	1.7	2.2	2.6	3.5	4.8	7.8	10.2	13.0	16.2
2%	2.2	2.8	3.3	4.5	6.1	9.6	12.6	15.9	19.6
1%	2.7	3.4	4.0	5.3	7.1	11.2	14.5	18.2	22.2

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.1	4.0	3.1	2.1	1.5	0.8	0.5	0.3	0.2
5%	7.6	4.9	3.8	2.6	1.8	1.0	0.6	0.4	0.2
2%	9.8	6.3	4.9	3.3	2.2	1.2	0.8	0.5	0.3
1%	11.8	7.5	5.8	3.9	2.6	1.4	0.9	0.6	0.3

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.7	4.8	5.7	7.7	10.5	17.1	22.7	29.3	36.5
5%	4.6	5.9	6.9	9.4	12.8	20.6	27.1	34.6	42.9
2%	5.9	7.5	8.8	11.9	16.1	25.5	33.3	42.2	51.9
1%	7.1	9.0	10.5	14.0	18.8	29.7	38.4	48.4	59.0

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.1	4.0	3.1	2.1	1.5	0.8	0.5	0.3	0.2
5%	7.6	4.9	3.8	2.6	1.8	1.0	0.6	0.4	0.2
2%	9.8	6.3	4.9	3.3	2.2	1.2	0.8	0.5	0.3
1%	11.8	7.5	5.8	3.9	2.6	1.4	0.9	0.6	0.3

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.8	2.5	2.0	1.3	0.9	0.5	0.3	0.2	0.1
5%	4.7	3.0	2.4	1.6	1.1	0.6	0.4	0.2	0.2
2%	6.1	3.9	3.1	2.1	1.4	0.7	0.5	0.3	0.2
1%	7.4	4.7	3.6	2.4	1.6	0.9	0.6	0.3	0.2

Sump inlet capacity to be sized to allow for 7.4l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd1 Soak1 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	413.82	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.80		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	1.4	1.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0
5%	2.0	1.9	1.7	0.6	0.0	0.0	0.0	0.0	0.0
2%	2.8	2.9	2.9	2.2	0.0	0.0	0.0	0.0	0.0
1%	3.5	3.8	3.9	3.5	1.2	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.7	3.2	2.4	0.0	0.0	0.0	0.0	0.0	0.0
5%	5.2	5.0	4.4	1.6	0.0	0.0	0.0	0.0	0.0
2%	7.3	7.7	7.6	5.7	0.0	0.0	0.0	0.0	0.0
1%	9.3	10.1	10.3	9.1	3.3	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.8	3.0	3.0	2.5	0.0	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd1 Soak1- A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	0.02	0.8	0.016
Berm	118.22	0.3	35.466
Footpath	5.25	0.8	4.2
Lots	10.49	0.8	8.392
Total	**133.98**		**48.074**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.7	0.5	0.4	0.3	0.2	0.1	0.1	0.0	0.0
5%	0.9	0.6	0.5	0.3	0.2	0.1	0.1	0.0	0.0
2%	1.2	0.8	0.6	0.4	0.3	0.1	0.1	0.1	0.0
1%	1.4	0.9	0.7	0.5	0.3	0.2	0.1	0.1	0.0

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.4	0.6	0.7	0.9	1.3	2.1	2.8	3.6	4.5
5%	0.6	0.7	0.8	1.1	1.6	2.5	3.3	4.2	5.2
2%	0.7	0.9	1.1	1.5	2.0	3.1	4.1	5.2	6.3
1%	0.9	1.1	1.3	1.7	2.3	3.6	4.7	5.9	7.2

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.9	0.6	0.5	0.3	0.2	0.1	0.1	0.0	0.0
5%	1.1	0.7	0.6	0.4	0.3	0.1	0.1	0.1	0.0
2%	1.4	0.9	0.7	0.5	0.3	0.2	0.1	0.1	0.0
1%	1.7	1.1	0.9	0.6	0.4	0.2	0.1	0.1	0.0

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.5	0.7	0.8	1.1	1.5	2.5	3.3	4.3	5.3
5%	0.7	0.9	1.0	1.4	1.9	3.0	4.0	5.0	6.3
2%	0.9	1.1	1.3	1.7	2.3	3.7	4.9	6.2	7.6
1%	1.0	1.3	1.5	2.0	2.8	4.3	5.6	7.1	8.6

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
5%	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.1	0.1	0.1	0.2	0.3	0.4	0.6	0.7	0.9
5%	0.1	0.1	0.2	0.2	0.3	0.5	0.7	0.9	1.1
2%	0.1	0.2	0.2	0.2	0.4	0.7	0.8	1.1	1.3
1%	0.1	0.2	0.2	0.2	0.4	0.8	1.0	1.2	1.5

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.7	0.5	0.4	0.3	0.2	0.1	0.1	0.0	0.0
5%	0.9	0.6	0.5	0.3	0.2	0.1	0.1	0.0	0.0
2%	1.4	0.9	0.7	0.4	0.3	0.1	0.1	0.1	0.0
1%	1.7	1.1	0.8	0.5	0.3	0.2	0.1	0.1	0.0

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 0.2l/s based on Table 3 - 10% AEP Post Development Runoff Rate

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd1 Soak1- A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	133.98	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.36		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	0.5	m	A/W
Actual Volume		1.88	m3	
Actual Area		0.75	m2	
Storage Volume		0.71	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.1	0.3	0.4	0.8	1.5	4.5	9.0	18.0	36.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.3	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd1 Soak2 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	662.8	0.8	530.24
Berm	184.42	0.3	55.326
Footpath	104	0.8	83.2
Lots	709.74	0.8	567.79
Total	**1660.96**		**1236.6**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.3	6.0	4.8	3.2	2.2	1.2	0.8	0.5	0.3
5%	11.5	7.4	5.8	3.9	2.7	1.4	0.9	0.6	0.4
2%	14.8	9.5	7.4	5.0	3.4	1.8	1.2	0.7	0.5
1%	17.9	11.3	8.8	5.9	4.0	2.1	1.3	0.8	0.5

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.6	7.2	8.6	11.7	16.0	25.9	34.4	44.3	55.3
5%	6.9	8.9	10.5	14.2	19.3	31.1	41.0	52.3	64.9
2%	8.9	11.4	13.4	18.0	24.3	38.6	50.4	63.9	78.5
1%	10.7	13.6	15.9	21.2	28.5	44.9	58.2	73.2	89.3

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	23.0	14.9	11.8	8.0	5.5	3.0	2.0	1.3	0.8
5%	28.5	18.4	14.4	9.8	6.7	3.6	2.4	1.5	0.9
2%	36.8	23.6	18.5	12.4	8.4	4.4	2.9	1.8	1.1
1%	44.3	28.1	21.9	14.6	9.8	5.2	3.3	2.1	1.3

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	13.8	17.9	21.2	29.0	39.6	64.3	85.4	109.9	137.2
5%	17.1	22.0	26.0	35.3	48.0	77.2	101.7	129.8	161.0
2%	22.1	28.3	33.2	44.7	60.4	95.8	125.0	158.6	194.8
1%	26.6	33.7	39.4	52.6	70.8	111.4	144.3	181.8	221.6

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.6	6.9	5.4	3.7	2.5	1.4	0.9	0.6	0.4
5%	13.1	8.4	2.3	2.3	3.1	1.6	1.1	0.7	0.4
2%	2.3	2.3	2.3	2.3	2.3	2.0	1.3	0.8	0.5
1%	2.3	2.3	2.3	2.3	2.3	2.4	1.5	1.0	0.6

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.3	8.2	9.7	13.3	18.2	29.5	39.2	50.5	63.0
5%	7.9	10.1	11.8	15.8	22.0	35.5	46.7	59.6	73.9
2%	9.1	10.4	11.8	15.8	23.9	44.0	57.4	72.8	89.5
1%	9.1	10.4	11.8	15.8	23.9	51.1	66.3	83.5	101.7

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	12.4	8.1	6.4	4.4	3.0	1.6	1.1	0.7	0.4
5%	15.4	9.9	12.2	7.5	3.6	1.9	1.3	0.8	0.5
2%	34.5	21.3	16.2	10.2	6.1	2.4	1.6	1.0	0.6
1%	42.1	25.8	19.6	12.4	7.6	2.8	1.8	1.1	0.7

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s)
(Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.2	2.1	1.6	1.1	0.8	0.4	0.3	0.2	0.1
5%	3.9	2.5	6.4	3.6	0.9	0.5	0.3	0.2	0.1
2%	19.7	11.8	8.8	5.2	2.8	0.6	0.4	0.3	0.2
1%	24.2	14.5	10.8	6.5	3.6	0.7	0.5	0.3	0.2

Sump inlet capacity to be sized to allow for 24.2l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd1 Soak2 - A

Calculations By	Linda Bos	Date	46128	
Reviewed By	Chris Sexton	Date	46129	

Catchment Area	A	1660.96	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.74		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	5.5	m	A/W
Actual Volume		20.63	m3	
Actual Area		8.25	m2	
Storage Volume		7.84	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	1.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	2.7	3.7	4.0	2.6	0.0	0.0	0.0	0.0	0.0
1%	5.5	7.0	7.6	7.3	1.8	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.4	2.8	4.1	8.3	16.5	49.5	99.0	198.0	396.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	2.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	7.2	9.8	10.4	6.9	0.0	0.0	0.0	0.0	0.0
1%	14.3	18.3	20.1	19.3	4.8	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.1	6.9	7.4	7.4	4.9	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd1 Soak3 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	493.02	0.8	394.42
Berm	158.6	0.3	47.58
Footpath	92.41	0.8	73.928
Lots	790.98	0.8	632.78
Total	**1535.01**		**1148.7**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.6	5.6	4.4	3.0	2.0	1.1	0.7	0.5	0.3
5%	10.6	6.8	5.4	3.6	2.5	1.3	0.9	0.6	0.3
2%	13.7	8.8	6.9	4.6	3.1	1.7	1.1	0.7	0.4
1%	16.5	10.5	8.2	5.4	3.7	1.9	1.2	0.8	0.5

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.1	6.7	7.9	10.8	14.7	23.9	31.8	40.9	51.1
5%	6.4	8.2	9.7	13.1	17.9	28.8	37.9	48.3	60.0
2%	8.2	10.5	12.4	16.6	22.5	35.7	46.6	59.1	72.6
1%	9.9	12.6	14.7	19.6	26.4	41.5	53.8	67.7	82.5

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	21.4	13.9	11.0	7.5	5.1	2.8	1.8	1.2	0.7
5%	26.5	17.1	13.4	9.1	6.2	3.3	2.2	1.4	0.9
2%	34.2	21.9	17.1	11.5	7.8	4.1	2.7	1.7	1.0
1%	41.2	26.1	20.3	13.6	9.1	4.8	3.1	2.0	1.2

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	12.8	16.6	19.7	26.9	36.8	59.7	79.3	102.1	127.5
5%	15.9	20.5	24.1	32.8	44.6	71.7	94.5	120.6	149.5
2%	20.5	26.3	30.9	41.5	56.1	89.0	116.2	147.3	181.0
1%	24.7	31.3	36.6	48.9	65.8	103.5	134.1	168.9	205.8

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.8	7.6	6.0	4.1	2.8	1.5	1.0	0.7	0.4
5%	14.6	9.4	2.5	2.5	3.4	1.8	1.2	0.8	0.5
2%	2.5	2.5	2.5	2.5	2.5	2.3	1.5	0.9	0.6
1%	2.5	2.5	2.5	2.5	2.5	2.6	1.7	1.1	0.7

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.1	9.2	10.9	14.8	20.3	32.9	43.7	56.2	70.2
5%	8.7	11.3	13.1	17.6	24.6	39.5	52.1	66.4	82.4
2%	10.1	11.6	13.1	17.6	26.7	49.0	64.0	81.2	99.7
1%	10.1	11.6	13.1	17.6	26.7	57.0	73.9	93.0	113.4

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.6	6.2	4.9	3.4	2.3	1.2	0.8	0.5	0.3
5%	11.9	7.7	10.9	6.6	2.8	1.5	1.0	0.6	0.4
2%	31.7	19.4	14.6	9.0	5.3	1.9	1.2	0.8	0.5
1%	38.7	23.6	17.8	11.1	6.6	2.2	1.4	0.9	0.5

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.0	0.7	0.5	0.4	0.2	0.1	0.1	0.1	0.0
5%	1.3	0.8	5.5	2.9	0.3	0.2	0.1	0.1	0.0
2%	18.0	10.6	7.8	4.4	2.2	0.2	0.1	0.1	0.1
1%	22.2	13.1	9.7	5.6	3.0	0.2	0.1	0.1	0.1

Sump inlet capacity to be sized to allow for 22.2l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd1 Soak3 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1535.01	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.75		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	4.5	m	A/W
Actual Volume		16.88	m3	
Actual Area		6.75	m2	
Storage Volume		6.41	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	1.1	1.9	2.0	0.5	0.0	0.0	0.0	0.0	0.0
1%	3.6	4.9	5.5	4.9	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.1	2.3	3.4	6.8	13.5	40.5	81.0	162.0	324.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	2.8	5.0	5.3	1.3	0.0	0.0	0.0	0.0	0.0
1%	9.4	12.9	14.4	12.9	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.6	5.2	5.5	5.3	3.0	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd1 Soak4 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	499.88	0.3	149.96
Road	836.24	0.8	668.99
Berm	301.83	0.3	90.549
Footpath	252.04	0.8	201.63
Lots	2491.59	0.8	1993.3
Total	**4381.58**		**3104.4**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	24.4	15.9	12.5	8.6	5.8	3.2	2.1	1.4	0.8
5%	30.3	19.5	15.3	10.4	7.1	3.8	2.5	1.6	1.0
2%	39.1	25.1	19.6	13.2	8.9	4.7	3.1	2.0	1.2
1%	47.1	29.9	23.3	15.5	10.5	5.5	3.6	2.2	1.4

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.7	19.0	22.6	30.8	42.1	68.4	90.8	116.8	145.9
5%	18.2	23.4	27.6	37.5	51.0	82.1	108.1	138.0	171.1
2%	23.5	30.1	35.3	47.5	64.2	101.8	132.9	168.6	207.1
1%	28.3	35.8	41.9	55.9	75.2	118.4	153.4	193.2	235.5

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	57.7	37.5	29.6	20.2	13.8	7.5	5.0	3.2	2.0
5%	71.5	46.1	36.2	24.6	16.7	9.0	5.9	3.8	2.3
2%	92.3	59.2	46.3	31.2	21.1	11.1	7.3	4.6	2.8
1%	111.3	70.5	55.0	36.7	24.7	12.9	8.4	5.3	3.2

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	34.6	44.9	53.3	72.7	99.4	161.4	214.4	275.9	344.5
5%	42.9	55.3	65.2	88.5	120.5	193.9	255.4	325.9	404.1
2%	55.4	71.0	83.4	112.2	151.6	240.5	313.9	398.2	489.1
1%	66.8	84.6	99.0	132.0	177.7	279.6	362.4	456.3	556.3

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	37.1	24.0	19.0	13.0	8.9	4.8	3.2	2.1	1.3
5%	45.9	29.6	7.9	7.9	10.8	5.8	3.8	2.4	1.5
2%	7.9	7.9	7.9	7.9	7.9	7.1	4.7	3.0	1.8
1%	7.9	7.9	7.9	7.9	7.9	8.3	5.4	3.4	2.1

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	22.2	28.9	34.2	46.7	63.8	103.7	137.6	177.1	221.2
5%	27.6	35.5	41.3	55.5	77.4	124.5	164.0	209.2	259.5
2%	31.8	36.5	41.3	55.5	84.0	154.4	201.6	255.7	314.1
1%	31.8	36.5	41.3	55.5	84.0	179.5	232.7	293.0	357.2

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	20.7	13.4	10.6	7.2	4.9	2.7	1.8	1.1	0.7
5%	25.6	16.5	28.3	16.7	6.0	3.2	2.1	1.3	0.8
2%	84.4	51.3	38.4	23.2	13.1	4.0	2.6	1.6	1.0
1%	103.4	62.6	47.1	28.8	16.8	4.6	3.0	1.9	1.2

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	13.0	6.3	0.0	0.0	0.0	0.0	0.0
2%	45.3	26.2	18.8	10.1	4.2	0.0	0.0	0.0	0.0
1%	56.3	32.7	23.8	13.2	6.3	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 56.3l/s based on Table 3 - 10% AEP Post Development Runoff Rate

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd1 Soak4 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	4381.58	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.71		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	9.0	m	A/W
Actual Volume		33.75	m3	
Actual Area		13.50	m2	
Storage Volume		12.83	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	2.3	4.5	6.8	13.5	27.0	81.0	162.0	324.0	648.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1%	4.5	7.7	9.0	7.1	0.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
1%	11.8	20.4	23.7	18.7	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.1	11.6	12.3	12.5	8.6	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd1 Soak5 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	588.53	0.8	470.82
Berm	181.45	0.3	54.435
Footpath	132.96	0.8	106.37
Lots	769.87	0.8	615.9
Total	**1672.81**		**1247.5**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.3	6.1	4.8	3.3	2.2	1.2	0.8	0.5	0.3
5%	11.6	7.4	5.9	4.0	2.7	1.5	1.0	0.6	0.4
2%	14.9	9.6	7.5	5.0	3.4	1.8	1.2	0.7	0.5
1%	18.0	11.4	8.9	5.9	4.0	2.1	1.4	0.9	0.5

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.6	7.3	8.6	11.8	16.1	26.1	34.7	44.6	55.7
5%	6.9	8.9	10.5	14.3	19.5	31.3	41.3	52.7	65.3
2%	9.0	11.5	13.5	18.1	24.5	38.9	50.7	64.4	79.1
1%	10.8	13.7	16.0	21.3	28.7	45.2	58.6	73.8	89.9

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	23.2	15.1	11.9	8.1	5.5	3.0	2.0	1.3	0.8
5%	28.8	18.5	14.6	9.9	6.7	3.6	2.4	1.5	0.9
2%	37.1	23.8	18.6	12.5	8.5	4.5	2.9	1.9	1.1
1%	44.7	28.3	22.1	14.7	9.9	5.2	3.4	2.1	1.3

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	13.9	18.1	21.4	29.2	40.0	64.9	86.1	110.9	138.4
5%	17.3	22.2	26.2	35.6	48.4	77.9	102.6	130.9	162.4
2%	22.3	28.5	33.5	45.1	60.9	96.6	126.2	160.0	196.6
1%	26.8	34.0	39.8	53.1	71.4	112.4	145.6	183.4	223.5

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.5	7.4	5.9	4.0	2.7	1.5	1.0	0.6	0.4
5%	14.2	9.1	2.4	2.4	3.3	1.8	1.2	0.7	0.5
2%	2.4	2.4	2.4	2.4	2.4	2.2	1.4	0.9	0.6
1%	2.4	2.4	2.4	2.4	2.4	2.6	1.7	1.0	0.6

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.9	8.9	10.6	14.4	19.7	32.0	42.5	54.7	68.3
5%	8.5	11.0	12.8	17.2	23.9	38.5	50.7	64.6	80.2
2%	9.8	11.3	12.8	17.2	26.0	47.7	62.3	79.0	97.0
1%	9.8	11.3	12.8	17.2	26.0	55.5	71.9	90.5	110.4

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.7	7.6	6.0	4.1	2.8	1.5	1.0	0.6	0.4
5%	14.6	9.4	12.1	7.4	3.4	1.8	1.2	0.8	0.5
2%	34.7	21.3	16.2	10.1	6.0	2.3	1.5	0.9	0.6
1%	42.3	25.9	19.6	12.3	7.5	2.6	1.7	1.1	0.7

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.4	1.6	1.2	0.8	0.6	0.3	0.2	0.1	0.1
5%	3.0	1.9	6.3	3.5	0.7	0.4	0.2	0.2	0.1
2%	19.7	11.8	8.7	5.0	2.6	0.5	0.3	0.2	0.1
1%	24.3	14.5	10.8	6.4	3.5	0.5	0.4	0.2	0.1

Sump inlet capacity to be sized to allow for 24.3l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd1 Soak5 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1672.81	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.75		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	5.5	m	A/W
Actual Volume		20.63	m3	
Actual Area		8.25	m2	
Storage Volume		7.84	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	2.1	3.0	3.2	1.5	0.0	0.0	0.0	0.0	0.0
1%	4.8	6.3	6.9	6.3	0.2	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.4	2.8	4.1	8.3	16.5	49.5	99.0	198.0	396.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	5.5	8.0	8.3	4.0	0.0	0.0	0.0	0.0	0.0
1%	12.7	16.5	18.1	16.6	0.6	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.7	6.4	6.7	6.5	3.7	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd1 Soak6 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	16.39	0.3	4.917
Road	1118.04	0.8	894.43
Berm	327.05	0.3	98.115
Footpath	323.35	0.8	258.68
Lots	4420.41	0.8	3536.3
Total	**6205.24**		**4792.5**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	34.6	22.5	17.8	12.1	8.3	4.5	3.0	1.9	1.2
5%	42.9	27.6	21.7	14.7	10.0	5.4	3.5	2.3	1.4
2%	55.4	35.5	27.8	18.7	12.6	6.7	4.4	2.8	1.7
1%	66.8	42.3	33.0	22.0	14.8	7.8	5.0	3.2	1.9

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	20.8	27.0	32.0	43.6	59.6	96.8	128.6	165.4	206.6
5%	25.7	33.2	39.1	53.1	72.3	116.3	153.1	195.4	242.3
2%	33.2	42.6	50.0	67.3	90.9	144.2	188.2	238.8	293.3
1%	40.1	50.7	59.3	79.2	106.6	167.7	217.3	273.6	333.6

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	89.1	57.8	45.7	31.2	21.3	11.5	7.7	4.9	3.1
5%	110.4	71.1	56.0	38.0	25.8	13.9	9.1	5.8	3.6
2%	142.6	91.4	71.5	48.1	32.5	17.2	11.2	7.1	4.4
1%	171.9	108.8	84.9	56.6	38.1	20.0	13.0	8.2	5.0

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	53.5	69.4	82.3	112.2	153.5	249.2	330.9	425.9	531.8
5%	66.3	85.4	100.7	136.7	186.1	299.3	394.3	503.0	623.9
2%	85.5	109.7	128.8	173.1	234.1	371.2	484.6	614.7	755.1
1%	103.1	130.6	152.8	203.8	274.3	431.7	559.4	704.5	858.7

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	65.8	42.7	33.7	23.0	15.7	8.5	5.7	3.6	2.3
5%	81.5	52.5	14.0	14.0	19.1	10.2	6.7	4.3	2.7
2%	14.0	14.0	14.0	14.0	14.0	12.7	8.3	5.2	3.2
1%	14.0	14.0	14.0	14.0	14.0	14.7	9.6	6.0	3.7

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	39.5	51.2	60.7	82.8	113.3	183.9	244.2	314.3	392.4
5%	48.9	63.0	73.3	98.5	137.3	220.8	290.9	371.2	460.4
2%	56.4	64.8	73.3	98.5	149.0	273.9	357.6	453.6	557.2
1%	56.4	64.8	73.3	98.5	149.0	318.5	412.8	519.8	633.7

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	23.4	15.2	12.0	8.2	5.6	3.0	2.0	1.3	0.8
5%	28.9	18.6	41.9	23.9	6.8	3.6	2.4	1.5	0.9
2%	128.5	77.4	57.5	34.1	18.5	4.5	2.9	1.9	1.1
1%	157.8	94.8	70.8	42.6	24.1	5.2	3.4	2.1	1.3

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s)
(Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	20.2	9.2	0.0	0.0	0.0	0.0	0.0
2%	73.1	41.9	29.7	15.4	5.8	0.0	0.0	0.0	0.0
1%	91.1	52.5	37.9	20.6	9.3	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 91.1l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd1 Soak6 - A

Calculations By	Linda Bos		Date	46128	
Reviewed By	Chris Sexton		Date	46129	
Catchment Area	A	6205.24	m2		
Pre-development Runoff Coeff	C	0.3			
Developed Runoff Coefficient	C	0.77			
Critical Duration	Dt	10min			
Infiltration	fa	3.0	m/hr		
Infiltration Safety Factor	SF	0.33333			
Infiltration Rate*SF	f	1.00	m/hr	SF*fa	
% Volume available for storage	V%	0.38	%		
Actual Depth	D	2.5	m		
Width	W	1.5	m		
Length	L	10.5	m	A/W	
Actual Volume		39.38	m3		
Actual Area		15.75	m2		
Storage Volume		14.96	m3		

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	4.0	9.8	12.3	10.4	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	2.6	5.3	7.9	15.8	31.5	94.5	189.0	378.0	756.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	10.6	25.8	32.4	27.4	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.4	12.9	13.7	13.7	8.7	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd19 Soak1 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	416.89	0.8	333.51
Berm	212.25	0.3	63.675
Footpath	153.78	0.8	123.02
Lots	1603.12	0.8	1282.5
Total	**2386.04**		**1802.7**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	13.3	8.6	6.8	4.7	3.2	1.7	1.1	0.7	0.5
5%	16.5	10.6	8.4	5.7	3.9	2.1	1.4	0.9	0.5
2%	21.3	13.7	10.7	7.2	4.9	2.6	1.7	1.1	0.7
1%	25.7	16.3	12.7	8.5	5.7	3.0	1.9	1.2	0.7

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.0	10.4	12.3	16.8	22.9	37.2	49.4	63.6	79.4
5%	9.9	12.8	15.0	20.4	27.8	44.7	58.9	75.1	93.2
2%	12.8	16.4	19.2	25.9	35.0	55.4	72.4	91.8	112.8
1%	15.4	19.5	22.8	30.4	41.0	64.5	83.6	105.2	128.3

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	33.5	21.8	17.2	11.7	8.0	4.3	2.9	1.9	1.2
5%	41.5	26.8	21.0	14.3	9.7	5.2	3.4	2.2	1.4
2%	53.6	34.4	26.9	18.1	12.2	6.5	4.2	2.7	1.6
1%	64.6	40.9	31.9	21.3	14.3	7.5	4.9	3.1	1.9

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	20.1	26.1	30.9	42.2	57.7	93.7	124.5	160.2	200.0
5%	24.9	32.1	37.9	51.4	70.0	112.6	148.3	189.2	234.7
2%	32.2	41.3	48.4	65.1	88.0	139.6	182.3	231.2	284.0
1%	38.8	49.1	57.5	76.7	103.2	162.4	210.4	265.0	323.0

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	23.9	15.5	12.2	8.3	5.7	3.1	2.1	1.3	0.8
5%	29.6	19.0	5.1	5.1	6.9	3.7	2.4	1.6	1.0
2%	5.1	5.1	5.1	5.1	5.1	4.6	3.0	1.9	1.2
1%	5.1	5.1	5.1	5.1	5.1	5.3	3.5	2.2	1.3

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.3	18.6	22.0	30.0	41.1	66.7	88.6	114.0	142.3
5%	17.7	22.8	26.6	35.7	49.8	80.1	105.5	134.6	167.0
2%	20.5	23.5	26.6	35.7	54.0	99.3	129.7	164.5	202.1
1%	20.5	23.5	26.6	35.7	54.0	115.5	149.7	188.5	229.8

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.7	6.3	5.0	3.4	2.3	1.3	0.8	0.5	0.3
5%	12.0	7.7	16.0	9.2	2.8	1.5	1.0	0.6	0.4
2%	48.5	29.3	21.8	13.0	7.1	1.9	1.2	0.8	0.5
1%	59.6	35.9	26.8	16.2	9.2	2.2	1.4	0.9	0.5

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	7.6	3.5	0.0	0.0	0.0	0.0	0.0
2%	27.2	15.6	11.1	5.8	2.3	0.0	0.0	0.0	0.0
1%	33.9	19.6	14.2	7.8	3.6	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 33.9l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd19 Soak1 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2386.04	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	4.5	m	A/W
Actual Volume		16.88	m3	
Actual Area		6.75	m2	
Storage Volume		6.41	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.8	3.9	4.7	3.8	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.1	2.3	3.4	6.8	13.5	40.5	81.0	162.0	324.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	4.7	10.2	12.4	9.9	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.7	5.3	5.6	5.4	3.2	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd19 Soak1 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	297.97	0.8	238.38
Berm	91.72	0.3	27.516
Footpath	127.22	0.8	101.78
Lots	1270	0.8	1016
Total	**1786.91**		**1383.7**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.0	6.5	5.1	3.5	2.4	1.3	0.9	0.6	0.3
5%	12.4	8.0	6.3	4.2	2.9	1.5	1.0	0.7	0.4
2%	15.9	10.2	8.0	5.4	3.6	1.9	1.3	0.8	0.5
1%	19.2	12.2	9.5	6.3	4.3	2.2	1.4	0.9	0.6

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.0	7.8	9.2	12.6	17.2	27.9	37.0	47.6	59.5
5%	7.4	9.5	11.3	15.3	20.8	33.5	44.1	56.3	69.8
2%	9.6	12.3	14.4	19.4	26.2	41.5	54.2	68.8	84.5
1%	11.5	14.6	17.1	22.8	30.7	48.3	62.6	78.8	96.1

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	25.7	16.7	13.2	9.0	6.2	3.3	2.2	1.4	0.9
5%	31.9	20.5	16.2	11.0	7.5	4.0	2.6	1.7	1.0
2%	41.2	26.4	20.7	13.9	9.4	5.0	3.2	2.1	1.3
1%	49.6	31.4	24.5	16.3	11.0	5.8	3.7	2.4	1.4

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	15.4	20.0	23.7	32.4	44.3	72.0	95.5	123.0	153.5
5%	19.1	24.6	29.1	39.5	53.7	86.4	113.8	145.2	180.1
2%	24.7	31.7	37.2	50.0	67.6	107.2	139.9	177.5	218.0
1%	29.8	37.7	44.1	58.9	79.2	124.6	161.5	203.4	247.9

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	18.9	12.3	9.7	6.6	4.5	2.4	1.6	1.0	0.7
5%	23.4	15.1	4.0	4.0	5.5	2.9	1.9	1.2	0.8
2%	4.0	4.0	4.0	4.0	4.0	3.6	2.4	1.5	0.9
1%	4.0	4.0	4.0	4.0	4.0	4.2	2.7	1.7	1.1

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.3	14.7	17.4	23.8	32.5	52.8	70.2	90.3	112.7
5%	14.0	18.1	21.0	28.3	39.5	63.4	83.6	106.6	132.3
2%	16.2	18.6	21.0	28.3	42.8	78.7	102.7	130.3	160.1
1%	16.2	18.6	21.0	28.3	42.8	91.5	118.6	149.3	182.1

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.8	4.4	3.5	2.4	1.6	0.9	0.6	0.4	0.2
5%	8.5	5.5	12.1	6.9	2.0	1.1	0.7	0.4	0.3
2%	37.1	22.4	16.6	9.9	5.4	1.3	0.9	0.5	0.3
1%	45.6	27.4	20.5	12.3	7.0	1.5	1.0	0.6	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	5.9	2.7	0.0	0.0	0.0	0.0	0.0
2%	21.2	12.1	8.6	4.5	1.7	0.0	0.0	0.0	0.0
1%	26.4	15.2	11.0	6.0	2.7	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 26.4l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd19 Soak1 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1786.91	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.77		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.0	m	A/W
Actual Volume		11.25	m3	
Actual Area		4.50	m2	
Storage Volume		4.28	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.3	3.0	3.7	3.2	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.8	1.5	2.3	4.5	9.0	27.0	54.0	108.0	216.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	3.4	7.8	9.8	8.5	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.4	3.8	4.1	4.1	2.8	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd20 Soak1 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	300.83	0.8	240.66
Berm	166.28	0.3	49.884
Footpath	130.52	0.8	104.42
Lots	1707.91	0.8	1366.3
Total	**2305.54**		**1761.3**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	12.9	8.3	6.6	4.5	3.1	1.7	1.1	0.7	0.4
5%	15.9	10.3	8.1	5.5	3.7	2.0	1.3	0.8	0.5
2%	20.6	13.2	10.3	6.9	4.7	2.5	1.6	1.0	0.6
1%	24.8	15.7	12.2	8.2	5.5	2.9	1.9	1.2	0.7

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.7	10.0	11.9	16.2	22.2	36.0	47.8	61.5	76.8
5%	9.6	12.3	14.5	19.7	26.9	43.2	56.9	72.6	90.0
2%	12.3	15.8	18.6	25.0	33.8	53.6	69.9	88.7	109.0
1%	14.9	18.9	22.0	29.4	39.6	62.3	80.7	101.7	123.9

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	32.8	21.3	16.8	11.5	7.8	4.2	2.8	1.8	1.1
5%	40.6	26.1	20.6	14.0	9.5	5.1	3.4	2.1	1.3
2%	52.4	33.6	26.3	17.7	11.9	6.3	4.1	2.6	1.6
1%	63.2	40.0	31.2	20.8	14.0	7.3	4.8	3.0	1.8

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	19.7	25.5	30.2	41.2	56.4	91.6	121.6	156.5	195.4
5%	24.4	31.4	37.0	50.2	68.4	110.0	144.9	184.9	229.3
2%	31.4	40.3	47.3	63.6	86.0	136.4	178.1	225.9	277.5
1%	37.9	48.0	56.1	74.9	100.8	158.6	205.6	258.9	315.6

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	25.4	16.5	13.0	8.9	6.1	3.3	2.2	1.4	0.9
5%	31.5	20.3	5.4	5.4	7.4	4.0	2.6	1.7	1.0
2%	5.4	5.4	5.4	5.4	5.4	4.9	3.2	2.0	1.2
1%	5.4	5.4	5.4	5.4	5.4	5.7	3.7	2.3	1.4

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	15.2	19.8	23.5	32.0	43.8	71.1	94.4	121.4	151.6
5%	18.9	24.3	28.3	38.1	53.1	85.3	112.4	143.4	177.9
2%	21.8	25.0	28.3	38.1	57.6	105.8	138.2	175.2	215.3
1%	21.8	25.0	28.3	38.1	57.6	123.1	159.5	200.8	244.8

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.3	4.8	3.8	2.6	1.8	1.0	0.6	0.4	0.3
5%	9.1	5.9	15.1	8.5	2.1	1.1	0.8	0.5	0.3
2%	47.0	28.2	20.9	12.3	6.5	1.4	0.9	0.6	0.4
1%	57.7	34.6	25.8	15.4	8.6	1.6	1.1	0.7	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	7.1	3.1	0.0	0.0	0.0	0.0	0.0
2%	26.4	15.0	10.5	5.3	1.8	0.0	0.0	0.0	0.0
1%	32.9	18.9	13.5	7.2	3.1	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 32.9l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd20 Soak1 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2305.54	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.3	2.4	3.2	2.2	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.9	6.2	8.3	5.7	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.5	4.0	4.2	4.0	2.1	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd20 Soak1 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	290.67	0.8	232.54
Berm	91.49	0.3	27.447
Footpath	126.06	0.8	100.85
Lots	1630.77	0.8	1304.6
Total	**2138.99**		**1665.4**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.9	7.7	6.1	4.2	2.9	1.5	1.0	0.7	0.4
5%	14.8	9.5	7.5	5.1	3.5	1.9	1.2	0.8	0.5
2%	19.1	12.2	9.6	6.4	4.4	2.3	1.5	1.0	0.6
1%	23.0	14.6	11.4	7.6	5.1	2.7	1.7	1.1	0.7

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.2	9.3	11.0	15.0	20.6	33.4	44.3	57.0	71.2
5%	8.9	11.4	13.5	18.3	24.9	40.1	52.8	67.4	83.5
2%	11.5	14.7	17.2	23.2	31.3	49.7	64.9	82.3	101.1
1%	13.8	17.5	20.5	27.3	36.7	57.8	74.9	94.3	115.0

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	31.0	20.1	15.9	10.8	7.4	4.0	2.7	1.7	1.1
5%	38.4	24.7	19.4	13.2	9.0	4.8	3.2	2.0	1.3
2%	49.5	31.8	24.9	16.7	11.3	6.0	3.9	2.5	1.5
1%	59.7	37.8	29.5	19.7	13.2	6.9	4.5	2.8	1.7

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	18.6	24.1	28.6	39.0	53.3	86.6	115.0	148.0	184.8
5%	23.0	29.7	35.0	47.5	64.7	104.0	137.0	174.8	216.8
2%	29.7	38.1	44.8	60.2	81.3	129.0	168.4	213.6	262.4
1%	35.8	45.4	53.1	70.8	95.3	150.0	194.4	244.8	298.4

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	24.3	15.7	12.4	8.5	5.8	3.1	2.1	1.3	0.8
5%	30.1	19.4	5.2	5.2	7.0	3.8	2.5	1.6	1.0
2%	5.2	5.2	5.2	5.2	5.2	4.7	3.1	1.9	1.2
1%	5.2	5.2	5.2	5.2	5.2	5.4	3.5	2.2	1.4

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.6	18.9	22.4	30.6	41.8	67.8	90.1	115.9	144.8
5%	18.0	23.2	27.0	36.3	50.7	81.5	107.3	136.9	169.8
2%	20.8	23.9	27.0	36.3	55.0	101.1	131.9	167.3	205.6
1%	20.8	23.9	27.0	36.3	55.0	117.5	152.3	191.8	233.8

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.7	4.4	3.4	2.3	1.6	0.9	0.6	0.4	0.2
5%	8.3	5.4	14.3	8.0	1.9	1.0	0.7	0.4	0.3
2%	44.4	26.6	19.7	11.5	6.1	1.3	0.8	0.5	0.3
1%	54.5	32.6	24.3	14.5	8.1	1.5	1.0	0.6	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	6.8	2.9	0.0	0.0	0.0	0.0	0.0
2%	25.3	14.3	10.1	5.1	1.8	0.0	0.0	0.0	0.0
1%	31.5	18.1	13.0	6.9	3.0	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 31.5l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd20 Soak1 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2138.99	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.78		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.0	m	A/W
Actual Volume		11.25	m3	
Actual Area		4.50	m2	
Storage Volume		4.28	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.5	2.5	3.4	2.7	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.8	1.5	2.3	4.5	9.0	27.0	54.0	108.0	216.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.2	6.5	8.8	7.1	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.3	3.7	3.9	4.0	2.6	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd23 Soak1 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	635.62	0.8	508.5
Berm	239.36	0.3	71.808
Footpath	217.74	0.8	174.19
Lots	2478.8	0.8	1983
Total	**3571.52**		**2737.5**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	19.9	12.9	10.2	7.0	4.8	2.6	1.7	1.1	0.7
5%	24.7	15.9	12.5	8.5	5.8	3.1	2.0	1.3	0.8
2%	31.9	20.4	16.0	10.8	7.3	3.8	2.5	1.6	1.0
1%	38.4	24.3	19.0	12.7	8.5	4.5	2.9	1.8	1.1

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	12.0	15.5	18.4	25.1	34.3	55.7	74.0	95.2	118.9
5%	14.8	19.1	22.5	30.6	41.6	66.9	88.1	112.5	139.5
2%	19.1	24.5	28.8	38.7	52.3	83.0	108.3	137.4	168.8
1%	23.1	29.2	34.2	45.6	61.3	96.5	125.1	157.5	192.0

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	50.9	33.0	26.1	17.8	12.2	6.6	4.4	2.8	1.8
5%	63.1	40.6	32.0	21.7	14.8	7.9	5.2	3.3	2.1
2%	81.4	52.2	40.9	27.5	18.6	9.8	6.4	4.1	2.5
1%	98.2	62.2	48.5	32.3	21.8	11.4	7.4	4.7	2.8

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	30.5	39.6	47.0	64.1	87.7	142.4	189.0	243.3	303.8
5%	37.9	48.8	57.5	78.1	106.3	171.0	225.2	287.3	356.4
2%	48.9	62.6	73.6	98.9	133.7	212.1	276.8	351.1	431.3
1%	58.9	74.6	87.3	116.4	156.7	246.6	319.6	402.4	490.5

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	36.9	23.9	18.9	12.9	8.8	4.8	3.2	2.0	1.3
5%	45.7	29.4	7.9	7.9	10.7	5.7	3.8	2.4	1.5
2%	7.9	7.9	7.9	7.9	7.9	7.1	4.6	2.9	1.8
1%	7.9	7.9	7.9	7.9	7.9	8.3	5.4	3.4	2.1

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	22.1	28.7	34.0	46.4	63.5	103.1	136.9	176.2	220.1
5%	27.4	35.3	41.1	55.2	77.0	123.8	163.1	208.1	258.2
2%	31.6	36.4	41.1	55.2	83.6	153.6	200.5	254.3	312.5
1%	31.6	36.4	41.1	55.2	83.6	178.6	231.5	291.5	355.3

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.0	9.1	7.2	4.9	3.4	1.8	1.2	0.8	0.5
5%	17.4	11.2	24.1	13.8	4.1	2.2	1.4	0.9	0.6
2%	73.6	44.3	33.0	19.6	10.7	2.7	1.8	1.1	0.7
1%	90.3	54.3	40.6	24.5	13.9	3.1	2.0	1.3	0.8

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	11.6	5.3	0.0	0.0	0.0	0.0	0.0
2%	41.7	23.9	17.0	8.9	3.4	0.0	0.0	0.0	0.0
1%	51.9	30.0	21.6	11.8	5.4	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 51.9l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd23 Soak1 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	3571.52	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.77		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	6.5	m	A/W
Actual Volume		24.38	m3	
Actual Area		9.75	m2	
Storage Volume		9.26	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.6	5.8	7.2	5.9	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.6	3.3	4.9	9.8	19.5	58.5	117.0	234.0	468.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	6.8	15.3	18.8	15.5	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.8	7.7	8.1	7.9	4.7	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd23 Soak2 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	268.97	0.3	80.691
Road	210.41	0.8	168.33
Berm	114.95	0.3	34.485
Footpath	81.31	0.8	65.048
Lots	2058.81	0.8	1647
Total	**2734.45**		**1995.6**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	15.3	9.9	7.8	5.3	3.6	2.0	1.3	0.8	0.5
5%	18.9	12.2	9.6	6.5	4.4	2.4	1.6	1.0	0.6
2%	24.4	15.6	12.2	8.2	5.6	2.9	1.9	1.2	0.7
1%	29.4	18.6	14.5	9.7	6.5	3.4	2.2	1.4	0.9

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.2	11.9	14.1	19.2	26.3	42.7	56.6	72.9	91.0
5%	11.3	14.6	17.2	23.4	31.9	51.2	67.5	86.1	106.8
2%	14.6	18.8	22.0	29.6	40.1	63.5	83.0	105.2	129.3
1%	17.7	22.4	26.1	34.9	47.0	73.9	95.8	120.6	147.0

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	37.1	24.1	19.0	13.0	8.9	4.8	3.2	2.1	1.3
5%	46.0	29.6	23.3	15.8	10.8	5.8	3.8	2.4	1.5
2%	59.4	38.1	29.8	20.0	13.5	7.2	4.7	3.0	1.8
1%	71.6	45.3	35.3	23.6	15.9	8.3	5.4	3.4	2.1

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	22.3	28.9	34.3	46.7	63.9	103.8	137.8	177.4	221.4
5%	27.6	35.6	41.9	56.9	77.5	124.6	164.2	209.5	259.8
2%	35.6	45.7	53.6	72.1	97.5	154.6	201.8	256.0	314.4
1%	42.9	54.4	63.6	84.9	114.2	179.7	233.0	293.3	357.6

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	30.6	19.9	15.7	10.7	7.3	4.0	2.6	1.7	1.1
5%	38.0	24.5	6.5	6.5	8.9	4.8	3.1	2.0	1.2
2%	6.5	6.5	6.5	6.5	6.5	5.9	3.9	2.4	1.5
1%	6.5	6.5	6.5	6.5	6.5	6.9	4.5	2.8	1.7

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	18.4	23.8	28.3	38.6	52.7	85.6	113.7	146.4	182.8
5%	22.8	29.3	34.1	45.9	64.0	102.9	135.5	172.9	214.4
2%	26.3	30.2	34.1	45.9	69.4	127.6	166.6	211.3	259.5
1%	26.3	30.2	34.1	45.9	69.4	148.4	192.3	242.1	295.1

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.5	4.2	3.3	2.3	1.6	0.8	0.6	0.4	0.2
5%	8.0	5.2	16.8	9.3	1.9	1.0	0.7	0.4	0.3
2%	52.8	31.5	23.3	13.5	7.0	1.2	0.8	0.5	0.3
1%	65.0	38.8	28.8	17.0	9.3	1.5	0.9	0.6	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	7.2	2.8	0.0	0.0	0.0	0.0	0.0
2%	28.4	15.9	11.0	5.3	1.4	0.0	0.0	0.0	0.0
1%	35.6	20.2	14.3	7.3	2.8	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 35.6l/s based on Table 3 - 10% AEP Post Development Runoff Rate

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd23 Soak2 - A

Calculations By	Linda Bos	Date	46128	
Reviewed By	Chris Sexton	Date	46129	

Catchment Area	A	2734.45	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.73		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	**D**	2.5	**m**	
Width	**W**	1.5	**m**	
Length	**L**	3.0	**m**	A/W
Actual Volume		**11.25**	**m3**	
Actual Area		**4.50**	**m2**	
Storage Volume		**4.28**	**m3**	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.3	1.1	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.8	1.5	2.3	4.5	9.0	27.0	54.0	108.0	216.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.9	2.9	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.1	3.5	3.7	3.7	2.2	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd23 Soak2 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	690.87	0.3	207.26
Road	209.81	0.8	167.85
Berm	114.76	0.3	34.428
Footpath	81.15	0.8	64.92
Lots	1986.66	0.8	1589.3
Total	**3083.25**		**2063.8**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.2	11.2	8.8	6.0	4.1	2.2	1.5	1.0	0.6
5%	21.3	13.7	10.8	7.3	5.0	2.7	1.8	1.1	0.7
2%	27.5	17.6	13.8	9.3	6.3	3.3	2.2	1.4	0.8
1%	33.2	21.0	16.4	10.9	7.4	3.9	2.5	1.6	1.0

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.3	13.4	15.9	21.7	29.6	48.1	63.9	82.2	102.6
5%	12.8	16.5	19.4	26.4	35.9	57.8	76.1	97.1	120.4
2%	16.5	21.2	24.9	33.4	45.2	71.7	93.5	118.6	145.7
1%	19.9	25.2	29.5	39.3	53.0	83.3	108.0	136.0	165.7

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	38.4	24.9	19.7	13.4	9.2	5.0	3.3	2.1	1.3
5%	47.6	30.6	24.1	16.4	11.1	6.0	3.9	2.5	1.6
2%	61.4	39.4	30.8	20.7	14.0	7.4	4.8	3.1	1.9
1%	74.0	46.9	36.5	24.4	16.4	8.6	5.6	3.5	2.1

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	23.0	29.9	35.4	48.3	66.1	107.3	142.5	183.4	229.0
5%	28.5	36.8	43.4	58.9	80.1	128.9	169.8	216.6	268.7
2%	36.8	47.2	55.5	74.6	100.8	159.9	208.7	264.7	325.2
1%	44.4	56.2	65.8	87.8	118.1	185.9	240.9	303.4	369.8

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	29.6	19.2	15.2	10.3	7.1	3.8	2.5	1.6	1.0
5%	36.6	23.6	6.3	6.3	8.6	4.6	3.0	1.9	1.2
2%	6.3	6.3	6.3	6.3	6.3	5.7	3.7	2.4	1.4
1%	6.3	6.3	6.3	6.3	6.3	6.6	4.3	2.7	1.6

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.7	23.0	27.3	37.2	50.9	82.6	109.8	141.2	176.4
5%	22.0	28.3	32.9	44.3	61.7	99.3	130.7	166.8	206.9
2%	25.4	29.1	32.9	44.3	67.0	123.1	160.7	203.9	250.4
1%	25.4	29.1	32.9	44.3	67.0	143.2	185.5	233.6	284.8

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.8	5.7	4.5	3.1	2.1	1.1	0.8	0.5	0.3
5%	10.9	7.0	17.8	10.0	2.6	1.4	0.9	0.6	0.4
2%	55.1	33.1	24.5	14.4	7.7	1.7	1.1	0.7	0.4
1%	67.7	40.6	30.2	18.1	10.1	2.0	1.3	0.8	0.5

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	7.0	2.7	0.0	0.0	0.0	0.0	0.0
2%	27.6	15.4	10.7	5.1	1.4	0.0	0.0	0.0	0.0
1%	34.5	19.6	13.9	7.1	2.7	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 34.5l/s based on Table 3 - 10% AEP Post Development Runoff Rate

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd23 Soak2 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	3083.25	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.67		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	4.0	m	A/W
Actual Volume		15.00	m3	
Actual Area		6.00	m2	
Storage Volume		5.70	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.0	2.0	3.0	6.0	12.0	36.0	72.0	144.0	288.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.3	4.9	5.1	5.1	3.2	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd23 Soak3 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	246.8	0.3	74.04
Road	190.47	0.8	152.38
Berm	104.15	0.3	31.245
Footpath	73.67	0.8	58.936
Lots	1867.41	0.8	1493.9
Total	**2482.5**		**1810.5**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	13.9	9.0	7.1	4.8	3.3	1.8	1.2	0.8	0.5
5%	17.2	11.1	8.7	5.9	4.0	2.2	1.4	0.9	0.6
2%	22.2	14.2	11.1	7.5	5.1	2.7	1.7	1.1	0.7
1%	26.7	16.9	13.2	8.8	5.9	3.1	2.0	1.3	0.8

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.3	10.8	12.8	17.4	23.9	38.7	51.4	66.2	82.6
5%	10.3	13.3	15.7	21.2	28.9	46.5	61.3	78.2	97.0
2%	13.3	17.0	20.0	26.9	36.4	57.7	75.3	95.5	117.3
1%	16.0	20.3	23.7	31.7	42.6	67.1	86.9	109.5	133.4

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	33.7	21.8	17.3	11.8	8.1	4.4	2.9	1.9	1.2
5%	41.7	26.9	21.1	14.3	9.8	5.2	3.4	2.2	1.4
2%	53.9	34.5	27.0	18.2	12.3	6.5	4.2	2.7	1.7
1%	64.9	41.1	32.1	21.4	14.4	7.5	4.9	3.1	1.9

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	20.2	26.2	31.1	42.4	58.0	94.2	125.0	160.9	200.9
5%	25.0	32.3	38.1	51.6	70.3	113.1	148.9	190.0	235.7
2%	32.3	41.4	48.7	65.4	88.4	140.2	183.1	232.2	285.3
1%	39.0	49.3	57.7	77.0	103.6	163.1	211.3	266.1	324.4

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	27.8	18.0	14.2	9.7	6.6	3.6	2.4	1.5	1.0
5%	34.4	22.2	5.9	5.9	8.1	4.3	2.8	1.8	1.1
2%	5.9	5.9	5.9	5.9	5.9	5.4	3.5	2.2	1.4
1%	5.9	5.9	5.9	5.9	5.9	6.2	4.0	2.5	1.5

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	16.7	21.6	25.6	35.0	47.8	77.7	103.2	132.8	165.8
5%	20.7	26.6	30.9	41.6	58.0	93.3	122.9	156.8	194.5
2%	23.8	27.4	30.9	41.6	63.0	115.7	151.1	191.6	235.4
1%	23.8	27.4	30.9	41.6	63.0	134.6	174.4	219.6	267.7

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.9	3.8	3.0	2.1	1.4	0.8	0.5	0.3	0.2
5%	7.3	4.7	15.2	8.4	1.7	0.9	0.6	0.4	0.2
2%	47.9	28.6	21.1	12.2	6.4	1.1	0.7	0.5	0.3
1%	59.0	35.2	26.1	15.5	8.5	1.3	0.9	0.5	0.3

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	6.5	2.5	0.0	0.0	0.0	0.0	0.0
2%	25.8	14.4	10.0	4.8	1.3	0.0	0.0	0.0	0.0
1%	32.3	18.3	12.9	6.7	2.5	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 32.3l/s based on Table 3 - 10% AEP Post Development Runoff Rate

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd23 Soak3 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2482.5	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.73		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.0	m	A/W
Actual Volume		11.25	m3	
Actual Area		4.50	m2	
Storage Volume		4.28	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.8	1.5	2.3	4.5	9.0	27.0	54.0	108.0	216.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.4	2.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.8	3.1	3.2	2.9	1.1	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd23 Soak3 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	254.27	0.3	76.281
Road	191.23	0.8	152.98
Berm	105.28	0.3	31.584
Footpath	74.63	0.8	59.704
Lots	1926.8	0.8	1541.4
Total	**2552.21**		**1862**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.2	9.2	7.3	5.0	3.4	1.8	1.2	0.8	0.5
5%	17.6	11.4	8.9	6.1	4.1	2.2	1.5	0.9	0.6
2%	22.8	14.6	11.4	7.7	5.2	2.7	1.8	1.1	0.7
1%	27.5	17.4	13.6	9.0	6.1	3.2	2.1	1.3	0.8

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.5	11.1	13.1	17.9	24.5	39.8	52.9	68.0	85.0
5%	10.6	13.6	16.1	21.8	29.7	47.8	63.0	80.4	99.7
2%	13.7	17.5	20.6	27.7	37.4	59.3	77.4	98.2	120.6
1%	16.5	20.9	24.4	32.6	43.8	69.0	89.4	112.6	137.2

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	34.6	22.5	17.8	12.1	8.3	4.5	3.0	1.9	1.2
5%	42.9	27.6	21.7	14.8	10.0	5.4	3.5	2.3	1.4
2%	55.4	35.5	27.8	18.7	12.6	6.7	4.4	2.8	1.7
1%	66.8	42.3	33.0	22.0	14.8	7.8	5.0	3.2	1.9

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	20.8	27.0	32.0	43.6	59.6	96.8	128.6	165.5	206.6
5%	25.7	33.2	39.1	53.1	72.3	116.3	153.2	195.4	242.4
2%	33.2	42.6	50.0	67.3	90.9	144.2	188.3	238.8	293.4
1%	40.1	50.7	59.4	79.2	106.6	167.7	217.4	273.7	333.6

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	28.7	18.6	14.7	10.0	6.9	3.7	2.5	1.6	1.0
5%	35.5	22.9	6.1	6.1	8.3	4.5	2.9	1.9	1.2
2%	6.1	6.1	6.1	6.1	6.1	5.5	3.6	2.3	1.4
1%	6.1	6.1	6.1	6.1	6.1	6.4	4.2	2.6	1.6

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.2	22.3	26.5	36.1	49.4	80.2	106.4	137.0	171.1
5%	21.3	27.5	31.9	42.9	59.9	96.3	126.8	161.8	200.7
2%	24.6	28.3	31.9	42.9	65.0	119.4	155.9	197.7	242.9
1%	24.6	28.3	31.9	42.9	65.0	138.8	179.9	226.6	276.2

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.0	3.9	3.1	2.1	1.4	0.8	0.5	0.3	0.2
5%	7.4	4.8	15.6	8.6	1.7	0.9	0.6	0.4	0.2
2%	49.3	29.4	21.7	12.6	6.5	1.1	0.8	0.5	0.3
1%	60.7	36.2	26.9	15.9	8.7	1.3	0.9	0.5	0.3

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	6.7	2.6	0.0	0.0	0.0	0.0	0.0
2%	26.5	14.8	10.2	4.9	1.3	0.0	0.0	0.0	0.0
1%	33.2	18.8	13.3	6.8	2.6	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 33.2l/s based on Table 3 - 10% AEP Post Development Runoff Rate

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd23 Soak3 - B

Calculations By	Linda Bos	Date	46128	
Reviewed By	Chris Sexton	Date	46129	

Catchment Area	A	2552.21	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.73		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.0	m	A/W
Actual Volume		11.25	m3	
Actual Area		4.50	m2	
Storage Volume		4.28	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.8	1.5	2.3	4.5	9.0	27.0	54.0	108.0	216.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.3	2.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.8	3.1	3.3	3.0	1.3	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd23 Soak4 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	346.13	0.8	276.9
Berm	161.7	0.3	48.51
Footpath	98.14	0.8	78.512
Lots	2745.71	0.8	2196.6
Total	**3351.68**		**2600.5**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	18.7	12.1	9.6	6.5	4.5	2.4	1.6	1.0	0.6
5%	23.2	14.9	11.7	8.0	5.4	2.9	1.9	1.2	0.8
2%	29.9	19.2	15.0	10.1	6.8	3.6	2.4	1.5	0.9
1%	36.1	22.8	17.8	11.9	8.0	4.2	2.7	1.7	1.0

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.2	14.6	17.3	23.5	32.2	52.3	69.4	89.4	111.6
5%	13.9	17.9	21.1	28.7	39.0	62.8	82.7	105.5	130.9
2%	17.9	23.0	27.0	36.3	49.1	77.9	101.7	129.0	158.4
1%	21.6	27.4	32.1	42.8	57.6	90.6	117.4	147.8	180.2

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	48.4	31.4	24.8	16.9	11.6	6.3	4.2	2.7	1.7
5%	59.9	38.6	30.4	20.6	14.0	7.5	5.0	3.2	2.0
2%	77.4	49.6	38.8	26.1	17.6	9.3	6.1	3.9	2.4
1%	93.3	59.1	46.1	30.7	20.7	10.8	7.0	4.4	2.7

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	29.0	37.7	44.6	60.9	83.3	135.2	179.6	231.1	288.6
5%	36.0	46.3	54.7	74.2	101.0	162.4	213.9	273.0	338.5
2%	46.4	59.5	69.9	94.0	127.0	201.4	263.0	333.5	409.7
1%	56.0	70.9	82.9	110.6	148.9	234.2	303.6	382.3	466.0

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	40.9	26.5	20.9	14.3	9.8	5.3	3.5	2.3	1.4
5%	50.6	32.6	8.7	8.7	11.8	6.4	4.2	2.7	1.7
2%	8.7	8.7	8.7	8.7	8.7	7.9	5.1	3.3	2.0
1%	8.7	8.7	8.7	8.7	8.7	9.2	5.9	3.7	2.3

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	24.5	31.8	37.7	51.4	70.3	114.2	151.7	195.2	243.8
5%	30.4	39.1	45.5	61.2	85.3	137.2	180.7	230.6	286.0
2%	35.0	40.3	45.5	61.2	92.6	170.2	222.1	281.7	346.1
1%	35.0	40.3	45.5	61.2	92.6	197.8	256.4	322.9	393.6

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.5	4.9	3.9	2.6	1.8	1.0	0.6	0.4	0.3
5%	9.3	6.0	21.6	11.9	2.2	1.2	0.8	0.5	0.3
2%	68.6	40.9	30.1	17.4	8.9	1.4	0.9	0.6	0.4
1%	84.5	50.3	37.3	22.0	12.0	1.7	1.1	0.7	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s)
(Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	9.9	3.9	0.0	0.0	0.0	0.0	0.0
2%	38.7	21.7	15.1	7.3	2.1	0.0	0.0	0.0	0.0
1%	48.5	27.5	19.5	10.1	4.0	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 48.5l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd23 Soak4 - A

Calculations By	Linda Bos	Date	46128	
Reviewed By	Chris Sexton	Date	46129	

Catchment Area	A	3351.68	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.78		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	1.5	2.7	1.4	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	3.8	7.1	3.7	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.6	4.1	4.3	4.2	2.4	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd23 Soak4 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	2.63	0.3	0.789
Road	500.34	0.8	400.27
Berm	245.35	0.3	73.605
Footpath	156.65	0.8	125.32
Lots	2550.3	0.8	2040.2
Total	**3455.27**		**2640.2**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	19.3	12.5	9.9	6.7	4.6	2.5	1.7	1.1	0.7
5%	23.9	15.4	12.1	8.2	5.6	3.0	2.0	1.3	0.8
2%	30.8	19.8	15.5	10.4	7.0	3.7	2.4	1.5	0.9
1%	37.2	23.5	18.4	12.2	8.2	4.3	2.8	1.8	1.1

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.6	15.0	17.8	24.3	33.2	53.9	71.6	92.1	115.0
5%	14.3	18.5	21.8	29.6	40.3	64.7	85.3	108.8	134.9
2%	18.5	23.7	27.9	37.5	50.6	80.3	104.8	133.0	163.3
1%	22.3	28.3	33.0	44.1	59.3	93.4	121.0	152.4	185.7

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	49.1	31.9	25.2	17.2	11.7	6.4	4.2	2.7	1.7
5%	60.8	39.2	30.8	20.9	14.2	7.6	5.0	3.2	2.0
2%	78.5	50.4	39.4	26.5	17.9	9.5	6.2	3.9	2.4
1%	94.7	60.0	46.8	31.2	21.0	11.0	7.1	4.5	2.7

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	29.5	38.2	45.3	61.8	84.6	137.3	182.3	234.6	293.0
5%	36.5	47.0	55.5	75.3	102.5	164.9	217.2	277.1	343.7
2%	47.1	60.4	70.9	95.4	128.9	204.5	267.0	338.6	416.0
1%	56.8	72.0	84.2	112.3	151.1	237.8	308.2	388.1	473.1

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	37.9	24.6	19.5	13.3	9.1	4.9	3.3	2.1	1.3
5%	47.0	30.3	8.1	8.1	11.0	5.9	3.9	2.5	1.5
2%	8.1	8.1	8.1	8.1	8.1	7.3	4.8	3.0	1.9
1%	8.1	8.1	8.1	8.1	8.1	8.5	5.5	3.5	2.1

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	22.8	29.5	35.0	47.8	65.3	106.1	140.9	181.3	226.4
5%	28.2	36.3	42.3	56.8	79.2	127.4	167.8	214.2	265.6
2%	32.5	37.4	42.3	56.8	86.0	158.0	206.3	261.7	321.5
1%	32.5	37.4	42.3	56.8	86.0	183.8	238.2	299.9	365.6

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.2	7.2	5.7	3.9	2.7	1.4	1.0	0.6	0.4
5%	13.8	8.9	22.7	12.8	3.2	1.7	1.1	0.7	0.5
2%	70.4	42.3	31.3	18.4	9.8	2.2	1.4	0.9	0.5
1%	86.6	51.9	38.7	23.1	12.9	2.5	1.6	1.0	0.6

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	10.6	4.6	0.0	0.0	0.0	0.0	0.0
2%	39.6	22.5	15.8	8.0	2.8	0.0	0.0	0.0	0.0
1%	49.4	28.3	20.3	10.9	4.7	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 49.4l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd23 Soak4 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	3455.27	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	5.0	m	A/W
Actual Volume		18.75	m3	
Actual Area		7.50	m2	
Storage Volume		7.13	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.3	2.5	3.8	7.5	15.0	45.0	90.0	180.0	360.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.7	3.8	5.1	3.9	0.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.9	10.0	13.4	10.2	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.4	6.2	6.5	6.6	4.2	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd24 Soak1 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	445.21	0.8	356.17
Berm	219.19	0.3	65.757
Footpath	139.24	0.8	111.39
Lots	1319.22	0.8	1055.4
Total	**2122.86**		**1588.7**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.8	7.7	6.1	4.1	2.8	1.5	1.0	0.7	0.4
5%	14.7	9.5	7.4	5.0	3.4	1.8	1.2	0.8	0.5
2%	18.9	12.1	9.5	6.4	4.3	2.3	1.5	0.9	0.6
1%	22.8	14.5	11.3	7.5	5.1	2.7	1.7	1.1	0.7

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.1	9.2	10.9	14.9	20.4	33.1	44.0	56.6	70.7
5%	8.8	11.3	13.4	18.2	24.7	39.8	52.4	66.8	82.9
2%	11.4	14.6	17.1	23.0	31.1	49.3	64.4	81.7	100.3
1%	13.7	17.4	20.3	27.1	36.5	57.4	74.3	93.6	114.1

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	29.5	19.2	15.1	10.3	7.1	3.8	2.5	1.6	1.0
5%	36.6	23.6	18.5	12.6	8.6	4.6	3.0	1.9	1.2
2%	47.3	30.3	23.7	15.9	10.8	5.7	3.7	2.4	1.4
1%	57.0	36.1	28.1	18.8	12.6	6.6	4.3	2.7	1.6

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.7	23.0	27.3	37.2	50.9	82.6	109.7	141.2	176.3
5%	22.0	28.3	33.4	45.3	61.7	99.2	130.7	166.8	206.8
2%	28.4	36.4	42.7	57.4	77.6	123.1	160.6	203.8	250.3
1%	34.2	43.3	50.6	67.6	90.9	143.1	185.5	233.5	284.7

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	19.6	12.7	10.1	6.9	4.7	2.5	1.7	1.1	0.7
5%	24.3	15.7	4.2	4.2	5.7	3.1	2.0	1.3	0.8
2%	4.2	4.2	4.2	4.2	4.2	3.8	2.5	1.6	1.0
1%	4.2	4.2	4.2	4.2	4.2	4.4	2.9	1.8	1.1

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.8	15.3	18.1	24.7	33.8	54.9	72.9	93.8	117.1
5%	14.6	18.8	21.9	29.4	41.0	65.9	86.8	110.8	137.4
2%	16.8	19.3	21.9	29.4	44.5	81.8	106.7	135.4	166.3
1%	16.8	19.3	21.9	29.4	44.5	95.1	123.2	155.1	189.1

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.9	6.4	5.1	3.5	2.4	1.3	0.9	0.5	0.3
5%	12.3	7.9	14.4	8.4	2.9	1.5	1.0	0.6	0.4
2%	43.1	26.1	19.5	11.8	6.6	1.9	1.2	0.8	0.5
1%	52.8	31.9	23.9	14.6	8.4	2.2	1.4	0.9	0.6

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	6.9	3.4	0.0	0.0	0.0	0.0	0.0
2%	24.1	14.0	10.0	5.4	2.3	0.0	0.0	0.0	0.0
1%	29.9	17.4	12.7	7.1	3.4	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 29.9l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd24 Soak1 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2122.86	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.75		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	4.5	m	A/W
Actual Volume		16.88	m3	
Actual Area		6.75	m2	
Storage Volume		6.41	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.5	4.3	5.1	4.3	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.1	2.3	3.4	6.8	13.5	40.5	81.0	162.0	324.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.5	0.9	0.0	0.0	0.0	0.0	0.0	0.0
1%	6.6	11.4	13.4	11.4	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.8	5.5	5.8	5.7	3.6	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd24 Soak1 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	263.59	0.8	210.87
Berm	144.44	0.3	43.332
Footpath	102.11	0.8	81.688
Lots	948.66	0.8	758.93
Total	**1458.8**		**1094.8**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.1	5.3	4.2	2.8	1.9	1.1	0.7	0.5	0.3
5%	10.1	6.5	5.1	3.5	2.4	1.3	0.8	0.5	0.3
2%	13.0	8.3	6.5	4.4	3.0	1.6	1.0	0.6	0.4
1%	15.7	9.9	7.7	5.2	3.5	1.8	1.2	0.7	0.5

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.9	6.3	7.5	10.2	14.0	22.8	30.2	38.9	48.6
5%	6.1	7.8	9.2	12.5	17.0	27.3	36.0	45.9	57.0
2%	7.8	10.0	11.8	15.8	21.4	33.9	44.3	56.1	69.0
1%	9.4	11.9	13.9	18.6	25.1	39.4	51.1	64.3	78.4

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	20.4	13.2	10.4	7.1	4.9	2.6	1.8	1.1	0.7
5%	25.2	16.3	12.8	8.7	5.9	3.2	2.1	1.3	0.8
2%	32.6	20.9	16.3	11.0	7.4	3.9	2.6	1.6	1.0
1%	39.3	24.9	19.4	12.9	8.7	4.6	3.0	1.9	1.1

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	12.2	15.9	18.8	25.6	35.1	56.9	75.6	97.3	121.5
5%	15.1	19.5	23.0	31.2	42.5	68.4	90.1	114.9	142.5
2%	19.5	25.1	29.4	39.6	53.5	84.8	110.7	140.4	172.5
1%	23.6	29.8	34.9	46.6	62.7	98.6	127.8	160.9	196.2

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.1	9.2	7.2	4.9	3.4	1.8	1.2	0.8	0.5
5%	17.5	11.3	3.0	3.0	4.1	2.2	1.4	0.9	0.6
2%	3.0	3.0	3.0	3.0	3.0	2.7	1.8	1.1	0.7
1%	3.0	3.0	3.0	3.0	3.0	3.2	2.1	1.3	0.8

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.5	11.0	13.0	17.8	24.3	39.5	52.4	67.4	84.2
5%	10.5	13.5	15.7	21.1	29.5	47.4	62.4	79.7	98.8
2%	12.1	13.9	15.7	21.1	32.0	58.8	76.7	97.3	119.6
1%	12.1	13.9	15.7	21.1	32.0	68.4	88.6	111.6	136.0

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.2	4.1	3.2	2.2	1.5	0.8	0.5	0.3	0.2
5%	7.7	5.0	9.8	5.7	1.8	1.0	0.6	0.4	0.3
2%	29.6	17.9	13.3	8.0	4.4	1.2	0.8	0.5	0.3
1%	36.3	21.9	16.4	9.9	5.7	1.4	0.9	0.6	0.3

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	4.7	2.2	0.0	0.0	0.0	0.0	0.0
2%	16.5	9.5	6.8	3.6	1.4	0.0	0.0	0.0	0.0
1%	20.6	11.9	8.6	4.8	2.2	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 20.6l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd24 Soak1 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1458.8	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.75		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.0	m	A/W
Actual Volume		11.25	m3	
Actual Area		4.50	m2	
Storage Volume		4.28	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.3	2.5	3.0	2.3	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.8	1.5	2.3	4.5	9.0	27.0	54.0	108.0	216.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	3.4	6.6	7.8	6.1	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.0	3.4	3.5	3.4	1.8	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd24 Soak2 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	308.22	0.8	246.58
Berm	166.56	0.3	49.968
Footpath	117.88	0.8	94.304
Lots	1648.32	0.8	1318.7
Total	**2240.98**		**1709.5**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	12.5	8.1	6.4	4.4	3.0	1.6	1.1	0.7	0.4
5%	15.5	10.0	7.8	5.3	3.6	1.9	1.3	0.8	0.5
2%	20.0	12.8	10.0	6.7	4.6	2.4	1.6	1.0	0.6
1%	24.1	15.3	11.9	7.9	5.3	2.8	1.8	1.1	0.7

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.5	9.7	11.5	15.7	21.5	35.0	46.4	59.7	74.6
5%	9.3	12.0	14.1	19.2	26.1	42.0	55.3	70.6	87.5
2%	12.0	15.4	18.1	24.3	32.8	52.1	68.0	86.2	105.9
1%	14.5	18.3	21.4	28.6	38.5	60.6	78.5	98.8	120.5

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	31.8	20.6	16.3	11.1	7.6	4.1	2.7	1.8	1.1
5%	39.4	25.4	20.0	13.5	9.2	4.9	3.3	2.1	1.3
2%	50.9	32.6	25.5	17.2	11.6	6.1	4.0	2.5	1.6
1%	61.3	38.8	30.3	20.2	13.6	7.1	4.6	2.9	1.8

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	19.1	24.8	29.3	40.0	54.7	88.9	118.1	151.9	189.7
5%	23.6	30.5	35.9	48.8	66.4	106.8	140.6	179.4	222.6
2%	30.5	39.1	45.9	61.8	83.5	132.4	172.9	219.3	269.4
1%	36.8	46.6	54.5	72.7	97.9	154.0	199.6	251.3	306.3

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	24.5	15.9	12.6	8.6	5.9	3.2	2.1	1.4	0.8
5%	30.4	19.6	5.2	5.2	7.1	3.8	2.5	1.6	1.0
2%	5.2	5.2	5.2	5.2	5.2	4.7	3.1	2.0	1.2
1%	5.2	5.2	5.2	5.2	5.2	5.5	3.6	2.2	1.4

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.7	19.1	22.6	30.9	42.2	68.6	91.1	117.2	146.3
5%	18.2	23.5	27.3	36.7	51.2	82.3	108.5	138.4	171.7
2%	21.0	24.2	27.3	36.7	55.6	102.1	133.3	169.1	207.8
1%	21.0	24.2	27.3	36.7	55.6	118.8	153.9	193.8	236.3

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.3	4.7	3.7	2.5	1.7	0.9	0.6	0.4	0.3
5%	9.0	5.8	14.7	8.3	2.1	1.1	0.7	0.5	0.3
2%	45.6	27.4	20.3	11.9	6.4	1.4	0.9	0.6	0.4
1%	56.1	33.6	25.0	15.0	8.4	1.6	1.1	0.7	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	6.9	3.0	0.0	0.0	0.0	0.0	0.0
2%	25.6	14.5	10.3	5.2	1.8	0.0	0.0	0.0	0.0
1%	32.0	18.3	13.1	7.0	3.0	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 32l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd24 Soak2 - A

Calculations By	Linda Bos	Date	46128	
Reviewed By	Chris Sexton	Date	46129	

Catchment Area	A	2240.98	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.4	2.3	3.1	2.1	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.1	6.2	8.2	5.6	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.5	3.9	4.1	3.9	2.0	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd24 Soak2 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	300.01	0.8	240.01
Berm	166.75	0.3	50.025
Footpath	118.04	0.8	94.432
Lots	1662.91	0.8	1330.3
Total	**2247.71**		**1714.8**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	12.5	8.1	6.4	4.4	3.0	1.6	1.1	0.7	0.4
5%	15.5	10.0	7.9	5.3	3.6	1.9	1.3	0.8	0.5
2%	20.1	12.9	10.1	6.8	4.6	2.4	1.6	1.0	0.6
1%	24.2	15.3	11.9	8.0	5.4	2.8	1.8	1.1	0.7

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.5	9.8	11.6	15.8	21.6	35.1	46.6	59.9	74.8
5%	9.3	12.0	14.2	19.2	26.2	42.1	55.5	70.8	87.8
2%	12.0	15.4	18.1	24.4	32.9	52.2	68.2	86.5	106.2
1%	14.5	18.4	21.5	28.7	38.6	60.7	78.7	99.1	120.8

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	31.9	20.7	16.4	11.2	7.6	4.1	2.7	1.8	1.1
5%	39.5	25.5	20.0	13.6	9.2	5.0	3.3	2.1	1.3
2%	51.0	32.7	25.6	17.2	11.6	6.1	4.0	2.5	1.6
1%	61.5	38.9	30.4	20.3	13.6	7.2	4.6	2.9	1.8

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	19.1	24.8	29.4	40.2	54.9	89.2	118.4	152.4	190.3
5%	23.7	30.5	36.0	48.9	66.6	107.1	141.1	180.0	223.2
2%	30.6	39.2	46.1	62.0	83.7	132.8	173.4	219.9	270.2
1%	36.9	46.7	54.7	72.9	98.2	154.5	200.2	252.1	307.3

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	24.7	16.1	12.7	8.7	5.9	3.2	2.1	1.4	0.9
5%	30.7	19.7	5.3	5.3	7.2	3.8	2.5	1.6	1.0
2%	5.3	5.3	5.3	5.3	5.3	4.8	3.1	2.0	1.2
1%	5.3	5.3	5.3	5.3	5.3	5.5	3.6	2.3	1.4

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.8	19.3	22.8	31.2	42.6	69.2	91.9	118.2	147.6
5%	18.4	23.7	27.6	37.1	51.7	83.1	109.4	139.6	173.2
2%	21.2	24.4	27.6	37.1	56.1	103.0	134.5	170.6	209.6
1%	21.2	24.4	27.6	37.1	56.1	119.8	155.3	195.6	238.4

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.2	4.6	3.7	2.5	1.7	0.9	0.6	0.4	0.2
5%	8.9	5.7	14.7	8.3	2.1	1.1	0.7	0.5	0.3
2%	45.7	27.4	20.3	11.9	6.4	1.4	0.9	0.6	0.4
1%	56.2	33.7	25.1	15.0	8.4	1.6	1.0	0.7	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	6.9	3.0	0.0	0.0	0.0	0.0	0.0
2%	25.7	14.6	10.3	5.2	1.8	0.0	0.0	0.0	0.0
1%	32.0	18.4	13.1	7.0	3.0	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 32l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd24 Soak2 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2247.71	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.3	2.2	3.0	1.9	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.8	5.8	7.9	5.1	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.4	3.8	4.0	3.8	1.8	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd24 Soak3 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	564.31	0.8	451.45
Berm	258.19	0.3	77.457
Footpath	165.93	0.8	132.74
Lots	1936.81	0.8	1549.4
Total	**2925.24**		**2211.1**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	16.3	10.6	8.4	5.7	3.9	2.1	1.4	0.9	0.6
5%	20.2	13.0	10.2	7.0	4.7	2.5	1.7	1.1	0.7
2%	26.1	16.7	13.1	8.8	6.0	3.1	2.1	1.3	0.8
1%	31.5	19.9	15.5	10.4	7.0	3.7	2.4	1.5	0.9

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.8	12.7	15.1	20.6	28.1	45.6	60.6	78.0	97.4
5%	12.1	15.6	18.4	25.0	34.1	54.8	72.2	92.1	114.2
2%	15.7	20.1	23.6	31.7	42.9	68.0	88.7	112.6	138.3
1%	18.9	23.9	28.0	37.3	50.2	79.0	102.4	129.0	157.2

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	41.1	26.7	21.1	14.4	9.8	5.3	3.5	2.3	1.4
5%	51.0	32.8	25.8	17.5	11.9	6.4	4.2	2.7	1.7
2%	65.8	42.2	33.0	22.2	15.0	7.9	5.2	3.3	2.0
1%	79.3	50.2	39.2	26.1	17.6	9.2	6.0	3.8	2.3

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	24.7	32.0	38.0	51.8	70.8	115.0	152.7	196.5	245.4
5%	30.6	39.4	46.5	63.1	85.9	138.1	181.9	232.1	287.8
2%	39.5	50.6	59.4	79.9	108.0	171.3	223.6	283.6	348.4
1%	47.6	60.3	70.5	94.0	126.6	199.2	258.1	325.0	396.2

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	28.8	18.7	14.8	10.1	6.9	3.7	2.5	1.6	1.0
5%	35.7	23.0	6.1	6.1	8.4	4.5	3.0	1.9	1.2
2%	6.1	6.1	6.1	6.1	6.1	5.6	3.6	2.3	1.4
1%	6.1	6.1	6.1	6.1	6.1	6.5	4.2	2.6	1.6

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.3	22.4	26.6	36.3	49.6	80.6	107.0	137.7	171.9
5%	21.4	27.6	32.1	43.2	60.2	96.8	127.5	162.6	201.7
2%	24.7	28.4	32.1	43.2	65.3	120.0	156.7	198.7	244.1
1%	24.7	28.4	32.1	43.2	65.3	139.6	180.9	227.8	277.6

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	12.3	8.0	6.3	4.3	2.9	1.6	1.1	0.7	0.4
5%	15.2	9.8	19.7	11.4	3.6	1.9	1.3	0.8	0.5
2%	59.6	36.0	26.9	16.0	8.8	2.4	1.5	1.0	0.6
1%	73.1	44.1	33.0	20.0	11.4	2.8	1.8	1.1	0.7

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	9.4	4.4	0.0	0.0	0.0	0.0	0.0
2%	33.5	19.3	13.8	7.2	2.9	0.0	0.0	0.0	0.0
1%	41.7	24.1	17.5	9.6	4.5	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 41.7l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd24 Soak3 - A

Calculations By	Linda Bos	Date	46128	
Reviewed By	Chris Sexton	Date	46129	

Catchment Area	A	2925.24	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	5.5	m	A/W
Actual Volume		20.63	m3	
Actual Area		8.25	m2	
Storage Volume		7.84	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.6	5.2	6.3	5.3	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.4	2.8	4.1	8.3	16.5	49.5	99.0	198.0	396.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	6.8	13.7	16.5	14.0	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.0	6.8	7.2	7.2	4.7	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd24 Soak3 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	397.32	0.8	317.86
Berm	219.03	0.3	65.709
Footpath	154.89	0.8	123.91
Lots	1843.93	0.8	1475.1
Total	**2615.17**		**1982.6**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.6	9.5	7.5	5.1	3.5	1.9	1.3	0.8	0.5
5%	18.1	11.6	9.2	6.2	4.2	2.3	1.5	1.0	0.6
2%	23.3	15.0	11.7	7.9	5.3	2.8	1.8	1.2	0.7
1%	28.1	17.8	13.9	9.3	6.2	3.3	2.1	1.3	0.8

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.8	11.4	13.5	18.4	25.1	40.8	54.2	69.7	87.1
5%	10.8	14.0	16.5	22.4	30.5	49.0	64.5	82.3	102.1
2%	14.0	18.0	21.1	28.3	38.3	60.8	79.3	100.6	123.6
1%	16.9	21.4	25.0	33.4	44.9	70.7	91.6	115.3	140.6

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	36.9	23.9	18.9	12.9	8.8	4.8	3.2	2.0	1.3
5%	45.7	29.4	23.1	15.7	10.7	5.7	3.8	2.4	1.5
2%	59.0	37.8	29.6	19.9	13.4	7.1	4.6	2.9	1.8
1%	71.1	45.0	35.1	23.4	15.8	8.3	5.4	3.4	2.1

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	22.1	28.7	34.0	46.4	63.5	103.1	136.9	176.2	220.0
5%	27.4	35.3	41.7	56.5	77.0	123.8	163.1	208.1	258.1
2%	35.4	45.4	53.3	71.6	96.8	153.6	200.5	254.3	312.4
1%	42.7	54.0	63.2	84.3	113.5	178.6	231.4	291.4	355.3

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	27.4	17.8	14.1	9.6	6.6	3.6	2.4	1.5	0.9
5%	34.0	21.9	5.9	5.9	8.0	4.3	2.8	1.8	1.1
2%	5.9	5.9	5.9	5.9	5.9	5.3	3.5	2.2	1.3
1%	5.9	5.9	5.9	5.9	5.9	6.2	4.0	2.5	1.5

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	16.5	21.4	25.3	34.5	47.2	76.7	101.9	131.1	163.7
5%	20.4	26.3	30.6	41.1	57.3	92.1	121.4	154.8	192.0
2%	23.5	27.0	30.6	41.1	62.2	114.3	149.2	189.2	232.4
1%	23.5	27.0	30.6	41.1	62.2	132.9	172.2	216.8	264.3

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.4	6.1	4.8	3.3	2.3	1.2	0.8	0.5	0.3
5%	11.7	7.5	17.3	9.9	2.7	1.5	1.0	0.6	0.4
2%	53.1	32.0	23.7	14.0	7.6	1.8	1.2	0.8	0.5
1%	65.2	39.2	29.3	17.6	9.9	2.1	1.4	0.9	0.5

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s)
(Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	8.1	3.6	0.0	0.0	0.0	0.0	0.0
2%	29.8	17.0	12.0	6.2	2.3	0.0	0.0	0.0	0.0
1%	37.1	21.4	15.4	8.3	3.7	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 37.1l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd24 Soak3 - B

Calculations By	Linda Bos	Date	46128	
Reviewed By	Chris Sexton	Date	46129	

Catchment Area	A	2615.17	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	4.5	m	A/W
Actual Volume		16.88	m3	
Actual Area		6.75	m2	
Storage Volume		6.41	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.1	3.4	4.3	3.1	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.1	2.3	3.4	6.8	13.5	40.5	81.0	162.0	324.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	3.0	8.8	11.2	8.2	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.5	5.1	5.3	5.1	2.8	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd25 Soak1 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	376.68	0.8	301.34
Berm	191.52	0.3	57.456
Footpath	140.49	0.8	112.39
Lots	1715.6	0.8	1372.5
Total	**2424.29**		**1843.7**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	13.5	8.8	6.9	4.7	3.2	1.8	1.2	0.7	0.5
5%	16.8	10.8	8.5	5.8	3.9	2.1	1.4	0.9	0.5
2%	21.6	13.9	10.9	7.3	4.9	2.6	1.7	1.1	0.7
1%	26.1	16.5	12.9	8.6	5.8	3.0	2.0	1.2	0.8

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.1	10.5	12.5	17.0	23.3	37.8	50.2	64.6	80.7
5%	10.1	13.0	15.3	20.7	28.2	45.4	59.8	76.3	94.7
2%	13.0	16.6	19.5	26.3	35.5	56.3	73.5	93.3	114.6
1%	15.6	19.8	23.2	30.9	41.6	65.5	84.9	106.9	130.3

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	34.3	22.2	17.6	12.0	8.2	4.4	2.9	1.9	1.2
5%	42.5	27.4	21.5	14.6	9.9	5.3	3.5	2.2	1.4
2%	54.8	35.2	27.5	18.5	12.5	6.6	4.3	2.7	1.7
1%	66.1	41.9	32.6	21.8	14.7	7.7	5.0	3.1	1.9

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	20.6	26.7	31.6	43.2	59.0	95.9	127.3	163.8	204.6
5%	25.5	32.8	38.7	52.6	71.6	115.1	151.7	193.5	240.0
2%	32.9	42.2	49.5	66.6	90.0	142.8	186.4	236.5	290.5
1%	39.7	50.2	58.8	78.4	105.5	166.1	215.2	271.0	330.4

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	25.5	16.6	13.1	8.9	6.1	3.3	2.2	1.4	0.9
5%	31.6	20.4	5.4	5.4	7.4	4.0	2.6	1.7	1.0
2%	5.4	5.4	5.4	5.4	5.4	4.9	3.2	2.0	1.3
1%	5.4	5.4	5.4	5.4	5.4	5.7	3.7	2.3	1.4

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	15.3	19.9	23.6	32.1	44.0	71.4	94.8	122.0	152.3
5%	19.0	24.4	28.4	38.2	53.3	85.7	112.9	144.1	178.7
2%	21.9	25.2	28.4	38.2	57.8	106.3	138.8	176.0	216.3
1%	21.9	25.2	28.4	38.2	57.8	123.6	160.2	201.8	245.9

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.8	5.7	4.5	3.1	2.1	1.1	0.8	0.5	0.3
5%	10.9	7.0	16.1	9.2	2.5	1.4	0.9	0.6	0.4
2%	49.4	29.7	22.1	13.1	7.1	1.7	1.1	0.7	0.4
1%	60.7	36.4	27.2	16.3	9.2	2.0	1.3	0.8	0.5

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	7.6	3.4	0.0	0.0	0.0	0.0	0.0
2%	27.8	15.8	11.2	5.8	2.1	0.0	0.0	0.0	0.0
1%	34.6	19.9	14.3	7.7	3.4	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 34.6l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd25 Soak1 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2424.29	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	4.0	m	A/W
Actual Volume		15.00	m3	
Actual Area		6.00	m2	
Storage Volume		5.70	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.1	3.3	4.2	3.3	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.0	2.0	3.0	6.0	12.0	36.0	72.0	144.0	288.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	3.0	8.6	10.9	8.6	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.3	4.8	5.1	5.0	3.1	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd25 Soak1 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	317.23	0.8	253.78
Berm	98.22	0.3	29.466
Footpath	137.54	0.8	110.03
Lots	952.15	0.8	761.72
Total	**1505.14**		**1155**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.4	5.4	4.3	2.9	2.0	1.1	0.7	0.5	0.3
5%	10.4	6.7	5.3	3.6	2.4	1.3	0.9	0.5	0.3
2%	13.4	8.6	6.7	4.5	3.1	1.6	1.1	0.7	0.4
1%	16.2	10.3	8.0	5.3	3.6	1.9	1.2	0.8	0.5

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.0	6.5	7.8	10.6	14.5	23.5	31.2	40.1	50.1
5%	6.2	8.0	9.5	12.9	17.5	28.2	37.1	47.4	58.8
2%	8.1	10.3	12.1	16.3	22.1	35.0	45.7	57.9	71.1
1%	9.7	12.3	14.4	19.2	25.8	40.7	52.7	66.4	80.9

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	21.5	13.9	11.0	7.5	5.1	2.8	1.8	1.2	0.7
5%	26.6	17.1	13.5	9.2	6.2	3.3	2.2	1.4	0.9
2%	34.4	22.0	17.2	11.6	7.8	4.1	2.7	1.7	1.1
1%	41.4	26.2	20.5	13.6	9.2	4.8	3.1	2.0	1.2

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	12.9	16.7	19.8	27.0	37.0	60.1	79.8	102.6	128.2
5%	16.0	20.6	24.3	32.9	44.8	72.1	95.0	121.2	150.4
2%	20.6	26.4	31.0	41.7	56.4	89.5	116.8	148.1	182.0
1%	24.9	31.5	36.8	49.1	66.1	104.0	134.8	169.8	207.0

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.2	9.2	7.3	5.0	3.4	1.8	1.2	0.8	0.5
5%	17.6	11.3	3.0	3.0	4.1	2.2	1.5	0.9	0.6
2%	3.0	3.0	3.0	3.0	3.0	2.7	1.8	1.1	0.7
1%	3.0	3.0	3.0	3.0	3.0	3.2	2.1	1.3	0.8

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.5	11.0	13.1	17.8	24.4	39.6	52.6	67.7	84.5
5%	10.5	13.6	15.8	21.2	29.6	47.6	62.7	80.0	99.2
2%	12.2	14.0	15.8	21.2	32.1	59.0	77.0	97.7	120.0
1%	12.2	14.0	15.8	21.2	32.1	68.6	88.9	112.0	136.5

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.3	4.7	3.8	2.6	1.7	0.9	0.6	0.4	0.3
5%	9.1	5.8	10.5	6.1	2.1	1.1	0.7	0.5	0.3
2%	31.3	19.0	14.2	8.6	4.8	1.4	0.9	0.6	0.4
1%	38.4	23.2	17.4	10.6	6.2	1.6	1.1	0.7	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	5.2	2.6	0.0	0.0	0.0	0.0	0.0
2%	17.9	10.4	7.5	4.0	1.7	0.0	0.0	0.0	0.0
1%	22.2	13.0	9.4	5.3	2.6	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 22.2l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd25 Soak1 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1505.14	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.77		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.1	3.5	4.0	3.5	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	1.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0
1%	5.6	9.1	10.6	9.1	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.5	3.9	4.1	4.0	2.1	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd25 Soak2 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	327.87	0.8	262.3
Berm	180.48	0.3	54.144
Footpath	141.49	0.8	113.19
Lots	1954.41	0.8	1563.5
Total	**2604.25**		**1993.2**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.5	9.4	7.4	5.1	3.5	1.9	1.2	0.8	0.5
5%	18.0	11.6	9.1	6.2	4.2	2.3	1.5	0.9	0.6
2%	23.2	14.9	11.7	7.8	5.3	2.8	1.8	1.2	0.7
1%	28.0	17.7	13.8	9.2	6.2	3.3	2.1	1.3	0.8

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.7	11.3	13.4	18.3	25.0	40.6	54.0	69.4	86.7
5%	10.8	13.9	16.4	22.3	30.3	48.8	64.3	82.0	101.7
2%	13.9	17.9	21.0	28.2	38.2	60.5	79.0	100.2	123.1
1%	16.8	21.3	24.9	33.2	44.7	70.4	91.2	114.8	140.0

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	37.1	24.0	19.0	13.0	8.9	4.8	3.2	2.1	1.3
5%	45.9	29.6	23.3	15.8	10.7	5.8	3.8	2.4	1.5
2%	59.3	38.0	29.8	20.0	13.5	7.1	4.7	3.0	1.8
1%	71.5	45.3	35.3	23.5	15.8	8.3	5.4	3.4	2.1

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	22.2	28.9	34.2	46.7	63.8	103.6	137.6	177.1	221.2
5%	27.6	35.5	41.9	56.9	77.4	124.5	164.0	209.2	259.5
2%	35.6	45.6	53.6	72.0	97.3	154.4	201.5	255.6	314.1
1%	42.9	54.3	63.5	84.8	114.1	179.5	232.7	293.0	357.1

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	29.1	18.9	14.9	10.2	7.0	3.8	2.5	1.6	1.0
5%	36.0	23.2	6.2	6.2	8.4	4.5	3.0	1.9	1.2
2%	6.2	6.2	6.2	6.2	6.2	5.6	3.7	2.3	1.4
1%	6.2	6.2	6.2	6.2	6.2	6.5	4.2	2.7	1.6

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.4	22.6	26.8	36.6	50.1	81.3	108.0	139.0	173.5
5%	21.6	27.9	32.4	43.6	60.7	97.6	128.6	164.1	203.5
2%	24.9	28.7	32.4	43.6	65.9	121.1	158.1	200.5	246.4
1%	24.9	28.7	32.4	43.6	65.9	140.8	182.5	229.8	280.2

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.0	5.2	4.1	2.8	1.9	1.0	0.7	0.4	0.3
5%	9.9	6.4	17.1	9.6	2.3	1.2	0.8	0.5	0.3
2%	53.1	31.8	23.6	13.8	7.3	1.5	1.0	0.6	0.4
1%	65.3	39.1	29.1	17.3	9.6	1.8	1.2	0.7	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	7.9	3.4	0.0	0.0	0.0	0.0	0.0
2%	29.8	16.9	11.9	6.0	2.0	0.0	0.0	0.0	0.0
1%	37.3	21.3	15.3	8.1	3.4	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 37.3l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd25 Soak2 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2604.25	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.77		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.3	2.6	3.6	2.7	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.7	6.9	9.5	7.2	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.9	4.5	4.7	4.8	3.3	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd25 Soak2 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	326.84	0.8	261.47
Berm	102.07	0.3	30.621
Footpath	141.87	0.8	113.5
Lots	1970.22	0.8	1576.2
Total	**2541**		**1981.8**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.2	9.2	7.3	5.0	3.4	1.8	1.2	0.8	0.5
5%	17.6	11.3	8.9	6.0	4.1	2.2	1.5	0.9	0.6
2%	22.7	14.5	11.4	7.7	5.2	2.7	1.8	1.1	0.7
1%	27.3	17.3	13.5	9.0	6.1	3.2	2.1	1.3	0.8

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.5	11.0	13.1	17.9	24.4	39.6	52.6	67.7	84.6
5%	10.5	13.6	16.0	21.7	29.6	47.6	62.7	80.0	99.2
2%	13.6	17.4	20.5	27.5	37.2	59.0	77.1	97.8	120.1
1%	16.4	20.8	24.3	32.4	43.6	68.7	89.0	112.1	136.6

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	36.9	23.9	18.9	12.9	8.8	4.8	3.2	2.0	1.3
5%	45.7	29.4	23.1	15.7	10.7	5.7	3.8	2.4	1.5
2%	58.9	37.8	29.6	19.9	13.4	7.1	4.6	2.9	1.8
1%	71.1	45.0	35.1	23.4	15.8	8.3	5.4	3.4	2.1

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	22.1	28.7	34.0	46.4	63.5	103.1	136.9	176.1	219.9
5%	27.4	35.3	41.7	56.5	77.0	123.8	163.0	208.0	258.0
2%	35.4	45.4	53.3	71.6	96.8	153.5	200.4	254.2	312.3
1%	42.6	54.0	63.2	84.3	113.4	178.5	231.3	291.3	355.1

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	29.3	19.0	15.0	10.3	7.0	3.8	2.5	1.6	1.0
5%	36.3	23.4	6.3	6.3	8.5	4.6	3.0	1.9	1.2
2%	6.3	6.3	6.3	6.3	6.3	5.7	3.7	2.3	1.4
1%	6.3	6.3	6.3	6.3	6.3	6.6	4.3	2.7	1.6

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.6	22.8	27.1	36.9	50.5	82.0	108.8	140.1	174.9
5%	21.8	28.1	32.6	43.9	61.2	98.4	129.7	165.4	205.2
2%	25.1	28.9	32.6	43.9	66.4	122.1	159.4	202.2	248.4
1%	25.1	28.9	32.6	43.9	66.4	142.0	184.0	231.7	282.4

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.5	4.9	3.9	2.6	1.8	1.0	0.6	0.4	0.3
5%	9.3	6.0	16.9	9.4	2.2	1.2	0.8	0.5	0.3
2%	52.7	31.5	23.3	13.6	7.2	1.5	0.9	0.6	0.4
1%	64.8	38.8	28.8	17.2	9.5	1.7	1.1	0.7	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	8.0	3.4	0.0	0.0	0.0	0.0	0.0
2%	30.0	17.0	12.0	6.0	2.0	0.0	0.0	0.0	0.0
1%	37.5	21.4	15.3	8.2	3.4	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 37.5l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd25 Soak2 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2541	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.78		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.2	2.6	3.6	2.7	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.6	6.8	9.5	7.1	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.7	4.1	4.3	4.2	2.5	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd25 Soak3 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	342.96	0.8	274.37
Berm	154.31	0.3	46.293
Footpath	114.29	0.8	91.432
Lots	1171.93	0.8	937.54
Total	**1783.49**		**1349.6**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.0	6.5	5.1	3.5	2.4	1.3	0.9	0.6	0.3
5%	12.3	7.9	6.2	4.2	2.9	1.5	1.0	0.7	0.4
2%	15.9	10.2	8.0	5.4	3.6	1.9	1.3	0.8	0.5
1%	19.2	12.2	9.5	6.3	4.3	2.2	1.4	0.9	0.6

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.0	7.7	9.2	12.5	17.1	27.8	36.9	47.6	59.4
5%	7.4	9.5	11.2	15.3	20.8	33.4	44.0	56.2	69.7
2%	9.5	12.2	14.4	19.3	26.1	41.4	54.1	68.6	84.3
1%	11.5	14.6	17.1	22.8	30.6	48.2	62.5	78.7	95.9

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	25.1	16.3	12.9	8.8	6.0	3.2	2.2	1.4	0.9
5%	31.1	20.0	15.8	10.7	7.3	3.9	2.6	1.6	1.0
2%	40.1	25.7	20.1	13.5	9.2	4.8	3.2	2.0	1.2
1%	48.4	30.7	23.9	15.9	10.7	5.6	3.6	2.3	1.4

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	15.1	19.5	23.2	31.6	43.2	70.2	93.2	119.9	149.8
5%	18.7	24.0	28.4	38.5	52.4	84.3	111.0	141.7	175.7
2%	24.1	30.9	36.3	48.8	65.9	104.5	136.5	173.1	212.7
1%	29.0	36.8	43.0	57.4	77.3	121.6	157.5	198.4	241.8

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.4	11.3	8.9	6.1	4.2	2.3	1.5	1.0	0.6
5%	21.6	13.9	3.7	3.7	5.1	2.7	1.8	1.1	0.7
2%	3.7	3.7	3.7	3.7	3.7	3.4	2.2	1.4	0.9
1%	3.7	3.7	3.7	3.7	3.7	3.9	2.5	1.6	1.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.5	13.6	16.1	22.0	30.0	48.8	64.7	83.3	104.0
5%	13.0	16.7	19.4	26.1	36.4	58.5	77.1	98.4	122.1
2%	15.0	17.2	19.4	26.1	39.5	72.6	94.8	120.3	147.7
1%	15.0	17.2	19.4	26.1	39.5	84.4	109.4	137.8	168.0

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.7	5.0	3.9	2.7	1.8	1.0	0.7	0.4	0.3
5%	9.5	6.1	12.0	7.0	2.2	1.2	0.8	0.5	0.3
2%	36.4	22.0	16.4	9.8	5.4	1.5	1.0	0.6	0.4
1%	44.7	26.9	20.2	12.2	7.0	1.7	1.1	0.7	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	5.8	2.7	0.0	0.0	0.0	0.0	0.0
2%	20.5	11.8	8.4	4.5	1.8	0.0	0.0	0.0	0.0
1%	25.5	14.8	10.7	5.9	2.8	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 25.5l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd25 Soak3 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1783.49	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.7	3.3	3.9	3.3	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	4.5	8.6	10.3	8.6	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.7	4.2	4.4	4.4	2.7	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd25 Soak3 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	346.35	0.8	277.08
Berm	96.54	0.3	28.962
Footpath	116.17	0.8	92.936
Lots	1179.01	0.8	943.21
Total	**1738.07**		**1342.2**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.7	6.3	5.0	3.4	2.3	1.3	0.8	0.5	0.3
5%	12.0	7.7	6.1	4.1	2.8	1.5	1.0	0.6	0.4
2%	15.5	9.9	7.8	5.2	3.5	1.9	1.2	0.8	0.5
1%	18.7	11.8	9.2	6.2	4.1	2.2	1.4	0.9	0.5

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.8	7.5	8.9	12.2	16.7	27.1	36.0	46.3	57.9
5%	7.2	9.3	11.0	14.9	20.2	32.6	42.9	54.7	67.9
2%	9.3	11.9	14.0	18.8	25.5	40.4	52.7	66.9	82.2
1%	11.2	14.2	16.6	22.2	29.8	47.0	60.9	76.6	93.4

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	25.0	16.2	12.8	8.7	6.0	3.2	2.1	1.4	0.9
5%	30.9	19.9	15.7	10.6	7.2	3.9	2.6	1.6	1.0
2%	39.9	25.6	20.0	13.5	9.1	4.8	3.1	2.0	1.2
1%	48.1	30.5	23.8	15.9	10.7	5.6	3.6	2.3	1.4

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	15.0	19.4	23.0	31.4	43.0	69.8	92.7	119.3	148.9
5%	18.6	23.9	28.2	38.3	52.1	83.8	110.4	140.9	174.7
2%	24.0	30.7	36.1	48.5	65.6	104.0	135.7	172.2	211.5
1%	28.9	36.6	42.8	57.1	76.8	120.9	156.7	197.3	240.5

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.5	11.4	9.0	6.1	4.2	2.3	1.5	1.0	0.6
5%	21.7	14.0	3.7	3.7	5.1	2.7	1.8	1.1	0.7
2%	3.7	3.7	3.7	3.7	3.7	3.4	2.2	1.4	0.9
1%	3.7	3.7	3.7	3.7	3.7	3.9	2.5	1.6	1.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.5	13.7	16.2	22.1	30.2	49.0	65.1	83.8	104.7
5%	13.0	16.8	19.5	26.3	36.6	58.9	77.6	99.0	122.8
2%	15.0	17.3	19.5	26.3	39.7	73.1	95.4	121.0	148.6
1%	15.0	17.3	19.5	26.3	39.7	85.0	110.1	138.6	169.0

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.4	4.8	3.8	2.6	1.8	1.0	0.6	0.4	0.3
5%	9.2	5.9	11.9	6.9	2.2	1.2	0.8	0.5	0.3
2%	36.2	21.9	16.3	9.7	5.4	1.4	0.9	0.6	0.4
1%	44.4	26.7	20.0	12.1	6.9	1.7	1.1	0.7	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	5.8	2.8	0.0	0.0	0.0	0.0	0.0
2%	20.7	11.9	8.5	4.5	1.8	0.0	0.0	0.0	0.0
1%	25.7	14.9	10.8	6.0	2.8	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 25.7l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd25 Soak3 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1738.07	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.77		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.7	3.3	4.0	3.4	0.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	4.6	8.8	10.5	8.9	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.6	4.0	4.2	4.1	2.3	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd26 Soak1 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	394.3	0.8	315.44
Berm	284.61	0.3	85.383
Footpath	183.85	0.8	147.08
Lots	2256.22	0.8	1805
Total	**3118.98**		**2352.9**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.4	11.3	8.9	6.1	4.2	2.3	1.5	1.0	0.6
5%	21.6	13.9	10.9	7.4	5.0	2.7	1.8	1.1	0.7
2%	27.8	17.8	14.0	9.4	6.3	3.4	2.2	1.4	0.9
1%	33.6	21.3	16.6	11.1	7.4	3.9	2.5	1.6	1.0

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.4	13.5	16.1	21.9	30.0	48.7	64.6	83.2	103.8
5%	12.9	16.7	19.7	26.7	36.3	58.4	77.0	98.2	121.8
2%	16.7	21.4	25.1	33.8	45.7	72.5	94.6	120.0	147.4
1%	20.1	25.5	29.8	39.8	53.6	84.3	109.2	137.5	167.7

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	43.8	28.4	22.4	15.3	10.5	5.7	3.8	2.4	1.5
5%	54.2	34.9	27.5	18.6	12.7	6.8	4.5	2.9	1.8
2%	70.0	44.9	35.1	23.6	16.0	8.4	5.5	3.5	2.1
1%	84.4	53.4	41.7	27.8	18.7	9.8	6.4	4.0	2.4

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	26.3	34.1	40.4	55.1	75.4	122.4	162.5	209.1	261.1
5%	32.5	41.9	49.4	67.1	91.4	146.9	193.6	247.0	306.3
2%	42.0	53.8	63.2	85.0	114.9	182.3	237.9	301.8	370.7
1%	50.6	64.1	75.0	100.1	134.7	211.9	274.7	345.9	421.6

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	33.6	21.8	17.2	11.7	8.0	4.3	2.9	1.9	1.2
5%	41.6	26.8	7.2	7.2	9.7	5.2	3.4	2.2	1.4
2%	7.2	7.2	7.2	7.2	7.2	6.5	4.2	2.7	1.6
1%	7.2	7.2	7.2	7.2	7.2	7.5	4.9	3.1	1.9

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	20.1	26.1	31.0	42.3	57.8	93.9	124.6	160.4	200.3
5%	25.0	32.2	37.4	50.3	70.1	112.7	148.5	189.5	235.0
2%	28.8	33.1	37.4	50.3	76.1	139.8	182.5	231.5	284.4
1%	28.8	33.1	37.4	50.3	76.1	162.6	210.7	265.3	323.4

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.2	6.6	5.2	3.6	2.4	1.3	0.9	0.6	0.4
5%	12.6	8.1	20.3	11.5	3.0	1.6	1.0	0.7	0.4
2%	62.8	37.7	28.0	16.5	8.8	2.0	1.3	0.8	0.5
1%	77.2	46.3	34.5	20.6	11.5	2.3	1.5	0.9	0.6

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	9.4	4.1	0.0	0.0	0.0	0.0	0.0
2%	35.0	19.9	14.0	7.1	2.5	0.0	0.0	0.0	0.0
1%	43.7	25.0	17.9	9.6	4.1	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 43.7l/s based on Table 3 - 10% AEP Post Development Runoff Rate

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd26 Soak1 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	3118.98	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.75		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	4.5	m	A/W
Actual Volume		16.88	m3	
Actual Area		6.75	m2	
Storage Volume		6.41	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.6	3.3	4.4	3.2	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.1	2.3	3.4	6.8	13.5	40.5	81.0	162.0	324.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.5	8.6	11.6	8.5	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.0	5.7	6.0	6.1	4.0	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd26 Soak2 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	186.21	0.8	148.97
Berm	113.54	0.3	34.062
Footpath	87.24	0.8	69.792
Lots	824.51	0.8	659.61
Total	**1211.5**		**912.43**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.8	4.4	3.5	2.4	1.6	0.9	0.6	0.4	0.2
5%	8.4	5.4	4.2	2.9	2.0	1.1	0.7	0.4	0.3
2%	10.8	6.9	5.4	3.6	2.5	1.3	0.9	0.5	0.3
1%	13.0	8.3	6.4	4.3	2.9	1.5	1.0	0.6	0.4

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.1	5.3	6.2	8.5	11.6	18.9	25.1	32.3	40.3
5%	5.0	6.5	7.6	10.4	14.1	22.7	29.9	38.1	47.3
2%	6.5	8.3	9.8	13.1	17.8	28.2	36.8	46.6	57.3
1%	7.8	9.9	11.6	15.5	20.8	32.7	42.4	53.4	65.1

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.0	11.0	8.7	5.9	4.1	2.2	1.5	0.9	0.6
5%	21.0	13.5	10.7	7.2	4.9	2.6	1.7	1.1	0.7
2%	27.1	17.4	13.6	9.2	6.2	3.3	2.1	1.4	0.8
1%	32.7	20.7	16.2	10.8	7.3	3.8	2.5	1.6	0.9

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.2	13.2	15.7	21.4	29.2	47.4	63.0	81.1	101.3
5%	12.6	16.3	19.2	26.0	35.4	57.0	75.1	95.8	118.8
2%	16.3	20.9	24.5	33.0	44.6	70.7	92.3	117.0	143.8
1%	19.6	24.9	29.1	38.8	52.2	82.2	106.5	134.1	163.5

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	12.3	8.0	6.3	4.3	2.9	1.6	1.1	0.7	0.4
5%	15.2	9.8	2.6	2.6	3.6	1.9	1.3	0.8	0.5
2%	2.6	2.6	2.6	2.6	2.6	2.4	1.5	1.0	0.6
1%	2.6	2.6	2.6	2.6	2.6	2.8	1.8	1.1	0.7

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.4	9.5	11.3	15.4	21.1	34.3	45.5	58.6	73.2
5%	9.1	11.8	13.7	18.4	25.6	41.2	54.3	69.2	85.9
2%	10.5	12.1	13.7	18.4	27.8	51.1	66.7	84.6	103.9
1%	10.5	12.1	13.7	18.4	27.8	59.4	77.0	97.0	118.2

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.7	3.1	2.4	1.6	1.1	0.6	0.4	0.3	0.2
5%	5.8	3.8	8.0	4.6	1.4	0.7	0.5	0.3	0.2
2%	24.5	14.8	11.0	6.5	3.6	0.9	0.6	0.4	0.2
1%	30.1	18.1	13.5	8.2	4.6	1.1	0.7	0.4	0.3

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s)
(Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	3.8	1.7	0.0	0.0	0.0	0.0	0.0
2%	13.7	7.9	5.6	2.9	1.1	0.0	0.0	0.0	0.0
1%	17.1	9.9	7.1	3.9	1.7	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 17.1l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd26 Soak2 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1211.5	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.75		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	2.5	m	A/W
Actual Volume		9.38	m3	
Actual Area		3.75	m2	
Storage Volume		3.56	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.7	1.6	2.0	1.2	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.6	1.3	1.9	3.8	7.5	22.5	45.0	90.0	180.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.8	4.3	5.2	3.2	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.2	2.4	2.5	2.2	0.6	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd27 Soak1 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	227.54	0.8	182.03
Berm	137.97	0.3	41.391
Footpath	106.77	0.8	85.416
Lots	1079.54	0.8	863.63
Total	**1551.82**		**1172.5**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.7	5.6	4.4	3.0	2.1	1.1	0.7	0.5	0.3
5%	10.7	6.9	5.4	3.7	2.5	1.3	0.9	0.6	0.4
2%	13.8	8.9	6.9	4.7	3.2	1.7	1.1	0.7	0.4
1%	16.7	10.6	8.2	5.5	3.7	1.9	1.3	0.8	0.5

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.2	6.7	8.0	10.9	14.9	24.2	32.1	41.4	51.7
5%	6.4	8.3	9.8	13.3	18.1	29.1	38.3	48.9	60.6
2%	8.3	10.7	12.5	16.8	22.7	36.1	47.1	59.7	73.4
1%	10.0	12.7	14.8	19.8	26.7	41.9	54.3	68.4	83.4

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	21.8	14.1	11.2	7.6	5.2	2.8	1.9	1.2	0.8
5%	27.0	17.4	13.7	9.3	6.3	3.4	2.2	1.4	0.9
2%	34.9	22.4	17.5	11.8	8.0	4.2	2.7	1.7	1.1
1%	42.0	26.6	20.8	13.9	9.3	4.9	3.2	2.0	1.2

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	13.1	17.0	20.1	27.5	37.5	61.0	81.0	104.2	130.1
5%	16.2	20.9	24.6	33.4	45.5	73.2	96.5	123.1	152.6
2%	20.9	26.8	31.5	42.4	57.3	90.8	118.6	150.4	184.7
1%	25.2	32.0	37.4	49.9	67.1	105.6	136.9	172.4	210.1

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	16.1	10.4	8.2	5.6	3.8	2.1	1.4	0.9	0.6
5%	19.9	12.8	3.4	3.4	4.7	2.5	1.6	1.0	0.7
2%	3.4	3.4	3.4	3.4	3.4	3.1	2.0	1.3	0.8
1%	3.4	3.4	3.4	3.4	3.4	3.6	2.3	1.5	0.9

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.6	12.5	14.8	20.2	27.7	44.9	59.6	76.8	95.8
5%	11.9	15.4	17.9	24.1	33.5	53.9	71.0	90.7	112.4
2%	13.8	15.8	17.9	24.1	36.4	66.9	87.3	110.8	136.1
1%	13.8	15.8	17.9	24.1	36.4	77.8	100.8	127.0	154.7

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.7	3.7	2.9	2.0	1.4	0.7	0.5	0.3	0.2
5%	7.1	4.6	10.3	5.9	1.7	0.9	0.6	0.4	0.2
2%	31.4	18.9	14.1	8.3	4.5	1.1	0.7	0.5	0.3
1%	38.6	23.2	17.3	10.4	5.9	1.3	0.8	0.5	0.3

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	4.8	2.2	0.0	0.0	0.0	0.0	0.0
2%	17.6	10.1	7.1	3.7	1.4	0.0	0.0	0.0	0.0
1%	21.9	12.6	9.1	4.9	2.2	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 21.9l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd27 Soak1 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1551.82	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	2.5	m	A/W
Actual Volume		9.38	m3	
Actual Area		3.75	m2	
Storage Volume		3.56	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.8	2.2	2.8	2.3	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.6	1.3	1.9	3.8	7.5	22.5	45.0	90.0	180.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.1	5.7	7.3	5.9	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.8	3.2	3.4	3.5	2.4	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd28 Soak1 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	279.92	0.8	223.94
Berm	159.38	0.3	47.814
Footpath	120.12	0.8	96.096
Lots	1529.19	0.8	1223.4
Total	**2088.61**		**1591.2**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.7	7.6	6.0	4.1	2.8	1.5	1.0	0.6	0.4
5%	14.4	9.3	7.3	5.0	3.4	1.8	1.2	0.8	0.5
2%	18.6	11.9	9.4	6.3	4.3	2.2	1.5	0.9	0.6
1%	22.5	14.2	11.1	7.4	5.0	2.6	1.7	1.1	0.6

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.0	9.1	10.8	14.7	20.1	32.6	43.3	55.7	69.5
5%	8.7	11.2	13.2	17.9	24.3	39.1	51.5	65.8	81.6
2%	11.2	14.3	16.8	22.6	30.6	48.5	63.4	80.4	98.7
1%	13.5	17.1	20.0	26.7	35.9	56.4	73.1	92.1	112.3

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	29.6	19.2	15.2	10.4	7.1	3.8	2.5	1.6	1.0
5%	36.7	23.6	18.6	12.6	8.6	4.6	3.0	1.9	1.2
2%	47.3	30.3	23.8	16.0	10.8	5.7	3.7	2.4	1.5
1%	57.1	36.1	28.2	18.8	12.7	6.6	4.3	2.7	1.6

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.8	23.0	27.3	37.3	51.0	82.7	109.9	141.4	176.6
5%	22.0	28.3	33.4	45.4	61.8	99.4	130.9	167.0	207.1
2%	28.4	36.4	42.8	57.5	77.7	123.3	160.9	204.1	250.7
1%	34.2	43.4	50.7	67.7	91.1	143.3	185.7	233.9	285.1

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	22.8	14.8	11.7	8.0	5.4	2.9	2.0	1.3	0.8
5%	28.2	18.2	4.9	4.9	6.6	3.5	2.3	1.5	0.9
2%	4.9	4.9	4.9	4.9	4.9	4.4	2.9	1.8	1.1
1%	4.9	4.9	4.9	4.9	4.9	5.1	3.3	2.1	1.3

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	13.7	17.7	21.0	28.6	39.2	63.6	84.5	108.7	135.8
5%	16.9	21.8	25.3	34.1	47.5	76.4	100.6	128.4	159.3
2%	19.5	22.4	25.3	34.1	51.6	94.8	123.7	156.9	192.8
1%	19.5	22.4	25.3	34.1	51.6	110.2	142.8	179.8	219.2

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.8	4.4	3.5	2.4	1.6	0.9	0.6	0.4	0.2
5%	8.5	5.5	13.7	7.8	2.0	1.1	0.7	0.4	0.3
2%	42.5	25.5	18.9	11.1	5.9	1.3	0.9	0.5	0.3
1%	52.2	31.3	23.3	13.9	7.8	1.5	1.0	0.6	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	6.4	2.8	0.0	0.0	0.0	0.0	0.0
2%	23.8	13.5	9.5	4.8	1.7	0.0	0.0	0.0	0.0
1%	29.7	17.1	12.2	6.5	2.8	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 29.7l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd28 Soak1 - A

Calculations By	Linda Bos	Date	46128	
Reviewed By	Chris Sexton	Date	46129	

Catchment Area	A	2088.61	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.0	m	A/W
Actual Volume		11.25	m3	
Actual Area		4.50	m2	
Storage Volume		4.28	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.5	2.4	3.2	2.4	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.8	1.5	2.3	4.5	9.0	27.0	54.0	108.0	216.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.3	6.2	8.3	6.4	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.4	3.8	4.1	4.1	2.8	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd28 Soak1 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	281	0.8	224.8
Berm	90.35	0.3	27.105
Footpath	114.82	0.8	91.856
Lots	1139.84	0.8	911.87
Total	**1626.01**		**1255.6**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.1	5.9	4.7	3.2	2.2	1.2	0.8	0.5	0.3
5%	11.2	7.2	5.7	3.9	2.6	1.4	0.9	0.6	0.4
2%	14.5	9.3	7.3	4.9	3.3	1.7	1.1	0.7	0.4
1%	17.5	11.1	8.6	5.8	3.9	2.0	1.3	0.8	0.5

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.4	7.1	8.4	11.4	15.6	25.4	33.7	43.4	54.1
5%	6.7	8.7	10.3	13.9	18.9	30.5	40.1	51.2	63.5
2%	8.7	11.2	13.1	17.6	23.8	37.8	49.3	62.6	76.9
1%	10.5	13.3	15.5	20.7	27.9	43.9	56.9	71.7	87.4

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	23.4	15.1	12.0	8.2	5.6	3.0	2.0	1.3	0.8
5%	28.9	18.6	14.7	9.9	6.8	3.6	2.4	1.5	0.9
2%	37.4	23.9	18.7	12.6	8.5	4.5	2.9	1.9	1.1
1%	45.0	28.5	22.2	14.8	10.0	5.2	3.4	2.1	1.3

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.0	18.2	21.6	29.4	40.2	65.3	86.7	111.6	139.3
5%	17.4	22.4	26.4	35.8	48.8	78.4	103.3	131.8	163.5
2%	22.4	28.7	33.7	45.4	61.3	97.3	127.0	161.1	197.8
1%	27.0	34.2	40.0	53.4	71.9	113.1	146.6	184.6	225.0

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.0	11.0	8.7	5.9	4.1	2.2	1.5	0.9	0.6
5%	21.0	13.5	3.6	3.6	4.9	2.6	1.7	1.1	0.7
2%	3.6	3.6	3.6	3.6	3.6	3.3	2.1	1.4	0.8
1%	3.6	3.6	3.6	3.6	3.6	3.8	2.5	1.6	0.9

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.2	13.2	15.7	21.4	29.2	47.4	63.0	81.0	101.2
5%	12.6	16.2	18.9	25.4	35.4	56.9	75.0	95.7	118.7
2%	14.5	16.7	18.9	25.4	38.4	70.6	92.2	117.0	143.7
1%	14.5	16.7	18.9	25.4	38.4	82.1	106.4	134.0	163.4

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.4	4.1	3.3	2.2	1.5	0.8	0.5	0.4	0.2
5%	7.9	5.1	11.0	6.3	1.9	1.0	0.7	0.4	0.3
2%	33.7	20.3	15.1	9.0	4.9	1.2	0.8	0.5	0.3
1%	41.4	24.9	18.6	11.2	6.4	1.4	0.9	0.6	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	5.3	2.5	0.0	0.0	0.0	0.0	0.0
2%	19.2	11.0	7.8	4.1	1.6	0.0	0.0	0.0	0.0
1%	23.9	13.8	10.0	5.5	2.5	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 23.9l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd28 Soak1 - B

Calculations By	Linda Bos	Date	46128	
Reviewed By	Chris Sexton	Date	46129	

Catchment Area	A	1626.01	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.77		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.0	m	A/W
Actual Volume		11.25	m3	
Actual Area		4.50	m2	
Storage Volume		4.28	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.8	1.5	2.3	4.5	9.0	27.0	54.0	108.0	216.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.2	2.7	3.3	2.8	0.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	3.2	7.1	8.8	7.3	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.1	3.5	3.7	3.6	2.0	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd28 Soak2 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	331.96	0.8	265.57
Berm	159.8	0.3	47.94
Footpath	118.82	0.8	95.056
Lots	1166.29	0.8	933.03
Total	**1776.87**		**1341.6**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.9	6.4	5.1	3.5	2.4	1.3	0.9	0.5	0.3
5%	12.3	7.9	6.2	4.2	2.9	1.5	1.0	0.6	0.4
2%	15.9	10.2	8.0	5.3	3.6	1.9	1.2	0.8	0.5
1%	19.1	12.1	9.4	6.3	4.2	2.2	1.4	0.9	0.6

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.9	7.7	9.1	12.5	17.1	27.7	36.8	47.4	59.2
5%	7.4	9.5	11.2	15.2	20.7	33.3	43.9	56.0	69.4
2%	9.5	12.2	14.3	19.3	26.0	41.3	53.9	68.4	84.0
1%	11.5	14.5	17.0	22.7	30.5	48.0	62.2	78.4	95.5

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	25.0	16.2	12.8	8.7	6.0	3.2	2.1	1.4	0.9
5%	30.9	19.9	15.7	10.6	7.2	3.9	2.6	1.6	1.0
2%	39.9	25.6	20.0	13.5	9.1	4.8	3.1	2.0	1.2
1%	48.1	30.5	23.8	15.9	10.7	5.6	3.6	2.3	1.4

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	15.0	19.4	23.0	31.4	43.0	69.8	92.6	119.2	148.9
5%	18.6	23.9	28.2	38.3	52.1	83.8	110.4	140.8	174.7
2%	23.9	30.7	36.1	48.5	65.5	103.9	135.7	172.1	211.4
1%	28.9	36.6	42.8	57.1	76.8	120.8	156.6	197.2	240.4

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.4	11.3	8.9	6.1	4.2	2.2	1.5	1.0	0.6
5%	21.5	13.9	3.7	3.7	5.0	2.7	1.8	1.1	0.7
2%	3.7	3.7	3.7	3.7	3.7	3.3	2.2	1.4	0.9
1%	3.7	3.7	3.7	3.7	3.7	3.9	2.5	1.6	1.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.4	13.5	16.0	21.9	29.9	48.5	64.4	82.9	103.5
5%	12.9	16.6	19.3	26.0	36.2	58.3	76.8	97.9	121.5
2%	14.9	17.1	19.3	26.0	39.3	72.3	94.3	119.7	147.0
1%	14.9	17.1	19.3	26.0	39.3	84.0	108.9	137.2	167.2

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.6	4.9	3.9	2.7	1.8	1.0	0.7	0.4	0.3
5%	9.4	6.1	12.0	6.9	2.2	1.2	0.8	0.5	0.3
2%	36.2	21.9	16.3	9.8	5.4	1.5	1.0	0.6	0.4
1%	44.4	26.8	20.1	12.1	7.0	1.7	1.1	0.7	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	5.7	2.7	0.0	0.0	0.0	0.0	0.0
2%	20.3	11.7	8.4	4.4	1.8	0.0	0.0	0.0	0.0
1%	25.3	14.7	10.6	5.9	2.7	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 25.3l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd28 Soak2 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1776.87	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.6	3.2	3.8	3.1	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	4.3	8.4	10.1	8.3	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.7	4.2	4.4	4.3	2.6	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd28 Soak2 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	325.26	0.8	260.21
Berm	91.08	0.3	27.324
Footpath	117.27	0.8	93.816
Lots	1164.6	0.8	931.68
Total	**1698.21**		**1313**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.5	6.1	4.9	3.3	2.3	1.2	0.8	0.5	0.3
5%	11.7	7.6	5.9	4.0	2.7	1.5	1.0	0.6	0.4
2%	15.2	9.7	7.6	5.1	3.5	1.8	1.2	0.8	0.5
1%	18.3	11.6	9.0	6.0	4.1	2.1	1.4	0.9	0.5

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.7	7.4	8.7	11.9	16.3	26.5	35.2	45.3	56.5
5%	7.0	9.1	10.7	14.5	19.8	31.8	41.9	53.5	66.3
2%	9.1	11.7	13.7	18.4	24.9	39.5	51.5	65.3	80.3
1%	11.0	13.9	16.2	21.7	29.2	45.9	59.5	74.9	91.3

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	24.4	15.8	12.5	8.5	5.8	3.2	2.1	1.4	0.8
5%	30.3	19.5	15.3	10.4	7.1	3.8	2.5	1.6	1.0
2%	39.1	25.0	19.6	13.2	8.9	4.7	3.1	1.9	1.2
1%	47.1	29.8	23.3	15.5	10.4	5.5	3.5	2.2	1.4

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.7	19.0	22.5	30.7	42.1	68.3	90.7	116.7	145.7
5%	18.2	23.4	27.6	37.5	51.0	82.0	108.0	137.8	170.9
2%	23.4	30.0	35.3	47.4	64.1	101.7	132.8	168.4	206.9
1%	28.3	35.8	41.9	55.8	75.2	118.3	153.3	193.0	235.3

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.3	11.2	8.9	6.1	4.1	2.2	1.5	1.0	0.6
5%	21.5	13.8	3.7	3.7	5.0	2.7	1.8	1.1	0.7
2%	3.7	3.7	3.7	3.7	3.7	3.3	2.2	1.4	0.8
1%	3.7	3.7	3.7	3.7	3.7	3.9	2.5	1.6	1.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.4	13.5	16.0	21.8	29.8	48.4	64.3	82.8	103.4
5%	12.9	16.6	19.3	26.0	36.2	58.2	76.6	97.8	121.3
2%	14.9	17.1	19.3	26.0	39.3	72.2	94.2	119.5	146.8
1%	14.9	17.1	19.3	26.0	39.3	83.9	108.8	137.0	166.9

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.1	4.6	3.6	2.5	1.7	0.9	0.6	0.4	0.2
5%	8.8	5.7	11.6	6.7	2.1	1.1	0.7	0.5	0.3
2%	35.4	21.3	15.9	9.5	5.2	1.4	0.9	0.6	0.3
1%	43.4	26.1	19.6	11.8	6.7	1.6	1.0	0.6	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	5.7	2.7	0.0	0.0	0.0	0.0	0.0
2%	20.2	11.6	8.3	4.4	1.8	0.0	0.0	0.0	0.0
1%	25.1	14.6	10.5	5.8	2.7	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 25.1l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd28 Soak2 - B

Calculations By	Linda Bos	Date	46128	
Reviewed By	Chris Sexton	Date	46129	

Catchment Area	A	1698.21	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.77		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.6	3.1	3.7	3.0	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	4.1	8.1	9.7	7.8	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.4	3.8	3.9	3.7	1.7	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd29 Soak1 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	443.32	0.8	354.66
Berm	216.18	0.3	64.854
Footpath	137.1	0.8	109.68
Lots	1688.82	0.8	1351.1
Total	**2485.42**		**1880.2**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	13.9	9.0	7.1	4.9	3.3	1.8	1.2	0.8	0.5
5%	17.2	11.1	8.7	5.9	4.0	2.2	1.4	0.9	0.6
2%	22.2	14.2	11.1	7.5	5.1	2.7	1.7	1.1	0.7
1%	26.7	16.9	13.2	8.8	5.9	3.1	2.0	1.3	0.8

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.3	10.8	12.8	17.5	23.9	38.8	51.5	66.3	82.7
5%	10.3	13.3	15.7	21.3	29.0	46.6	61.3	78.3	97.1
2%	13.3	17.1	20.0	26.9	36.4	57.8	75.4	95.6	117.5
1%	16.0	20.3	23.8	31.7	42.7	67.2	87.0	109.6	133.6

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	35.0	22.7	17.9	12.2	8.4	4.5	3.0	1.9	1.2
5%	43.3	27.9	22.0	14.9	10.1	5.4	3.6	2.3	1.4
2%	55.9	35.9	28.1	18.9	12.8	6.7	4.4	2.8	1.7
1%	67.4	42.7	33.3	22.2	14.9	7.8	5.1	3.2	1.9

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	21.0	27.2	32.3	44.0	60.2	97.8	129.8	167.1	208.6
5%	26.0	33.5	39.5	53.6	73.0	117.4	154.7	197.4	244.8
2%	33.6	43.0	50.5	67.9	91.8	145.6	190.1	241.2	296.3
1%	40.5	51.2	59.9	80.0	107.6	169.4	219.5	276.4	336.9

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	25.1	16.3	12.9	8.8	6.0	3.3	2.2	1.4	0.9
5%	31.1	20.1	5.4	5.4	7.3	3.9	2.6	1.6	1.0
2%	5.4	5.4	5.4	5.4	5.4	4.8	3.2	2.0	1.2
1%	5.4	5.4	5.4	5.4	5.4	5.6	3.7	2.3	1.4

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	15.1	19.6	23.2	31.6	43.3	70.3	93.3	120.1	149.9
5%	18.7	24.1	28.0	37.6	52.5	84.4	111.1	141.8	175.9
2%	21.6	24.8	28.0	37.6	56.9	104.7	136.6	173.3	212.9
1%	21.6	24.8	28.0	37.6	56.9	121.7	157.7	198.6	242.1

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.8	6.4	5.0	3.4	2.4	1.3	0.8	0.5	0.3
5%	12.2	7.9	16.6	9.5	2.9	1.5	1.0	0.6	0.4
2%	50.6	30.5	22.7	13.5	7.4	1.9	1.2	0.8	0.5
1%	62.1	37.3	27.9	16.9	9.6	2.2	1.4	0.9	0.5

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	7.9	3.6	0.0	0.0	0.0	0.0	0.0
2%	28.4	16.3	11.6	6.0	2.3	0.0	0.0	0.0	0.0
1%	35.3	20.4	14.7	8.0	3.7	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 35.3l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd29 Soak1 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2485.42	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	4.5	m	A/W
Actual Volume		16.88	m3	
Actual Area		6.75	m2	
Storage Volume		6.41	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.7	3.9	4.8	3.9	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.1	2.3	3.4	6.8	13.5	40.5	81.0	162.0	324.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	4.6	10.3	12.6	10.2	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.8	5.4	5.7	5.6	3.4	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd29 Soak1 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	328.91	0.8	263.13
Berm	180.44	0.3	54.132
Footpath	127.62	0.8	102.1
Lots	1530.85	0.8	1224.7
Total	**2167.82**		**1644**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	12.1	7.8	6.2	4.2	2.9	1.6	1.0	0.7	0.4
5%	15.0	9.7	7.6	5.2	3.5	1.9	1.2	0.8	0.5
2%	19.3	12.4	9.7	6.5	4.4	2.3	1.5	1.0	0.6
1%	23.3	14.8	11.5	7.7	5.2	2.7	1.8	1.1	0.7

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.3	9.4	11.2	15.2	20.8	33.8	44.9	57.8	72.2
5%	9.0	11.6	13.7	18.5	25.3	40.6	53.5	68.3	84.7
2%	11.6	14.9	17.5	23.5	31.8	50.4	65.8	83.4	102.5
1%	14.0	17.7	20.7	27.7	37.2	58.6	75.9	95.6	116.5

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	30.6	19.8	15.7	10.7	7.3	4.0	2.6	1.7	1.1
5%	37.9	24.4	19.2	13.0	8.9	4.8	3.1	2.0	1.2
2%	48.9	31.4	24.5	16.5	11.2	5.9	3.8	2.4	1.5
1%	59.0	37.3	29.1	19.4	13.1	6.9	4.4	2.8	1.7

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	18.3	23.8	28.2	38.5	52.7	85.5	113.5	146.1	182.4
5%	22.7	29.3	34.6	46.9	63.8	102.7	135.2	172.6	214.0
2%	29.3	37.6	44.2	59.4	80.3	127.4	166.2	210.9	259.0
1%	35.4	44.8	52.4	69.9	94.1	148.1	191.9	241.7	294.6

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	22.8	14.8	11.7	8.0	5.4	2.9	2.0	1.3	0.8
5%	28.2	18.2	4.9	4.9	6.6	3.5	2.3	1.5	0.9
2%	4.9	4.9	4.9	4.9	4.9	4.4	2.9	1.8	1.1
1%	4.9	4.9	4.9	4.9	4.9	5.1	3.3	2.1	1.3

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	13.7	17.7	21.0	28.7	39.2	63.7	84.6	108.8	135.9
5%	16.9	21.8	25.4	34.1	47.6	76.5	100.7	128.5	159.4
2%	19.5	22.5	25.4	34.1	51.6	94.9	123.8	157.1	193.0
1%	19.5	22.5	25.4	34.1	51.6	110.3	143.0	180.0	219.4

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.8	5.1	4.0	2.7	1.9	1.0	0.7	0.4	0.3
5%	9.7	6.2	14.3	8.2	2.3	1.2	0.8	0.5	0.3
2%	44.0	26.5	19.7	11.6	6.3	1.5	1.0	0.6	0.4
1%	54.1	32.5	24.3	14.6	8.2	1.7	1.1	0.7	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	6.7	3.0	0.0	0.0	0.0	0.0	0.0
2%	24.7	14.1	10.0	5.1	1.9	0.0	0.0	0.0	0.0
1%	30.8	17.7	12.7	6.9	3.0	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 30.8l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd29 Soak1 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2167.82	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.0	2.9	3.7	2.9	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.6	7.6	9.7	7.6	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.8	4.3	4.6	4.6	2.9	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd29 Soak2 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	437.81	0.8	350.25
Berm	198.96	0.3	59.688
Footpath	141.41	0.8	113.13
Lots	1303.78	0.8	1043
Total	**2081.96**		**1566.1**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.6	7.5	6.0	4.1	2.8	1.5	1.0	0.6	0.4
5%	14.4	9.3	7.3	4.9	3.4	1.8	1.2	0.8	0.5
2%	18.6	11.9	9.3	6.3	4.2	2.2	1.5	0.9	0.6
1%	22.4	14.2	11.1	7.4	5.0	2.6	1.7	1.1	0.6

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.0	9.0	10.7	14.6	20.0	32.5	43.1	55.5	69.3
5%	8.6	11.1	13.1	17.8	24.3	39.0	51.4	65.6	81.3
2%	11.1	14.3	16.8	22.6	30.5	48.4	63.2	80.1	98.4
1%	13.4	17.0	19.9	26.6	35.8	56.3	72.9	91.8	111.9

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	29.1	18.9	14.9	10.2	7.0	3.8	2.5	1.6	1.0
5%	36.1	23.2	18.3	12.4	8.4	4.5	3.0	1.9	1.2
2%	46.6	29.9	23.4	15.7	10.6	5.6	3.7	2.3	1.4
1%	56.2	35.6	27.7	18.5	12.5	6.5	4.2	2.7	1.6

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.5	22.7	26.9	36.7	50.2	81.4	108.1	139.2	173.8
5%	21.7	27.9	32.9	44.7	60.8	97.8	128.8	164.4	203.9
2%	28.0	35.8	42.1	56.6	76.5	121.3	158.4	200.9	246.8
1%	33.7	42.7	49.9	66.6	89.7	141.1	182.8	230.2	280.6

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	19.4	12.6	9.9	6.8	4.6	2.5	1.7	1.1	0.7
5%	24.0	15.5	4.1	4.1	5.6	3.0	2.0	1.3	0.8
2%	4.1	4.1	4.1	4.1	4.1	3.7	2.4	1.5	1.0
1%	4.1	4.1	4.1	4.1	4.1	4.3	2.8	1.8	1.1

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.6	15.1	17.9	24.4	33.4	54.2	72.0	92.7	115.7
5%	14.4	18.6	21.6	29.1	40.5	65.1	85.8	109.5	135.8
2%	16.6	19.1	21.6	29.1	44.0	80.8	105.5	133.8	164.3
1%	16.6	19.1	21.6	29.1	44.0	93.9	121.8	153.3	186.9

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.7	6.3	5.0	3.4	2.3	1.3	0.8	0.5	0.3
5%	12.1	7.8	14.1	8.3	2.8	1.5	1.0	0.6	0.4
2%	42.4	25.7	19.2	11.6	6.5	1.9	1.2	0.8	0.5
1%	52.0	31.4	23.6	14.4	8.3	2.2	1.4	0.9	0.5

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	6.9	3.3	0.0	0.0	0.0	0.0	0.0
2%	23.9	13.8	9.9	5.3	2.2	0.0	0.0	0.0	0.0
1%	29.6	17.2	12.5	7.0	3.3	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 29.6l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd29 Soak2 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2081.96	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.75		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	4.5	m	A/W
Actual Volume		16.88	m3	
Actual Area		6.75	m2	
Storage Volume		6.41	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.5	4.3	5.0	4.2	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.1	2.3	3.4	6.8	13.5	40.5	81.0	162.0	324.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0
1%	6.6	11.3	13.2	11.2	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.7	5.3	5.6	5.5	3.3	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd29 Soak2 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	357.44	0.8	285.95
Berm	164.07	0.3	49.221
Footpath	96.37	0.8	77.096
Lots	758.9	0.8	607.12
Total	**1376.78**		**1019.4**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.7	5.0	3.9	2.7	1.8	1.0	0.7	0.4	0.3
5%	9.5	6.1	4.8	3.3	2.2	1.2	0.8	0.5	0.3
2%	12.3	7.9	6.2	4.1	2.8	1.5	1.0	0.6	0.4
1%	14.8	9.4	7.3	4.9	3.3	1.7	1.1	0.7	0.4

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.6	6.0	7.1	9.7	13.2	21.5	28.5	36.7	45.8
5%	5.7	7.4	8.7	11.8	16.0	25.8	34.0	43.4	53.8
2%	7.4	9.5	11.1	14.9	20.2	32.0	41.8	53.0	65.1
1%	8.9	11.3	13.2	17.6	23.6	37.2	48.2	60.7	74.0

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	19.0	12.3	9.7	6.6	4.5	2.5	1.6	1.0	0.7
5%	23.5	15.1	11.9	8.1	5.5	2.9	1.9	1.2	0.8
2%	30.3	19.4	15.2	10.2	6.9	3.7	2.4	1.5	0.9
1%	36.6	23.2	18.1	12.0	8.1	4.3	2.8	1.7	1.1

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.4	14.8	17.5	23.9	32.6	53.0	70.4	90.6	113.1
5%	14.1	18.2	21.4	29.1	39.6	63.7	83.9	107.0	132.7
2%	18.2	23.3	27.4	36.8	49.8	79.0	103.1	130.7	160.6
1%	21.9	27.8	32.5	43.4	58.4	91.8	119.0	149.8	182.7

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.3	7.3	5.8	3.9	2.7	1.5	1.0	0.6	0.4
5%	14.0	9.0	2.4	2.4	3.3	1.8	1.2	0.7	0.5
2%	2.4	2.4	2.4	2.4	2.4	2.2	1.4	0.9	0.6
1%	2.4	2.4	2.4	2.4	2.4	2.5	1.6	1.0	0.6

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.8	8.8	10.4	14.2	19.4	31.6	41.9	54.0	67.4
5%	8.4	10.8	12.6	16.9	23.6	37.9	49.9	63.7	79.0
2%	9.7	11.1	12.6	16.9	25.6	47.0	61.4	77.9	95.7
1%	9.7	11.1	12.6	16.9	25.6	54.7	70.9	89.2	108.8

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.7	5.0	3.9	2.7	1.8	1.0	0.7	0.4	0.3
5%	9.5	6.1	9.5	5.7	2.2	1.2	0.8	0.5	0.3
2%	27.9	17.0	12.8	7.8	4.5	1.5	1.0	0.6	0.4
1%	34.1	20.7	15.6	9.6	5.7	1.7	1.1	0.7	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	4.7	2.4	0.0	0.0	0.0	0.0	0.0
2%	15.6	9.2	6.6	3.7	1.7	0.0	0.0	0.0	0.0
1%	19.3	11.4	8.3	4.8	2.4	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 19.3l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd29 Soak2 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1376.78	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.74		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.3	1.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.5	3.6	4.1	3.6	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.7	2.6	2.9	0.0	0.0	0.0	0.0	0.0	0.0
1%	6.5	9.6	10.9	9.5	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.7	4.2	4.5	4.4	2.7	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd6 Soak1 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	38.32	0.8	30.656
Berm	270.79	0.3	81.237
Footpath	121.28	0.8	97.024
Lots	115.3	0.8	92.24
Total	**545.69**		**301.16**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.0	2.0	1.6	1.1	0.7	0.4	0.3	0.2	0.1
5%	3.8	2.4	1.9	1.3	0.9	0.5	0.3	0.2	0.1
2%	4.9	3.1	2.4	1.6	1.1	0.6	0.4	0.2	0.1
1%	5.9	3.7	2.9	1.9	1.3	0.7	0.4	0.3	0.2

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.8	2.4	2.8	3.8	5.2	8.5	11.3	14.5	18.2
5%	2.3	2.9	3.4	4.7	6.4	10.2	13.5	17.2	21.3
2%	2.9	3.7	4.4	5.9	8.0	12.7	16.6	21.0	25.8
1%	3.5	4.5	5.2	7.0	9.4	14.7	19.1	24.1	29.3

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.6	3.6	2.9	2.0	1.3	0.7	0.5	0.3	0.2
5%	6.9	4.5	3.5	2.4	1.6	0.9	0.6	0.4	0.2
2%	9.0	5.7	4.5	3.0	2.0	1.1	0.7	0.4	0.3
1%	10.8	6.8	5.3	3.6	2.4	1.3	0.8	0.5	0.3

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.4	4.4	5.2	7.1	9.6	15.7	20.8	26.8	33.4
5%	4.2	5.4	6.3	8.6	11.7	18.8	24.8	31.6	39.2
2%	5.4	6.9	8.1	10.9	14.7	23.3	30.5	38.6	47.5
1%	6.5	8.2	9.6	12.8	17.2	27.1	35.2	44.3	54.0

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.7	1.1	0.9	0.6	0.4	0.2	0.1	0.1	0.1
5%	2.1	1.4	0.4	0.4	0.5	0.3	0.2	0.1	0.1
2%	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.1	0.1
1%	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.1

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.0	1.3	1.6	2.2	3.0	4.8	6.4	8.2	10.2
5%	1.3	1.6	1.9	2.6	3.6	5.8	7.6	9.7	12.0
2%	1.5	1.7	1.9	2.6	3.9	7.1	9.3	11.8	14.5
1%	1.5	1.7	1.9	2.6	3.9	8.3	10.8	13.6	16.5

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.9	2.5	2.0	1.4	0.9	0.5	0.3	0.2	0.1
5%	4.8	3.1	3.2	2.0	1.1	0.6	0.4	0.3	0.2
2%	8.6	5.4	4.1	2.7	1.7	0.7	0.5	0.3	0.2
1%	10.4	6.5	5.0	3.2	2.0	0.9	0.6	0.4	0.2

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.8	0.5	0.4	0.3	0.2	0.1	0.1	0.0	0.0
5%	1.0	0.7	1.2	0.7	0.2	0.1	0.1	0.1	0.0
2%	3.7	2.3	1.7	1.0	0.6	0.2	0.1	0.1	0.0
1%	4.6	2.8	2.1	1.3	0.7	0.2	0.1	0.1	0.0

Sump inlet capacity to be sized to allow for 4.6l/s based on Table 3 - 10% AEP Post Development Runoff Rate

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd6 Soak1 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	545.69	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.55		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	2.0	m	A/W
Actual Volume		7.50	m3	
Actual Area		3.00	m2	
Storage Volume		2.85	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.5	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.0	1.1	1.0	0.3	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.5	1.0	1.5	3.0	6.0	18.0	36.0	72.0	144.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	1.3	1.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.6	2.8	2.6	0.7	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.8	2.0	2.1	1.9	0.7	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd6 Soak1 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	454.5	0.8	363.6
Berm	0	0.3	0
Footpath	0	0.8	0
Lots	0	0.8	0
Total	**454.5**		**363.6**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.5	1.6	1.3	0.9	0.6	0.3	0.2	0.1	0.1
5%	3.1	2.0	1.6	1.1	0.7	0.4	0.3	0.2	0.1
2%	4.1	2.6	2.0	1.4	0.9	0.5	0.3	0.2	0.1
1%	4.9	3.1	2.4	1.6	1.1	0.6	0.4	0.2	0.1

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.5	2.0	2.3	3.2	4.4	7.1	9.4	12.1	15.1
5%	1.9	2.4	2.9	3.9	5.3	8.5	11.2	14.3	17.8
2%	2.4	3.1	3.7	4.9	6.7	10.6	13.8	17.5	21.5
1%	2.9	3.7	4.3	5.8	7.8	12.3	15.9	20.0	24.4

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.8	4.4	3.5	2.4	1.6	0.9	0.6	0.4	0.2
5%	8.4	5.4	4.2	2.9	2.0	1.1	0.7	0.4	0.3
2%	10.8	6.9	5.4	3.6	2.5	1.3	0.9	0.5	0.3
1%	13.0	8.3	6.4	4.3	2.9	1.5	1.0	0.6	0.4

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.1	5.3	6.2	8.5	11.6	18.9	25.1	32.3	40.3
5%	5.0	6.5	7.6	10.4	14.1	22.7	29.9	38.2	47.3
2%	6.5	8.3	9.8	13.1	17.8	28.2	36.8	46.6	57.3
1%	7.8	9.9	11.6	15.5	20.8	32.8	42.4	53.4	65.2

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.8	4.4	3.5	2.4	1.6	0.9	0.6	0.4	0.2
5%	8.4	5.4	4.2	2.9	2.0	1.1	0.7	0.4	0.3
2%	10.8	6.9	5.4	3.6	2.5	1.3	0.9	0.5	0.3
1%	13.0	8.3	6.4	4.3	2.9	1.5	1.0	0.6	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.2	2.7	2.2	1.5	1.0	0.5	0.4	0.2	0.1
5%	5.2	3.4	2.7	1.8	1.2	0.7	0.4	0.3	0.2
2%	6.8	4.3	3.4	2.3	1.5	0.8	0.5	0.3	0.2
1%	8.1	5.2	4.0	2.7	1.8	0.9	0.6	0.4	0.2

Sump inlet capacity to be sized to allow for 8.1l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd6 Soak1 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	454.5	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.80		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	1.7	1.5	1.3	0.1	0.0	0.0	0.0	0.0	0.0
5%	2.3	2.3	2.2	1.2	0.0	0.0	0.0	0.0	0.0
2%	3.2	3.5	3.5	3.0	0.6	0.0	0.0	0.0	0.0
1%	4.0	4.4	4.6	4.4	2.5	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.4	4.1	3.4	0.2	0.0	0.0	0.0	0.0	0.0
5%	6.0	6.0	5.7	3.2	0.0	0.0	0.0	0.0	0.0
2%	8.4	9.1	9.2	7.8	1.6	0.0	0.0	0.0	0.0
1%	10.6	11.7	12.2	11.6	6.6	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.2	3.5	3.6	3.3	1.1	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd6 Soak2 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	325.3	0.8	260.24
Berm	153.77	0.3	46.131
Footpath	87.92	0.8	70.336
Lots	2.14	0.8	1.712
Total	**569.13**		**378.42**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.2	2.1	1.6	1.1	0.8	0.4	0.3	0.2	0.1
5%	3.9	2.5	2.0	1.4	0.9	0.5	0.3	0.2	0.1
2%	5.1	3.3	2.5	1.7	1.2	0.6	0.4	0.3	0.2
1%	6.1	3.9	3.0	2.0	1.4	0.7	0.5	0.3	0.2

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.9	2.5	2.9	4.0	5.5	8.9	11.8	15.2	18.9
5%	2.4	3.0	3.6	4.9	6.6	10.7	14.0	17.9	22.2
2%	3.0	3.9	4.6	6.2	8.3	13.2	17.3	21.9	26.9
1%	3.7	4.7	5.4	7.3	9.8	15.4	19.9	25.1	30.6

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.0	4.6	3.6	2.5	1.7	0.9	0.6	0.4	0.2
5%	8.7	5.6	4.4	3.0	2.0	1.1	0.7	0.5	0.3
2%	11.3	7.2	5.6	3.8	2.6	1.4	0.9	0.6	0.3
1%	13.6	8.6	6.7	4.5	3.0	1.6	1.0	0.6	0.4

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.2	5.5	6.5	8.9	12.1	19.7	26.1	33.6	42.0
5%	5.2	6.7	8.0	10.8	14.7	23.6	31.1	39.7	49.3
2%	6.8	8.7	10.2	13.7	18.5	29.3	38.3	48.5	59.6
1%	8.1	10.3	12.1	16.1	21.7	34.1	44.2	55.6	67.8

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2
5%	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2
2%	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3
1%	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.0	4.5	3.6	2.5	1.7	0.9	0.6	0.4	0.2
5%	8.7	5.6	4.4	3.0	2.0	1.1	0.7	0.5	0.3
2%	11.2	7.2	5.6	3.8	2.6	1.4	0.9	0.6	0.3
1%	13.6	8.6	6.7	4.5	3.0	1.6	1.0	0.6	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.8	2.5	2.0	1.3	0.9	0.5	0.3	0.2	0.1
5%	4.7	3.1	2.4	1.6	1.1	0.6	0.4	0.3	0.2
2%	6.2	4.0	3.1	2.1	1.4	0.7	0.5	0.3	0.2
1%	7.4	4.7	3.7	2.4	1.6	0.9	0.6	0.4	0.2

Sump inlet capacity to be sized to allow for 7.4l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd6 Soak2 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	569.13	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.66		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	1.4	1.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0
5%	2.0	1.9	1.7	0.6	0.0	0.0	0.0	0.0	0.0
2%	2.8	3.0	2.9	2.2	0.0	0.0	0.0	0.0	0.0
1%	3.6	3.9	4.0	3.5	1.3	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.7	3.2	2.4	0.0	0.0	0.0	0.0	0.0	0.0
5%	5.2	5.1	4.5	1.6	0.0	0.0	0.0	0.0	0.0
2%	7.4	7.8	7.7	5.8	0.0	0.0	0.0	0.0	0.0
1%	9.4	10.2	10.4	9.3	3.5	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.3	3.7	3.8	3.6	1.6	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd6 Soak2 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	519.36	0.8	415.49
Berm	256.36	0.3	76.908
Footpath	167.71	0.8	134.17
Lots	1722.52	0.8	1378
Total	**2665.95**		**2004.6**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.9	9.6	7.6	5.2	3.6	1.9	1.3	0.8	0.5
5%	18.4	11.9	9.3	6.3	4.3	2.3	1.5	1.0	0.6
2%	23.8	15.3	11.9	8.0	5.4	2.9	1.9	1.2	0.7
1%	28.7	18.2	14.2	9.4	6.4	3.3	2.2	1.4	0.8

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.9	11.6	13.7	18.7	25.6	41.6	55.2	71.1	88.8
5%	11.1	14.2	16.8	22.8	31.1	49.9	65.8	83.9	104.1
2%	14.3	18.3	21.5	28.9	39.1	62.0	80.9	102.6	126.0
1%	17.2	21.8	25.5	34.0	45.8	72.0	93.4	117.6	143.3

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	37.3	24.2	19.1	13.0	8.9	4.8	3.2	2.1	1.3
5%	46.2	29.8	23.4	15.9	10.8	5.8	3.8	2.4	1.5
2%	59.6	38.2	29.9	20.1	13.6	7.2	4.7	3.0	1.8
1%	71.9	45.5	35.5	23.7	15.9	8.4	5.4	3.4	2.1

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	22.4	29.0	34.4	46.9	64.2	104.2	138.4	178.1	222.4
5%	27.7	35.7	42.1	57.2	77.8	125.2	164.9	210.4	261.0
2%	35.8	45.9	53.9	72.4	97.9	155.3	202.7	257.1	315.9
1%	43.1	54.6	63.9	85.3	114.8	180.6	234.0	294.7	359.2

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	25.6	16.6	13.1	9.0	6.1	3.3	2.2	1.4	0.9
5%	31.8	20.5	5.5	5.5	7.4	4.0	2.6	1.7	1.0
2%	5.5	5.5	5.5	5.5	5.5	4.9	3.2	2.0	1.3
1%	5.5	5.5	5.5	5.5	5.5	5.7	3.7	2.3	1.4

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	15.4	20.0	23.7	32.3	44.1	71.7	95.2	122.5	152.9
5%	19.1	24.5	28.5	38.4	53.5	86.1	113.4	144.6	179.4
2%	22.0	25.3	28.5	38.4	58.1	106.7	139.3	176.7	217.1
1%	22.0	25.3	28.5	38.4	58.1	124.1	160.9	202.6	246.9

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.7	7.6	6.0	4.1	2.8	1.5	1.0	0.6	0.4
5%	14.4	9.3	17.9	10.4	3.4	1.8	1.2	0.8	0.5
2%	54.2	32.8	24.5	14.6	8.1	2.2	1.5	0.9	0.6
1%	66.4	40.1	30.0	18.2	10.5	2.6	1.7	1.1	0.6

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	8.6	4.1	0.0	0.0	0.0	0.0	0.0
2%	30.4	17.5	12.5	6.6	2.7	0.0	0.0	0.0	0.0
1%	37.7	21.9	15.9	8.8	4.1	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 37.7l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd6 Soak2 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2665.95	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.75		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	5.5	m	A/W
Actual Volume		20.63	m3	
Actual Area		8.25	m2	
Storage Volume		7.84	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.6	4.8	5.7	4.6	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.4	2.8	4.1	8.3	16.5	49.5	99.0	198.0	396.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	6.8	12.7	15.1	12.1	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.6	6.3	6.6	6.4	3.6	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd6 Soak3 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	587.56	0.8	470.05
Berm	293.76	0.3	88.128
Footpath	191.11	0.8	152.89
Lots	1975.31	0.8	1580.2
Total	**3047.74**		**2291.3**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.0	11.0	8.7	5.9	4.1	2.2	1.5	0.9	0.6
5%	21.1	13.6	10.7	7.2	4.9	2.6	1.7	1.1	0.7
2%	27.2	17.4	13.6	9.2	6.2	3.3	2.1	1.4	0.8
1%	32.8	20.8	16.2	10.8	7.3	3.8	2.5	1.6	0.9

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.2	13.2	15.7	21.4	29.3	47.5	63.1	81.3	101.5
5%	12.6	16.3	19.2	26.1	35.5	57.1	75.2	96.0	119.0
2%	16.3	20.9	24.6	33.0	44.7	70.8	92.5	117.3	144.1
1%	19.7	24.9	29.1	38.9	52.3	82.4	106.7	134.4	163.8

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	42.6	27.6	21.8	14.9	10.2	5.5	3.7	2.4	1.5
5%	52.8	34.0	26.8	18.2	12.4	6.6	4.4	2.8	1.7
2%	68.2	43.7	34.2	23.0	15.5	8.2	5.4	3.4	2.1
1%	82.2	52.0	40.6	27.1	18.2	9.6	6.2	3.9	2.4

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	25.6	33.2	39.3	53.7	73.4	119.2	158.2	203.6	254.3
5%	31.7	40.8	48.2	65.4	89.0	143.1	188.5	240.5	298.3
2%	40.9	52.4	61.6	82.8	111.9	177.5	231.7	293.9	361.0
1%	49.3	62.4	73.0	97.5	131.2	206.4	267.5	336.8	410.6

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	29.4	19.1	15.1	10.3	7.0	3.8	2.5	1.6	1.0
5%	36.4	23.5	6.3	6.3	8.5	4.6	3.0	1.9	1.2
2%	6.3	6.3	6.3	6.3	6.3	5.7	3.7	2.3	1.4
1%	6.3	6.3	6.3	6.3	6.3	6.6	4.3	2.7	1.6

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.6	22.9	27.1	37.0	50.6	82.2	109.1	140.4	175.4
5%	21.9	28.2	32.7	44.0	61.4	98.7	130.0	165.9	205.7
2%	25.2	29.0	32.7	44.0	66.6	122.4	159.8	202.7	249.0
1%	25.2	29.0	32.7	44.0	66.6	142.3	184.5	232.3	283.2

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	13.2	8.6	6.8	4.6	3.2	1.7	1.1	0.7	0.5
5%	16.4	10.6	20.5	11.9	3.8	2.1	1.4	0.9	0.5
2%	61.9	37.4	27.9	16.7	9.3	2.6	1.7	1.1	0.6
1%	75.9	45.8	34.3	20.8	11.9	3.0	1.9	1.2	0.7

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	9.8	4.6	0.0	0.0	0.0	0.0	0.0
2%	34.7	20.0	14.3	7.5	3.1	0.0	0.0	0.0	0.0
1%	43.1	25.0	18.1	10.0	4.7	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 43.1l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd6 Soak3 - A

Calculations By	Linda Bos	Date	46128		
Reviewed By	Chris Sexton	Date	46129		

Catchment Area	A	3047.74	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.75		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	6.0	m	A/W
Actual Volume		22.50	m3	
Actual Area		9.00	m2	
Storage Volume		8.55	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.9	5.6	6.7	5.5	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.5	3.0	4.5	9.0	18.0	54.0	108.0	216.0	432.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	7.7	14.6	17.5	14.6	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.4	7.3	7.7	7.7	4.8	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd6 Soak4 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	445.86	0.8	356.69
Berm	206.57	0.3	61.971
Footpath	134.58	0.8	107.66
Lots	1140.98	0.8	912.78
Total	**1927.99**		**1439.1**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.8	7.0	5.5	3.8	2.6	1.4	0.9	0.6	0.4
5%	13.3	8.6	6.8	4.6	3.1	1.7	1.1	0.7	0.4
2%	17.2	11.0	8.6	5.8	3.9	2.1	1.4	0.9	0.5
1%	20.7	13.1	10.2	6.8	4.6	2.4	1.6	1.0	0.6

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.5	8.4	9.9	13.5	18.5	30.1	39.9	51.4	64.2
5%	8.0	10.3	12.2	16.5	22.5	36.1	47.6	60.7	75.3
2%	10.3	13.2	15.5	20.9	28.2	44.8	58.5	74.2	91.1
1%	12.4	15.8	18.4	24.6	33.1	52.1	67.5	85.0	103.6

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	26.8	17.4	13.7	9.4	6.4	3.5	2.3	1.5	0.9
5%	33.2	21.4	16.8	11.4	7.8	4.2	2.7	1.7	1.1
2%	42.8	27.4	21.5	14.4	9.8	5.2	3.4	2.1	1.3
1%	51.6	32.7	25.5	17.0	11.4	6.0	3.9	2.4	1.5

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	16.1	20.8	24.7	33.7	46.1	74.8	99.4	127.9	159.7
5%	19.9	25.6	30.2	41.0	55.9	89.9	118.4	151.1	187.3
2%	25.7	32.9	38.7	52.0	70.3	111.5	145.5	184.6	226.8
1%	31.0	39.2	45.9	61.2	82.4	129.6	168.0	211.5	257.9

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.0	11.0	8.7	5.9	4.1	2.2	1.5	0.9	0.6
5%	21.0	13.6	3.6	3.6	4.9	2.6	1.7	1.1	0.7
2%	3.6	3.6	3.6	3.6	3.6	3.3	2.1	1.4	0.8
1%	3.6	3.6	3.6	3.6	3.6	3.8	2.5	1.6	0.9

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.2	13.2	15.7	21.4	29.2	47.5	63.0	81.1	101.3
5%	12.6	16.3	18.9	25.4	35.4	57.0	75.1	95.8	118.8
2%	14.6	16.7	18.9	25.4	38.5	70.7	92.3	117.1	143.8
1%	14.6	16.7	18.9	25.4	38.5	82.2	106.6	134.2	163.6

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.8	6.4	5.0	3.4	2.3	1.3	0.8	0.5	0.3
5%	12.1	7.8	13.2	7.8	2.8	1.5	1.0	0.6	0.4
2%	39.2	23.8	17.9	10.8	6.1	1.9	1.2	0.8	0.5
1%	48.0	29.1	21.9	13.4	7.8	2.2	1.4	0.9	0.5

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	6.4	3.2	0.0	0.0	0.0	0.0	0.0
2%	22.0	12.8	9.2	5.0	2.2	0.0	0.0	0.0	0.0
1%	27.2	15.9	11.6	6.5	3.2	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 27.2l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd6 Soak4 - A

Calculations By	Linda Bos		Date	46128	
Reviewed By	Chris Sexton		Date	46129	
Catchment Area	A	1927.99	m2		
Pre-development Runoff Coeff	C	0.3			
Developed Runoff Coefficient	C	0.75			
Critical Duration	Dt	10min			
Infiltration	fa	3.0	m/hr		
Infiltration Safety Factor	SF	0.33333			
Infiltration Rate*SF	f	1.00	m/hr	SF*fa	
% Volume available for storage	V%	0.38	%		
Actual Depth	D	2.5	m		
Width	W	1.5	m		
Length	L	4.5	m	A/W	
Actual Volume		16.88	m3		
Actual Area		6.75	m2		
Storage Volume		6.41	m3		

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.7	0.8	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.8	4.5	5.2	4.4	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.1	2.3	3.4	6.8	13.5	40.5	81.0	162.0	324.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	1.9	2.2	0.0	0.0	0.0	0.0	0.0	0.0
1%	7.5	11.8	13.6	11.7	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.7	5.4	5.7	5.6	3.4	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd6 Soak5 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0.01	0.3	0.003
Road	518.78	0.8	415.02
Berm	284.17	0.3	85.251
Footpath	196.55	0.8	157.24
Lots	2485.11	0.8	1988.1
Total	**3484.62**		**2645.6**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	19.4	12.6	10.0	6.8	4.6	2.5	1.7	1.1	0.7
5%	24.1	15.5	12.2	8.3	5.6	3.0	2.0	1.3	0.8
2%	31.1	19.9	15.6	10.5	7.1	3.7	2.4	1.6	1.0
1%	37.5	23.7	18.5	12.4	8.3	4.4	2.8	1.8	1.1

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.7	15.1	17.9	24.5	33.5	54.4	72.2	92.9	116.0
5%	14.5	18.6	22.0	29.8	40.6	65.3	86.0	109.7	136.1
2%	18.7	23.9	28.1	37.8	51.1	81.0	105.7	134.1	164.7
1%	22.5	28.5	33.3	44.5	59.8	94.2	122.0	153.7	187.3

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	49.2	31.9	25.2	17.2	11.8	6.4	4.2	2.7	1.7
5%	61.0	39.3	30.9	21.0	14.3	7.6	5.0	3.2	2.0
2%	78.7	50.5	39.5	26.6	17.9	9.5	6.2	3.9	2.4
1%	94.9	60.1	46.8	31.3	21.0	11.0	7.1	4.5	2.7

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	29.5	38.3	45.4	62.0	84.7	137.6	182.7	235.1	293.6
5%	36.6	47.1	55.6	75.5	102.7	165.2	217.6	277.7	344.4
2%	47.2	60.5	71.1	95.6	129.2	204.9	267.5	339.3	416.9
1%	56.9	72.1	84.3	112.5	151.4	238.3	308.8	388.9	474.0

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	37.0	24.0	19.0	12.9	8.8	4.8	3.2	2.0	1.3
5%	45.8	29.5	7.9	7.9	10.7	5.7	3.8	2.4	1.5
2%	7.9	7.9	7.9	7.9	7.9	7.1	4.7	3.0	1.8
1%	7.9	7.9	7.9	7.9	7.9	8.3	5.4	3.4	2.1

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	22.2	28.8	34.1	46.6	63.7	103.4	137.3	176.7	220.6
5%	27.5	35.4	41.2	55.4	77.2	124.2	163.6	208.7	258.8
2%	31.7	36.4	41.2	55.4	83.8	154.0	201.0	255.0	313.3
1%	31.7	36.4	41.2	55.4	83.8	179.1	232.1	292.2	356.2

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	12.2	7.9	6.3	4.3	2.9	1.6	1.1	0.7	0.4
5%	15.2	9.8	23.0	13.1	3.5	1.9	1.3	0.8	0.5
2%	70.8	42.6	31.6	18.7	10.1	2.4	1.5	1.0	0.6
1%	87.0	52.2	39.0	23.4	13.1	2.7	1.8	1.1	0.7

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	10.8	4.8	0.0	0.0	0.0	0.0	0.0
2%	39.7	22.6	16.0	8.2	3.0	0.0	0.0	0.0	0.0
1%	49.5	28.5	20.4	11.0	4.8	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 49.5l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd6 Soak5 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	3484.62	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	5.5	m	A/W
Actual Volume		20.63	m3	
Actual Area		8.25	m2	
Storage Volume		7.84	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.3	4.4	5.7	4.4	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.4	2.8	4.1	8.3	16.5	49.5	99.0	198.0	396.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	3.5	11.6	15.0	11.7	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.0	6.8	7.2	7.1	4.6	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd6 Soak5 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	500	0.8	400
Berm	270.19	0.3	81.057
Footpath	251.17	0.8	200.94
Lots	393.56	0.8	314.85
Total	**1414.92**		**996.84**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.9	5.1	4.0	2.8	1.9	1.0	0.7	0.4	0.3
5%	9.8	6.3	5.0	3.4	2.3	1.2	0.8	0.5	0.3
2%	12.6	8.1	6.3	4.3	2.9	1.5	1.0	0.6	0.4
1%	15.2	9.6	7.5	5.0	3.4	1.8	1.1	0.7	0.4

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.7	6.1	7.3	9.9	13.6	22.1	29.3	37.7	47.1
5%	5.9	7.6	8.9	12.1	16.5	26.5	34.9	44.6	55.3
2%	7.6	9.7	11.4	15.3	20.7	32.9	42.9	54.4	66.9
1%	9.1	11.6	13.5	18.1	24.3	38.2	49.6	62.4	76.1

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	18.5	12.0	9.5	6.5	4.4	2.4	1.6	1.0	0.6
5%	23.0	14.8	11.6	7.9	5.4	2.9	1.9	1.2	0.8
2%	29.7	19.0	14.9	10.0	6.8	3.6	2.3	1.5	0.9
1%	35.7	22.6	17.7	11.8	7.9	4.2	2.7	1.7	1.0

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.1	14.4	17.1	23.3	31.9	51.8	68.8	88.6	110.6
5%	13.8	17.8	21.0	28.4	38.7	62.3	82.0	104.6	129.8
2%	17.8	22.8	26.8	36.0	48.7	77.2	100.8	127.9	157.1
1%	21.4	27.2	31.8	42.4	57.1	89.8	116.4	146.5	178.6

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.9	3.8	3.0	2.0	1.4	0.8	0.5	0.3	0.2
5%	7.3	4.7	1.2	1.2	1.7	0.9	0.6	0.4	0.2
2%	1.2	1.2	1.2	1.2	1.2	1.1	0.7	0.5	0.3
1%	1.2	1.2	1.2	1.2	1.2	1.3	0.9	0.5	0.3

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.5	4.6	5.4	7.4	10.1	16.4	21.7	28.0	34.9
5%	4.4	5.6	6.5	8.8	12.2	19.7	25.9	33.0	41.0
2%	5.0	5.8	6.5	8.8	13.3	24.4	31.8	40.4	49.6
1%	5.0	5.8	6.5	8.8	13.3	28.4	36.8	46.3	56.4

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	12.7	8.2	6.5	4.4	3.0	1.6	1.1	0.7	0.4
5%	15.7	10.1	10.4	6.6	3.7	2.0	1.3	0.8	0.5
2%	28.4	17.8	13.6	8.8	5.5	2.4	1.6	1.0	0.6
1%	34.5	21.4	16.4	10.5	6.7	2.8	1.8	1.2	0.7

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s)
(Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.8	3.1	2.5	1.7	1.1	0.6	0.4	0.3	0.2
5%	5.9	3.8	5.4	3.3	1.4	0.7	0.5	0.3	0.2
2%	15.8	9.7	7.3	4.5	2.6	0.9	0.6	0.4	0.2
1%	19.3	11.8	8.9	5.5	3.3	1.1	0.7	0.4	0.3

Sump inlet capacity to be sized to allow for 19.3l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd6 Soak5 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1414.92	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.70		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	5.5	m	A/W
Actual Volume		20.63	m3	
Actual Area		8.25	m2	
Storage Volume		7.84	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.4	2.8	4.1	8.3	16.5	49.5	99.0	198.0	396.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	1.5	1.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
5%	2.2	1.8	1.4	0.0	0.0	0.0	0.0	0.0	0.0
2%	3.8	4.6	4.7	3.7	0.0	0.0	0.0	0.0	0.0
1%	5.9	7.1	7.6	7.3	3.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.9	2.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0
5%	5.8	4.8	3.6	0.0	0.0	0.0	0.0	0.0	0.0
2%	10.0	12.0	12.5	9.6	0.0	0.0	0.0	0.0	0.0
1%	15.6	18.6	20.0	19.3	7.9	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.2	7.1	7.6	7.7	5.3	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd7 Soak1 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	270.5	0.8	216.4
Berm	103.35	0.3	31.005
Footpath	85.67	0.8	68.536
Lots	510.59	0.8	408.47
Total	**970.11**		**724.41**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.4	3.5	2.8	1.9	1.3	0.7	0.5	0.3	0.2
5%	6.7	4.3	3.4	2.3	1.6	0.8	0.6	0.4	0.2
2%	8.7	5.6	4.3	2.9	2.0	1.0	0.7	0.4	0.3
1%	10.4	6.6	5.2	3.4	2.3	1.2	0.8	0.5	0.3

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.2	4.2	5.0	6.8	9.3	15.1	20.1	25.9	32.3
5%	4.0	5.2	6.1	8.3	11.3	18.2	23.9	30.5	37.9
2%	5.2	6.7	7.8	10.5	14.2	22.5	29.4	37.3	45.9
1%	6.3	7.9	9.3	12.4	16.7	26.2	34.0	42.8	52.1

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	13.5	8.7	6.9	4.7	3.2	1.7	1.2	0.7	0.5
5%	16.7	10.8	8.5	5.7	3.9	2.1	1.4	0.9	0.5
2%	21.5	13.8	10.8	7.3	4.9	2.6	1.7	1.1	0.7
1%	26.0	16.5	12.8	8.6	5.8	3.0	2.0	1.2	0.8

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.1	10.5	12.4	17.0	23.2	37.7	50.0	64.4	80.4
5%	10.0	12.9	15.2	20.7	28.1	45.2	59.6	76.0	94.3
2%	12.9	16.6	19.5	26.2	35.4	56.1	73.3	92.9	114.1
1%	15.6	19.7	23.1	30.8	41.5	65.2	84.6	106.5	129.8

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.6	4.9	3.9	2.7	1.8	1.0	0.7	0.4	0.3
5%	9.4	6.1	1.6	1.6	2.2	1.2	0.8	0.5	0.3
2%	1.6	1.6	1.6	1.6	1.6	1.5	1.0	0.6	0.4
1%	1.6	1.6	1.6	1.6	1.6	1.7	1.1	0.7	0.4

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.6	5.9	7.0	9.6	13.1	21.2	28.2	36.3	45.3
5%	5.6	7.3	8.5	11.4	15.9	25.5	33.6	42.9	53.2
2%	6.5	7.5	8.5	11.4	17.2	31.6	41.3	52.4	64.4
1%	6.5	7.5	8.5	11.4	17.2	36.8	47.7	60.0	73.2

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.9	3.8	3.0	2.1	1.4	0.8	0.5	0.3	0.2
5%	7.3	4.7	6.8	4.1	1.7	0.9	0.6	0.4	0.2
2%	19.9	12.2	9.2	5.6	3.3	1.1	0.7	0.5	0.3
1%	24.4	14.8	11.2	6.9	4.1	1.3	0.9	0.5	0.3

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s)
(Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.5	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0
5%	0.6	0.4	3.4	1.8	0.1	0.1	0.0	0.0	0.0
2%	11.3	6.6	4.8	2.7	1.3	0.1	0.1	0.0	0.0
1%	13.9	8.2	6.1	3.5	1.8	0.1	0.1	0.0	0.0

Sump inlet capacity to be sized to allow for 13.9l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd7 Soak1 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	970.11	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.75		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.0	m	A/W
Actual Volume		11.25	m3	
Actual Area		4.50	m2	
Storage Volume		4.28	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.5	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.1	2.8	3.1	2.6	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.8	1.5	2.3	4.5	9.0	27.0	54.0	108.0	216.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	1.2	2.4	2.5	0.0	0.0	0.0	0.0	0.0	0.0
1%	5.4	7.4	8.2	6.7	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.8	3.1	3.2	2.9	1.1	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd7 Soak1 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	252.62	0.8	202.1
Berm	118.89	0.3	35.667
Footpath	63.6	0.8	50.88
Lots	793.26	0.8	634.61
Total	**1228.37**		**923.25**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.9	4.4	3.5	2.4	1.6	0.9	0.6	0.4	0.2
5%	8.5	5.5	4.3	2.9	2.0	1.1	0.7	0.4	0.3
2%	11.0	7.0	5.5	3.7	2.5	1.3	0.9	0.5	0.3
1%	13.2	8.4	6.5	4.4	2.9	1.5	1.0	0.6	0.4

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.1	5.3	6.3	8.6	11.8	19.2	25.4	32.7	40.9
5%	5.1	6.6	7.7	10.5	14.3	23.0	30.3	38.7	48.0
2%	6.6	8.4	9.9	13.3	18.0	28.5	37.3	47.3	58.1
1%	7.9	10.0	11.7	15.7	21.1	33.2	43.0	54.2	66.0

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.2	11.1	8.8	6.0	4.1	2.2	1.5	0.9	0.6
5%	21.3	13.7	10.8	7.3	5.0	2.7	1.8	1.1	0.7
2%	27.5	17.6	13.8	9.3	6.3	3.3	2.2	1.4	0.8
1%	33.1	21.0	16.3	10.9	7.3	3.8	2.5	1.6	1.0

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.3	13.4	15.8	21.6	29.6	48.0	63.8	82.1	102.5
5%	12.8	16.4	19.4	26.3	35.9	57.7	76.0	96.9	120.2
2%	16.5	21.1	24.8	33.4	45.1	71.5	93.4	118.4	145.5
1%	19.9	25.2	29.4	39.3	52.9	83.2	107.8	135.7	165.4

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.8	7.7	6.1	4.1	2.8	1.5	1.0	0.7	0.4
5%	14.6	9.4	2.5	2.5	3.4	1.8	1.2	0.8	0.5
2%	2.5	2.5	2.5	2.5	2.5	2.3	1.5	0.9	0.6
1%	2.5	2.5	2.5	2.5	2.5	2.6	1.7	1.1	0.7

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.1	9.2	10.9	14.9	20.3	33.0	43.8	56.4	70.4
5%	8.8	11.3	13.1	17.7	24.6	39.6	52.2	66.6	82.6
2%	10.1	11.6	13.1	17.7	26.7	49.2	64.2	81.4	100.0
1%	10.1	11.6	13.1	17.7	26.7	57.2	74.1	93.3	113.7

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.4	3.5	2.8	1.9	1.3	0.7	0.5	0.3	0.2
5%	6.7	4.3	8.3	4.8	1.6	0.8	0.5	0.4	0.2
2%	24.9	15.1	11.3	6.7	3.7	1.0	0.7	0.4	0.3
1%	30.6	18.5	13.8	8.4	4.8	1.2	0.8	0.5	0.3

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	4.0	1.9	0.0	0.0	0.0	0.0	0.0
2%	14.0	8.1	5.8	3.0	1.2	0.0	0.0	0.0	0.0
1%	17.4	10.1	7.3	4.0	1.9	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 17.4l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd7 Soak1 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1228.37	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.75		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	2.5	m	A/W
Actual Volume		9.38	m3	
Actual Area		3.75	m2	
Storage Volume		3.56	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.2	2.2	2.7	2.2	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.6	1.3	1.9	3.8	7.5	22.5	45.0	90.0	180.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	3.1	5.9	7.0	5.7	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.6	2.9	3.1	3.0	1.7	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd7 Soak2 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	232.18	0.8	185.74
Berm	100.01	0.3	30.003
Footpath	120.55	0.8	96.44
Lots	790.98	0.8	632.78
Total	**1243.72**		**944.97**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.9	4.5	3.6	2.4	1.7	0.9	0.6	0.4	0.2
5%	8.6	5.5	4.4	3.0	2.0	1.1	0.7	0.5	0.3
2%	11.1	7.1	5.6	3.7	2.5	1.3	0.9	0.6	0.3
1%	13.4	8.5	6.6	4.4	3.0	1.6	1.0	0.6	0.4

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.2	5.4	6.4	8.7	11.9	19.4	25.8	33.2	41.4
5%	5.2	6.6	7.8	10.6	14.5	23.3	30.7	39.2	48.6
2%	6.7	8.5	10.0	13.5	18.2	28.9	37.7	47.9	58.8
1%	8.0	10.2	11.9	15.9	21.4	33.6	43.6	54.8	66.9

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.6	11.4	9.0	6.1	4.2	2.3	1.5	1.0	0.6
5%	21.8	14.0	11.0	7.5	5.1	2.7	1.8	1.1	0.7
2%	28.1	18.0	14.1	9.5	6.4	3.4	2.2	1.4	0.9
1%	33.9	21.5	16.7	11.2	7.5	3.9	2.6	1.6	1.0

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.5	13.7	16.2	22.1	30.3	49.1	65.3	84.0	104.9
5%	13.1	16.8	19.9	27.0	36.7	59.0	77.7	99.2	123.0
2%	16.9	21.6	25.4	34.1	46.2	73.2	95.6	121.2	148.9
1%	20.3	25.8	30.1	40.2	54.1	85.1	110.3	138.9	169.3

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.8	7.6	6.0	4.1	2.8	1.5	1.0	0.7	0.4
5%	14.6	9.4	2.5	2.5	3.4	1.8	1.2	0.8	0.5
2%	2.5	2.5	2.5	2.5	2.5	2.3	1.5	0.9	0.6
1%	2.5	2.5	2.5	2.5	2.5	2.6	1.7	1.1	0.7

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.1	9.2	10.9	14.8	20.3	32.9	43.7	56.2	70.2
5%	8.7	11.3	13.1	17.6	24.6	39.5	52.1	66.4	82.4
2%	10.1	11.6	13.1	17.6	26.7	49.0	64.0	81.2	99.7
1%	10.1	11.6	13.1	17.6	26.7	57.0	73.9	93.0	113.4

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.8	3.8	3.0	2.0	1.4	0.8	0.5	0.3	0.2
5%	7.2	4.6	8.5	5.0	1.7	0.9	0.6	0.4	0.2
2%	25.6	15.5	11.6	7.0	3.9	1.1	0.7	0.5	0.3
1%	31.4	19.0	14.2	8.7	5.0	1.3	0.8	0.5	0.3

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	4.2	2.0	0.0	0.0	0.0	0.0	0.0
2%	14.5	8.4	6.0	3.2	1.4	0.0	0.0	0.0	0.0
1%	18.0	10.5	7.6	4.2	2.0	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 18l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd7 Soak2 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1243.72	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	2.5	m	A/W
Actual Volume		9.38	m3	
Actual Area		3.75	m2	
Storage Volume		3.56	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.6	2.7	3.2	2.9	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.6	1.3	1.9	3.8	7.5	22.5	45.0	90.0	180.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.6	1.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	4.2	7.2	8.5	7.8	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.9	3.3	3.5	3.6	2.5	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd7 Soak2 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	310.27	0.8	248.22
Berm	152.67	0.3	45.801
Footpath	92.29	0.8	73.832
Lots	754.51	0.8	603.61
Total	**1309.74**		**971.46**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.3	4.7	3.7	2.6	1.7	0.9	0.6	0.4	0.3
5%	9.1	5.8	4.6	3.1	2.1	1.1	0.7	0.5	0.3
2%	11.7	7.5	5.9	3.9	2.7	1.4	0.9	0.6	0.4
1%	14.1	8.9	7.0	4.6	3.1	1.6	1.1	0.7	0.4

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.4	5.7	6.7	9.2	12.6	20.4	27.1	34.9	43.6
5%	5.4	7.0	8.3	11.2	15.3	24.5	32.3	41.2	51.2
2%	7.0	9.0	10.6	14.2	19.2	30.4	39.7	50.4	61.9
1%	8.5	10.7	12.5	16.7	22.5	35.4	45.9	57.8	70.4

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	18.1	11.7	9.3	6.3	4.3	2.3	1.6	1.0	0.6
5%	22.4	14.4	11.3	7.7	5.2	2.8	1.8	1.2	0.7
2%	28.9	18.5	14.5	9.7	6.6	3.5	2.3	1.4	0.9
1%	34.8	22.1	17.2	11.5	7.7	4.1	2.6	1.7	1.0

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.8	14.1	16.7	22.8	31.1	50.5	67.1	86.3	107.8
5%	13.4	17.3	20.4	27.7	37.7	60.7	79.9	102.0	126.5
2%	17.3	22.2	26.1	35.1	47.4	75.3	98.2	124.6	153.1
1%	20.9	26.5	31.0	41.3	55.6	87.5	113.4	142.8	174.1

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.2	7.3	5.8	3.9	2.7	1.5	1.0	0.6	0.4
5%	13.9	9.0	2.4	2.4	3.3	1.7	1.1	0.7	0.5
2%	2.4	2.4	2.4	2.4	2.4	2.2	1.4	0.9	0.6
1%	2.4	2.4	2.4	2.4	2.4	2.5	1.6	1.0	0.6

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.7	8.7	10.4	14.1	19.3	31.4	41.7	53.6	67.0
5%	8.3	10.8	12.5	16.8	23.4	37.7	49.7	63.4	78.6
2%	9.6	11.1	12.5	16.8	25.4	46.8	61.0	77.4	95.1
1%	9.6	11.1	12.5	16.8	25.4	54.4	70.5	88.7	108.2

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.8	4.4	3.5	2.4	1.6	0.9	0.6	0.4	0.2
5%	8.5	5.5	8.9	5.3	2.0	1.1	0.7	0.4	0.3
2%	26.5	16.1	12.1	7.4	4.2	1.3	0.9	0.5	0.3
1%	32.4	19.7	14.8	9.1	5.3	1.5	1.0	0.6	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	4.4	2.2	0.0	0.0	0.0	0.0	0.0
2%	14.8	8.6	6.2	3.4	1.5	0.0	0.0	0.0	0.0
1%	18.4	10.7	7.8	4.4	2.2	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 18.4l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd7 Soak2 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1309.74	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.74		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.0	m	A/W
Actual Volume		11.25	m3	
Actual Area		4.50	m2	
Storage Volume		4.28	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.8	1.5	2.3	4.5	9.0	27.0	54.0	108.0	216.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.7	0.8	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.1	3.2	3.7	3.3	0.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	1.8	2.1	0.0	0.0	0.0	0.0	0.0	0.0
1%	5.4	8.4	9.7	8.7	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.4	3.8	4.1	4.1	2.8	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd7 Soak3 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	234.78	0.8	187.82
Berm	100.62	0.3	30.186
Footpath	117.64	0.8	94.112
Lots	795.48	0.8	636.38
Total	**1248.52**		**948.51**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.0	4.5	3.6	2.4	1.7	0.9	0.6	0.4	0.2
5%	8.6	5.6	4.4	3.0	2.0	1.1	0.7	0.5	0.3
2%	11.1	7.1	5.6	3.8	2.5	1.3	0.9	0.6	0.3
1%	13.4	8.5	6.6	4.4	3.0	1.6	1.0	0.6	0.4

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.2	5.4	6.4	8.8	12.0	19.5	25.9	33.3	41.6
5%	5.2	6.7	7.9	10.7	14.5	23.4	30.8	39.3	48.8
2%	6.7	8.6	10.1	13.5	18.3	29.0	37.9	48.0	59.0
1%	8.1	10.2	11.9	15.9	21.4	33.7	43.7	55.1	67.1

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.6	11.4	9.0	6.2	4.2	2.3	1.5	1.0	0.6
5%	21.9	14.1	11.1	7.5	5.1	2.7	1.8	1.2	0.7
2%	28.2	18.1	14.2	9.5	6.4	3.4	2.2	1.4	0.9
1%	34.0	21.5	16.8	11.2	7.5	4.0	2.6	1.6	1.0

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.6	13.7	16.3	22.2	30.4	49.3	65.5	84.3	105.3
5%	13.1	16.9	19.9	27.1	36.8	59.2	78.0	99.6	123.5
2%	16.9	21.7	25.5	34.3	46.3	73.5	95.9	121.7	149.5
1%	20.4	25.9	30.2	40.3	54.3	85.4	110.7	139.4	170.0

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.8	7.7	6.1	4.1	2.8	1.5	1.0	0.7	0.4
5%	14.7	9.4	2.5	2.5	3.4	1.8	1.2	0.8	0.5
2%	2.5	2.5	2.5	2.5	2.5	2.3	1.5	0.9	0.6
1%	2.5	2.5	2.5	2.5	2.5	2.7	1.7	1.1	0.7

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.1	9.2	10.9	14.9	20.4	33.1	43.9	56.6	70.6
5%	8.8	11.3	13.2	17.7	24.7	39.7	52.4	66.8	82.8
2%	10.2	11.7	13.2	17.7	26.8	49.3	64.4	81.6	100.3
1%	10.2	11.7	13.2	17.7	26.8	57.3	74.3	93.5	114.0

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.8	3.8	3.0	2.0	1.4	0.8	0.5	0.3	0.2
5%	7.2	4.6	8.5	5.0	1.7	0.9	0.6	0.4	0.2
2%	25.7	15.6	11.6	7.0	3.9	1.1	0.7	0.5	0.3
1%	31.5	19.0	14.3	8.7	5.0	1.3	0.8	0.5	0.3

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	4.2	2.0	0.0	0.0	0.0	0.0	0.0
2%	14.5	8.4	6.0	3.2	1.4	0.0	0.0	0.0	0.0
1%	18.1	10.5	7.6	4.3	2.0	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 18.1l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd7 Soak3 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1248.52	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	2.5	m	A/W
Actual Volume		9.38	m3	
Actual Area		3.75	m2	
Storage Volume		3.56	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.6	2.7	3.2	2.9	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.6	1.3	1.9	3.8	7.5	22.5	45.0	90.0	180.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.6	1.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	4.1	7.2	8.5	7.7	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.9	3.3	3.5	3.6	2.5	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd7 Soak3 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	257.51	0.8	206.01
Berm	133.73	0.3	40.119
Footpath	87.14	0.8	69.712
Lots	2151	0.8	1720.8
Total	**2629.38**		**2036.6**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.7	9.5	7.5	5.1	3.5	1.9	1.3	0.8	0.5
5%	18.2	11.7	9.2	6.2	4.3	2.3	1.5	1.0	0.6
2%	23.5	15.0	11.8	7.9	5.4	2.8	1.8	1.2	0.7
1%	28.3	17.9	14.0	9.3	6.3	3.3	2.1	1.3	0.8

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.8	11.4	13.5	18.5	25.3	41.0	54.5	70.1	87.5
5%	10.9	14.1	16.6	22.5	30.6	49.3	64.9	82.8	102.7
2%	14.1	18.1	21.2	28.5	38.5	61.1	79.8	101.2	124.3
1%	17.0	21.5	25.1	33.6	45.2	71.1	92.1	116.0	141.3

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	37.9	24.6	19.4	13.2	9.1	4.9	3.3	2.1	1.3
5%	46.9	30.2	23.8	16.1	11.0	5.9	3.9	2.5	1.5
2%	60.6	38.8	30.4	20.4	13.8	7.3	4.8	3.0	1.9
1%	73.0	46.3	36.1	24.1	16.2	8.5	5.5	3.5	2.1

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	22.7	29.5	35.0	47.7	65.2	105.9	140.6	181.0	226.0
5%	28.2	36.3	42.8	58.1	79.1	127.2	167.5	213.8	265.1
2%	36.3	46.6	54.7	73.6	99.5	157.8	205.9	261.2	320.9
1%	43.8	55.5	64.9	86.6	116.6	183.4	237.7	299.4	364.9

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	32.0	20.8	16.4	11.2	7.7	4.1	2.8	1.8	1.1
5%	39.7	25.5	6.8	6.8	9.3	5.0	3.3	2.1	1.3
2%	6.8	6.8	6.8	6.8	6.8	6.2	4.0	2.6	1.6
1%	6.8	6.8	6.8	6.8	6.8	7.2	4.6	2.9	1.8

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	19.2	24.9	29.5	40.3	55.1	89.5	118.8	152.9	191.0
5%	23.8	30.7	35.6	47.9	66.8	107.5	141.6	180.6	224.0
2%	27.5	31.5	35.6	47.9	72.5	133.3	174.0	220.7	271.1
1%	27.5	31.5	35.6	47.9	72.5	155.0	200.9	253.0	308.3

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.9	3.8	3.0	2.1	1.4	0.8	0.5	0.3	0.2
5%	7.3	4.7	17.0	9.3	1.7	0.9	0.6	0.4	0.2
2%	53.8	32.0	23.6	13.6	7.0	1.1	0.7	0.5	0.3
1%	66.2	39.4	29.2	17.2	9.4	1.3	0.9	0.5	0.3

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	7.7	3.1	0.0	0.0	0.0	0.0	0.0
2%	30.3	17.0	11.8	5.7	1.6	0.0	0.0	0.0	0.0
1%	37.9	21.5	15.3	7.9	3.1	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 37.9l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd7 Soak3 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2629.38	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.77		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.0	m	A/W
Actual Volume		11.25	m3	
Actual Area		4.50	m2	
Storage Volume		4.28	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	1.0	1.9	0.6	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.8	1.5	2.3	4.5	9.0	27.0	54.0	108.0	216.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	2.5	4.9	1.7	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.8	3.1	3.2	2.9	1.1	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd7 Soak3 - C

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	256.95	0.8	205.56
Berm	156.33	0.3	46.899
Footpath	120.01	0.8	96.008
Lots	705.72	0.8	564.58
Total	**1239.01**		**913.04**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.9	4.5	3.5	2.4	1.7	0.9	0.6	0.4	0.2
5%	8.6	5.5	4.3	2.9	2.0	1.1	0.7	0.5	0.3
2%	11.1	7.1	5.5	3.7	2.5	1.3	0.9	0.6	0.3
1%	13.3	8.4	6.6	4.4	3.0	1.6	1.0	0.6	0.4

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.1	5.4	6.4	8.7	11.9	19.3	25.7	33.0	41.2
5%	5.1	6.6	7.8	10.6	14.4	23.2	30.6	39.0	48.4
2%	6.6	8.5	10.0	13.4	18.2	28.8	37.6	47.7	58.6
1%	8.0	10.1	11.8	15.8	21.3	33.5	43.4	54.6	66.6

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.0	11.0	8.7	5.9	4.1	2.2	1.5	0.9	0.6
5%	21.0	13.6	10.7	7.2	4.9	2.6	1.7	1.1	0.7
2%	27.2	17.4	13.6	9.2	6.2	3.3	2.1	1.4	0.8
1%	32.7	20.7	16.2	10.8	7.3	3.8	2.5	1.6	0.9

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.2	13.2	15.7	21.4	29.2	47.5	63.1	81.1	101.3
5%	12.6	16.3	19.2	26.0	35.5	57.0	75.1	95.8	118.9
2%	16.3	20.9	24.5	33.0	44.6	70.7	92.3	117.1	143.9
1%	19.6	24.9	29.1	38.8	52.3	82.2	106.6	134.2	163.6

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.5	6.8	5.4	3.7	2.5	1.4	0.9	0.6	0.4
5%	13.0	8.4	2.2	2.2	3.0	1.6	1.1	0.7	0.4
2%	2.2	2.2	2.2	2.2	2.2	2.0	1.3	0.8	0.5
1%	2.2	2.2	2.2	2.2	2.2	2.4	1.5	1.0	0.6

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.3	8.2	9.7	13.2	18.1	29.4	39.0	50.2	62.7
5%	7.8	10.1	11.7	15.7	21.9	35.3	46.4	59.3	73.5
2%	9.0	10.4	11.7	15.7	23.8	43.7	57.1	72.4	89.0
1%	9.0	10.4	11.7	15.7	23.8	50.9	65.9	83.0	101.2

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.5	4.2	3.3	2.3	1.5	0.8	0.6	0.4	0.2
5%	8.0	5.2	8.4	5.0	1.9	1.0	0.7	0.4	0.3
2%	24.9	15.2	11.4	6.9	4.0	1.2	0.8	0.5	0.3
1%	30.5	18.5	13.9	8.5	5.0	1.5	0.9	0.6	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	4.1	2.0	0.0	0.0	0.0	0.0	0.0
2%	13.9	8.1	5.8	3.2	1.4	0.0	0.0	0.0	0.0
1%	17.2	10.1	7.3	4.2	2.1	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 17.2l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd7 Soak3 - C

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1239.01	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.74		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.0	m	A/W
Actual Volume		11.25	m3	
Actual Area		4.50	m2	
Storage Volume		4.28	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.8	1.5	2.3	4.5	9.0	27.0	54.0	108.0	216.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.9	2.9	3.3	2.8	0.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	1.4	1.6	0.0	0.0	0.0	0.0	0.0	0.0
1%	5.0	7.6	8.7	7.4	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.1	3.5	3.7	3.7	2.2	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd7 Soak4 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	181.52	0.8	145.22
Berm	60	0.3	18
Footpath	66.2	0.8	52.96
Lots	0	0.8	0
Total	**307.72**		**216.18**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.7	1.1	0.9	0.6	0.4	0.2	0.1	0.1	0.1
5%	2.1	1.4	1.1	0.7	0.5	0.3	0.2	0.1	0.1
2%	2.7	1.8	1.4	0.9	0.6	0.3	0.2	0.1	0.1
1%	3.3	2.1	1.6	1.1	0.7	0.4	0.2	0.2	0.1

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.0	1.3	1.6	2.2	3.0	4.8	6.4	8.2	10.2
5%	1.3	1.6	1.9	2.6	3.6	5.8	7.6	9.7	12.0
2%	1.6	2.1	2.5	3.3	4.5	7.2	9.3	11.8	14.5
1%	2.0	2.5	2.9	3.9	5.3	8.3	10.8	13.6	16.5

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.0	2.6	2.1	1.4	1.0	0.5	0.3	0.2	0.1
5%	5.0	3.2	2.5	1.7	1.2	0.6	0.4	0.3	0.2
2%	6.4	4.1	3.2	2.2	1.5	0.8	0.5	0.3	0.2
1%	7.8	4.9	3.8	2.6	1.7	0.9	0.6	0.4	0.2

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.4	3.1	3.7	5.1	6.9	11.2	14.9	19.2	24.0
5%	3.0	3.9	4.5	6.2	8.4	13.5	17.8	22.7	28.1
2%	3.9	4.9	5.8	7.8	10.6	16.7	21.9	27.7	34.1
1%	4.7	5.9	6.9	9.2	12.4	19.5	25.2	31.8	38.7

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.0	2.6	2.1	1.4	1.0	0.5	0.3	0.2	0.1
5%	5.0	3.2	2.5	1.7	1.2	0.6	0.4	0.3	0.2
2%	6.4	4.1	3.2	2.2	1.5	0.8	0.5	0.3	0.2
1%	7.8	4.9	3.8	2.6	1.7	0.9	0.6	0.4	0.2

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.3	1.5	1.2	0.8	0.6	0.3	0.2	0.1	0.1
5%	2.9	1.8	1.4	1.0	0.7	0.4	0.2	0.2	0.1
2%	3.7	2.4	1.8	1.2	0.8	0.4	0.3	0.2	0.1
1%	4.4	2.8	2.2	1.5	1.0	0.5	0.3	0.2	0.1

Sump inlet capacity to be sized to allow for 4.4l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd7 Soak4 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	307.72	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.70		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	**D**	2.5	**m**	
Width	**W**	1.5	**m**	
Length	**L**	2.0	**m**	A/W
Actual Volume		**7.50**	**m3**	
Actual Area		**3.00**	**m2**	
Storage Volume		**2.85**	**m3**	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.9	0.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0
5%	1.2	1.2	1.1	0.5	0.0	0.0	0.0	0.0	0.0
2%	1.7	1.8	1.8	1.5	0.0	0.0	0.0	0.0	0.0
1%	2.2	2.4	2.4	2.3	1.1	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.5	1.0	1.5	3.0	6.0	18.0	36.0	72.0	144.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.3	2.1	1.6	0.0	0.0	0.0	0.0	0.0	0.0
5%	3.2	3.2	2.9	1.4	0.0	0.0	0.0	0.0	0.0
2%	4.5	4.8	4.8	3.9	0.1	0.0	0.0	0.0	0.0
1%	5.7	6.3	6.4	6.0	2.9	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	1.9	2.1	2.2	2.1	0.9	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd7 Soak4 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	817.77	0.8	654.22
Berm	267.11	0.3	80.133
Footpath	236.09	0.8	188.87
Lots	1816.11	0.8	1452.9
Total	**3137.08**		**2376.1**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.5	11.4	9.0	6.1	4.2	2.3	1.5	1.0	0.6
5%	21.7	14.0	11.0	7.5	5.1	2.7	1.8	1.1	0.7
2%	28.0	17.9	14.0	9.4	6.4	3.4	2.2	1.4	0.9
1%	33.8	21.4	16.7	11.1	7.5	3.9	2.5	1.6	1.0

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.5	13.6	16.2	22.0	30.1	48.9	65.0	83.6	104.4
5%	13.0	16.8	19.8	26.8	36.5	58.8	77.4	98.8	122.5
2%	16.8	21.5	25.3	34.0	46.0	72.9	95.2	120.7	148.3
1%	20.3	25.7	30.0	40.0	53.9	84.8	109.9	138.3	168.6

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	44.2	28.7	22.7	15.5	10.6	5.7	3.8	2.4	1.5
5%	54.8	35.3	27.7	18.8	12.8	6.9	4.5	2.9	1.8
2%	70.7	45.3	35.5	23.8	16.1	8.5	5.6	3.5	2.2
1%	85.2	54.0	42.1	28.1	18.9	9.9	6.4	4.0	2.5

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	26.5	34.4	40.8	55.6	76.1	123.6	164.1	211.2	263.7
5%	32.9	42.3	49.9	67.8	92.3	148.4	195.5	249.4	309.3
2%	42.4	54.4	63.8	85.8	116.0	184.1	240.3	304.8	374.4
1%	51.1	64.8	75.7	101.1	136.0	214.0	277.4	349.3	425.8

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	27.0	17.5	13.9	9.5	6.5	3.5	2.3	1.5	0.9
5%	33.5	21.6	5.8	5.8	7.8	4.2	2.8	1.8	1.1
2%	5.8	5.8	5.8	5.8	5.8	5.2	3.4	2.2	1.3
1%	5.8	5.8	5.8	5.8	5.8	6.1	3.9	2.5	1.5

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	16.2	21.0	24.9	34.0	46.5	75.6	100.3	129.1	161.2
5%	20.1	25.9	30.1	40.5	56.4	90.7	119.5	152.5	189.1
2%	23.2	26.6	30.1	40.5	61.2	112.5	146.9	186.4	228.9
1%	23.2	26.6	30.1	40.5	61.2	130.9	169.6	213.6	260.3

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.2	11.1	8.8	6.0	4.1	2.2	1.5	0.9	0.6
5%	21.3	13.7	22.0	13.1	5.0	2.7	1.8	1.1	0.7
2%	64.9	39.5	29.7	18.1	10.4	3.3	2.2	1.4	0.8
1%	79.4	48.2	36.3	22.3	13.1	3.8	2.5	1.6	1.0

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s)
(Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	11.0	5.6	0.0	0.0	0.0	0.0	0.0
2%	36.9	21.6	15.7	8.6	4.0	0.0	0.0	0.0	0.0
1%	45.7	26.8	19.6	11.2	5.6	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 45.7l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd7 Soak4 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	3137.08	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	7.5	m	A/W
Actual Volume		28.13	m3	
Actual Area		11.25	m2	
Storage Volume		10.69	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.6	2.5	2.8	0.1	0.0	0.0	0.0	0.0	0.0
1%	5.8	8.7	10.0	9.3	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.9	3.8	5.6	11.3	22.5	67.5	135.0	270.0	540.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	1.5	6.5	7.5	0.3	0.0	0.0	0.0	0.0	0.0
1%	15.3	23.0	26.4	24.5	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.4	9.6	10.2	10.4	7.1	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd8 Soak1 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	354.6	0.8	283.68
Berm	94.41	0.3	28.323
Footpath	122.51	0.8	98.008
Lots	1078.17	0.8	862.54
Total	**1649.69**		**1272.5**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.2	6.0	4.7	3.2	2.2	1.2	0.8	0.5	0.3
5%	11.4	7.3	5.8	3.9	2.7	1.4	0.9	0.6	0.4
2%	14.7	9.4	7.4	5.0	3.4	1.8	1.2	0.7	0.5
1%	17.7	11.2	8.8	5.8	3.9	2.1	1.3	0.8	0.5

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.5	7.2	8.5	11.6	15.8	25.7	34.2	44.0	54.9
5%	6.8	8.8	10.4	14.1	19.2	30.9	40.7	51.9	64.4
2%	8.8	11.3	13.3	17.9	24.2	38.3	50.0	63.5	78.0
1%	10.6	13.5	15.8	21.1	28.3	44.6	57.8	72.8	88.7

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	23.7	15.4	12.1	8.3	5.7	3.1	2.0	1.3	0.8
5%	29.3	18.9	14.9	10.1	6.9	3.7	2.4	1.5	1.0
2%	37.9	24.3	19.0	12.8	8.6	4.6	3.0	1.9	1.2
1%	45.6	28.9	22.5	15.0	10.1	5.3	3.4	2.2	1.3

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.2	18.4	21.8	29.8	40.8	66.2	87.9	113.1	141.2
5%	17.6	22.7	26.7	36.3	49.4	79.5	104.7	133.6	165.7
2%	22.7	29.1	34.2	46.0	62.1	98.6	128.7	163.2	200.5
1%	27.4	34.7	40.6	54.1	72.8	114.6	148.5	187.1	228.0

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	16.0	10.4	8.2	5.6	3.8	2.1	1.4	0.9	0.6
5%	19.9	12.8	3.4	3.4	4.7	2.5	1.6	1.0	0.6
2%	3.4	3.4	3.4	3.4	3.4	3.1	2.0	1.3	0.8
1%	3.4	3.4	3.4	3.4	3.4	3.6	2.3	1.5	0.9

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.6	12.5	14.8	20.2	27.6	44.9	59.6	76.7	95.7
5%	11.9	15.4	17.9	24.0	33.5	53.9	71.0	90.5	112.3
2%	13.8	15.8	17.9	24.0	36.3	66.8	87.2	110.6	135.9
1%	13.8	15.8	17.9	24.0	36.3	77.7	100.7	126.8	154.6

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.6	4.9	3.9	2.7	1.8	1.0	0.7	0.4	0.3
5%	9.4	6.1	11.4	6.7	2.2	1.2	0.8	0.5	0.3
2%	34.4	20.8	15.6	9.3	5.2	1.5	1.0	0.6	0.4
1%	42.2	25.5	19.1	11.6	6.7	1.7	1.1	0.7	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	5.7	2.7	0.0	0.0	0.0	0.0	0.0
2%	19.7	11.4	8.2	4.4	1.9	0.0	0.0	0.0	0.0
1%	24.5	14.2	10.3	5.8	2.8	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 24.5l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd8 Soak1 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1649.69	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.77		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.1	3.6	4.3	3.8	0.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.6	1.1	0.0	0.0	0.0	0.0	0.0	0.0
1%	5.5	9.6	11.3	10.0	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.7	4.2	4.4	4.4	2.6	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd8 Soak1 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	347.97	0.8	278.38
Berm	150.08	0.3	45.024
Footpath	99.16	0.8	79.328
Lots	802.6	0.8	642.08
Total	**1399.81**		**1044.8**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.8	5.1	4.0	2.7	1.9	1.0	0.7	0.4	0.3
5%	9.7	6.2	4.9	3.3	2.3	1.2	0.8	0.5	0.3
2%	12.5	8.0	6.3	4.2	2.8	1.5	1.0	0.6	0.4
1%	15.1	9.5	7.4	5.0	3.3	1.8	1.1	0.7	0.4

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.7	6.1	7.2	9.8	13.4	21.8	29.0	37.3	46.6
5%	5.8	7.5	8.8	12.0	16.3	26.2	34.5	44.1	54.7
2%	7.5	9.6	11.3	15.2	20.5	32.5	42.5	53.9	66.2
1%	9.0	11.4	13.4	17.9	24.0	37.8	49.0	61.7	75.2

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	19.4	12.6	10.0	6.8	4.6	2.5	1.7	1.1	0.7
5%	24.1	15.5	12.2	8.3	5.6	3.0	2.0	1.3	0.8
2%	31.1	19.9	15.6	10.5	7.1	3.7	2.4	1.6	1.0
1%	37.5	23.7	18.5	12.3	8.3	4.4	2.8	1.8	1.1

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.7	15.1	17.9	24.5	33.5	54.3	72.1	92.9	115.9
5%	14.4	18.6	22.0	29.8	40.6	65.2	86.0	109.7	136.0
2%	18.6	23.9	28.1	37.7	51.0	80.9	105.7	134.0	164.6
1%	22.5	28.5	33.3	44.4	59.8	94.1	122.0	153.6	187.2

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.9	7.7	6.1	4.2	2.9	1.5	1.0	0.7	0.4
5%	14.8	9.5	2.5	2.5	3.5	1.9	1.2	0.8	0.5
2%	2.5	2.5	2.5	2.5	2.5	2.3	1.5	1.0	0.6
1%	2.5	2.5	2.5	2.5	2.5	2.7	1.7	1.1	0.7

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.2	9.3	11.0	15.0	20.6	33.4	44.3	57.1	71.3
5%	8.9	11.4	13.3	17.9	24.9	40.1	52.8	67.4	83.6
2%	10.2	11.8	13.3	17.9	27.1	49.7	64.9	82.4	101.2
1%	10.2	11.8	13.3	17.9	27.1	57.8	75.0	94.4	115.0

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.5	4.9	3.8	2.6	1.8	1.0	0.6	0.4	0.3
5%	9.3	6.0	9.7	5.7	2.2	1.2	0.8	0.5	0.3
2%	28.5	17.4	13.0	7.9	4.5	1.4	0.9	0.6	0.4
1%	34.9	21.2	16.0	9.8	5.8	1.7	1.1	0.7	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	4.7	2.4	0.0	0.0	0.0	0.0	0.0
2%	16.0	9.4	6.8	3.7	1.7	0.0	0.0	0.0	0.0
1%	19.9	11.6	8.5	4.8	2.4	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 19.9l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd8 Soak1 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1399.81	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.75		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.8	0.9	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.3	3.5	4.0	3.4	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.1	2.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0
1%	6.1	9.2	10.5	9.1	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.6	4.1	4.3	4.2	2.4	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd8 Soak2 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	360.59	0.8	288.47
Berm	133	0.3	39.9
Footpath	180.26	0.8	144.21
Lots	1615.98	0.8	1292.8
Total	**2289.83**		**1765.4**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	12.8	8.3	6.6	4.5	3.1	1.7	1.1	0.7	0.4
5%	15.8	10.2	8.0	5.4	3.7	2.0	1.3	0.8	0.5
2%	20.4	13.1	10.3	6.9	4.7	2.5	1.6	1.0	0.6
1%	24.6	15.6	12.2	8.1	5.5	2.9	1.9	1.2	0.7

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.7	9.9	11.8	16.1	22.0	35.7	47.4	61.0	76.2
5%	9.5	12.2	14.4	19.6	26.7	42.9	56.5	72.1	89.4
2%	12.3	15.7	18.5	24.8	33.5	53.2	69.5	88.1	108.2
1%	14.8	18.7	21.9	29.2	39.3	61.9	80.2	101.0	123.1

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	32.8	21.3	16.8	11.5	7.9	4.3	2.8	1.8	1.1
5%	40.7	26.2	20.6	14.0	9.5	5.1	3.4	2.1	1.3
2%	52.5	33.7	26.4	17.7	12.0	6.3	4.1	2.6	1.6
1%	63.3	40.1	31.3	20.9	14.0	7.4	4.8	3.0	1.8

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	19.7	25.6	30.3	41.3	56.5	91.8	121.9	156.9	195.9
5%	24.4	31.4	37.1	50.4	68.6	110.2	145.2	185.3	229.8
2%	31.5	40.4	47.4	63.8	86.2	136.7	178.5	226.4	278.2
1%	38.0	48.1	56.3	75.1	101.1	159.0	206.1	259.5	316.3

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	24.0	15.6	12.3	8.4	5.8	3.1	2.1	1.3	0.8
5%	29.8	19.2	5.1	5.1	7.0	3.7	2.5	1.6	1.0
2%	5.1	5.1	5.1	5.1	5.1	4.6	3.0	1.9	1.2
1%	5.1	5.1	5.1	5.1	5.1	5.4	3.5	2.2	1.3

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.4	18.7	22.2	30.3	41.4	67.2	89.3	114.9	143.5
5%	17.9	23.0	26.8	36.0	50.2	80.7	106.4	135.7	168.3
2%	20.6	23.7	26.8	36.0	54.5	100.1	130.7	165.8	203.7
1%	20.6	23.7	26.8	36.0	54.5	116.4	150.9	190.0	231.6

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.8	5.7	4.5	3.1	2.1	1.1	0.8	0.5	0.3
5%	10.9	7.0	15.5	8.9	2.5	1.4	0.9	0.6	0.4
2%	47.4	28.5	21.2	12.6	6.8	1.7	1.1	0.7	0.4
1%	58.2	35.0	26.1	15.7	8.9	2.0	1.3	0.8	0.5

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	7.5	3.4	0.0	0.0	0.0	0.0	0.0
2%	26.9	15.4	11.0	5.7	2.2	0.0	0.0	0.0	0.0
1%	33.5	19.4	14.0	7.6	3.4	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 33.5l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd8 Soak2 - A

Calculations By	Linda Bos	Date	46128		
Reviewed By	Chris Sexton	Date	46129		

Catchment Area	A	2289.83	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.77		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	4.0	m	A/W
Actual Volume		15.00	m3	
Actual Area		6.00	m2	
Storage Volume		5.70	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.6	3.7	4.6	3.9	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.0	2.0	3.0	6.0	12.0	36.0	72.0	144.0	288.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	4.2	9.7	12.1	10.1	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.3	4.8	5.1	5.1	3.1	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd8 Soak2 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	381.89	0.8	305.51
Berm	162.53	0.3	48.759
Footpath	88.01	0.8	70.408
Lots	754.49	0.8	603.59
Total	**1386.92**		**1028.3**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.7	5.0	4.0	2.7	1.9	1.0	0.7	0.4	0.3
5%	9.6	6.2	4.9	3.3	2.2	1.2	0.8	0.5	0.3
2%	12.4	7.9	6.2	4.2	2.8	1.5	1.0	0.6	0.4
1%	14.9	9.5	7.4	4.9	3.3	1.7	1.1	0.7	0.4

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.6	6.0	7.1	9.7	13.3	21.6	28.7	37.0	46.2
5%	5.8	7.4	8.7	11.9	16.2	26.0	34.2	43.7	54.2
2%	7.4	9.5	11.2	15.0	20.3	32.2	42.1	53.4	65.6
1%	9.0	11.3	13.3	17.7	23.8	37.5	48.6	61.2	74.6

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	19.1	12.4	9.8	6.7	4.6	2.5	1.6	1.1	0.7
5%	23.7	15.3	12.0	8.1	5.5	3.0	2.0	1.2	0.8
2%	30.6	19.6	15.4	10.3	7.0	3.7	2.4	1.5	0.9
1%	36.9	23.4	18.2	12.1	8.2	4.3	2.8	1.7	1.1

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.5	14.9	17.6	24.1	32.9	53.5	71.0	91.4	114.1
5%	14.2	18.3	21.6	29.3	39.9	64.2	84.6	107.9	133.9
2%	18.4	23.5	27.6	37.2	50.2	79.7	104.0	131.9	162.0
1%	22.1	28.0	32.8	43.7	58.9	92.6	120.0	151.2	184.2

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.2	7.3	5.8	3.9	2.7	1.5	1.0	0.6	0.4
5%	13.9	9.0	2.4	2.4	3.3	1.7	1.1	0.7	0.5
2%	2.4	2.4	2.4	2.4	2.4	2.2	1.4	0.9	0.6
1%	2.4	2.4	2.4	2.4	2.4	2.5	1.6	1.0	0.6

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.7	8.7	10.4	14.1	19.3	31.4	41.7	53.6	67.0
5%	8.3	10.8	12.5	16.8	23.4	37.7	49.7	63.4	78.6
2%	9.6	11.1	12.5	16.8	25.4	46.8	61.0	77.4	95.1
1%	9.6	11.1	12.5	16.8	25.4	54.4	70.5	88.7	108.2

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.9	5.1	4.0	2.8	1.9	1.0	0.7	0.4	0.3
5%	9.8	6.3	9.6	5.8	2.3	1.2	0.8	0.5	0.3
2%	28.2	17.2	13.0	7.9	4.6	1.5	1.0	0.6	0.4
1%	34.5	21.0	15.8	9.8	5.8	1.8	1.1	0.7	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
5%	0.2	0.1	4.8	2.5	0.0	0.0	0.0	0.0	0.0
2%	15.8	9.3	6.7	3.7	1.8	0.0	0.0	0.0	0.0
1%	19.6	11.5	8.4	4.8	2.5	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 19.6l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd8 Soak2 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1386.92	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.74		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.4	1.2	1.3	0.1	0.0	0.0	0.0	0.0	0.0
1%	2.7	3.9	4.4	4.0	0.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	1.1	3.1	3.5	0.1	0.0	0.0	0.0	0.0	0.0
1%	7.0	10.2	11.5	10.5	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.9	4.4	4.7	4.7	3.1	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd8 Soak3 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	317	0.8	253.6
Berm	116.8	0.3	35.04
Footpath	158.22	0.8	126.58
Lots	1415.09	0.8	1132.1
Total	**2007.11**		**1547.3**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.2	7.3	5.7	3.9	2.7	1.4	1.0	0.6	0.4
5%	13.9	8.9	7.0	4.8	3.2	1.7	1.1	0.7	0.5
2%	17.9	11.5	9.0	6.0	4.1	2.2	1.4	0.9	0.5
1%	21.6	13.7	10.7	7.1	4.8	2.5	1.6	1.0	0.6

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.7	8.7	10.3	14.1	19.3	31.3	41.6	53.5	66.8
5%	8.3	10.7	12.7	17.2	23.4	37.6	49.5	63.2	78.4
2%	10.7	13.8	16.2	21.8	29.4	46.6	60.9	77.2	94.9
1%	13.0	16.4	19.2	25.6	34.5	54.2	70.3	88.5	107.9

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	28.8	18.7	14.8	10.1	6.9	3.7	2.5	1.6	1.0
5%	35.7	23.0	18.1	12.3	8.3	4.5	2.9	1.9	1.2
2%	46.0	29.5	23.1	15.5	10.5	5.5	3.6	2.3	1.4
1%	55.5	35.1	27.4	18.3	12.3	6.5	4.2	2.6	1.6

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.3	22.4	26.6	36.2	49.6	80.5	106.8	137.5	171.7
5%	21.4	27.6	32.5	44.1	60.1	96.6	127.3	162.4	201.4
2%	27.6	35.4	41.6	55.9	75.6	119.9	156.5	198.5	243.8
1%	33.3	42.2	49.3	65.8	88.6	139.4	180.6	227.4	277.2

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	21.1	13.7	10.8	7.4	5.0	2.7	1.8	1.2	0.7
5%	26.1	16.8	4.5	4.5	6.1	3.3	2.2	1.4	0.9
2%	4.5	4.5	4.5	4.5	4.5	4.1	2.6	1.7	1.0
1%	4.5	4.5	4.5	4.5	4.5	4.7	3.1	1.9	1.2

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	12.6	16.4	19.4	26.5	36.3	58.9	78.2	100.6	125.6
5%	15.7	20.2	23.5	31.5	44.0	70.7	93.1	118.8	147.4
2%	18.1	20.8	23.5	31.5	47.7	87.7	114.5	145.2	178.4
1%	18.1	20.8	23.5	31.5	47.7	102.0	132.2	166.4	202.8

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.7	5.0	4.0	2.7	1.8	1.0	0.7	0.4	0.3
5%	9.6	6.2	13.6	7.8	2.2	1.2	0.8	0.5	0.3
2%	41.5	25.0	18.6	11.0	6.0	1.5	1.0	0.6	0.4
1%	51.0	30.7	22.9	13.8	7.8	1.7	1.1	0.7	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	6.5	3.0	0.0	0.0	0.0	0.0	0.0
2%	23.6	13.5	9.6	5.0	1.9	0.0	0.0	0.0	0.0
1%	29.4	17.0	12.2	6.7	3.0	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 29.4l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd8 Soak3 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	2007.11	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.77		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.4	3.3	4.1	3.4	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	3.7	8.6	10.7	9.0	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.8	4.3	4.5	4.5	2.8	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd8 Soak3 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	271.85	0.8	217.48
Berm	131.28	0.3	39.384
Footpath	85.78	0.8	68.624
Lots	1144.89	0.8	915.91
Total	**1633.8**		**1241.4**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.1	5.9	4.7	3.2	2.2	1.2	0.8	0.5	0.3
5%	11.3	7.3	5.7	3.9	2.6	1.4	0.9	0.6	0.4
2%	14.6	9.3	7.3	4.9	3.3	1.8	1.1	0.7	0.4
1%	17.6	11.1	8.7	5.8	3.9	2.0	1.3	0.8	0.5

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	5.5	7.1	8.4	11.5	15.7	25.5	33.8	43.6	54.4
5%	6.8	8.7	10.3	14.0	19.0	30.6	40.3	51.4	63.8
2%	8.7	11.2	13.2	17.7	23.9	38.0	49.6	62.9	77.2
1%	10.5	13.4	15.6	20.8	28.1	44.1	57.2	72.0	87.8

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	23.1	15.0	11.8	8.1	5.5	3.0	2.0	1.3	0.8
5%	28.6	18.4	14.5	9.8	6.7	3.6	2.4	1.5	0.9
2%	36.9	23.7	18.5	12.5	8.4	4.5	2.9	1.8	1.1
1%	44.5	28.2	22.0	14.7	9.9	5.2	3.4	2.1	1.3

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	13.9	18.0	21.3	29.1	39.8	64.6	85.7	110.3	137.8
5%	17.2	22.1	26.1	35.4	48.2	77.5	102.1	130.3	161.6
2%	22.2	28.4	33.4	44.9	60.6	96.2	125.5	159.2	195.6
1%	26.7	33.8	39.6	52.8	71.1	111.8	144.9	182.5	222.4

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	17.0	11.1	8.7	6.0	4.1	2.2	1.5	0.9	0.6
5%	21.1	13.6	3.6	3.6	4.9	2.6	1.7	1.1	0.7
2%	3.6	3.6	3.6	3.6	3.6	3.3	2.1	1.4	0.8
1%	3.6	3.6	3.6	3.6	3.6	3.8	2.5	1.6	0.9

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.2	13.3	15.7	21.4	29.3	47.6	63.2	81.4	101.6
5%	12.7	16.3	19.0	25.5	35.6	57.2	75.3	96.1	119.2
2%	14.6	16.8	19.0	25.5	38.6	70.9	92.6	117.5	144.3
1%	14.6	16.8	19.0	25.5	38.6	82.5	106.9	134.6	164.1

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.1	3.9	3.1	2.1	1.4	0.8	0.5	0.3	0.2
5%	7.5	4.8	10.9	6.2	1.8	0.9	0.6	0.4	0.2
2%	33.3	20.0	14.9	8.8	4.8	1.2	0.8	0.5	0.3
1%	40.9	24.6	18.3	11.0	6.2	1.4	0.9	0.6	0.3

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	5.1	2.3	0.0	0.0	0.0	0.0	0.0
2%	18.7	10.7	7.6	3.9	1.5	0.0	0.0	0.0	0.0
1%	23.3	13.4	9.7	5.2	2.3	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 23.3l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd8 Soak3 - B

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1633.8	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.0	m	A/W
Actual Volume		11.25	m3	
Actual Area		4.50	m2	
Storage Volume		4.28	m3	

SOAKPIT SIZING OKAY

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.8	1.5	2.3	4.5	9.0	27.0	54.0	108.0	216.0

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	0.8	2.2	2.7	1.9	0.0	0.0	0.0	0.0	0.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.1	5.7	7.2	5.1	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	2.9	3.2	3.3	3.1	1.4	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd8 Soak3 - C

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	278.29	0.8	222.63
Berm	169.23	0.3	50.769
Footpath	129.89	0.8	103.91
Lots	1225.17	0.8	980.14
Total	**1802.58**		**1357.4**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.1	6.5	5.2	3.5	2.4	1.3	0.9	0.6	0.3
5%	12.5	8.0	6.3	4.3	2.9	1.6	1.0	0.7	0.4
2%	16.1	10.3	8.1	5.4	3.7	1.9	1.3	0.8	0.5
1%	19.4	12.3	9.6	6.4	4.3	2.3	1.5	0.9	0.6

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.0	7.8	9.3	12.7	17.3	28.1	37.3	48.1	60.0
5%	7.5	9.6	11.4	15.4	21.0	33.8	44.5	56.8	70.4
2%	9.7	12.4	14.5	19.5	26.4	41.9	54.7	69.4	85.2
1%	11.6	14.7	17.2	23.0	31.0	48.7	63.1	79.5	96.9

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	25.2	16.4	12.9	8.8	6.0	3.3	2.2	1.4	0.9
5%	31.3	20.2	15.8	10.8	7.3	3.9	2.6	1.6	1.0
2%	40.4	25.9	20.3	13.6	9.2	4.9	3.2	2.0	1.2
1%	48.7	30.8	24.0	16.0	10.8	5.7	3.7	2.3	1.4

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	15.1	19.7	23.3	31.8	43.5	70.6	93.7	120.6	150.6
5%	18.8	24.2	28.5	38.7	52.7	84.8	111.7	142.5	176.7
2%	24.2	31.1	36.5	49.0	66.3	105.2	137.3	174.1	213.9
1%	29.2	37.0	43.3	57.7	77.7	122.3	158.5	199.5	243.2

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	18.2	11.8	9.3	6.4	4.4	2.4	1.6	1.0	0.6
5%	22.6	14.6	3.9	3.9	5.3	2.8	1.9	1.2	0.7
2%	3.9	3.9	3.9	3.9	3.9	3.5	2.3	1.5	0.9
1%	3.9	3.9	3.9	3.9	3.9	4.1	2.6	1.7	1.0

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	10.9	14.2	16.8	23.0	31.4	51.0	67.7	87.1	108.8
5%	13.6	17.5	20.3	27.3	38.1	61.2	80.6	102.9	127.6
2%	15.6	18.0	20.3	27.3	41.3	75.9	99.1	125.7	154.4
1%	15.6	18.0	20.3	27.3	41.3	88.3	114.4	144.1	175.6

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.0	4.6	3.6	2.5	1.7	0.9	0.6	0.4	0.2
5%	8.7	5.6	12.0	6.9	2.0	1.1	0.7	0.5	0.3
2%	36.5	22.0	16.4	9.7	5.3	1.4	0.9	0.6	0.3
1%	44.8	26.9	20.1	12.1	6.9	1.6	1.0	0.6	0.4

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	5.6	2.6	0.0	0.0	0.0	0.0	0.0
2%	20.4	11.7	8.3	4.3	1.7	0.0	0.0	0.0	0.0
1%	25.4	14.7	10.6	5.8	2.6	0.0	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 25.4l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd8 Soak3 - C

Calculations By	Linda Bos	Date	46128	
Reviewed By	Chris Sexton	Date	46129	

Catchment Area	A	1802.58	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.75		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	3.5	m	A/W
Actual Volume		13.13	m3	
Actual Area		5.25	m2	
Storage Volume		4.99	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	1.1	2.5	3.1	2.2	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	0.9	1.8	2.6	5.3	10.5	31.5	63.0	126.0	252.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1%	2.8	6.7	8.2	5.7	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	3.3	3.7	3.9	3.6	1.6	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd8 Soak4 - A

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	428.85	0.8	343.08
Berm	122.27	0.3	36.681
Footpath	130.88	0.8	104.7
Lots	771.97	0.8	617.58
Total	**1453.97**		**1102**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.1	5.3	4.2	2.8	1.9	1.1	0.7	0.4	0.3
5%	10.1	6.5	5.1	3.5	2.4	1.3	0.8	0.5	0.3
2%	13.0	8.3	6.5	4.4	3.0	1.6	1.0	0.6	0.4
1%	15.6	9.9	7.7	5.2	3.5	1.8	1.2	0.7	0.5

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.9	6.3	7.5	10.2	14.0	22.7	30.1	38.8	48.4
5%	6.0	7.8	9.2	12.4	16.9	27.2	35.9	45.8	56.8
2%	7.8	10.0	11.7	15.8	21.3	33.8	44.1	55.9	68.7
1%	9.4	11.9	13.9	18.6	25.0	39.3	50.9	64.1	78.2

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	20.5	13.3	10.5	7.2	4.9	2.7	1.8	1.1	0.7
5%	25.4	16.4	12.9	8.7	5.9	3.2	2.1	1.3	0.8
2%	32.8	21.0	16.5	11.1	7.5	4.0	2.6	1.6	1.0
1%	39.5	25.0	19.5	13.0	8.8	4.6	3.0	1.9	1.1

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	12.3	16.0	18.9	25.8	35.3	57.3	76.1	97.9	122.3
5%	15.2	19.6	23.2	31.4	42.8	68.8	90.7	115.7	143.5
2%	19.7	25.2	29.6	39.8	53.8	85.4	111.4	141.4	173.6
1%	23.7	30.0	35.1	46.9	63.1	99.3	128.6	162.0	197.5

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	11.5	7.5	5.9	4.0	2.7	1.5	1.0	0.6	0.4
5%	14.2	9.2	2.5	2.5	3.3	1.8	1.2	0.8	0.5
2%	2.5	2.5	2.5	2.5	2.5	2.2	1.4	0.9	0.6
1%	2.5	2.5	2.5	2.5	2.5	2.6	1.7	1.1	0.6

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	6.9	8.9	10.6	14.5	19.8	32.1	42.6	54.9	68.5
5%	8.5	11.0	12.8	17.2	24.0	38.6	50.8	64.8	80.4
2%	9.9	11.3	12.8	17.2	26.0	47.8	62.4	79.2	97.3
1%	9.9	11.3	12.8	17.2	26.0	55.6	72.1	90.8	110.7

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	9.0	5.8	4.6	3.2	2.2	1.2	0.8	0.5	0.3
5%	11.2	7.2	10.4	6.3	2.6	1.4	0.9	0.6	0.4
2%	30.3	18.6	14.0	8.6	5.0	1.7	1.1	0.7	0.4
1%	37.1	22.6	17.1	10.6	6.3	2.0	1.3	0.8	0.5

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.9	0.6	0.5	0.3	0.2	0.1	0.1	0.0	0.0
5%	1.1	0.7	5.3	2.8	0.3	0.1	0.1	0.1	0.0
2%	17.4	10.2	7.5	4.2	2.1	0.2	0.1	0.1	0.0
1%	21.4	12.7	9.3	5.4	2.8	0.2	0.1	0.1	0.1

Sump inlet capacity to be sized to allow for 21.4l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd8 Soak4 - A

Calculations By	Linda Bos	Date	46128
Reviewed By	Chris Sexton	Date	46129

Catchment Area	A	1453.97	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	4.0	m	A/W
Actual Volume		15.00	m3	
Actual Area		6.00	m2	
Storage Volume		5.70	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	1.0	1.9	2.1	0.9	0.0	0.0	0.0	0.0	0.0
1%	3.5	4.8	5.4	5.1	0.1	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.0	2.0	3.0	6.0	12.0	36.0	72.0	144.0	288.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	2.7	5.0	5.5	2.2	0.0	0.0	0.0	0.0	0.0
1%	9.1	12.7	14.3	13.5	0.2	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	4.4	5.0	5.3	5.3	3.5	0.0	0.0	0.0	0.0

Stormwater Catchment Calculations

Soakpit Location	ENTER HERE
Catchment ID	Rd8 Soak4 - B

Calculations By	Linda Bos	Date	16/04/2026
Reviewed By	Chris Sexton	Date	17/04/2026

	Area	C	C×A
Reserve	0	0.3	0
Road	700.36	0.8	560.29
Berm	230.6	0.3	69.18
Footpath	197.62	0.8	158.1
Lots	1450.88	0.8	1160.7
Total	**2579.46**		**1948.3**

Note:
This calculator will work out the amount of stormwater discharged on individual lots soakpits sized for the 10% AEP event and remove that volume from the overall discharged volume to the primary network. This will also carry out a pre vs post development analysis to ensure that soakpits are only sized to capture the 1% Post development difference. A check is also carried out to ensure that all 10% AEP events are able to be captured and disposed of in their entireity.

TABLE 1: Pre-Development Runoff Rate (l/s):

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.4	9.3	7.4	5.0	3.4	1.9	1.2	0.8	0.5
5%	17.8	11.5	9.0	6.1	4.2	2.2	1.5	0.9	0.6
2%	23.0	14.8	11.6	7.8	5.2	2.8	1.8	1.1	0.7
1%	27.8	17.6	13.7	9.1	6.2	3.2	2.1	1.3	0.8

TABLE 2: Pre-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	8.6	11.2	13.3	18.1	24.8	40.2	53.4	68.8	85.9
5%	10.7	13.8	16.3	22.1	30.0	48.3	63.7	81.2	100.7
2%	13.8	17.7	20.8	28.0	37.8	59.9	78.3	99.3	121.9
1%	16.7	21.1	24.7	32.9	44.3	69.7	90.3	113.8	138.7

TABLE 3: Post Development Runoff Rate (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	36.2	23.5	18.6	12.7	8.7	4.7	3.1	2.0	1.3
5%	44.9	28.9	22.7	15.4	10.5	5.6	3.7	2.4	1.5
2%	58.0	37.2	29.1	19.6	13.2	7.0	4.6	2.9	1.8
1%	69.9	44.3	34.5	23.0	15.5	8.1	5.3	3.3	2.0

TABLE 4: Post-Development Runoff Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	21.7	28.2	33.4	45.6	62.4	101.3	134.5	173.1	216.2
5%	26.9	34.7	40.9	55.6	75.7	121.7	160.3	204.5	253.6
2%	34.8	44.6	52.4	70.4	95.2	150.9	197.0	249.9	307.0
1%	41.9	53.1	62.1	82.9	111.5	175.5	227.4	286.4	349.1

TABLE 5: Runoff Attentuated within Residential Lots (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	21.6	14.0	11.1	7.6	5.2	2.8	1.9	1.2	0.7
5%	26.7	17.2	4.6	4.6	6.3	3.4	2.2	1.4	0.9
2%	4.6	4.6	4.6	4.6	4.6	4.2	2.7	1.7	1.1
1%	4.6	4.6	4.6	4.6	4.6	4.8	3.1	2.0	1.2

TABLE 6: Volume Disposed & Stored from Residential Allotments (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	13.0	16.8	19.9	27.2	37.2	60.4	80.2	103.2	128.8
5%	16.0	20.7	24.0	32.3	45.1	72.5	95.5	121.8	151.1
2%	18.5	21.3	24.0	32.3	48.9	89.9	117.4	148.9	182.9
1%	18.5	21.3	24.0	32.3	48.9	104.5	135.5	170.6	208.0

TABLE 7: Post Development Runoff - Lot Attenuated Flow (l/s)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	14.6	9.5	7.5	5.1	3.5	1.9	1.3	0.8	0.5
5%	18.2	11.7	18.1	10.8	4.2	2.3	1.5	1.0	0.6
2%	53.3	32.5	24.5	14.9	8.6	2.8	1.8	1.2	0.7
1%	65.3	39.6	29.9	18.4	10.9	3.3	2.1	1.3	0.8

TABLE 8: Post Development Runoff - Lot Attenuated Flow - Pre Development (l/s) (Table 3 - Table 5 - Table 1)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
5%	0.3	0.2	9.1	4.7	0.1	0.0	0.0	0.0	0.0
2%	30.3	17.8	12.9	7.2	3.4	0.0	0.0	0.0	0.0
1%	37.5	22.1	16.2	9.3	4.7	0.1	0.0	0.0	0.0

Sump inlet capacity to be sized to allow for 37.5l/s based on Table 8 - Post-Pre development runoff critical 1% AEP event

Soakpit Sizing - Single Catchment

Soakpit Location	ENTER HERE
Catchment ID(s)	Rd8 Soak4 - B

Calculations By	Linda Bos	Date	46128	
Reviewed By	Chris Sexton	Date	46129	

Catchment Area	A	2579.46	m2	
Pre-development Runoff Coeff	C	0.3		
Developed Runoff Coefficient	C	0.76		
Critical Duration	Dt	10min		
Infiltration	fa	3.0	m/hr	
Infiltration Safety Factor	SF	0.33333		
Infiltration Rate*SF	f	1.00	m/hr	SF*fa
% Volume available for storage	V%	0.38	%	
Actual Depth	D	2.5	m	
Width	W	1.5	m	
Length	L	6.5	m	A/W
Actual Volume		24.38	m3	
Actual Area		9.75	m2	
Storage Volume		9.26	m3	

SOAKPIT SIZING OKAY

TABLE 10: Net Storage Required (Table 4 -Table 2 -Table 9 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
	10	20	30	60	120	360	720	1440	2880
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	0.8	2.3	2.6	0.3	0.0	0.0	0.0	0.0	0.0
1%	5.1	7.5	8.5	7.9	0.0	0.0	0.0	0.0	0.0

TABLE 9: Volume Disposed to Ground via Road Soakpit (m3)

	Duration								
	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
Vol. *	1.6	3.3	4.9	9.8	19.5	58.5	117.0	234.0	468.0

TABLE 11:Total Required Soakpit Volume (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2%	2.2	6.2	6.9	0.9	0.0	0.0	0.0	0.0	0.0
1%	13.5	19.7	22.4	20.7	0.0	0.0	0.0	0.0	0.0

TABLE 12: Post Development Check (Table 4 - Table 5 - Table 6) (m3)

	Duration								
AEP	10min	20min	30min	1hr	2hrs	6hrs	12hrs	24hrs	48hrs
10%	7.2	8.2	8.6	8.7	5.7	0.0	0.0	0.0	0.0

Appendix 3 OneWater Report and SDC Water Supply Master Plan

Westhaven Pipe Capacity Review

Westhaven Rolleston Limited

12 October 2026

one water modelling

Document Revisions

Revision	Detail
1.0	Draft
2.0	Draft for Selwyn Water
3.0	Final

Document History

Revision	Date	Author	Reviewer
1.0	24 September 2026	Debbie Weeds	Jeff McLean
2.0	29 September	Debbie Weeds	Hugh Blake-Manson
3.0	12 October	Debbie Weeds	

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Status	Final

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Executive Summary

Purpose and Scope

Westhaven Rolleston Limited commissioned One Water Limited to review the Westhaven water master plan to ensure that pipe sizes are efficient, effective and aligned with overall network objectives. The review covers the 296-ha Holmes, Brookside, Skellerup and Skellerup South blocks, containing approximately 4,735 planned residential and non-domestic connections. The master-plan pipe sizes were tested for peak demand minimum and maximum pressure, maximum head loss, maximum velocity, and fire-flow.

Design basis and demand

- **Level of service criteria:** minimum pressure 31 m, maximum pressure 60 m, and residential fire flow of 25 L/s at 10 m residual pressure; noting the forthcoming Fire Code may require 60 L/s for medium-high-density housing.
- **Demand assumptions:** 2,000 L/property/day for lots under 350 m², peak-hour factor 2, non-domestic demand 1 L/s/ha, and target head loss below 3 m/km (or below 5 m/km where modelling confirms pressure compliance).
- **Ultimate demand:** approximately 128 L/s on the peak day and 238 L/s at peak hour. This equates to roughly three 50 L/s bores if storage can buffer the peak, or five for peak instantaneous supply.

Key findings

- Some strategic connections and trunk sections were upsized, while oversized internal mains were reduced to DN125 or DN180. Constructed Stage 1A pipes remain unchanged.
- The interconnected grid pipework removes the need for dedicated internal north–south and east–west trunk mains. Holmes should have two connections to the DN630 PE100 trunk main on Dunns Crossing Road; Brookside/Skellerup should have three, plus additional planned connections to the DN355 / DN250 PE100 trunk mains.
- Westhaven system performance is acceptable: maximum head loss is 3.3 m/km, maximum velocity is 1.1 m/s, and open-hydrant flow is 75–150+ L/s. Maximum pressure only slightly exceeds 60 m and remains within the PN12.5 pressure envelope.
- Holmes Block minimum pressure is 24.6 m in the ultimate growth peak day model and is below the 31 m pressure level of service due to undersized Izone transfer pumps rather than internal pipe capacity.
- Existing Rolleston sources cannot support full Westhaven growth: under existing peak conditions the Izone reservoir empties, and network pressure falls below 10 m. Planned Izone and Helpet wells will provide interim relief, but a new source or sources are required to supply Westhaven.

Recommendations and conclusion

1. **Investigate a 2–3 ML Holmes reservoir:** Izone sources can be optimised by constructing a reservoir on Holmes Block land to buffer peak hour demand. Alternatively new water bores and treatment are needed.
2. **Staging:** confirm sufficient source capacity with SWL before each stage release; preferably develop north to south and deliver the Lowes/Brookside trunk main early.
3. **Connectivity:** ideally construct at least two hydraulic connections between Skellerup and Edwards Blocks.
4. **Monitor Holmes pressure:** if no reservoir and pump station is constructed at Holmes Block, install a transducer near the critical customer and upgrade Izone transfer pumps if needed.
5. **Manage demand:** consider water-efficiency covenants and confirm fire flow requirements for future commercial premises.

Overall conclusion: the revised internal network is hydraulically sound, but timely SWL source, storage and transfer-pump investment will be required to support Westhaven's full development.

1 Introduction

In September 2026, Westhaven Rolleston Limited (WRL) engaged One Water Modelling Limited (One Water) to:

- Update the Rolleston peak day and growth models with shapefiles for the proposed Westhaven network, as supplied by the developer's engineer Inovo.
- Review the master plan pipe sizing and recommend changes where applicable.

The purpose of the project is to review the Westhaven water master plan to ensure the pipe sizes are efficient, effective and aligned with overall network objectives.

The Rolleston InfoWorks WS Pro water model is owned by Selwyn Water Limited (SWL) and hosted by One Water. SWL have agreed for the Rolleston model to be used by One Water to review the West Rolleston master plan.

2 Limitations

This report has been prepared by One Water based on specific instructions supplied by our Client and SWL. It is intended for their sole use in accordance with the agreed scope of work. Any third party uses the information contained within this report at their own risk.

In preparing the Report, One Water has relied upon data, designs, plans and other information provided by Inovo on behalf of the Client. One Water will not be liable for any inaccuracies or withheld information that could affect the recommendations or conclusions contained in this report.

3 Terminology

One Water use the following conventions when referring to pipe sizes:

- Nominal bore (NB) is the approximate internal diameter of a pipe
- Internal diameter (ID) is a precise internal diameter in millimetres from Standards or manufacturers' data
- Nominal diameter (DN) is the nominal size of a pipe from Standards or manufacturers' data, and represents the nominal bore for some materials such as PVC-U and represents the approximate external diameter for other materials such as PE.

4 Development Overview

4.1 Location

The Westhaven development comprises four blocks of land south of Dunns Crossing Road in Rolleston. The Brookside, Skellerup and Skellerup South blocks are bounded by Dunns Crossing, Brookside, Edwards and Selwyn Roads, and the Holmes block is bounded by Dunns Crossing Road, Burnham School Road and State Highway 1. The total development area is 296 ha.

The development blocks supplied by Inovo are shown in Figure 4-1.

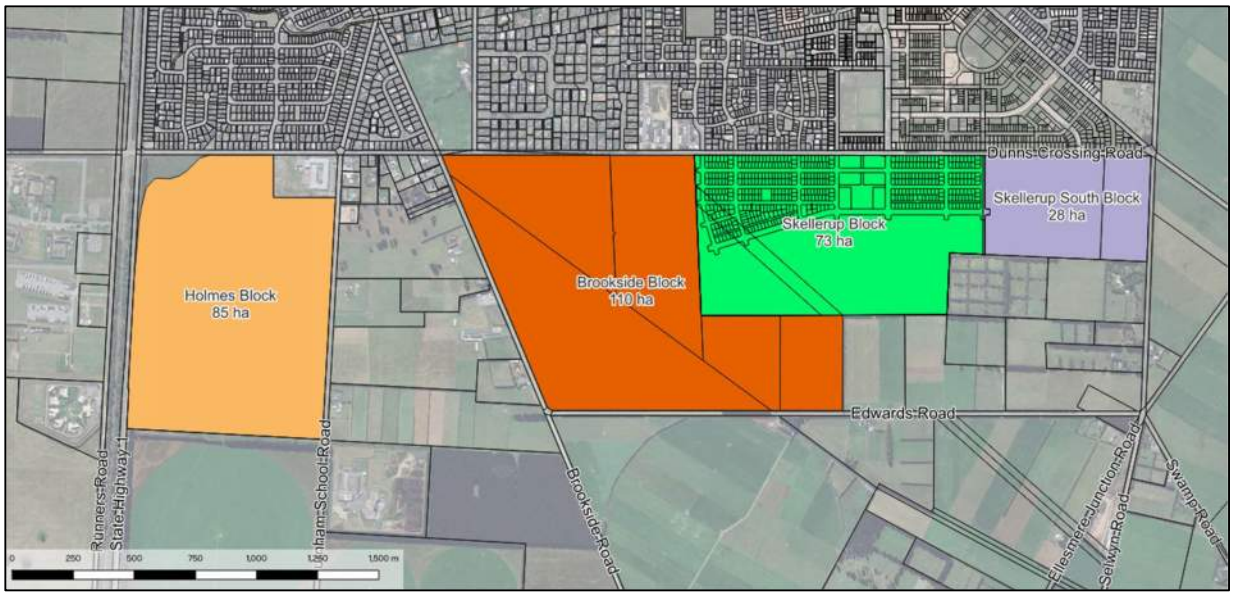


Figure 4-1 Westhaven development blocks

4.2 Connections

The master plan includes up to 4,730 new residential water connections.

The development will primarily comprise medium-high density residential housing, three areas dedicated to townhouse super lots, and four commercial precincts.

4.3 Water Supply

The Rolleston water supply comprises four existing water treatment plants (WTPs) at Izone Drive, Helpet Park, Moore Street and Overbury Terrace. Multiple bores supply each WTP, except for Overbury Terrace which has a single bore.

A fifth bore field, WTP, reservoir and pump station is planned in the Weedons Road vicinity, but a consented water source and land for the WTP and reservoir still needs to be secured. With a lag time of approximately 5-6 years to find and consent a water source and design and construct the Weedons Road WTP infrastructure, SWL will be reliant on existing sources plus new wells at Helpet and Izone to service interim growth.

Long-term, water from the five WTPs will service all development within the area bounded by Edwards, Selwyn and Weedons Road and State Highway 1. A ring main provides bulk transfer of water from all WTPs to customers. The Westhaven development is located immediately adjacent to the ring main on Dunns Crossing Road and will primarily be supplied from Izone.

5 Level of Service

SWL require the water network to meet the following level of service (LoS):

- Minimum Pressure – 310 kPa or 31 metres
- Maximum Pressure - 600 kPa or 60 metres
- Maximum Velocity – 1.5 m/s
- Fire flow - 25 L/s to all residential customers at two thirds peak day demand from a hydrant located within 135 metres of the property and with residual pressure greater than 10 m (New Zealand Fire Service Firefighting Water Supplies Code of Practice: SNZ PAS 4509:2008 [Fire Code])

The Fire Code is currently undergoing review, has undergone public consultation and is due for publication in 2026 / 27. The draft Fire Code requires 60 L/s fire flow for medium-high density housing development.

6 Design Parameters

The SDC Engineering Code of Practice (ECoP) is currently being updated to create a bespoke Selwyn Water Code. As the design demand in the existing SDC ECoP is highly conservative, SWL and WRL both agreed in principle to design the Westhaven water pipes using the following updated design parameters:

- Domestic design demand – 2000 L/property/day for lot sizes less than 350 m^2 and a peak hour factor of 2
- Non-domestic design demand – 1 L/s/ha
- Pipe headloss – less than 3 m/km in the fully developed network or less than 5 m/km with modelling evidence that there is no impact on pressure LoS

Future design parameters will be subject to consultation and may change. However, the proposed figures are believed to be fit for purpose for the current assessment.

7 Design Demand

Table 7-1 summarises Westhaven design residential demand.

Table 7-1 Summary of Westhaven design residential demand

Development Block	Connections	Average day demand (L/s)	Peak day demand (L/s)	Peak day peak hour demand (L/s)
Holmes	1114	8.4	25.8	51.6
Brookside / Skellerup	3612	27.2	83.6	167.2
Total	4726	35.6	108.8	218.8

Assumptions are:

- Average day domestic demand is 650 L/property/day calculated from 2025 average billing
- As advised by Inovo, approximately 3.8 ha will be developed at 65 HH/Ha at 2000 L/property/day as townhouse super lots (or 245 HH)
- Leakage is assumed to be included in the peak day design demand

Table 7-2 summarises Westhaven non-domestic design demand.

Table 7-2 Summary of Westhaven non-domestic demand

Commercial area	Area (ha)	Peak Day Peak Hour (L/s)
Holmes commercial	5.7	12.8
Lowes Road commercial	1.3	2.9
Edwards Road commercial	0.6	1.4
Dunns Crossing Road commercial	0.9	2.0
Total	8.5	19.1

Assumptions are:

- Standard commercial 10-Hour demand profile with a peak hour scaling factor of 2.25
- Community facilities such as schools, sports grounds and parks have not been specified or assessed.

Demand from the fully developed Westhaven subdivision is expected to be significant. Theoretical peak day demand is 128 L/s and peak hour demand is 238 L/s.

The subdivision needs up to 3 x 50 L/s bores plus storage to buffer peak hour demand, or 5 x 50 L/s bores to supply peak instantaneous demand.

8 Model Update

The 2025 Rolleston peak day model was updated to include Westhaven by:

- Updating the trunk main details on Dunns Crossing Road to match as-built drawings and up-to-date SWL GIS
- Importing the West Rolleston water master plan shapefiles provided by Inovo (pipes, nodes, hydrants, customer points) into the Rolleston growth model
- Snapping all hydrants to pipes and adding nodes at junctions
- Allocating customer points to the nearest point
- Setting customer categories to match the Inovo designation
- Matching design demand to each customer

9 Updated Pipe Diameters

9.1 Holmes Block

Figure 9-1 shows original pipe diameters in Holmes Block and Figure 9-2 shows updated pipe diameters.



Figure 9-1 Original Holmes Block water master plan

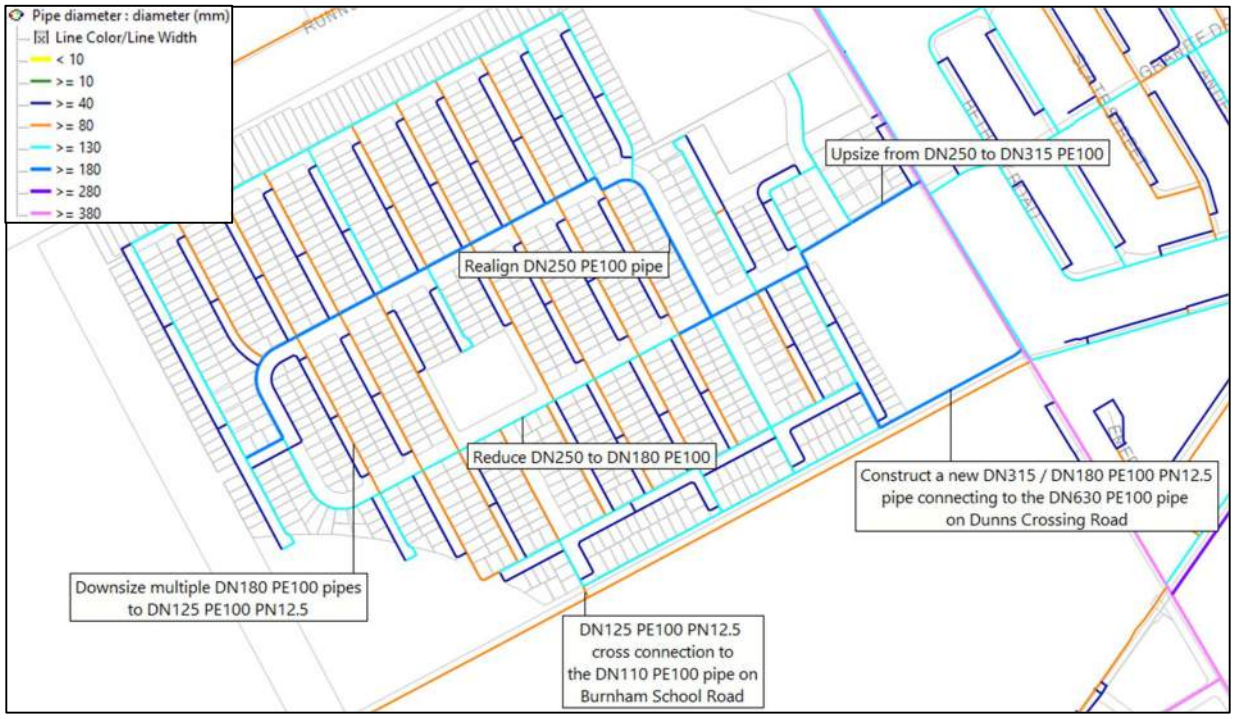


Figure 9-2 Updated Holmes Block water master plan

The original master plan contains a mixture of DN180 and DN250 PE100 PN12.5 distribution mains and DN63 PE80 PN12.5 rider mains. The development is shown as connecting to the DN630 PE100 PN12.5 trunk main on Dunns Crossing Road and the DN110 PE100 PN12.5 on Burnham School Road.

The pipe network was iterated multiple times to find a sensible balance between pipe head loss under high demand, minimum pipe velocities under low demand, fire flow and resilience.

Key changes to the original master plan are:

- Southern pipes will connect to a new 230 m section of DN315 PE100 PN12.5 trunk main on Burnham School Road that in turn connects to the DN630 PE100 PN12.5 pipe on Dunns Crossing Road. The trunk main can reduce to DN180 PE100 PN12.5 after the first connection into Holmes Block on Burnham School Road. The DN110 PE100 PN12.5 pipe to Burnham needs to remain dedicated, but a DN125 PE100 PN12.5 cross connection between the two pipes at the terminus of the Holmes Block trunk main would be beneficial.
- The northern connection pipe off Dunns Crossing Road has been upsized from DN250 to DN315 PE100 PN12.5 to reduce head loss.
- Part of the DN250 PE100 PN12.5 loop main in the centre of the development has been reduced to DN180 PE100 and the DN250 PE100 PN12.5 section has been partially realigned to provide a low head loss pipe route to high elevation customers in the northwest of the development.
- 4.9 km of DN180 PE100 PN12.5 pipe with connections at both ends has been reduced in size to DN125 PE100 PN12.5 to increase minimum pipe velocities.

9.2 Brookside and Skellerup Blocks

Figure 9-3 shows original pipe diameters in Brookside and Skellerup Blocks and Figure 9-4 shows updated pipe diameters. Stage 1A assets and a section of DN355 trunk main on Dunns Crossing Road that have already been constructed are highlighted in red in Figure 9-3.

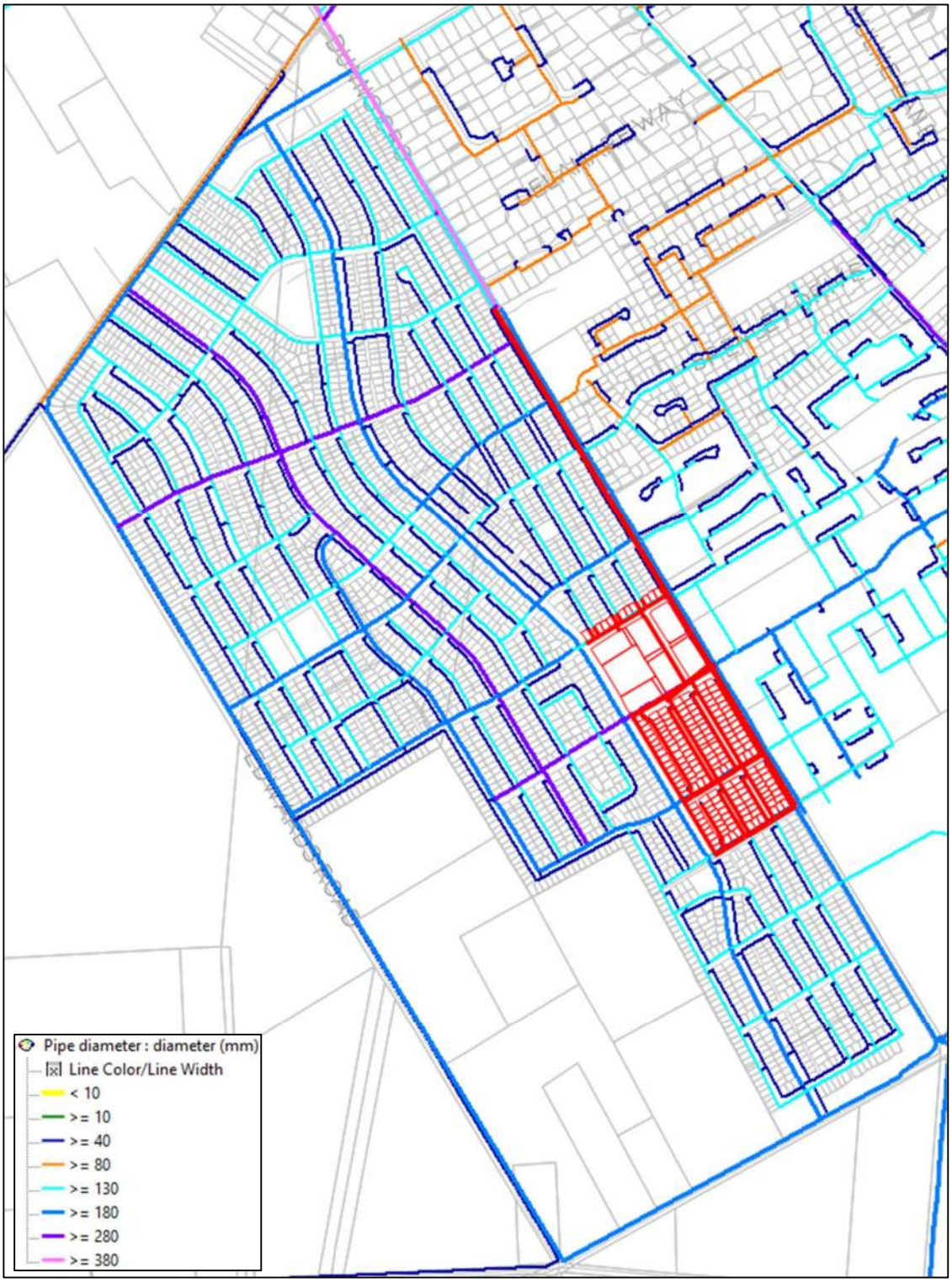


Figure 9-3 Original Brookside and Skellerup Blocks water master plan

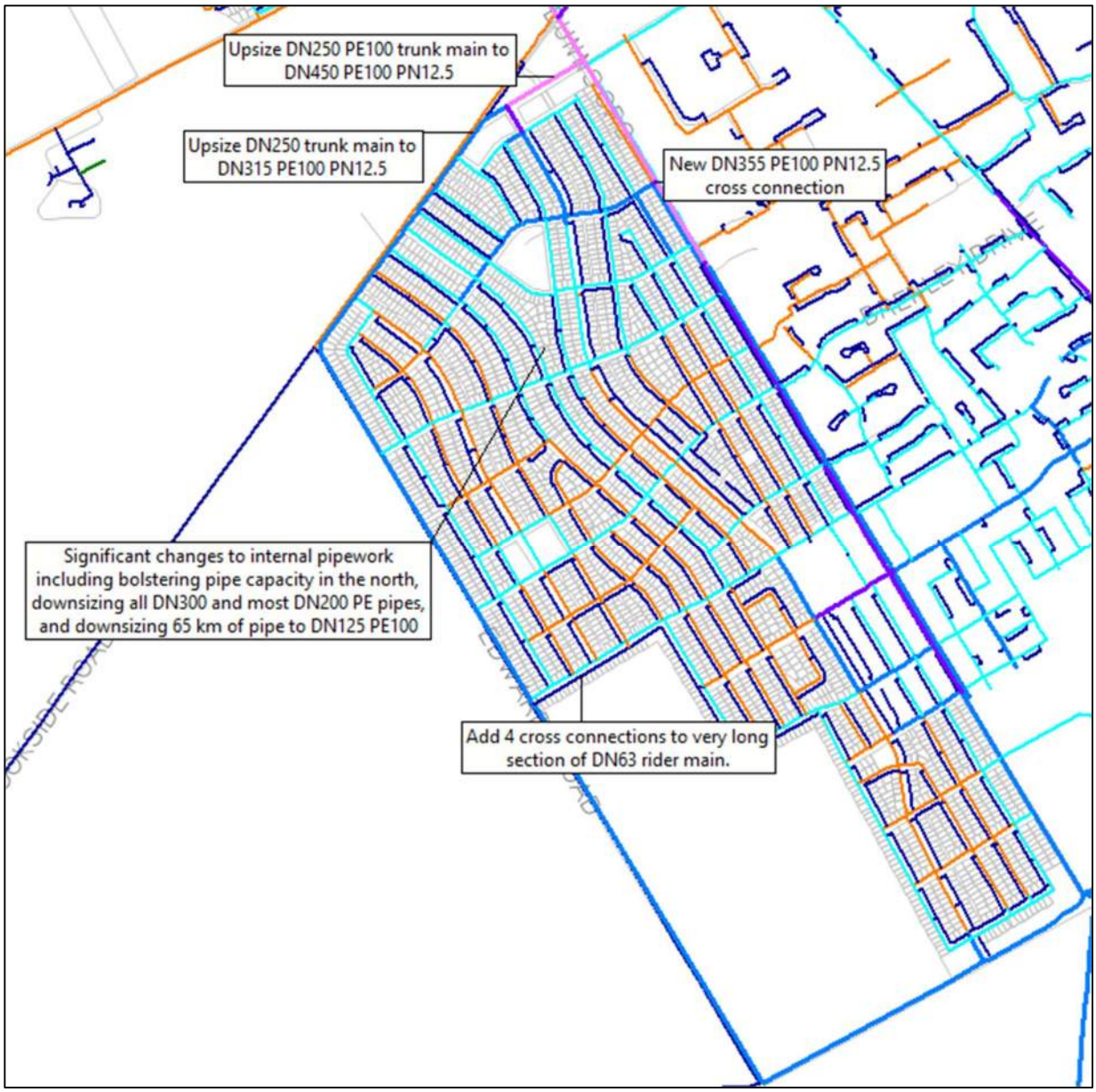


Figure 9-4 Updated Brookside and Skellerup Blocks water master plan

The originally proposed pipes are a mixture of DN180, DN250 and DN355 PE100 PN12.5 distribution mains and DN63 PE80 PN12.5 rider mains.

Key changes to the original plans are:

- The primary connecting trunk main on Lowes Road has been upsized from DN250 to DN450 PE100 PN12.5 and a section of DN250 PE100 south of Lowes Road has been upsized to DN355 PE100 PN12.5 to reduce head loss. The DN450 trunk main is the primary northern connection into Westhaven from the Izone transfer pipeline and carries more flow than any other connection point.
- The trunk main on Brookside Road has been partially upgraded from DN250 PE100 to DN315 PE100 PN12.5 to reduce head loss.
- 3.2 km of DN355 PE100 pipe has been downsized to DN125 or DN180 PN12.5 to increase minimum pipe velocities.
- 5.5 km of DN250 PE100 pipe has been downsized to DN125 or DN180 PN12.5 to increase minimum pipe velocities.
- 0.9 km of DN180 PE100 pipe has been upsized to DN250 PE100 PN12.5 in the north of the network to reduce head loss.
- Overall, 65 km of pipe exceeding DN180 PE100 has been downsized to DN125 PE100 PN12.5 to increase minimum pipe velocities.
- An additional DN355 PE100 cross connection was added south of Lowes Road.
- Additional DN63 PE100 cross connections were added on a very long rider main located in the southeast of the network.

Already constructed Stage 1A pipes were not altered.

Both the Holmes and Brookside / Skellerup blocks will be primarily supplied from Izone WTP via the transfer trunk main on Two Chain and Dunns Crossing Roads. Hence, some of the northern pipes have been upsized. However, many pipes have been downsized to increase minimum pipe velocities.

The 2025 Rolleston infrastructure plan indicated that one NB200 north to south trunk mains and two NB200 east to west trunk mains would be needed. However, the tightly interconnected pipe grid means internal trunk mains are no longer needed.

The pipe sizes were sensitivity tested by applying further growth south of Edwards Road. Due to proximity to the Pines wastewater treatment plant, this land is not currently included in the long-term plan and is not expected to develop in the foreseeable future. If a large development takes place, pipe head loss through the Brookside, Edwards and Selwyn Road trunk mains and internal Westhaven pipes increases, but we do not recommend upsizing any pipes based on this possibility.

An A3 plan showing the final pipe diameters is also included in Appendix A and shapefiles with revised pipe sizes have been supplied to Inovo.

10 Connection Details

10.1 Holmes Block

Holmes Block is connected to the DN630 PE100 PN12.5 trunk main from Izone WTP at two locations:

1) Immediately north of Rolleston High School
2) At Burnham School Road

Figure 10-1 shows the two primary pipe connections details for Holmes Block and the proposed new section of trunk main on Burnham School Road, including a cross connection to the existing DN110 PE100 pipe to Burnham. The alignment of the trunk main will need to avoid wastewater trunk mains to Pines Wastewater Treatment Plant.

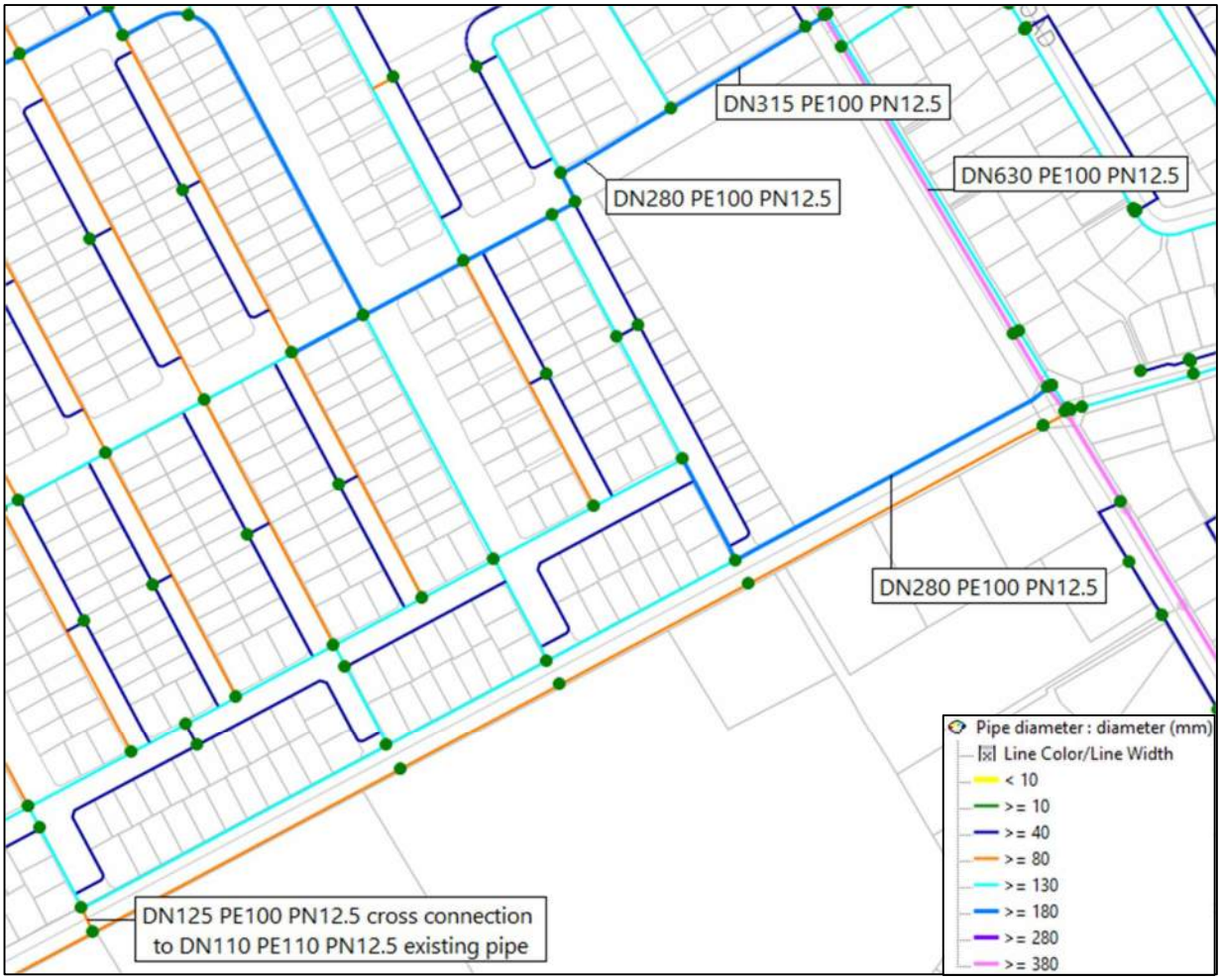


Figure 10-1 Updated Holmes Block Connections

Inovo have noted that constructing the connections to the DN650 PE100 trunk main will require either live tapping of the main or a planned shutdown and cut in of tees at the appropriate locations. It will likely be possible to plan a shutdown of the DN630 PE100 trunk main during winter months, but this would need to be confirmed in the Rolleston model based on up-to-date growth and demand.

10.2 Brookside and Skellerup Blocks

The original plans do not appear to include a direct connection to the DN630 PE100 trunk main at the intersection of Dunns Crossing Road and Lowes Road. We recommend three connections to the DN630 PE100 pipe at:

1) Lowes Road
2) The first Westhaven Street south of Lowes Road
3) Immediately prior to the transition from DN630 PE100 to dual DN200 PVC-U / DN355 PE100 at Pierre Avenue

The DN355 PE100 connection located approximately halfway between Lowes Road and Pierre Avenue is essential to avoid the need to upsize the Lowes Road trunk main and internal pipes due to high head loss.

In addition, there are multiple planned connections to the DN355 PE100 / DN250 PE100 trunk mains south of Pierre Avenue and no further changes have been made to the proposed connection points.

Figure 10-2 shows the three connection points to the DN630 PE100 trunk main.

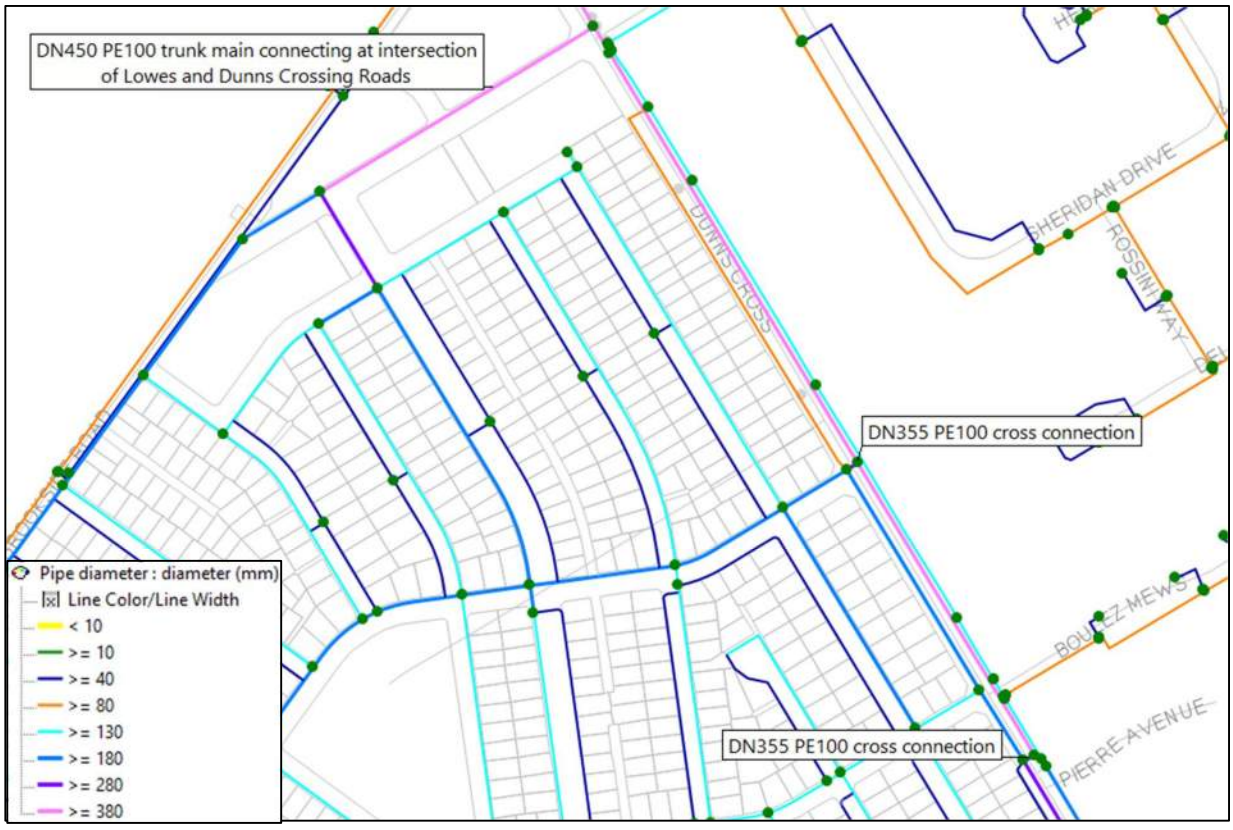


Figure 10-2 Updated Lowes Road Connections

No issues are anticipated with shutting down the trunk main during periods of low demand, but this would need to be confirmed in the Rolleston model based on up-to-date growth and whether the remaining section of DN250 PE100 trunk main on Dunns Crossing Road has been constructed to Selwyn Road.

11 Results

11.1 Ultimate Growth Model

Westhaven system performance has been assessed in the Rolleston ultimate growth model. This assumes that all greenfield development land in the area bounded by State Highway 1 and Edwards, Selwyn and Weedons Roads is fully developed and all necessary sources and trunk mains to supply the development areas have been constructed. Future growth outside the defined area will be serviced independently.

11.2 Minimum Pressures

Figure 11-1 shows minimum pressures at the peak hour on the peak day in the fully developed Westhaven network. The results show that pressures in Holmes Block fall below the pressure LoS of 31 m, but this is due to undersized transfer pumps at Izone and will be discussed further in section 11.

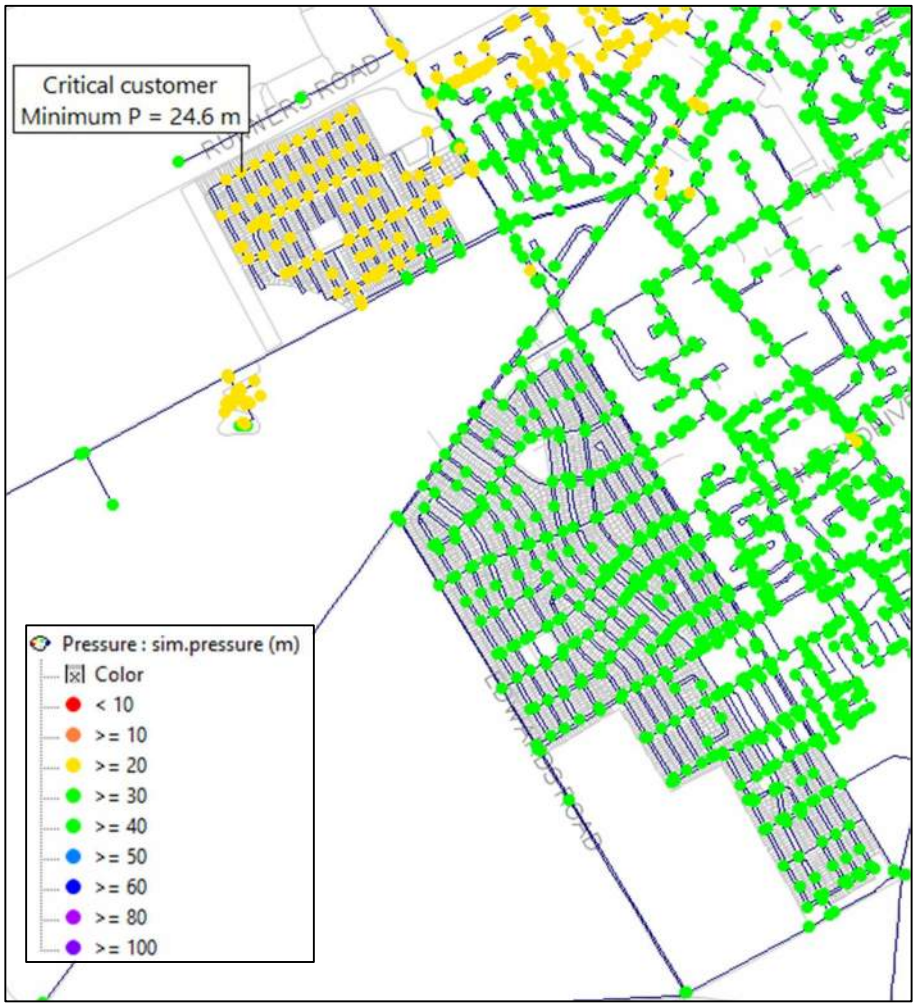


Figure 11-1 Minimum Westhaven pressures at peak hour on the peak day

Figure 11-2 shows that downsizing the pipes in Holmes Block has negligible impact on minimum pressure at the critical customer. The minimum pressure with the original pipe network (blue results) is 25.1 m versus 24.6 m with the updated pipe network (green results).

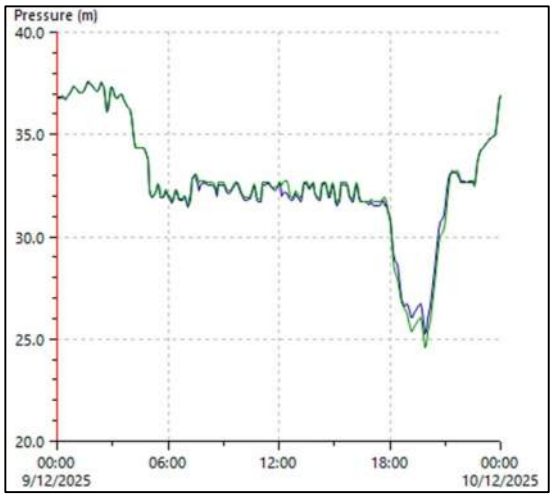


Figure 11-2 Comparison of pressure at the critical customer in Holmes Block with the original proposed pipes and the updated pipes

11.3 Maximum Pressures

Figure 11-3 shows maximum pressures at low demand in the fully developed Westhaven network. Due to the high elevation differential, the maximum pressure slightly exceeds 60 m but is well within the pipe derating envelope of a PN12.5 pipe and no pressure management is required.

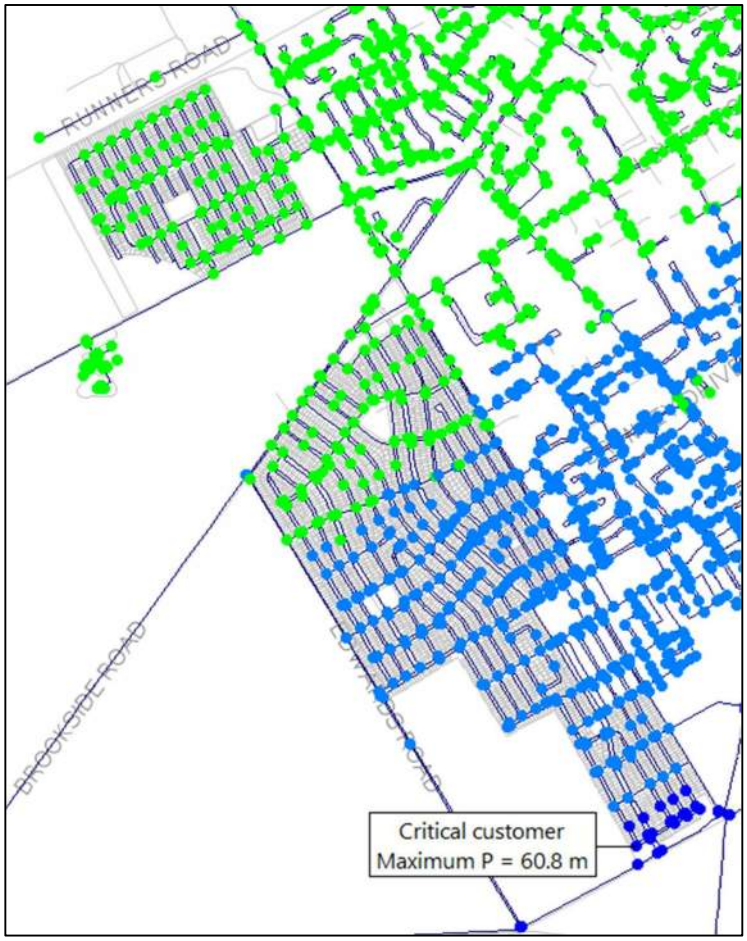


Figure 11-3 Maximum Westhaven pressures at peak hour on the peak day

11.4 Pipe Head Loss

Figure 11-4 shows pipe head loss per unit distance (m/km) at the peak hour on the peak day in the fully developed Westhaven network. The maximum pipe head loss within Westhaven is 3.3 m/km.

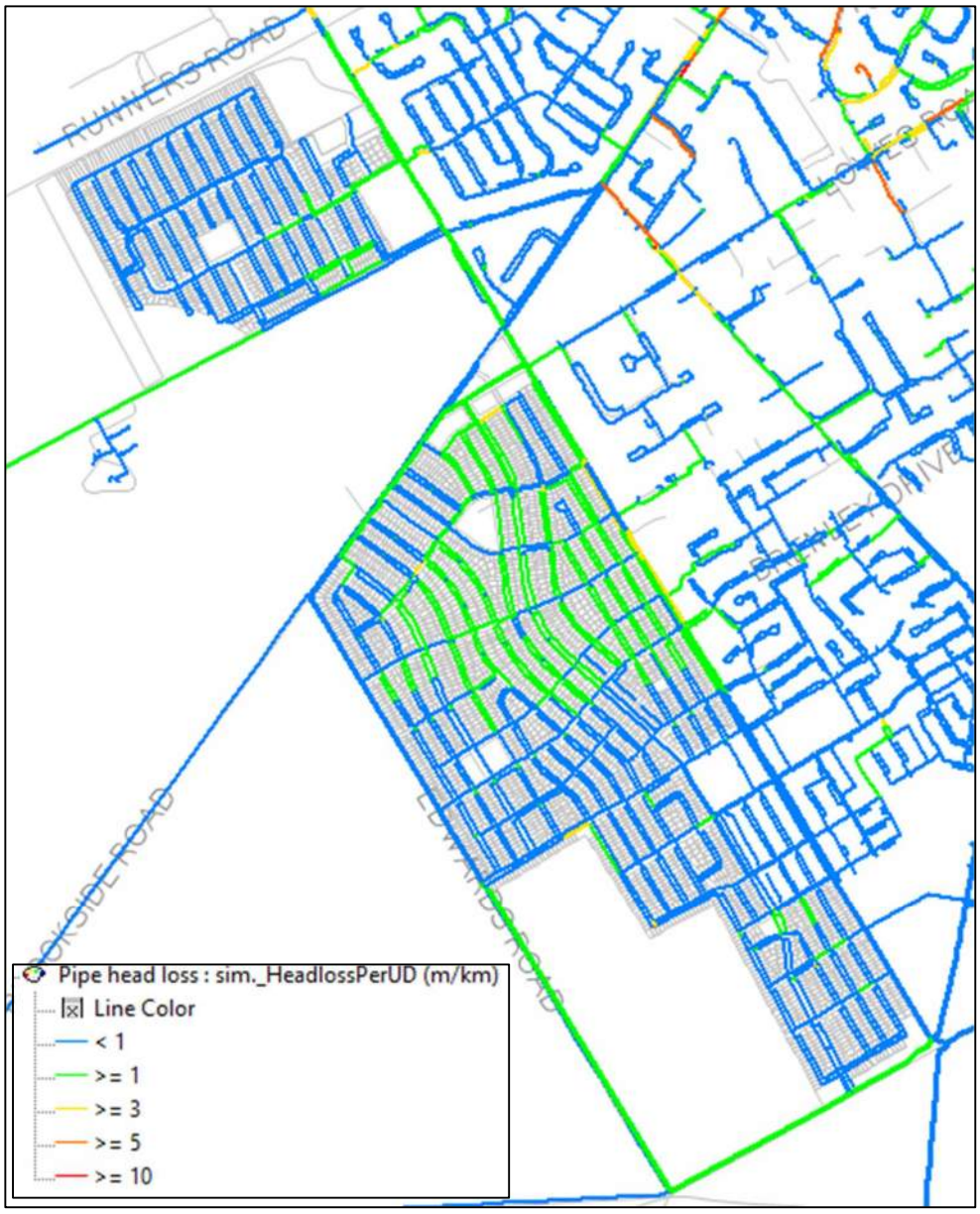


Figure 11-4 Maximum pipe head loss per unit distance

11.5 Pipe Velocity

Figure 11-5 shows maximum pipe velocities at the peak hour on the peak day in the fully developed Westhaven network. The maximum pipe velocity within Westhaven is 1.1 m/s which is acceptable.

There is no design parameter or LoS for flushing velocity in clean water pipes, but oversized pipes may increase the risk of water quality issues, particularly in tightly spaced, grid networks. Hence, where appropriate DN125 PE100 pipe has been included in the revised design to reduce the risk of sediment or biofilm build-up.



Figure 11-5 Maximum pipe velocity

11.6 Fire Flow

Figure 11-6 shows open hydrant flow at hydrants in the fully developed Westhaven network at 2/3 peak day demand and with 10 m residual pressure.

Open hydrant flow analysis assesses the maximum flow that can be extracted from the network at a given point with a 10-metre residual pressure. If the open hydrant flow indicates 100 L/s is available, and there are four hydrants near to the test location, it is likely there would be 100 L/s across those hydrants.



Figure 11-6 Westhaven open hydrant flow

Due to the highly gridded network and proximity to large diameter trunk mains supplied from multiple sources, open hydrant flow ranges from 75 L/s to greater than 150 L/s. This indicates the network has high capacity.

Required hydrant flows depend on the requirements of SNZ PAS 4509:2008 New Zealand Fire Service Firefighting Water Supplies Code of Practice (Fire Code) and allow for type of activity, the size of the largest fire cell, and whether there is a fire sprinkler system.

There are no issues supplying Residential and Residential 2 customers with 25 or 60 L/s fire flow, depending on Fire Code requirements.

Commercial fire flow needs cannot be accurately known until development is underway, but it is very likely that the network can meet the needs of all commercial development.

12 Further Discussion

12.1 Impact on Sources

Section 11 discusses system performance for internal Westhaven pipes. However, the Westhaven development will also have a significant impact on existing sources and the wider network. To recap, design average peak day demand is 128 L/s and peak hour demand is 238 L/s.

Table 12-1 shows the impact of the fully developed Westhaven development on peak day peak hour water pressures in the wider Rolleston network with existing sources.

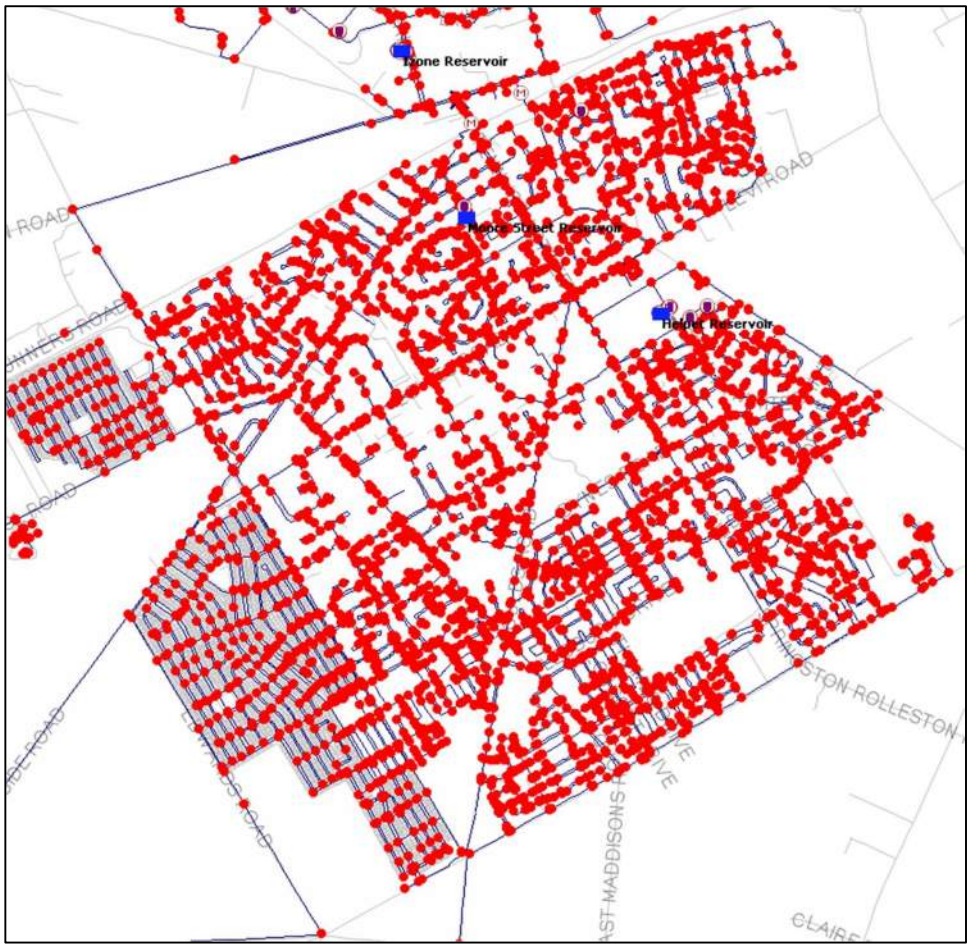


Figure 12-1 Minimum Westhaven pressures at peak hour on the existing peak day

At 18:30 the Izone reservoir fully empties and pressures across the network fall below 10 m. Existing sources cannot accommodate the Westhaven development, and the source deficit will be further exacerbated by high growth in other parts of the network.

Westhaven and SWL have three options to service the deficit:

1) Supply Westhaven and all other pending Rolleston development from a new bore field, WTP, reservoir and pump station on Weedons Road.

2) Supply a 2-3 ML reservoir at Holmes site directly from the Izone bulk transfer pipeline and use the reservoir to buffer peak hour demand.

3) Construct 5 x 50 L/s wells plus a new WTP, small reservoir and pump station at Holmes Block to pump directly into the Izone transfer pipeline. The number of wells can be reduced by increasing available storage to buffer peak hour demand.

Option 1 is a global solution for Rolleston and options 2 and 3 are Westhaven specific solutions. One Water recommend that SWL and Westhaven strongly consider option 2. This is because new source water at Weedons Road is speculative and not yet consented. By contrast, option 2 provides certainty and will likely result in a shorter design and construction time than consent for new bores and construction of affiliated infrastructure.

In addition, option 1 allows the source water at Izone to be optimised. Izone reservoir is very small (500 m^3) and has limited capacity to buffer peak hour demand. If 2 - 300 L/s average flow is transferred from Izone to a new reservoir at Holmes Block, the reservoir can buffer peak instantaneous demand, and the overall capacity of the network is increased. A reservoir plus pumping station also improves pressure control and resilience for the wider scheme. The sizing for any new infrastructure will be addressed as part of Selwyn Water's infrastructure planning process and is not included in the scope of this assessment.

Due to source constraints, we also recommend that Westhaven and SWL consider water demand management covenants for this development, such as water efficient fittings and fixtures. Rolleston-wide water restrictions may also be required if sources cannot keep pace with growth.

12.2 High elevation customers in Holmes Block

Customers within Holmes Block are located at higher elevation than other Rolleston customers and section 11.2 showed that minimum pressures fall below 31 m on the peak day. This is because the Izone transfer pumps are too small to maintain the downstream target pressure and the pump runs down its curve.

There are two reasons for the deficit:

1) The pump was designed for 4473 Westhaven customers (assumed) rather than 4726 (actual).
2) The pumps were installed with a combined duty of 210 L/s @ 46 m without sufficient spare capacity in the duty head for increased head loss at higher flows.

One Water recommend that SWL install a pressure transducer nearby the critical customer in Holmes Block and monitor the pressure LoS. Pump upgrade is only needed if long-term demand approaches design demand, which is expected to be conservative. If a Holmes Block reservoir is constructed, there will be no issues with pump capacity.

12.3 Staging

No information was provided about staging. Ideally the development should proceed from north to south, with the trunk main on Lowes and Brookside Roads to be constructed as soon as possible.

Sensitivity testing indicates that if the development is constructed before the full trunk main around Lowes, Brookside, Edwards and Selwyn Roads is constructed, minimum peak day peak hour pressures will fall to 27.9 m, and high head loss is recorded in some pipes immediately west of Dunns Crossing Road. No significant issues are predicted.

12.4 Connectivity to Edwards Block

One Water recommend that at least two connections are maintained between the Skellerup Blocks and the Edwards Block to provide hydraulic connectivity.

13 Recommendations and Conclusions

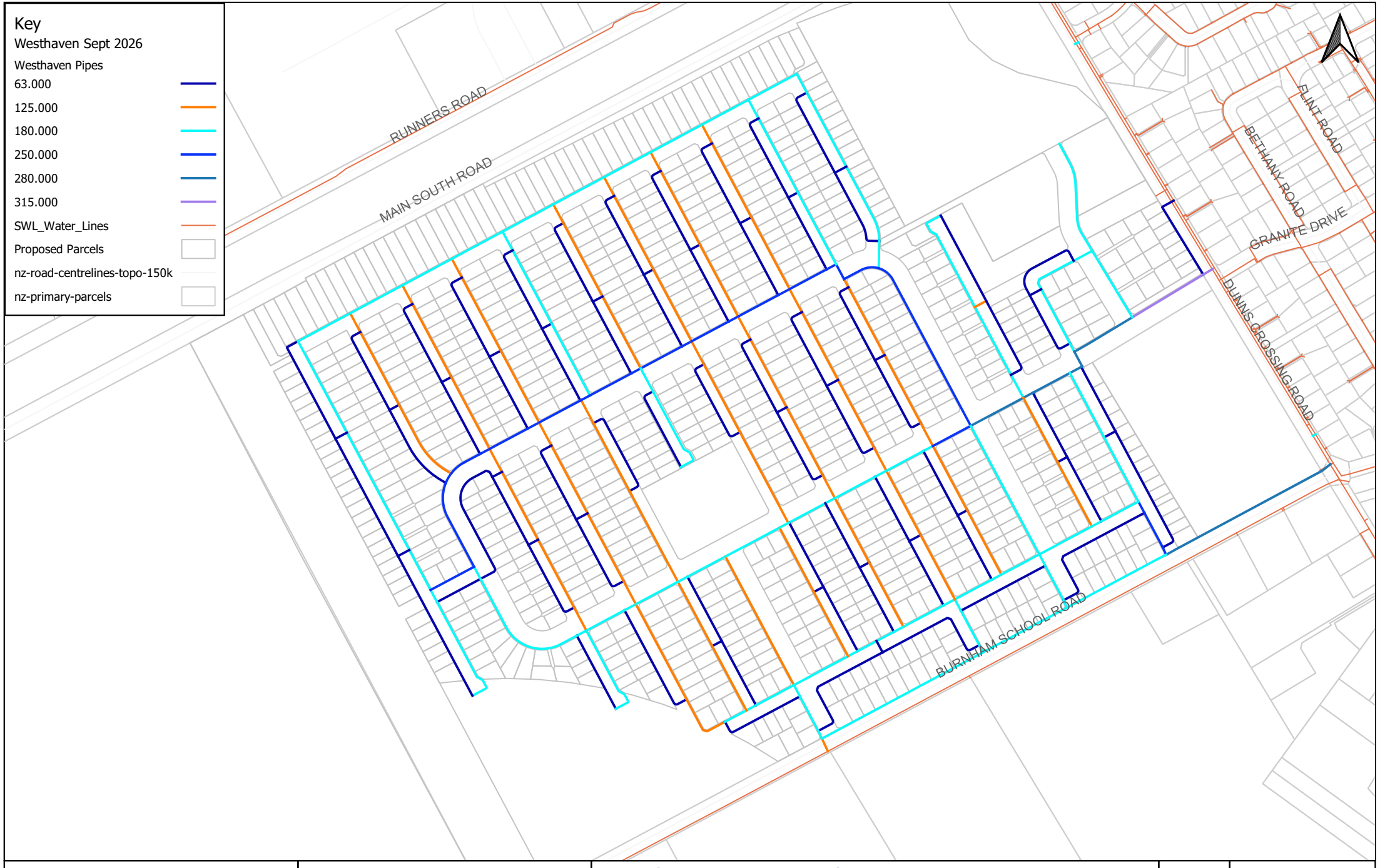
One Water have provided revised pipe sizing and connection details for the Holmes and Brookside / Skellerup Blocks that represent a balance between pipe head loss under high demand, minimum pipe velocities under low demand, fire flow and resilience. The design parameters used to size the pipes are believed to be robust and sensible.

Minimum pressures are less than 31 m in the Holmes Block in the ultimate growth model, but this is due to pump operation rather than an issue with the pipe sizing and head loss in the Holmes Block. Maximum pressures slightly exceed 60 m in the south of the Skellerup network but remain well below the pipe derating envelope for PN12.5 pipe. There are no obvious pitfalls associated with staging order, but staging information has not been provided. Hydraulic connections between the Skellerup and Edwards Blocks are recommended.

One Water also recommend that Westhaven and SWL consider a 2-3 ML reservoir, with size to be confirmed, located at Holmes Block to optimise the Izone source and supply the additional Westhaven demand. Alternatively, bore sources can be considered but the lead in time for consenting and construction is expected to be too slow to avoid water restrictions or peak day water outages.

Appendix A

Westhaven Water Pipe Plans



WESTHAVEN

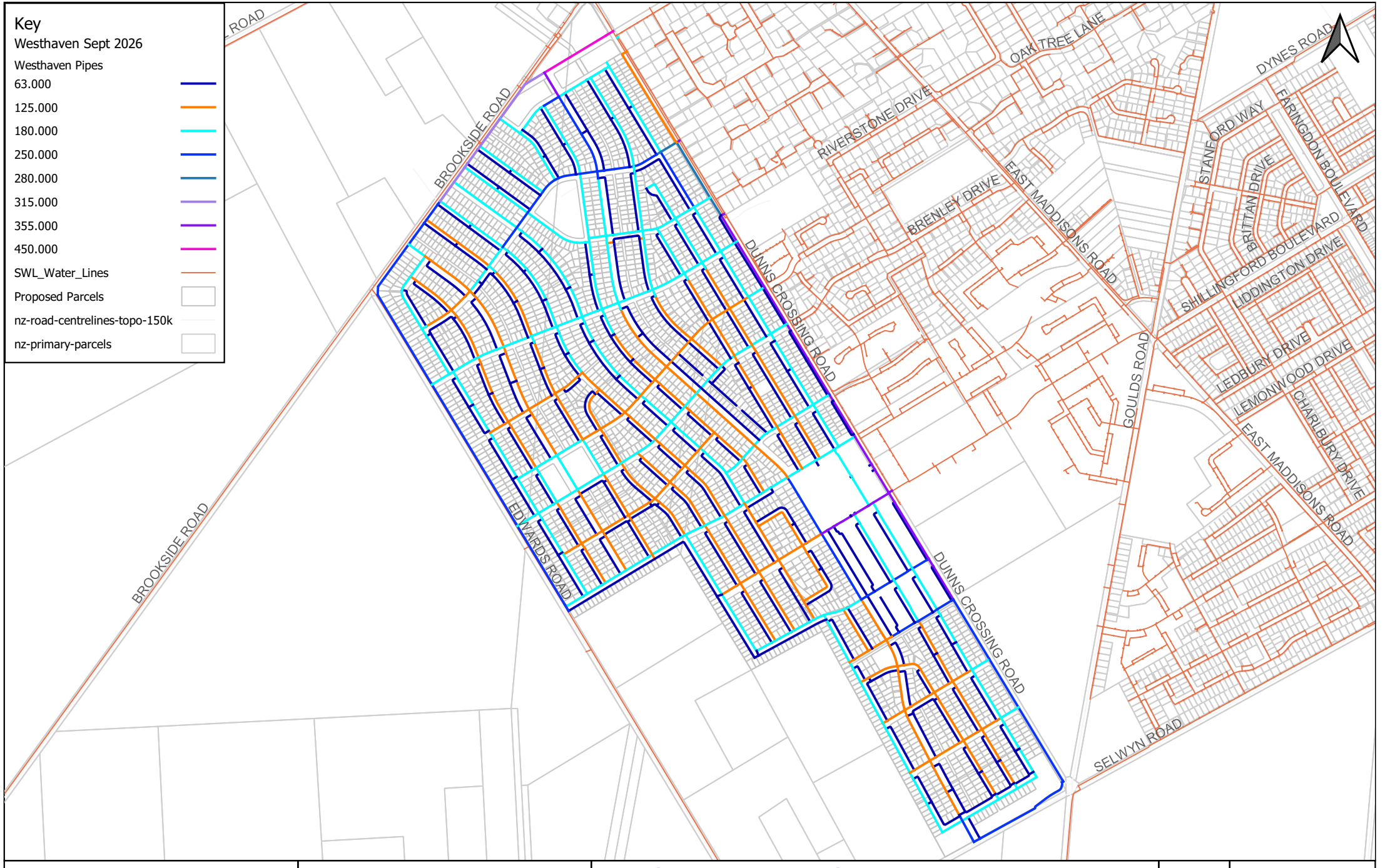
one water modelling

Westhaven Master Plan

Holmes Block Water Pipes

Date Stamp:	Sheet No:	Revision:
24 September 2026	1	A

Project No.	SWL003	
Scale	1:4100	
	Initials	Date
Drawn by	DW	24/09/2026
Reviewed by	JM	24/09/2026



WESTHAVEN

one water modelling

Westhaven Master Plan

Brookside and Skellerup Blocks Water Pipes

Date Stamp:	Sheet No:	Revision:
24 September 2026	1	A

Project No.	SWL003	
Scale	1:10400	
	Initials	Date
Drawn by	DW	24/09/2026
Reviewed by	JM	24/09/2026

Appendix 4 Wastewater Design Flow Calculations and Catchments

Pipe Hydraulic Capacity Check - Colebrook-White Hydraulic Calculation

Project: 16521 - Rolleston West Subdivision - Holmes Block

Calculation Description: Gravity Reticulation capacity check using Colebrook White

	Name	Date:
Designed By	BTH	1/06/2026
Checked By	-	##/06/2026
Reviewed By	-	

References:
NZS4404-2010
CPAA "A Rational Approach to the Hydraulic Design of Pipe Conduits (Technical Brief)"
CPAA "Hydraulics of Precast Concrete Conduits (Design Manual)"

Instructions

Note 1: Input Values in Blue fields
Note 2: Black text fields are calculated. Do not change.
Note 3: This spreadsheet provides a means to check the available capacity for multiple gravity pipes across the project site.
Note 4: Calculations have been verified/confirmed when compared Concrete Pipes Association Target Values

Type of system	Wastewater	Defines the available Roughness 'Ks' values for the Colebrook-White calculations. See reference table to right
Design Temp	10 C	
percentage full	80%	**note that system capacity will actually be achieved at 82% pipe fullness (allows for pocket of air)
vk (m2.s-1)	1.32E-06	m2.s-1 (kinematic viscosity of water is 1.3mm2/s at 10deg Celsius)
g (m.s-2)	9.810	Gravity constant

Velocity 'V' Calculated using the Colebrook-White Equation:

$$v = -2 \cdot \sqrt{(2 \cdot g \cdot D_h \cdot S)} \cdot \log_{10}\left(\frac{k_s}{3.71 \cdot D_h} + \frac{2.51 \cdot \nu_k}{D_h \cdot \sqrt{(2 \cdot g \cdot D_h \cdot S)}}\right)$$

Roughness Coefficient Reference Table:

Pipe Material	Typical values for Ks (mm) Circular Pipes: NZS4404-2010 Table 5.2 – Wastewater	NZS4404-2010 Table 4.2 – Stormwater
PVC	0.600	0.015
PE or epoxy lining	0.600	0.015
Vitreous Clay	1.000	0.600
Spun Concrete to AS/NZS 4058	1.500	0.150
GRP (Glass Reinforced Plastic)	0.600	0.015
PP	0.600	0.015

NZS4404 - Minimum WW Grades (Council)

DN (mm)	Min Slope %	Grade (1 in)
150	0.006	182
225	0.003	303
300	0.003	400

Table 5.2 – Guide to roughness coefficients for gravity sewer lines

Material	Colebrook-White coefficient k (mm)	Manning roughness coefficient (n)
VC	1.0	0.012
PVC	0.6	0.011
PE	0.6	0.009 – 0.011
GRP	0.6	0.011
Concrete machine made to AS/NZS 4058	1.5	0.012
PE or epoxy lining	0.6	0.011
PP	0.6	0.009 – 0.011

NOTE –
(1) These values take into account possible effects of rubber ring joints, silting, and debris.
(2) The n and k values apply for pipes up to DN 300.
(3) For further guidance refer to WSA 02:1999 table 2.4; AS 2200 table 2; Plastics pipes for water supply and sewage disposal (Lamson); Metrication: Hydraulic data and formulae (Lamont); or the Handbook of PVC pipe (Uni-Bell).

SDC CoP - Section 6: Wastewater Reticulation

Table 2 - Minimum gravity pipeline gradients

	Diameter (mm)	Unflushed Grade	Minimum number of houses above reduced Gradient
Public	150	1:160	≤ 5
Public	150	1:200	> 5

SDC Manhole Spacing
Manhole spacing should be as follows:
o 150mm – 225mm diameter mains maximum spacing of 100m
o 300mm – 900mm diameter mains maximum spacing of 120m

Self Cleansing Velocity Checks at upper reaches:
Where Self-cleansing velocities are not achieved within the uppermost reaches of the network, these are due to low contributing flows from terminal upstream catchments.

These upstream branches are located at the end of roads such as a cul-de-sac, with no further development potential, and therefore will remain low-flow sections under ultimate development conditions.

Minimum pipe sizes (DN150) and grading constraints limit the ability to achieve self-cleansing velocities in these locations. This condition is typical of terminal branches in residential subdivisions and is accepted practice.

The design mitigates potential sedimentation risk by:
- limiting the length of low-flow upstream pipes
- maintaining consistent grades with no sags or flat sections
- providing appropriate access via manholes for maintenance and flushing if required

Self-cleansing conditions are achieved further downstream within the network where sufficient contributing catchment exists.

** Make sure this reference is correct

Enter the Lot Schedule here, where cells are blue. | Manually enter in Commercial Areas in this column | Calculated Fields | Enter in pipe parameters here where cells are blue. | Calculated Fields

Number	Descriptor	Area	Estimated no. of lots	Commercial Area (SDC CoP Flow 1 L/s per hectare)	Catchment Lot Connections (assess each catchment individually)	ASF (L/s)	MF (L/s) (no future densification)	Auto-Sized Pipe Diameter (mm)	Slope (1 in .....m)	Pipe Material (list)	d/D (% full)	Capacity of Pipe at % full Q = V x A (L/s)	Capacity Check (MF vs Q)	V (m/s)	Velocity Check (min 0.6 m/s @ capacity)	Surcharge Check	SCF Velocity Check **References SCF sheet
	BURNHAM SCHOOL RD EAST	10,058	27		27	0.19	0.74	DN225	1 in 280 m	PVC	80%	29.93	PASS	0.88	OK	OK - 98% spare	Low Flow Conditions
	BURNHAM SCHOOL RD WEST	18,593	50		77	0.53	2.12	DN225	1 in 150 m	PVC	80%	41.09	PASS	1.21	OK	OK - 95% spare	Low Flow Conditions
	CATCHMENT 1	40,428	109		109	0.75	3.00	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 75% spare	OK - Self Cleansing
	CATCHMENT 2	39,714	107		107	0.74	2.94	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 76% spare	OK - Self Cleansing
	CATCHMENT 3	32,938	89		89	0.61	2.45	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 80% spare	OK - Self Cleansing
	CATCHMENT 4	19,857	53		53	0.36	1.46	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 88% spare	Low Flow Conditions
	CATCHMENT 5	23,407	63		63	0.43	1.73	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 86% spare	Low Flow Conditions
	CATCHMENT 6	31,443	84		84	0.58	2.31	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 81% spare	OK - Self Cleansing
	CATCHMENT 7	22,361	60		60	0.41	1.65	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 86% spare	Low Flow Conditions
	CATCHMENT a	43,185	116		116	0.80	3.19	DN225	1 in 300 m	PVC	80%	28.90	PASS	0.85	OK	OK - 89% spare	OK - Self Cleansing
	CATCHMENT b	45,260	122		238	1.64	6.55	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 82% spare	OK - Self Cleansing
	CATCHMENT A	21,248	892	57,342	892	6.13	24.52	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 31% spare	OK - Self Cleansing
	CATCHMENT B	39,368	106		106	0.73	2.92	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 92% spare	OK - Self Cleansing
	CATCHMENT C	34,868	94		200	1.38	5.50	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 85% spare	Low Flow Conditions
	CATCHMENT D	42,026	113		313	2.15	8.61	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 76% spare	OK - Self Cleansing

Number	Descriptor	Area	Estimated no. of lots	Commercial Area (SDC CoP Flow 1 L/s per hectare)	Cumulative Catchment Lot Connections	ASF (L/s)	MF (L/s) (no future densification)	Auto-Sized Pipe Diameter (mm)	Slope (1 in .....m)	Pipe Material (list)	d/D (% full)	Capacity of Pipe at % full Q = V x A (L/s)	Capacity Check (MF vs Q)	V (m/s)	Velocity Check (min 0.6 m/s @ capacity)	Surcharge Check	SCF Velocity Check **References SCF sheet
	CATCHMENT 1-2	80,142	216		216	1.49	5.94	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 51% spare	OK - Self Cleansing
	CATCHMENT 3-5	99,608	269		485	3.33	13.34	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 62% spare	OK - Self Cleansing
	CATCHMENT 6-7	53,804	145		630	4.33	17.33	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 51% spare	OK - Self Cleansing
	CATCHMENT A-B	60,615	998	57,342	1628	16.92	67.70	DN300	1 in 200 m	PVC	80%	75.92	PASS	1.25	OK	OK - 11% spare	OK - Self Cleansing
	CATCHMENT C-D	76,894	207		1835	12.61	50.45	DN300	1 in 200 m	PVC	80%	75.92	PASS	1.25	OK	OK - 34% spare	OK - Self Cleansing
	CATCHMENT a-b	88,445	239		2074	14.26	57.03	DN300	1 in 200 m	PVC	80%	75.92	PASS	1.25	OK	OK - 25% spare	OK - Self Cleansing

Notes on Lot number determination.
1. Lot numbers are calculated based on available areas per section
   1.a. Medium Density lots average 370m2
   1.b. High Density lots average 340m3
2. Commercial flows are expressed in Residential Connection Equivalents (RCE) calculated from SDC CoP Flow 1 L/s per hectare, and 0.00687L/s average flow

Pipe Hydraulic Capacity Check - Colebrook-White Hydraulic Calculation

Project:	16521 - Rolleston West Subdivision - Holmes Block
Calculation Description:	Gravity Reticulation capacity check using Colebrook White

	Name	Date:
Designed By	BTH	1/06/2026
Checked By	-	##/06/2026
Reviewed By	-	

References:
NZS4404-2010
CPAA "A Rational Approach to the Hydraulic Design of Pipe Conduits (Technical Brief)"
CPAA "Hydraulics of Precast Concrete Conduits (Design Manual)"

Instructions

Note 1: Input Values in Blue fields
Note 2: Black text fields are calculated. Do not change.
Note 3: This spreadsheet provides a means to check the available capacity for multiple gravity pipes across the project site.
Note 4: Calculations have been verified/confirmed when compared Concrete Pipes Association Target Values

NZS4404 - Minimum WW Grades (Council)

DN (mm)	Min Slope %	Grade (1 in)
150	0.006	182
225	0.003	303
300	0.003	400

SDC CoP - Section 6: Wastewater Reticulation

Table 2 - Minimum gravity pipeline gradients

	Diameter (mm)	Unflushed Grade	Minimum number of houses above reduced Gradient
Public	150	1:160	≤ 5
Public	150	1:200	> 5

SDC Manhole Spacing

Manhole spacing should be as follows:

Holmes Catchment Plan



Pipe Hydraulic Self Cleansing Flow Check - Colebrook-White Hydraulic Calculation

Project:	16521 - Rolleston West Subdivision - Holmes Block
Calculation Description:	Gravity Reticulation SCF check using Colebrook White

	Name	Date:
Designed By	BTH	1/06/2026
Checked By	-	##/06/2026
Reviewed By	-	

References:
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Note 3: This spreadsheet provides a means to check the available capacity for multiple gravity pipes across the project site.
Note 4: Calculations have been verified/confirmed when compared Concrete Pipes Association Target Values

Type of system	Wastewater	Defines the available Roughness 'Ks' values for the Colebrook-White calculations. See reference table to right
Design Temp	10 C	
percentage full	80%	**note that system capacity will actually be achieved at 82% pipe fullness (allows for pocket of air)
vk (m2.s-1)	1.32E-06	m2.s-1 (kinematic viscosity of water is 1.3mm2/s at 10deg Celsius)
g (m.s-2)	9.810	Gravity constant

Velocity 'V' Calculated using the Colebrook-White Equation:

$$v = -2 \cdot \sqrt{(2 \cdot g \cdot D_h \cdot S)} \cdot \log_{10}\left(\frac{k_s}{3.71 \cdot D_h} + \frac{2.51 \cdot v_k}{D_h \cdot \sqrt{(2 \cdot g \cdot D_h \cdot S)}}\right)$$

Roughness Coefficient Reference Table:

Pipe Material	Typical values for Ks (mm) Circular Pipes NZS4404-2010 Table 5.2 Wastewater	NZS4404-2010 Table 4.2 Stormwater
PVC	0.600	0.015
PE or epoxy lining	0.600	0.015
Vitreous Clay	1.000	0.600
Spun Concrete to AS/NZS 4058	1.500	0.150
GRP (Glass Reinforced Plastic)	0.600	0.015
PP	0.600	0.015

NZS4404 - Minimum WW Grades (Council)

DN (mm)	Min Slope %	Grade (1 in)
150	0.55%	182
225	0.33%	303
300	0.25%	400

Table 5.2 – Guide to roughness coefficients for gravity sewer lines

Material	Colebrook-White coefficient k (mm)	Manning roughness coefficient (n)
VC	1.0	0.012
PVC	0.6	0.011
PE	0.6	0.009 – 0.011
GRP	0.6	0.011
Concrete machine made to AS/NZS 4058	1.5	0.012
PE or epoxy lining	0.6	0.011
PP	0.6	0.009 – 0.011

NOTE –
(1) These values take into account possible effects of rubber ring joints, slime, and debris.
(2) The k and k values apply for pipes up to DN 300.
(3) For further guidance refer to WSA 02:1999 table 2.4, AS 2200 table 2, Plastics pipes for water supply and sewage disposal (Lamont), Multiradius: Hydraulic data and formulae (Lamont), or the Handbook of PVC pipe (Uni-Bell).

SDC CoP - Section 6: Wastewater Reticulation

Table 2 - Minimum gravity pipeline gradients

	Diameter (mm)	Unflushed Grade	Minimum number of houses above reduced Gradient
Public	150	1:160	≤ 5
Public	150	1:200	> 5

SDC Manhole Spacing
Manhole spacing should be as follows:
o 150mm – 225mm diameter mains maximum spacing of 100m
o 300mm – 900mm diameter mains maximum spacing of 120m

Self Cleansing Velocity Checks at upper reaches:

Where Self-cleansing velocities are not achieved within the uppermost reaches of the network, these are due to low contributing flows from terminal upstream catchments.

These upstream branches are located at the end of roads such as a cul-de-sac, with no further development potential, and therefore will remain low-flow sections under ultimate development conditions.

Minimum pipe sizes (DN150) and grading constraints limit the ability to achieve self-cleansing velocities in these locations. This condition is typical of terminal branches in residential subdivisions and is accepted practice.

The design mitigates potential sedimentation risk by:
- limiting the length of low-flow upstream pipes
- maintaining consistent grades with no sags or flat sections
- providing appropriate access via manholes for maintenance and flushing if required

Self-cleansing conditions are achieved further downstream within the network where sufficient contributing catchment exists.

Enter the Lot Schedule here, where cells are blue. | Manually enter in Commercial Areas in this column | Calculated Fields | These values reference Step 1 CW Capacity Check. DO NOT CHANGE VALUES HERE ** Make sure this reference is correct | Calculated Fields

Number	Descriptor	Area	Estimated no. of lots	Commercial Area (SDC CoP Flow 1 L/s per hectare)	Catchment Lot Connections (assess each catchment individually)	ASF (L/s)	SCF (L/s)	Pipe Internal Diameter (mm) **(refers Capacity sheet)	Slope (1 in .....m) **(refers Capacity sheet)	Pipe Material (list) **(refers Capacity sheet)	Q = V x A (L/s) (Est. to SCF)	d/D at SCF (%)	V (m/s)	SCF Velocity Check (≥0.6m/s)	Tractive Force (N/m²) τ = ρ x g x Rh x S	Tractive Force Check (≥1.0 N/m²)
	BURNHAM SCHOOL RD EAST	10,058	27		27	0.19	0.46	DN225	1 in 280 m	PVC	0.55	9%	0.29	Low Flow Conditions	0.47	Low Flow
	BURNHAM SCHOOL RD WEST	18,593	50		50	0.34	0.86	DN225	1 in 150 m	PVC	1.04	11%	0.45	Low Flow Conditions	1.01	OK
	CATCHMENT 1	40,428	109		109	0.75	1.87	DN150	1 in 200 m	PVC	4.42	41%	0.64	OK - Self Cleansing	1.61	OK
	CATCHMENT 2	39,714	107		107	0.74	1.84	DN150	1 in 200 m	PVC	4.38	41%	0.64	OK - Self Cleansing	1.60	OK
	CATCHMENT 3	32,938	89		89	0.61	1.53	DN150	1 in 200 m	PVC	3.94	39%	0.62	OK - Self Cleansing	1.54	OK
	CATCHMENT 4	19,857	53		53	0.36	0.91	DN150	1 in 200 m	PVC	2.97	33%	0.58	Low Flow Conditions	1.37	OK
	CATCHMENT 5	23,407	63		63	0.43	1.08	DN150	1 in 200 m	PVC	3.25	35%	0.59	Low Flow Conditions	1.42	OK
	CATCHMENT 6	31,443	84		84	0.58	1.44	DN150	1 in 200 m	PVC	3.81	38%	0.62	OK - Self Cleansing	1.52	OK
	CATCHMENT 7	22,361	60		60	0.41	1.03	DN150	1 in 200 m	PVC	3.17	34%	0.59	Low Flow Conditions	1.41	OK
	CATCHMENT a	43,185	116		116	0.80	1.99	DN225	1 in 300 m	PVC	6.79	32%	0.61	OK - Self Cleansing	1.34	OK
	CATCHMENT b	45,260	122		122	0.84	2.10	DN225	1 in 200 m	PVC	7.72	31%	0.73	OK - Self Cleansing	1.95	OK
	CATCHMENT A	21,248	892	57,342	892	11.86	29.66	DN225	1 in 200 m	PVC	32.97	75%	1.04	OK - Self Cleansing	3.33	OK
	CATCHMENT B	39,368	106		106	0.73	1.82	DN225	1 in 200 m	PVC	7.19	30%	0.72	OK - Self Cleansing	1.89	OK
	CATCHMENT C	34,868	94		94	0.65	1.62	DN225	1 in 200 m	PVC	2.03	16%	0.49	Low Flow Conditions	1.09	OK
	CATCHMENT D	42,026	113		207	1.42	3.56	DN225	1 in 200 m	PVC	10.20	36%	0.79	OK - Self Cleansing	2.19	OK

Number	Descriptor	Area	Estimated no. of lots	Commercial Area (SDC CoP Flow 1 L/s per hectare)	Cumulative Catchment Lot Connections	ASF (L/s)	SCF (L/s)	Pipe Internal Diameter (mm) **(refers Capacity sheet)	Slope (1 in .....m) **(refers Capacity sheet)	Pipe Material (list) **(refers Capacity sheet)	Q = V x A (L/s) (Est. to SCF)	d/D at SCF (%)	V (m/s)	SCF Velocity Check (≥0.6m/s)	Tractive Force (N/m²)	Tractive Force Check (≥1.0 N/m²)
	CATCHMENT 1-2	80,142	216		216	1.49	3.71	DN150	1 in 200 m	PVC	6.58	52%	0.71	OK - Self Cleansing	1.88	OK
	CATCHMENT 3-5	99,608	269		485	3.33	8.34	DN225	1 in 200 m	PVC	16.55	47%	0.90	OK - Self Cleansing	2.66	OK
	CATCHMENT 6-7	53,804	145		630	4.33	10.83	DN225	1 in 200 m	PVC	19.26	52%	0.93	OK - Self Cleansing	2.82	OK
	CATCHMENT A-B	60,615	1,018	58,752	1648	17.21	43.02	DN300	1 in 200 m	PVC	58.26	65%	1.21	OK - Self Cleansing	4.23	OK
	CATCHMENT C-D	76,894	207		1855	12.75	31.89	DN300	1 in 200 m	PVC	49.48	58%	1.17	OK - Self Cleansing	4.01	OK
	CATCHMENT a-b	88,445	239		2094	14.40	35.99	DN300	1 in 200 m	PVC	52.92	60%	1.18	OK - Self Cleansing	4.10	OK

Notes on Lot number determination.
1. Lot numbers are calculated based on available areas per section
1.a. Medium Density lots average 370m2
1.b. High Density lots average 340m3
2. Commercial flows are expressed in Residential Connection Equivalents (RCE) calculated from SDC CoP Flow 1 L/s per hectare, and 0.00687L/s average flow

Pipe Hydraulic Self Cleansing Flow Check - Colebrook-White Hydraulic Calculation

Project:	16521 - Rolleston West Subdivision - Holmes Block
Calculation Description:	Gravity Reticulation SCF check using Colebrook White

	Name	Date:
Designed By	BTH	1/06/2026
Checked By	-	##/06/2026
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References:

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SDC CoP - Section 6: Wastewater Reticulation

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SDC Manhole Spacing

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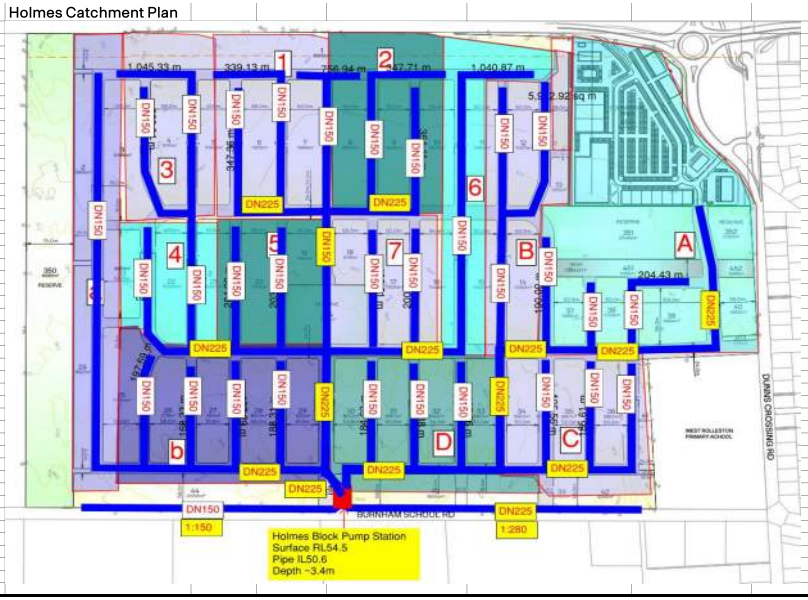
Holmes Catchment Plan



Pipe Hydraulic Capacity Check - Colebrook-White Hydraulic Calculation

Project: 16521 - Rolleston West Subdivision - Brookside to Skellerup South Blocks

Calculation Description: Gravity Reticulation capacity check using Colebrook White

	Name	Date:
Designed By	BTH	1/06/2026
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References:
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NOTE –
(1) These values take into account possible effects of rubber ring joints, slime, and debris.
(2) The n and k values apply for pipes up to DN 300.
(3) For further guidance refer to WSA 02:1999 table 2.4, AS 2200 table 2, Plastics pipes for water supply and sewage disposal (Lamson), Reticulation; Hydraulic data and formulae (Lamont), or the Handbook of PVC pipe (Uni-Bell).

SDC CoP - Section 6: Wastewater Reticulation

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** Make sure this reference is correct

Enter the Lot Schedule here, where cells are blue.				Manually enter in Commercial Areas in this column	Calculated Fields			Enter in pipe parameters here where cells are blue.			Calculated Fields					
Number	Descriptor	Area	Estimated no. of lots	Commercial Area (SDC CoP Flow 1 L/s per hectare)	Catchment Lot Connections (assess each catchment individually)	ASF (L/s)	MF (L/s) (no future densification)	Auto-Sized Pipe Diameter (mm)	Slope (1 in .....m)	Pipe Material (list)	d/D (% full)	Capacity of Pipe at % full Q = V x A (L/s)	Capacity Check (MF vs Q)	V (m/s)	Velocity Check (min 0.6 m/s @ capacity)	Surcharge Check	SCF Velocity Check **References SCF sheet
EAST TRUNK																	
1		70,044	464	18,871	464	3.19	12.75	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 64% spare	OK - Self Cleansing
2		47,715	128		128	0.88	3.52	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 71% spare	OK - Self Cleansing
3		62,992	170		170	1.17	4.68	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 61% spare	OK - Self Cleansing
4		122,230	330		330	2.27	9.08	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 25% spare	OK - Self Cleansing
5		55,379	149		149	1.02	4.10	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 66% spare	OK - Self Cleansing
6		27,181	73		73	0.50	2.01	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 83% spare	OK - Self Cleansing
7		39,921	107		107	0.74	2.94	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 76% spare	OK - Self Cleansing
8		38,270	103		103	0.71	2.83	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 77% spare	OK - Self Cleansing
9		48,943	132		132	0.91	3.63	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 70% spare	OK - Self Cleansing
WEST TRUNK																	
A		109,550	296		296	2.04	8.14	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 33% spare	OK - Self Cleansing
B		38,964	105		105	0.72	2.89	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 76% spare	OK - Self Cleansing
C		116,362	314		314	2.16	8.64	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 29% spare	OK - Self Cleansing
D		46,369	125		125	0.86	3.44	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 72% spare	OK - Self Cleansing
a		78,915	213		213	1.46	5.86	DN150	1 in 200 m	PVC	80%	12.13	PASS	0.80	OK	OK - 52% spare	OK - Self Cleansing
b		79,892	297	5,619	510	3.50	14.02	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 61% spare	OK - Self Cleansing
c		43,696	118		628	4.32	17.26	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 51% spare	OK - Self Cleansing
d		49,762	134		762	5.24	20.95	DN225	1 in 300 m	PVC	80%	28.90	PASS	0.85	OK	OK - 28% spare	OK - Self Cleansing
e		75,645	204		204	1.40	5.61	DN225	1 in 300 m	PVC	80%	28.90	PASS	0.85	OK	OK - 81% spare	OK - Self Cleansing
f		68,939	186		186	1.28	5.12	DN225	1 in 300 m	PVC	80%	28.90	PASS	0.85	OK	OK - 82% spare	OK - Self Cleansing

Pipe Hydraulic Capacity Check - Colebrook-White Hydraulic Calculation

Project: 16521 - Rolleston West Subdivision - Brookside to Skellerup South Blocks

Calculation Description: Gravity Reticulation capacity check using Colebrook White

	Name	Date:
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SDC CoP - Section 6: Wastewater Reticulation

Table 2 - Minimum gravity pipeline gradients

	Diameter (mm)	Unflushed Grade	Minimum number of houses above reduced Gradient
Public	150	1:160	≤ 5
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SDC Manhole Spacing
Manhole spacing should be as follows:

Number	Descriptor	Area	Estimated no. of lots	Commercial Area (SDC CoP Flow 1 L/s per hectare)	Cumulative Catchment Lot Connections	ASF (L/s)	MF (L/s) (no future densification)	Auto-Sized Pipe Diameter (mm)	Slope (1 in .....m)	Pipe Material (list)	d/D (% full)	Capacity of Pipe at % full Q = V x A (L/s)	Capacity Check (MF vs Q)	V (m/s)	Velocity Check (min 0.6 m/s @ capacity)	Surcharge Check	SCF Velocity Check **References SCF sheet
EAST TRUNK																	
1		70,044	464	18,871	464	3.19	12.75	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 64% spare	OK - Self Cleansing
2		47,715	128		592	4.07	16.27	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 54% spare	OK - Self Cleansing
3		62,992	170		762	5.24	20.95	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 41% spare	OK - Self Cleansing
4		122,230	330		1092	7.51	30.02	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 15% spare	OK - Self Cleansing
5		55,379	149		1241	8.53	34.12	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 4% spare	OK - Self Cleansing
6		27,181	73		1314	9.03	36.13	DN300	1 in 200 m	PVC	80%	75.92	PASS	1.25	OK	OK - 52% spare	OK - Self Cleansing
7		39,921	107		1421	9.77	39.07	DN300	1 in 200 m	PVC	80%	75.92	PASS	1.25	OK	OK - 49% spare	OK - Self Cleansing
8		38,270	103		1524	10.48	41.90	DN300	1 in 200 m	PVC	80%	75.92	PASS	1.25	OK	OK - 45% spare	OK - Self Cleansing
9		48,943	132		1656	11.38	45.53	DN300	1 in 200 m	PVC	80%	75.92	PASS	1.25	OK	OK - 40% spare	OK - Self Cleansing
WEST TRUNK																	
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B		38,964	105		401	2.76	11.03	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 69% spare	OK - Self Cleansing
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D		46,369	125		840	5.78	23.10	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 35% spare	OK - Self Cleansing
a		78,915	213		1053	7.24	28.96	DN225	1 in 200 m	PVC	80%	35.51	PASS	1.04	OK	OK - 18% spare	OK - Self Cleansing
b		79,892	297	5,619	1350	9.28	37.12	DN300	1 in 200 m	PVC	80%	75.92	PASS	1.25	OK	OK - 51% spare	OK - Self Cleansing
c		43,696	118		1468	10.09	40.36	DN300	1 in 300 m	PVC	80%	61.81	PASS	1.02	OK	OK - 35% spare	OK - Self Cleansing
d		49,762	134		1602	11.01	44.05	DN300	1 in 300 m	PVC	80%	61.81	PASS	1.02	OK	OK - 29% spare	OK - Self Cleansing
e		75,645	204		1806	12.41	49.66	DN300	1 in 300 m	PVC	80%	61.81	PASS	1.02	OK	OK - 20% spare	OK - Self Cleansing
f		68,939	186		1992	13.69	54.77	DN300	1 in 300 m	PVC	80%	61.81	PASS	1.02	OK	OK - 11% spare	OK - Self Cleansing
EAST + WEST to PS					3692	25.39	101.54	DN375	1 in 300 m	PVC	80%	111.33	PASS	1.18	OK	OK - 9% spare	OK - Self Cleansing

Notes on Lot number determination.
1. Lot numbers are calculated based on available areas per section
   1.a. Medium Density lots average 370m2
   1.b. High Density lots average 340m3
2. Commercial flows are expressed in Residential Connection Equivalents (RCE) calculated from SDC CoP Flow 1 L/s per hectare, and 0.00687L/s average flow

Pipe Hydraulic Capacity Check - Colebrook-White Hydraulic Calculation

Project:	16521 - Rolleston West Subdivision - Brookside to Skellerup South Blocks
Calculation Description:	Gravity Reticulation capacity check using Colebrook White

	Name	Date:
Designed By	BTH	1/06/2026
Checked By	-	##/06/2026
Reviewed By	-	

References:
NZS4404-2010
CPAA "A Rational Approach to the Hydraulic Design of Pipe Conduits (Technical Brief)"
CPAA "Hydraulics of Precast Concrete Conduits (Design Manual)"

Instructions
Note 1: Input Values in Blue fields
Note 2: Black text fields are calculated. Do not change.
Note 3: This spreadsheet provides a means to check the available capacity for multiple gravity pipes across the project site.
Note 4: Calculations have been verified/confirmed when compared Concrete Pipes Association Target Values

NZS4404 - Minimum WW Grades (Council)

DN (mm)	Min Slope %	Grade (1 in)
150	0.006	182
225	0.003	303
300	0.003	400

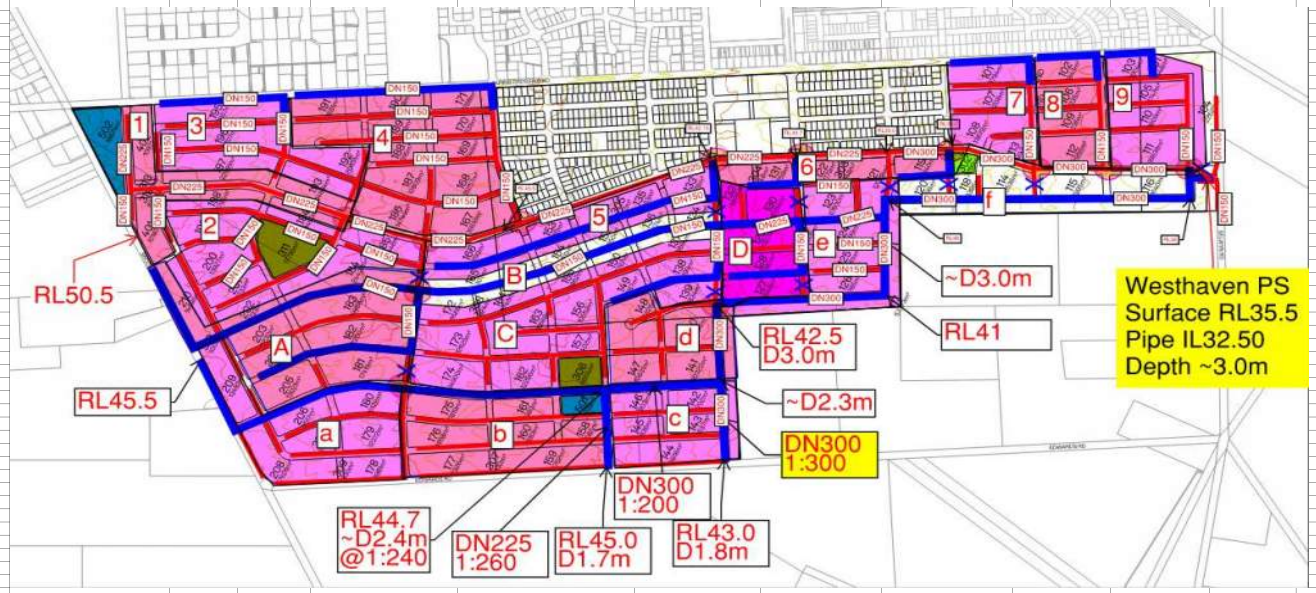
SDC CoP - Section 6: Wastewater Reticulation

Table 2 - Minimum gravity pipeline gradients

	Diameter (mm)	Unflushed Grade	Minimum number of houses above reduced Gradient
Public	150	1:160	≤ 5
Public	150	1:200	> 5

SDC Manhole Spacing
Manhole spacing should be as follows:

Westhaven South Catchment Plan



Pipe Hydraulic Self Cleansing Flow Check - Colebrook-White Hydraulic Calculation

Project:	16521 - Rolleston West Subdivision - Brookside to Skellerup South Blocks
Calculation Description:	Gravity Reticulation SCF check using Colebrook White

	Name	Date:
Designed By	BTH	1/06/2026
Checked By	-	##/06/2026
Reviewed By	-	

References:
NZS4404-2010
CPAA "A Rational Approach to the Hydraulic Design of Pipe Conduits (Technical Brief)"
CPAA "Hydraulics of Precast Concrete Conduits (Design Manual)"

Instructions
Note 1: Input Values in Blue fields
Note 2: Black text fields are calculated. Do not change.
Note 3: This spreadsheet provides a means to check the available capacity for multiple gravity pipes across the project site.
Note 4: Calculations have been verified/confirmed when compared Concrete Pipes Association Target Values

Type of system	Wastewater	Defines the available Roughness 'Ks' values for the Colebrook-White calculations. See reference table to right
Design Temp	10 C	
percentage full	80%	**note that system capacity will actually be achieved at 82% pipe fullness (allows for pocket of air)
vk (m2.s-1)	1.32E-06	m2.s-1 (kinematic viscosity of water is 1.3mm2/s at 10deg Celsius)
g (m.s-2)	9.810	Gravity constant

Velocity 'V' Calculated using the Colebrook-White Equation:

$$v = -2 \cdot \sqrt{(2 \cdot g \cdot D_h \cdot S)} \cdot \log_{10}\left(\frac{k_s}{3.71 \cdot D_h} + \frac{2.51 \cdot \nu_k}{D_h \cdot \sqrt{(2 \cdot g \cdot D_h \cdot S)}}\right)$$

Roughness Coefficient Reference Table:

Pipe Material	Typical values for Ks (mm) Circular Pipes: NZS4404-2010 Table 5.2 Wastewater	NZS4404-2010 Table 4.2 Stormwater
PVC	0.600	0.015
PE or epoxy lining	0.600	0.015
Vitreous Clay	1.000	0.600
Spun Concrete to AS/NZS 4058	1.500	0.150
GRP (Glass Reinforced Plastic)	0.600	0.015
PP	0.600	0.015

NZS4404 - Minimum WW Grades (Council)

DN (mm)	Min Slope %	Grade (1 in)
150	0.006	182
225	0.003	303
300	0.003	400

Table 5.2 – Guide to roughness coefficients for gravity sewer lines

Material	Colebrook-White coefficient k (mm)	Manning roughness coefficient (n)
VC	1.0	0.012
PVC	0.6	0.011
PE	0.6	0.009 – 0.011
GRP	0.6	0.011
Concrete machine made to AS/NZS 4058	1.5	0.012
PE or epoxy lining	0.6	0.011
PP	0.6	0.009 – 0.011

NOTE –
(1) These values take into account possible effects of rubber ring joints, slime, and debris.
(2) The n and k values apply for pipes up to DN 300.
(3) For further guidance refer to WSA 02:1999 table 2.4, AS 2200 table 2, Plastics pipes for water supply and sewage disposal (Janson), Matrication: Hydraulic data and formulae (Lamont), or the Handbook of PVC pipe (Uni-Bell).

SDC CoP - Section 6: Wastewater Reticulation

Table 2 - Minimum gravity pipeline gradients

	Diameter (mm)	Unflushed Grade	Minimum number of houses above reduced Gradient
Public	150	1:160	≤ 5
Public	150	1:200	> 5

SDC Manhole Spacing
Manhole spacing should be as follows:
o 150mm – 225mm diameter mains maximum spacing of 100m
o 300mm – 900mm diameter mains maximum spacing of 120m

Self Cleansing Velocity Checks at upper reaches:

Where Self-cleansing velocities are not achieved within the uppermost reaches of the network, these are due to low contributing flows from terminal upstream catchments.

These upstream branches are located at the end of roads such as a cul-de-sac, with no further development potential, and therefore will remain low-flow sections under ultimate development conditions.

Minimum pipe sizes (DN150) and grading constraints limit the ability to achieve self-cleansing velocities in these locations. This condition is typical of terminal branches in residential subdivisions and is accepted practice.

The design mitigates potential sedimentation risk by:
- limiting the length of low-flow upstream pipes
- maintaining consistent grades with no sags or flat sections
- providing appropriate access via manholes for maintenance and flushing if required

Self-cleansing conditions are achieved further downstream within the network where sufficient contributing catchment exists.

Enter the Lot Schedule here, where cells are blue.	Manually enter in Commercial Areas in this column	Calculated Fields	These values reference Step 1 CW Capacity Check. DO NOT CHANGE VALUES HERE ** Make sure this reference is correct	Calculated Fields

Number	Descriptor	Area	Estimated no. of lots	Commercial Area (SDC CoP Flow 1 L/s per hectare)	Catchment Lot Connections (assess each catchment individually)	ASF (L/s)	SCF (L/s)	Pipe Internal Diameter (mm) **(refers Capacity sheet)	Slope (1 in ....m) **(refers Capacity sheet)	Pipe Material (list) **(refers Capacity sheet)	Q = V x A (L/s) (Est. to SCF)	d/D at SCF (%)	V (m/s)	SCF Velocity Check (min 0.6 m/s)	Tractive Force (N/m^2) $\tau = \rho \times g \times Rh \times S$	Tractive Force Check (≥1.0 N/m^2)
EAST TRUNK																
1		70,044	464	18,871	464	3.19	7.97	DN225	1 in 200 m	PVC	16.12	47%	0.89	OK - Self Cleansing	2.63	OK
2		47,715	128		592	4.07	10.17	DN150	1 in 200 m	PVC	11.28	75%	0.80	OK - Self Cleansing	2.22	OK
3		62,992	170		762	5.24	13.09	DN150	1 in 200 m	PVC	12.41	82%	0.80	OK - Self Cleansing	2.24	OK
4		122,230	330		1092	7.51	18.76	DN150	1 in 200 m	PVC	12.41	82%	0.80	OK - Self Cleansing	2.24	OK
5		55,379	149		1241	8.53	21.32	DN150	1 in 200 m	PVC	12.41	82%	0.80	OK - Self Cleansing	2.24	OK
6		27,181	73		1314	9.03	22.58	DN150	1 in 200 m	PVC	12.41	82%	0.80	OK - Self Cleansing	2.24	OK
7		39,921	107		1421	9.77	24.42	DN150	1 in 200 m	PVC	12.41	82%	0.80	OK - Self Cleansing	2.24	OK
8		38,270	103		1524	10.48	26.19	DN150	1 in 200 m	PVC	12.41	82%	0.80	OK - Self Cleansing	2.24	OK
9		48,943	132		1656	11.38	28.46	DN150	1 in 200 m	PVC	12.41	82%	0.80	OK - Self Cleansing	2.24	OK
WEST TRUNK																
A		109,550	296		296	2.04	5.09	DN150	1 in 200 m	PVC	7.88	58%	0.74	OK - Self Cleansing	2.00	OK
B		38,964	105		401	2.76	6.89	DN150	1 in 200 m	PVC	9.31	65%	0.77	OK - Self Cleansing	2.11	OK
C		116,362	314		715	4.92	12.29	DN150	1 in 200 m	PVC	12.19	80%	0.80	OK - Self Cleansing	2.24	OK
D		46,369	125		840	5.78	14.44	DN150	1 in 200 m	PVC	12.41	82%	0.80	OK - Self Cleansing	2.24	OK
a		78,915	213		1053	7.24	18.10	DN150	1 in 200 m	PVC	12.41	82%	0.80	OK - Self Cleansing	2.24	OK
b		79,892	297	5,619	1350	9.28	23.20	DN225	1 in 200 m	PVC	29.32	68%	1.02	OK - Self Cleansing	3.24	OK
c		43,696	118		1468	10.09	25.23	DN225	1 in 200 m	PVC	30.57	70%	1.02	OK - Self Cleansing	3.27	OK
d		49,762	134		1602	11.01	27.53	DN225	1 in 300 m	PVC	28.36	79%	0.85	OK - Self Cleansing	2.24	OK
e		75,645	204		1806	12.41	31.04	DN225	1 in 300 m	PVC	29.58	82%	0.85	OK - Self Cleansing	2.24	OK
f		68,939	186		1992	13.69	34.23	DN225	1 in 300 m	PVC	29.58	82%	0.85	OK - Self Cleansing	2.24	OK

Pipe Hydraulic Self Cleansing Flow Check - Colebrook-White Hydraulic Calculation

Project: 16521 - Rolleston West Subdivision - Brookside to Skellerup South Blocks

Calculation Description: Gravity Reticulation SCF check using Colebrook White

	Name	Date:
Designed By	BTH	1/06/2026
Checked By	-	##/06/2026
Reviewed By	-	

References:
NZS4404-2010
CPAA "A Rational Approach to the Hydraulic Design of Pipe Conduits (Technical Brief)"
CPAA "Hydraulics of Precast Concrete Conduits (Design Manual)"

Instructions
Note 1: Input Values in Blue fields
Note 2: Black text fields are calculated. Do not change.
Note 3: This spreadsheet provides a means to check the available capacity for multiple gravity pipes across the project site.
Note 4: Calculations have been verified/confirmed when compared Concrete Pipes Association Target Values

NZS4404 - Minimum WW Grades (Council)

DN (mm)	Min Slope %	Grade (1 in)
150	0.006	182
225	0.003	303
300	0.003	400

SDC CoP - Section 6: Wastewater Reticulation

Table 2 - Minimum gravity pipeline gradients

	Diameter (mm)	Unflushed Grade	Minimum number of houses above reduced Gradient
Public	150	1:160	≤ 5
Public	150	1:200	> 5

SDC Manhole Spacing
Manhole spacing should be as follows:

Number	Descriptor	Area	Estimated no. of lots	Commercial Area (SDC CoP Flow 1 L/s per hectare)	Cumulative Catchment Lot Connections	ASF (L/s)	SCF (L/s)	Pipe Internal Diameter (mm) **(refers Capacity sheet)	Slope (1 in .....m) **(refers Capacity sheet)	Pipe Material (list) **(refers Capacity sheet)	Q = V x A (L/s) (Est. to SCF)	d/D at SCF (%)	V (m/s)	SCF Velocity Check (≥0.6m/s)	Tractive Force (N/m²)	Tractive Force Check (≥1.0 N/m²)
EAST TRUNK																
1		70,044	464	18,871	464	3.19	7.97	DN225	1 in 200 m	PVC	16.12	47%	0.89	OK - Self Cleansing	2.63	OK
2		47,715	128		592	4.07	10.17	DN225	1 in 200 m	PVC	18.57	51%	0.92	OK - Self Cleansing	2.78	OK
3		62,992	170		762	5.24	13.09	DN300	1 in 200 m	PVC	29.66	43%	1.03	OK - Self Cleansing	3.30	OK
4		122,230	330		1092	7.51	18.76	DN300	1 in 200 m	PVC	36.51	48%	1.09	OK - Self Cleansing	3.59	OK
5		55,379	149		1241	8.53	21.32	DN300	1 in 200 m	PVC	39.32	50%	1.11	OK - Self Cleansing	3.69	OK
6		27,181	73		1314	9.03	22.58	DN300	1 in 200 m	PVC	40.64	51%	1.12	OK - Self Cleansing	3.73	OK
7		39,921	107		1421	9.77	24.42	DN225	1 in 200 m	PVC	30.08	69%	1.02	OK - Self Cleansing	3.26	OK
8		38,270	103		1524	10.48	26.19	DN225	1 in 200 m	PVC	31.13	71%	1.03	OK - Self Cleansing	3.29	OK
9		48,943	132		1656	11.38	28.46	DN225	1 in 200 m	PVC	32.36	74%	1.03	OK - Self Cleansing	3.31	OK
WEST TRUNK																
A		109,550	296		296	2.04	5.09	DN225	1 in 200 m	PVC	12.45	40%	0.83	OK - Self Cleansing	2.37	OK
B		38,964	105		401	2.76	6.89	DN225	1 in 200 m	PVC	14.82	44%	0.87	OK - Self Cleansing	2.55	OK
C		116,362	314		715	4.92	12.29	DN225	1 in 200 m	PVC	20.72	54%	0.95	OK - Self Cleansing	2.89	OK
D		46,369	125		840	5.78	14.44	DN225	1 in 200 m	PVC	22.71	57%	0.97	OK - Self Cleansing	2.99	OK
a		78,915	213		1053	7.24	18.10	DN225	1 in 200 m	PVC	25.74	62%	0.99	OK - Self Cleansing	3.12	OK
b		79,892	297	5,619	1350	9.28	23.20	DN300	1 in 200 m	PVC	41.28	52%	1.12	OK - Self Cleansing	3.76	OK
c		43,696	118		1468	10.09	25.23	DN300	1 in 300 m	PVC	39.63	57%	0.95	OK - Self Cleansing	2.66	OK
d		49,762	134		1602	11.01	27.53	DN300	1 in 300 m	PVC	41.62	59%	0.96	OK - Self Cleansing	2.70	OK
e		75,645	204		1806	12.41	31.04	DN300	1 in 300 m	PVC	44.45	62%	0.97	OK - Self Cleansing	2.76	OK
f		68,939	186		1992	13.69	34.23	DN300	1 in 300 m	PVC	46.86	64%	0.98	OK - Self Cleansing	2.81	OK
COMBINED																
EAST + WEST to PS		-	-		3692	25.39	63.46	DN375	1 in 300 m	PVC	85.72	65%	1.13	OK - Self Cleansing	3.53	OK

Notes on Lot number determination.
1. Lot numbers are calculated based on available areas per section
   1.a. Medium Density lots average 370m2
   1.b. High Density lots average 340m3
2. Commercial flows are expressed in Residential Connection Equivalents (RCE) calculated from SDC CoP Flow 1 L/s per hectare, and 0.00687L/s average flow

Pipe Hydraulic Self Cleansing Flow Check - Colebrook-White Hydraulic Calculation

Project:	16521 - Rolleston West Subdivision - Brookside to Skellerup South Blocks
Calculation Description:	Gravity Reticulation SCF check using Colebrook White

	Name	Date:
Designed By	BTH	1/06/2026
Checked By	-	##/06/2026
Reviewed By	-	

References:
NZS4404-2010
CPAA "A Rational Approach to the Hydraulic Design of Pipe Conduits (Technical Brief)"
CPAA "Hydraulics of Precast Concrete Conduits (Design Manual)"

Instructions

Note 1: Input Values in Blue fields
Note 2: Black text fields are calculated. Do not change.
Note 3: This spreadsheet provides a means to check the available capacity for multiple gravity pipes across the project site.
Note 4: Calculations have been verified/confirmed when compared Concrete Pipes Association Target Values

NZS4404 - Minimum WW Grades (Council)

DN (mm)	Min Slope %	Grade (1 in)
150	0.006	182
225	0.003	303
300	0.003	400

SDC CoP - Section 6: Wastewater Reticulation

Table 2 - Minimum gravity pipeline gradients

	Diameter (mm)	Unflushed Grade	Minimum number of houses above reduced Gradient
Public	150	1:160	≤ 5
Public	150	1:200	> 5

SDC Manhole Spacing
Manhole spacing should be as follows:

Westhaven South Catchment Plan



Pipe Hydraulic Flow - Mannings Hydraulic Calculation for pipe flow

Project:	Enter project # and name
Calculation Description:	Gravity Reticulation capacity check using Mannings Equation

	Name	Date:
Designed By	BTH	1/05/2024
Checked By	BTH	1/05/2024
Reviewed By		2/05/2024

References:
NZS4404-2010
CPAA "A Rational Approach to the Hydraulic Design of Pipe Conduits (Technical Brief)"
CPAA "Hydraulics of Precast Concrete Conduits (Design Manual)"

Note 1: Input Values in Blue fields
Note 2: Black text fields are calculated. Do not change.
Note 3: **Yellow fill** is to highlight **RESULT** of Calcs (helps quickly show answer)
Note 4: **This spreadsheet provides a means to check the available capacity of a single gravity pipe.**
Note 5: Calculations have been confirmed when compared Concrete Pipes Association target values

Enter in pipe parameters here:

Stormwater or Sewer flow?	Wastewater	Defines the available Roughness 'Ks' values for the Colebrook-White calculations. See reference table to right
Pipe Material (list):	PVC	Refers to Ref table to right
Internal Diameter (mm):	150.0 mm	**Enter Pipe Internal Diameter (refer Pipe Dimensions sheet)**
Slope (1 in):	160 m	enter given pipe slope here
percentage full	5%	Default Conservative 82% - Refer below table below ****Note that system capacity will actually be achieved at 82% pipe fullness (allows for pocket of air)**

Calculated Values in Meters and Litres:

Internal Diameter (m):	0.150 m	calculation. Do not change these calculated fields
Radius (m):	0.075 m	calculation
S (m/m)	0.00625	Slope shown in m/m. Percentage = 0.63%
Mannings Coefficient n	0.0110	unitless as per NZS4404 (Note NZBC uses 0.013)

V (m/s)	**0.21 m/s**	*RESULT (VLOOKUP based on % full)*	**0.00488**	**Rh (Hydraulic Radius)**	0.950	**Froude**	89%
Q (L/s)	**0.07 L/s**	*RESULT (VLOOKUP based on % full)*					100%
Q (m^3/s)	**0.00 m3/s**	*RESULT (VLOOKUP based on % full)*					

Note that the difference between Colebrook-White and Manning's formula can range from 5% to 30% or more, with Colebrook-White typically predicting higher flow rates and velocities. The exact percentage depends on the pipe roughness, slope, diameter, and flow regime.

Roughness Coefficient Reference Table:

	Typical Mannings Coefficient values (n) Circular Pipes	
	NZS4404-2010 Table 5.2	NZS4404-2010 Table 4.2
Pipe Material	**Wastewater**	**Stormwater**
PVC	0.011	0.009
PE or epoxy lining	0.010	0.009
Vitreous Clay	0.012	0.013
Spun Concrete to AS/NZS 4058	0.012	0.012
GRP (Glass Reinforced Plastic)	0.011	0.009
PP	0.010	0.008
NZBC	*0.013*	*0.013*

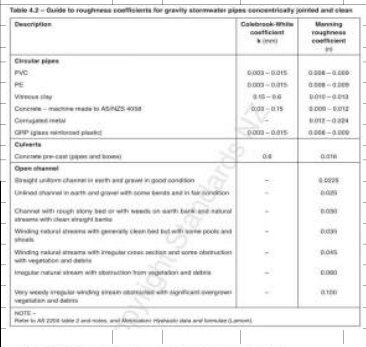


Table 4.2 – Guide to roughness coefficients for gravity stormwater pipes concentrically jointed and clean

Description	Colebrook-White coefficient k (mm)	Manning roughness coefficient (n)
Circular pipes		
PVC	0.003 – 0.015	0.008 – 0.009
PE	0.003 – 0.015	0.008 – 0.009
Vitreous clay	0.15 – 0.6	0.010 – 0.013
Concrete – machine made to AS/NZS 4058	0.03 – 0.15	0.009 – 0.012
Corrugated metal	–	0.012 – 0.024
GRP (glass reinforced plastic)	0.003 – 0.015	0.008 – 0.009
Culverts		
Concrete pre-cast (pipes and boxes)	0.6	0.016
Open channel		
Straight uniform channel in earth and gravel in good condition	–	0.0225
Unlined channel in earth and gravel with some bends and in fair condition	–	0.025
Channel with rough stony bed or with weeds on earth bank and natural streams with clean straight banks	–	0.030
Winding natural streams with generally clean bed but with some pools and shoals	–	0.033
Winding natural streams with irregular cross section and some obstruction with vegetation and debris	–	0.045
Irregular natural stream with obstruction from vegetation and debris	–	0.060
Very weedy irregular winding stream obstructed with significant overgrown vegetation and debris	–	0.100

NOTE –
Refer to AS 2200 table 2 and notes, and *Manning's Hydraulic data and formulae* (Lamont).

Table 5.2 – Guide to roughness coefficients for gravity sewer lines

Material	Colebrook-White coefficient k (mm)	Manning roughness coefficient (n)
VC	1.0	0.012
PVC	0.6	0.011
PE	0.6	0.009 – 0.011
GRP	0.6	0.011
Concrete machine made to AS/NZS 4058	1.5	0.012
PE or epoxy lining	0.6	0.011
PP	0.6	0.009 – 0.011

NOTE –
(1) These values take into account possible effects of rubber ring joints, slime, and debris.
(2) The n and k values apply for pipes up to DN 300.
(3) For further guidance refer to WSA 02:1999 table 2.4, AS 2200 table 2; *Plastics pipes for water supply and sewage disposal* (Jensen), *Manning's Hydraulic data and formulae* (Lamont), or the *Handbook of PVC pipe* (Uni-Bell).

Pipe Hydraulic Flow - Mannings Hydraulic Calculation for pipe flow

Project:	Enter project # and name
Calculation Description:	Gravity Reticulation capacity check using Mannings Equation

	Name	Date:
Designed By	BTH	1/05/2024
Checked By	BTH	1/05/2024
Reviewed By		2/05/2024

References:

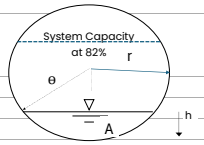
NZS4404-2010

CPAA "A Rational Approach to the Hydraulic Design of Pipe Conduits (Technical Brief)"

CPAA "Hydraulics of Precast Concrete Conduits (Design Manual)"

Note 1: All text on this page is calculated based on values given on page 1

d/D (percentage full)	Q = ($^1/_n$)AR$^{2/3}$S$^{1/2}$ (m3/s)	V=($^1/_n$)R$_h^{2/3}$S$^{1/2}$=Q/A (m/s)	h (m)	θ (Radians)	A (x-section area) (m^2)	P (wetted perimeter)	Rh (Hydraulic Radius)
5%	0.000	0.21	0.0075	0.9021	0.00033	0.07	0.00488
10%	0.000	0.32	0.0150	1.2870	0.00092	0.10	0.00953
15%	0.001	0.42	0.0225	1.5908	0.00166	0.12	0.01393
20%	0.001	0.50	0.0300	1.8546	0.00252	0.14	0.01809
25%	0.002	0.56	0.0375	2.0944	0.00345	0.16	0.02199
30%	0.003	0.62	0.0450	2.3186	0.00446	0.17	0.02564
35%	0.004	0.68	0.0525	2.5322	0.00551	0.19	0.02902
40%	0.005	0.73	0.0600	2.7389	0.00660	0.21	0.03213
45%	0.006	0.77	0.0675	2.9413	0.00771	0.22	0.03496
50%	0.007	0.81	0.0750	3.1416	0.00884	0.24	0.03750
55%	0.008	0.84	0.0675	2.9413	0.00996	0.25	0.03973
60%	0.010	0.86	0.0600	2.7389	0.01107	0.27	0.04165
65%	0.011	0.89	0.0525	2.5322	0.01216	0.28	0.04322
70%	0.012	0.90	0.0450	2.3186	0.01321	0.30	0.04444
75%	0.013	0.91	0.0375	2.0944	0.01422	0.31	0.04525
80%	0.014	0.92	0.0300	1.8546	0.01516	0.33	0.04563
82%	0.014	0.92	0.0270	1.7526	0.01551	0.34	0.04564
83%	0.014	0.92	0.0255	1.7000	0.01568	0.34	0.04561
85%	0.015	0.92	0.0225	1.5908	0.01601	0.35	0.04549
90%	0.015	0.91	0.0150	1.2870	0.01675	0.37	0.04471
95%	0.015	0.88	0.0075	0.9021	0.01734	0.40	0.04297
100%	0.014	0.81	0.0000	0.0000	0.01767	0.47	0.03750



A Word of Caution

Designing pipelines to flow 94% full in order to capture that 7.5% capacity bonus is very tempting but risky and should probably be avoided except in the most controlled environment such as a constant flow feed pipe in an industrial plant. In a public storm or sanitary sewer system, even a slight increase in the quantity of flow above the design flow condition will fill the pipe immediately and push the system into surcharge. By designing for a full pipe on the other hand, the system capacity will actually be achieved when the pipe is only 82% full (see Figure 15) leaving a safety margin of 7.5% and a useful air gap at the top of the pipe.

An air gap at the top of the pipe can often be an important part of a gravity pipeline. For example, full pipes in a sanitary sewer can often block the escape of gas, severely restricting hydraulic capacity and creating undesirable odor control conditions such as splashing, bubbling and "burping" of the venting gas into manholes. This is particularly true when manholes are sealed to prevent the inflow of surface water.

Mannings uses different formulas depending on pipe fullness (+/-50%)

Less than half full flow:

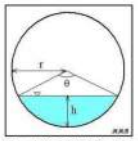


Figure 1. Partially Full Pipe Flow Parameters (Less than Half Full)

$r = \frac{D}{2}$ $\quad h = y$

$\theta = 2 \arccos\left(\frac{r-h}{r}\right)$

$A = \frac{r^2(\theta - \sin\theta)}{2}$

$P = r\theta$

$R_h = A/P$

Greater than half full flow:

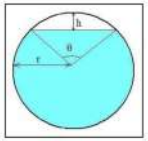


Figure 2. Partially Full Pipe Flow Parameters (more than half full)

$r = D/2$ $\quad h = 2r - y$

$\theta = 2 \arccos\left(\frac{r-h}{r}\right)$

$A = \pi r^2 - \frac{r^2(\theta - \sin\theta)}{2}$

$P = 2\pi r - r\theta$

$R_h = A/P$



Pipe Hydraulic Flow - Mannings Hydraulic Calculation for pipe flow

Project:	Enter project # and name
Calculation Description:	Gravity Reticulation capacity check using Mannings Equation

	Name	**Date:**
Designed By	BTH	1/05/2024
Checked By	BTH	1/05/2024
Reviewed By		2/05/2024

References:

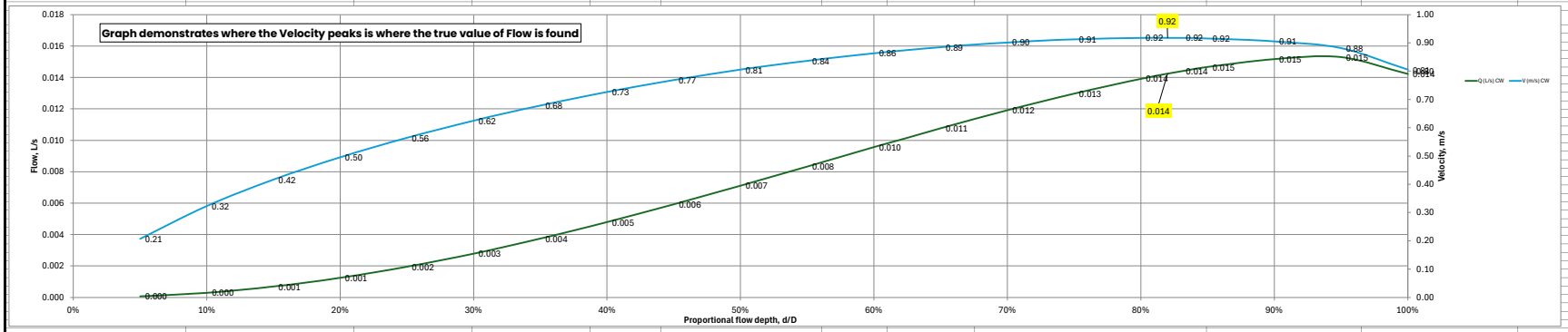
NZS4404-2010

CPAA "A Rational Approach to the Hydraulic Design of Pipe Conduits (Technical Brief)"

CPAA "Hydraulics of Precast Concrete Conduits (Design Manual)"


Table 4.2 – Guide to roughness coefficients for gravity stormwater pipes concentrically jointed and clean

Description	Colebrook-White coefficient k (mm)	Manning roughness coefficient n
Circular pipes		
PVC	0.003 – 0.015	0.008 – 0.009
PE	0.003 – 0.015	0.008 – 0.009
Vitreous clay	0.15 – 0.6	0.010 – 0.013
Concrete – machine made to AS/NZS 4058	0.03 – 0.15	0.009 – 0.012
Corrugated metal	–	0.012 – 0.024
GRP (glass reinforced plastic)	0.003 – 0.015	0.008 – 0.009
Culverts		



Pipe Hydraulic Flow - Colebrook-White Hydraulic Calculation

Project:	Enter project # and name
Calculation Description:	Gravity Reticulation capacity check using Colebrook White

	Name	Date:
Designed By	Ben Henry	1/05/2024
Checked By	Marlon Silva	
Reviewed By		2/05/2024

References:

NZS4404-2010

CPAA "A Rational Approach to the Hydraulic Design of Pipe Conduits (Technical Brief)"

CPAA "Hydraulics of Precast Concrete Conduits (Design Manual)"

Note 1: Input Values in Blue fields

Note 2: Black text fields are calculated. Do not change.

Note 3: **Yellow fill** is to highlight **RESULT** of Calcs (helps quickly show answer)

Note 4: **This spreadsheet provides a means to check the available capacity of a single gravity pipe.**

Note 5: Calculations have been confirmed when compared Concrete Pipes Association target values

Roughness Coefficient Reference Table:

	Typical values for Ks (mm) Circular Pipes	
	NZS4404-2010 Table 5.2	NZS4404-2010 Table 4.2
Pipe Material	**Wastewater**	**Stormwater**
PVC	0.600	0.015
PE or epoxy lining	0.600	0.015
Vitreous Clay	1.000	0.600
Spun Concrete to AS/NZS 4058	1.500	0.150
GRP (Glass Reinforced Plastic)	0.600	0.015
PP	0.600	0.015
NZBC	*0.013*	*0.013*

Enter in pipe parameters here:

Stormwater or Sewer flow?	Wastewater	Defines the available Roughness 'Ks' values for the Colebrook-White calculations. See reference table to right
Pipe Material (list):	PVC	Refers to Ref table to right
Internal Diameter (mm):	150.0 mm	**Enter Pipe Internal Diameter (refer Pipe Dimensions sheet)**
Slope (1 in):	160 m	enter given pipe slope here
Design Temp	10 C	Temperature Celsius
percentage full	5%	Default Conservative 82% - Refer below table below ****Note that system capacity will actually be achieved at 82% pipe fullness (allows for pocket of air)**

Calculated Values in Meters and Litres:

Internal Diameter (m):	0.150 m	calculation. Do not change these calculated fields
Radius (m):	0.075 m	calculation
S (m/m)	0.006	Slope shown in m/m. Percentage = 0.63%
vk (m2.s-1)	1.32E-06	m2.s-1 (kinematic viscosity of water is 1.3mm2/s at 10deg Celsius)
g (m.s-2)	9.810	Gravity constant
Roughness Coefficient ks (mm)	0.600	Converted to meters below
Roughness Coefficient ks (m)	6.0E-04	m (roughness coefficient in meters)

V (m/s)	**0.19 m/s**	*RESULT (VLOOKUP based on % full)*	**0.00488**	**Rh (Hydraulic Radius)**	0.860	**Froude**
Q (L/s)	**0.06 L/s**	*RESULT (VLOOKUP based on % full)*	Spreadsheet Calculated Values can be verified at the following site (using 100% pipe full flow): https://tools.pipelife.com/Colebrook			
Q (m^3/s)	**0.000 m3/s**	*RESULT (VLOOKUP based on % full)*				

Note that the difference between Colebrook-White and Manning's formula can range from 5% to 30% or more, with Colebrook-White typically predicting higher flow rates and velocities. The exact percentage depends on the pipe roughness, slope, diameter, and flow regime.

Table 4.2 – Guide to roughness coefficients for gravity stormwater pipes concentrically jointed and clean

Description	Colebrook-White coefficient k (mm)	Manning roughness coefficient (n)
Circular pipes		
PVC	0.003 – 0.015	0.008 – 0.009
PE	0.003 – 0.015	0.008 – 0.009
Vitreous clay	0.15 – 0.6	0.010 – 0.013
Concrete – machine made to AS/NZS 4058	0.03 – 0.15	0.009 – 0.012
Corrugated metal	–	0.012 – 0.024
GRP (glass reinforced plastic)	0.003 – 0.015	0.008 – 0.009
Culverts		
Concrete pre-cast (pipes and boxes)	0.6	0.016
Open channel		
Straight uniform channel in earth and gravel in good condition	–	0.0225
Unlined channel in earth and gravel with some bends and in fair condition	–	0.025
Channel with rough stony bed or with weeds on earth bank and natural streams with clean straight banks	–	0.030
Winding natural streams with generally clean bed but with some pools and shoals	–	0.033
Winding natural streams with irregular cross section and some obstruction with vegetation and debris	–	0.045
Irregular natural stream with obstruction from vegetation and debris	–	0.060
Very weedy irregular winding stream obstructed with significant overgrown vegetation and debris	–	0.100

NOTE –
Refer to AS 2200 table 2 and notes, and Metrication: Hydraulic data and formulae (Lamont).

Table 5.2 – Guide to roughness coefficients for gravity sewer lines

Material	Colebrook-White coefficient k (mm)	Manning roughness coefficient (n)
VC	1.0	0.012
PVC	0.6	0.011
PE	0.6	0.009 – 0.011
GRP	0.6	0.011
Concrete machine made to AS/NZS 4058	1.5	0.012
PE or epoxy lining	0.6	0.011
PP	0.6	0.009 – 0.011

NOTE –
(1) These values take into account possible effects of rubber ring joints, slime, and debris.
(2) The n and k values apply for pipes up to DN 300.
(3) For further guidance refer to WSA 02:1999 table 2.4, AS 2200 table 2; *Plastics pipes for water supply and sewage disposal* (Janson), Metrication: Hydraulic data and formulae (Lamont), or the *Handbook of PVC pipe* (Uni-Bell).

NOTE –
(1) These values take into account possible effects of rubber ring joints, slime, and debris.
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Pipe Hydraulic Flow - Colebrook-White Hydraulic Calculation

Project:	Enter project # and name
Calculation Description:	Gravity Reticulation capacity check using Colebrook White

	Name	Date:
Designed By	Ben Henry	1/05/2024
Checked By	Marlon Silva	
Reviewed By		2/05/2024

References:

NZS4404-2010

CPAA "A Rational Approach to the Hydraulic Design of Pipe Conduits (Technical Brief)"

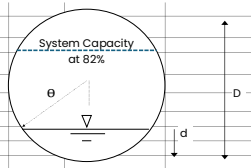
CPAA "Hydraulics of Precast Concrete Conduits (Design Manual)"

Note 1: All text on this page is calculated based on values given on page 1

Velocity 'V' Calculated using the Colebrook-White Equation:

$$v = -2\cdot\sqrt{\left(2\cdot g\cdot D_h\cdot S\right)}\cdot\log_{10}\left(\frac{k_s}{3.71\cdot D_h}+\frac{2.51\cdot\nu_k}{D_h\cdot\sqrt{\left(2\cdot g\cdot D_h\cdot S\right)}}\right)$$

$$-2\cdot\sqrt{\left(2\cdot g\cdot D_h\cdot S\right)} \qquad \frac{k_s}{3.71\cdot D_h} \qquad \frac{2.51\cdot\nu_k}{D_h\cdot\sqrt{\left(2\cdot g\cdot D_h\cdot S\right)}}$$



This is an **explicit velocity form derived from the Colebrook–White relation combined with Darcy–Weisbach**, assuming **uniform open channel or partially full pipe flow where the energy slope SSS equals the friction slope**.

Table 4.2 – Guide to roughness coefficients for gravity stormwater pipes concentrically jointed and clean

Description	Colebrook-White coefficient k (mm)	Manning roughness coefficient (n)
Circular pipes		
PVC	0.003 – 0.015	0.008 – 0.009
PE	0.003 – 0.015	0.008 – 0.009
Vitreous clay	0.15 – 0.6	0.010 – 0.013
Concrete – machine made to AS/NZS 4058	0.03 – 0.15	0.009 – 0.012

d/D (percentage full)	Q = V x A (L/s)	V (m/s)	SQRT(2*g*Dh*Hg)	ks/ (3.71*Dh)	(2.51*vk)/ (Dh*SQRT(2*g*Dh*Hg))	d (m)	θ (Radians)	A (m^2)	P (wetted perimeter)	Rh (Hydraulic Radius)	Dh = 4xRh (Hydraulic Dia.)
5%	0.06	0.19	0.0489	0.0083	0.0035	0.0075	0.4510	0.00033	0.07	0.00488	0.01953
10%	0.28	0.31	0.0684	0.0042	0.0013	0.0150	0.6435	0.00092	0.10	0.00953	0.03811
15%	0.67	0.40	0.0827	0.0029	0.0007	0.0225	0.7954	0.00166	0.12	0.01393	0.05573
20%	1.22	0.48	0.0942	0.0022	0.0005	0.0300	0.9273	0.00252	0.14	0.01809	0.07235
25%	1.91	0.55	0.1039	0.0018	0.0004	0.0375	1.0472	0.00345	0.16	0.02199	0.08798
30%	2.73	0.61	0.1121	0.0016	0.0003	0.0450	1.1593	0.00446	0.17	0.02564	0.10256
35%	3.67	0.67	0.1193	0.0014	0.0002	0.0525	1.2661	0.00551	0.19	0.02902	0.11609
40%	4.70	0.71	0.1255	0.0013	0.0002	0.0600	1.3694	0.00660	0.21	0.03213	0.12854
45%	5.81	0.75	0.1310	0.0012	0.0002	0.0675	1.4706	0.00771	0.22	0.03496	0.13985
50%	6.97	0.79	0.1356	0.0011	0.0002	0.0750	1.5708	0.00884	0.24	0.03750	0.15000
55%	8.16	0.82	0.1396	0.0010	0.0001	0.0825	1.6710	0.00996	0.25	0.03973	0.15893
60%	9.35	0.84	0.1429	0.0010	0.0001	0.0900	1.7722	0.01107	0.27	0.04165	0.16659
65%	10.52	0.87	0.1456	0.0009	0.0001	0.0975	1.8755	0.01216	0.28	0.04322	0.17289
70%	11.64	0.88	0.1476	0.0009	0.0001	0.1050	1.9823	0.01321	0.30	0.04444	0.17774
75%	12.68	0.89	0.1490	0.0009	0.0001	0.1125	2.0944	0.01422	0.31	0.04525	0.18101
80%	13.59	0.90	0.1496	0.0009	0.0001	0.1200	2.2143	0.01516	0.33	0.04563	0.18252
82%	**13.91**	**0.90**	0.1496	0.0009	0.0001	0.1230	2.2653	0.01551	0.34	0.04564	0.18256
83%	14.06	0.90	0.1496	0.0009	0.0001	0.1245	2.2916	0.01568	0.34	0.04561	0.18246
85%	14.33	0.89	0.1494	0.0009	0.0001	0.1275	2.3462	0.01601	0.35	0.04549	0.18196
90%	14.82	0.88	0.1481	0.0009	0.0001	0.1350	2.4981	0.01675	0.37	0.04471	0.17882
95%	14.95	0.86	0.1452	0.0009	0.0001	0.1425	2.6906	0.01734	0.40	0.04297	0.17187
100%	13.93	0.79	0.1356	0.0011	0.0002	0.1500	3.1416	0.01767	0.47	0.03750	0.15000

A Word of Caution

Designing pipelines to flow 94% full in order to capture that 7.5% capacity bonus is very tempting but risky and should probably be avoided except in the most controlled environment such as a constant flow feed pipe in an industrial plant. In a public storm or sanitary sewer system, even a slight increase in the quantity of flow above the design flow condition will fill the pipe immediately and push the system into surcharge. By designing for a full pipe on the other hand, the system capacity will actually be achieved when the pipe is only 82% full (see Figure 15) leaving a safety margin of 7.5% and a useful air gap at the top of the pipe.

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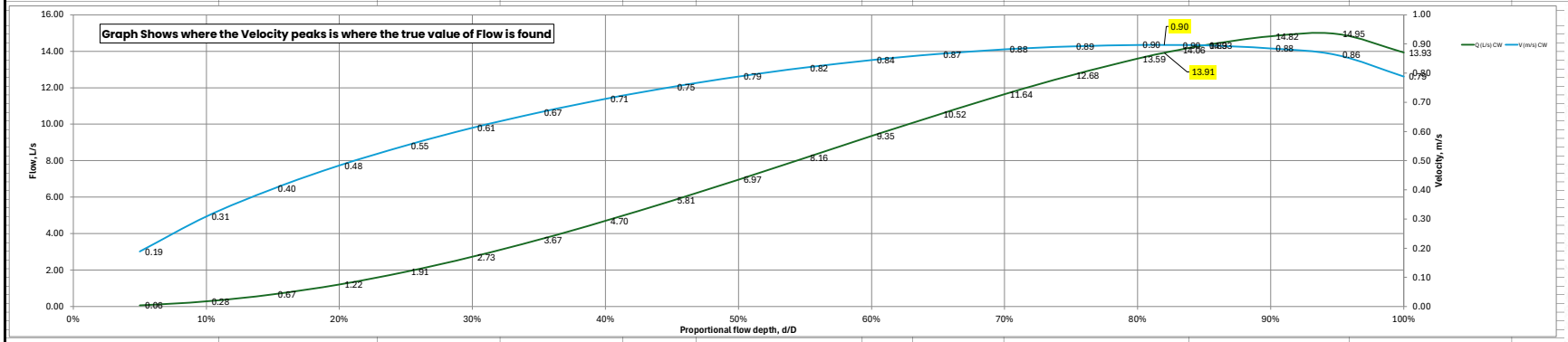
Pipe Hydraulic Flow - Colebrook-White Hydraulic Calculation

Project:	Enter project # and name
Calculation Description:	Gravity Reticulation capacity check using Colebrook White

	Name	Date:	References:
Designed By	Ben Henry	1/05/2024	NZS4404-2010
Checked By	Marlon Silva		CPAA "A Rational Approach to the Hydraulic Design of Pipe Conduits (Technical Brief)"
Reviewed By		2/05/2024	CPAA "Hydraulics of Precast Concrete Conduits (Design Manual)"



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Vitreous clay	0.15 – 0.6	0.010 – 0.013
Concrete – machine made to AS/NZS 4058	0.03 – 0.15	0.009 – 0.012

Hydraulics

Don D. Ratnayaka, ... K. Michael Johnson, in Water Supply (Sixth Edition), 2009

Colebrook–White Formula

Colebrook and White showed that f in the Darcy–Wiesbach formula is a function of the relative roughness of the pipe surface, the viscosity of the flow, and the Reynold's number, R_e. From a combination of theoretical analysis and empirical data they showed that:

$$\sqrt{\left(\frac{1}{f}\right)} = -2\log_{10}\left[\frac{k_s}{(3.7\,id)} + \frac{2.51}{(R_e\sqrt{f})}\right]$$

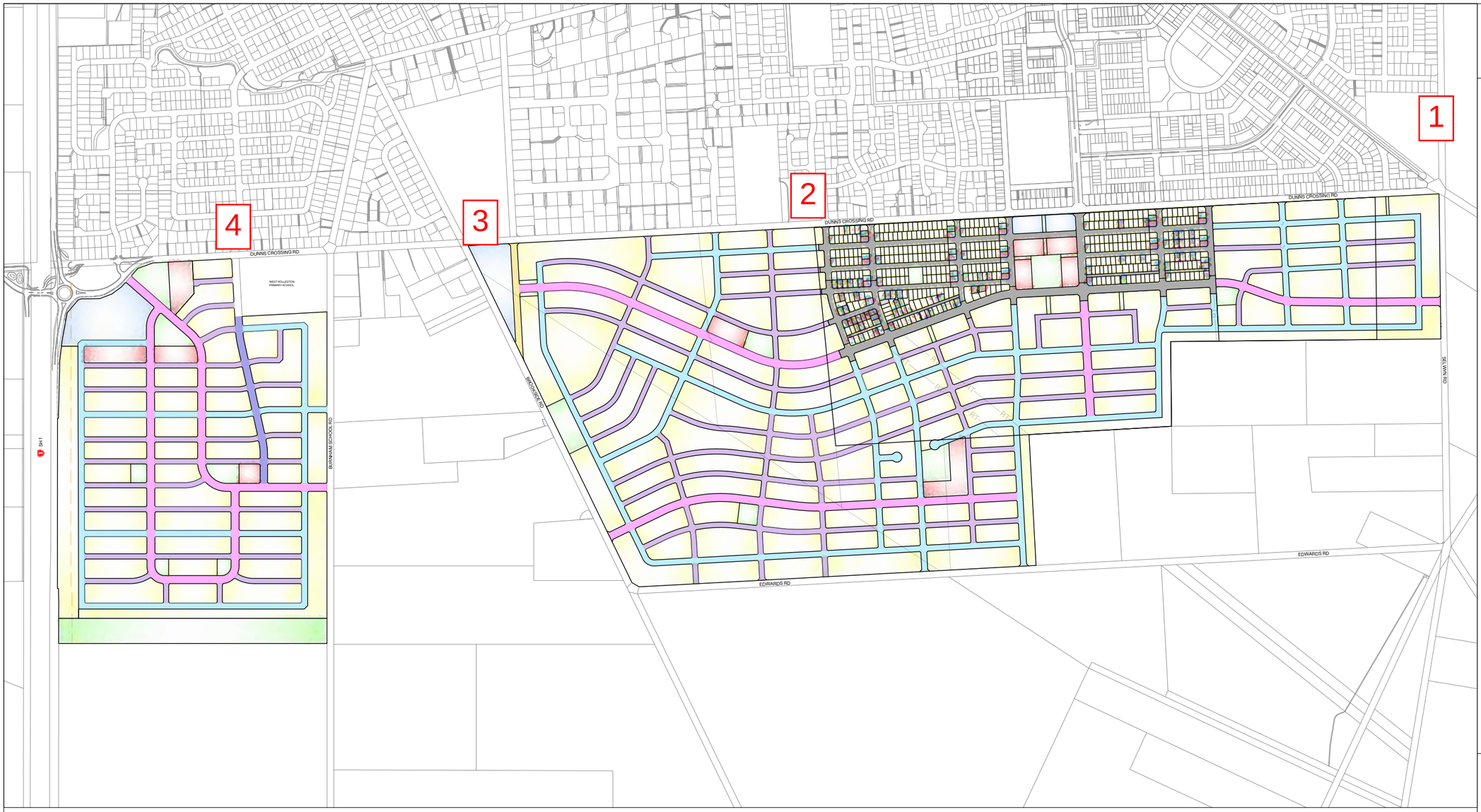
which can also be written as:

$$\sqrt{\left(\frac{1}{f}\right)} = -2\log_{10}\left[\frac{k_s}{(3.7\,id)} + \frac{2.51\nu}{(d\sqrt{2gdi})}\right]$$

where i is the hydraulic gradient, H/L; k_s is the roughness of the internal surface of the pipe; ν is the kinematic viscosity of the water.

The experimental data showing variation of f with Reynold's number and relative roughness was plotted by Moody and forms the basis of the diagram illustrated in Figure 12.2. Thus the Colebrook–White equation is, in effect, a mathematical representation of the Moody diagram. The Colebrook–White equation is a formulation of the Darcy–Weisbach equation with f replaced and is usually written as:

$$V = -2\sqrt{(2gdi)}\cdot\log_{10}\left[\frac{k_s}{(3.7\,id)} + \frac{2.51\nu}{(d\sqrt{2gdi})}\right] \quad (12.4)$$



LEGEND:

- PROPOSED BOUNDARY
- EXISTING BOUNDARY
- RESERVE
- MEDIUM DENSITY
- HIGH DENSITY
- R.O.W
- COMMERCIAL AREA
- ROAD - 24m WIDE
- ROAD - 22m WIDE
- ROAD - 18m WIDE
- ROAD - 15.5m WIDE

SCHEDULE OF AREAS

TYPE	NO. OF LOTS	AVERAGE AREA (m^2)	TOTAL AREA (m^2)
RESIDENTIAL-MEDIUM DENSITY	4652	370	1721231
RESIDENTIAL-HIGH DENSITY	142	332	47170
RESERVE			123179
COMMERIAL			52486

CLIENT: WESTHAVEN Rolleston

PROJECT:
WESTHAVEN SUBDIVISION
SUBDIVISIONS DEVELOPMENT

DRAWING TITLE:
PROPOSED LAYOUT

-	-	-	-
REVISION DETAILS		BY	DATE

	SURVEYED	-	-
	DESIGNED	MP	21/05/2026
	DRAWN	ARA	26/05/2026
	REVIEWED	-	-
	APPROVED	-	-
SCALE	NOT TO SCALE		REVISION
STATUS	FOR INFORMATION NOT FOR CONSTRUCTION		A
DWG NO	16521-00-SK-1000		

Synergy Version:

Plot Date: 11:29:32,27 May 2026, ADMINMANUX

File: D:\12D SYNERGY\TEMP\12DSYNERGY\12DSYNERGYSERVERSERVICE\5156\D0B8D165-8873-4C95-B5BD-B0317332956B\16521-00-SK-1000.DWG

Appendix 5 Wastewater Pump Station Basis of Design Example

WWPS BASIS OF DESIGN

Rolleston West Fast Track – Westhaven WWPS

Carter Group Ltd.

Version 1



QUALITY ASSURANCE

PREPARED BY	Chris Sexton	Senior Civil Engineer	2/7/2026
REVIEWED BY	Michael Paterson	Director	2/7/2026

APPROVALS

ACCEPTED BY	Elaine McLaren	Director of Operations	Signature
ACCEPTED BY	Hugh Blake-Mason		Signature
ACCEPTED BY			Signature

VERSION HISTORY

0.1	Chris Sexton	2/7/2026	Initial Draft for comment
1.0	Chris Sexton	2/11/2026	Example issued for submission

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Appendix 1 Wastewater Catchment Plan

1 Introduction

1.1 Purpose

The purpose of this Basis of Design (BoD) document is to establish a comprehensive framework for the detailed design of the wastewater pump station located near Selwyn Road as part of the Westhaven Subdivision. This document serves as a definitive reference outlining the key design decisions, technical criteria, and operational considerations agreed upon by Selwyn Water Limited and Westhaven Rolleston Ltd (Developer). It aims to ensure that all design and engineering solutions align with regulatory requirements, address future needs, and incorporate best practices in wastewater management. By documenting the rationale behind design choices related to catchment analysis, emergency storage, resilience, and technical specifications, this BoD will guide the subsequent phases of detailed design, procurement, and construction, ultimately ensuring the successful implementation of a reliable and efficient wastewater pump station.

1.2 Location and Site Description

The proposed location for the Westhaven Wastewater Pump Station yet to be finalised but will be located north of Selwyn Road between Dunns Crossing Road and Edwards Road. The WWPS will be located such that the gravity sewer depths are optimised and the pump station site has road frontage access. The current site usage is pasture. The site generally falls to the east, with the location of the WWPS being located to optimally service the largest possible area via gravity.

1.3 Scope

The scope of this project involves the detailed design and construction of a wastewater pump station for the wider Westhaven Development and future stages (beyond Stage 1A and 1B). It includes the selection criteria for pumps, structural and mechanical design, and integration with existing systems. The project will address wastewater flow analysis, emergency storage requirements, and resilience to ensure reliable operation. The outcome will be a fully functional pump station meeting the area's wastewater management needs.

1.4 Stakeholders and Roles

Stakeholder	Role	Responsibilities
Westhaven Rolleston Ltd.	Developer	Funding of development and Pump Station design and Construction
Inovo	Design Consultant	Develop detailed design, perform hydraulic analysis, ensure technical criteria are met, construction monitoring.
Selwyn District Council	Local Territorial Authority	Provide project consenting approvals and oversight.
Selwyn Water Limited	Local Water Authority	Provide project acceptance of engineering design and assume ownership of assets post completion.
Corde	Operations and Maintenance Contractor	Operate and maintain the pump station post-construction; ensure ongoing functionality.
Nairn Electrical	Electrical Controls Design and Maintenance Contractor	Design, construct and install electrical control systems; provide ongoing maintenance of electrical components within the pump station post-construction.

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2 Document Hierarchy

Documents used in the design of the Wastewater Pump Station will fall into the following hierarchy:

Document Hierarchy	Document Name
1	Basis of Design – Westhaven WWPS (this document)
2	Selwyn District Council Engineering Code of Practice (SDC ECOP)
3	CCC Wastewater Pump Station Design Guide (CCC WPSDG)
4	Watercare DP-13 Design Principles for Wastewater Pumping Stations (WCDP)
5	NZS4404:2010 – Land Development and Subdivision Infrastructure (NZS4404)

Any regulatory or legal requirements will take precedence over the document hierarchy. In the case that there are any conflicts between the above documents, the higher-level document shall take precedence. If necessary, revisions to the Basis of Design or other documents will be made to reflect the resolved conflicts and ensure alignment with the highest priority guidance.

2.1 'Must' versus 'Shall' versus 'Will'

Where the verbs must, shall and will (or its past tense forms) are used they describe a requirement for compliance with the statement in which it is used.

'Shall' and 'must' expresses a mandatory condition or action. 'Will' is used to prescribe a performance outcome or intent.

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3 Flow Assessment

3.1 Catchment Definition

The Westhaven WWPS is proposed to service the wastewater catchment shown in Appendix 1. The ultimate catchment comprises approximately 180 ha of residentially zoned land and is anticipated to service approximately 3,028 residential allotments and 1.68 ha of commercial land at full development. Wastewater flows have been assessed in accordance with the requirements of the SDC ECOP.

3.2 Design Flow Assumptions

Item	Comments
Average Sewer Flow (ASF)	Calculated as per SDC ECOP S6.4.3
Maximum Sewer Flow (MSF)	Calculated as per SDC ECOP S6.4.1
Storm Peak Factor (SPF)	1.6 (Deep groundwater as per SDC ECOP S6.4.2)
Occupancy Rate	2.7 persons/dwelling
Wastewater Generation	220 L/person/day
Commercial Site(s)	1 L/s/ha where applicable as per SDC ECOP Section 6.4.3
Future Densification (FD)	• Flows from commercial areas do not include any future densification factors when calculating maximum flow. • Residential allotments include a FD factor of 1.2 as per the SDC ECOP Section 6.4.1

3.3 Groundwater Assessment and Storm Peak Factor

Groundwater monitoring undertaken across the Westhaven catchment indicates that groundwater levels generally occur at depths greater than 4.0 m below ground level. Monitoring undertaken at the southern extent of the catchment has recorded groundwater levels of approximately 3.9 m below ground level, representing the shallowest groundwater levels observed within the wider development area.

In accordance with the SDC ECOP, a Storm Peak Factor (SPF) of 1.6 has been adopted for the flow assessment, corresponding to deep groundwater conditions.

The proposed WWPS catchment encompasses approximately 180 ha and is expected to service approximately 3,028 residential allotments equivalent at ultimate development. Given the scale of the catchment, significant diversity exists across the contributing area, including variation in groundwater conditions, rainfall response, infiltration potential, and timing of flow generation. It is therefore considered that application of a catchment-wide SPF of 1.6 is appropriate and provides a reasonable representation of anticipated system performance.

The adoption of a shallow groundwater SPF of 2.4 for the entire catchment would disproportionately weight a very small area of marginally shallower groundwater and would not accurately reflect the overall groundwater conditions present across the wider catchment. Accordingly, an SPF of 1.6 has been adopted for the purposes of flow estimation and pump station sizing.

Figure 1 presents the available groundwater monitoring data across the catchment and the locations used to inform the adopted groundwater classification.

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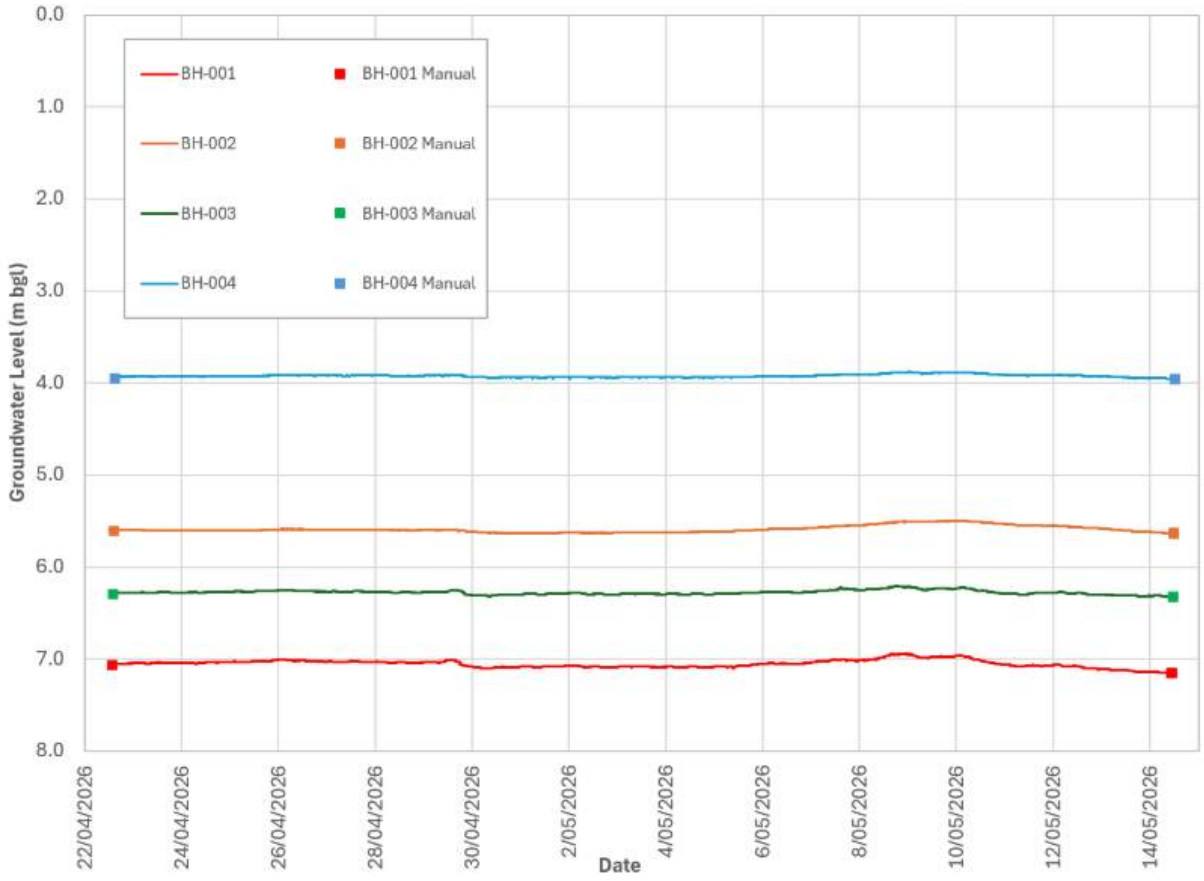

Figure 1: Groundwater Monitoring Records

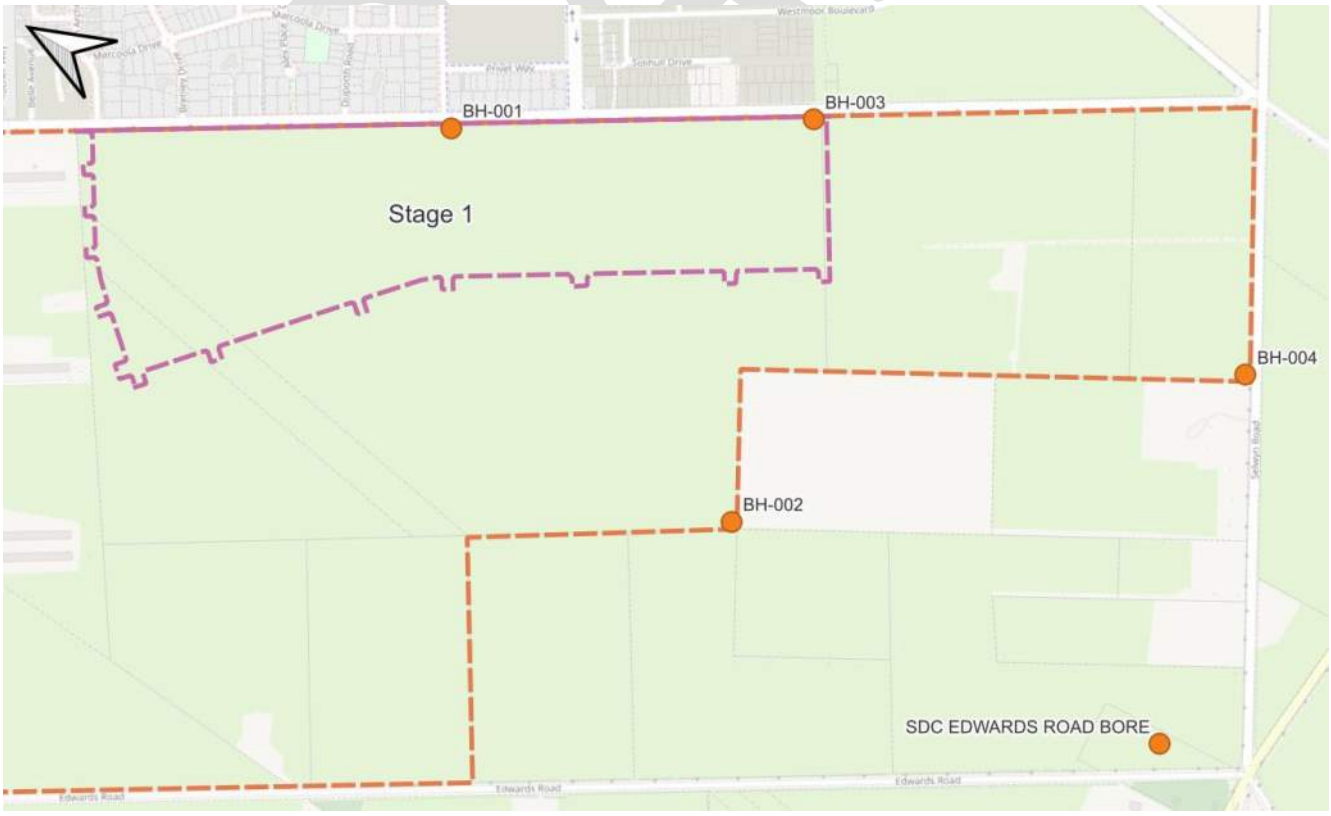

Figure 2: Groundwater Monitoring Bore Locations

3.4 Ultimate Design Flows

Ultimate design flows have been calculated in accordance with the assumptions outlined above and are summarised in the table below.

Land Use	Units/Area	Rate	ASF	MF
Residential	3,028	2.7 people/dwelling × 220 L/person/day	20.82 L/s	99.92 L/s
Commercial	1.68 ha	1 L/s/Ha	1.68 L/s	10.08 L/s
Total			**22.50 L/s**	**110.00 L/s**

Detailed design shall verify ultimate catchment assumptions flow allowances.

3.5 Staging Flows:

The Westhaven development is anticipated to be constructed progressively over a number of stages, with an estimated delivery rate of approximately 500 residential allotments per annum. On this basis, the catchment is expected to reach ultimate development approximately 6–7 years following commencement of servicing.

During the early stages of development, wastewater flows entering the pump station will be substantially lower than the ultimate design flows adopted for sizing of the pump station and rising main infrastructure. As a result, consideration shall be given during detailed design to the operational performance of the system under low-flow conditions, including pump cycling frequency, wastewater retention times, odour generation, hydrogen sulphide (H_2S) formation, and rising main flushing velocities.

The proposed shared rising main arrangement with the Westwood WWPS has been incorporated as a key component of the staging strategy. By combining flows from both catchments, the shared rising main is expected to increase turnover within the pressure system during the early stages of development, reducing wastewater residence times and improving overall network performance prior to ultimate build-out.

Pump station infrastructure, rising mains, valve arrangements, and associated mechanical and electrical systems shall be designed to accommodate the full ultimate catchment while maintaining acceptable operational performance throughout all stages of development.

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4 Emergency Storage Requirements

4.1 Design Intent

The Westhaven WWPS shall incorporate emergency storage and network resilience measures sufficient to maintain an appropriate level of service during equipment failure, power outage, maintenance activities, and other abnormal operating conditions.

A combination of local storage, downstream network storage, redundant pumping arrangements, standby power provisions and bypass pumping capability shall be utilised to provide system resilience and redundancy.

4.2 Proposed Storage Provision

The SDC ECOP requires a minimum emergency storage volume equivalent to eight hours Average Dry Weather Flow (ADWF), which for the ultimate Westhaven catchment equates to approximately 660 m^3.

The proposed design departs from the traditional approach of providing the full storage requirement at the local pump station. Instead, a combination of the following will be adopted:

- Local emergency storage at the Westhaven WWPS.
- Downstream storage within the Edwards Road WWPS storage tank farm.
- System redundancy measures.

The Westhaven WWPS shall provide approximately 60 m^3 of dedicated emergency storage onsite, excluding wetwell storage and any storage available within the reticulation network.

At ultimate development, this represents approximately 9.1% of the storage volume that would otherwise be required to be provided locally under a strict application of the ECOP requirements.

4.3 Justification for Departure

The proposed departure is considered appropriate due to the wider network configuration and resilience measures incorporated into the design.

The Edwards Road WWPS includes a substantial storage tank farm that is designed to provide centralised emergency storage for multiple wastewater catchments within the wider network. Consolidating storage at Edwards Road provides several advantages, including:

- Improved operational management of emergency storage assets.
- Reduced duplication of infrastructure across multiple pump stations.
- Simplified inspection, maintenance and cleaning requirements.
- Centralisation of emergency response and operational activities.
- More efficient utilisation of available network storage.

The storage strategy therefore shifts storage capacity from an individual pump station level to a managed network-wide level while maintaining the overall resilience objectives of the wastewater system.

4.4 Staging Considerations

During the initial stages of development, the proposed 60 m^3 of emergency storage provides a significantly greater level of service than at ultimate development.

Based on the ECOP ADWF methodology, 60 m^3 of storage is equivalent to approximately eight hours of average dry weather storage for approximately 303 standard residential dwellings.

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Accordingly, the local storage volume is expected to satisfy the ECOP intent during the early stages of development until a substantial proportion of the catchment has been established.

4.5 Network Resilience Measures

The emergency storage strategy is supported by a number of additional resilience measures incorporated into the pump station and wider network design, including:

- Triplex pump configuration comprising duty, assist and standby pumps.
- Alternative discharge routing via the Westwood WWPS and Radar WWPS catchment through the proposed valving arrangement.
- Emergency generator connection facilities.
- Provision for temporary bypass pumping and over-pumping operations.
- Centralised downstream storage within the Edwards Road WWPS storage tank farm.

Collectively, these measures significantly reduce the likelihood of storage being required during normal operational incidents and provide multiple independent layers of resilience beyond reliance on emergency storage volume alone.

4.6 Configuration of Emergency Storage

Emergency storage shall be provided in below-ground storage tank(s) located within the WWPS site.

The storage system shall be configured to receive flows automatically during abnormal operating conditions without requiring manual intervention by operators or maintenance personnel. Transfer of flows into emergency storage shall occur as part of the normal pump station control philosophy and provide seamless operation during pump station failure, power outage, maintenance activities, or other emergency events.

The emergency storage system shall incorporate:

- Isolation arrangements to allow individual storage tanks or the entire storage system to be removed from service for inspection, maintenance, cleaning, or repair without compromising the operation of the wider pump station.
- Automated washdown systems designed to minimise solids accumulation, septicity, odour generation and maintenance requirements.
- Access provisions suitable for inspection, maintenance and cleaning activities.
- Monitoring and telemetry integrated with the pump station SCADA system to provide operational status, storage levels and alarm functions.

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5 Hydraulic Design

5.1 Pump Duty and Capacity

The Westhaven WWPS shall be designed to service the ultimate wastewater catchment identified within this Basis of Design while maintaining acceptable operational performance throughout all stages of development.

The ultimate design of the pump station shall incorporate a triplex pump arrangement comprising:

- One duty pump
- One standby pump
- One assist pump

During the initial stages of development, wastewater flows will be significantly lower than ultimate design conditions and the WWPS may be commissioned with a duplex pump arrangement utilising smaller pumps more suited to the initial catchment demand. The pump station, pipework, valve arrangements, electrical infrastructure and control systems shall be designed to facilitate staged pump upgrades as development progresses and flows increase. This approach will allow pumps to operate closer to their best efficiency point (BEP), minimise pump cycling, optimise energy consumption and ensure adequate pumping capacity is available for each stage of catchment development. The ultimate WWPS configuration shall comprise a triplex arrangement in accordance with the requirements of this Basis of Design.

The duty pump shall be selected to efficiently convey anticipated dry weather flows while minimising pump cycling under low-flow conditions. The assist pump shall automatically operate during periods of elevated flow to ensure the station is capable of conveying the design maximum flow. The standby pump shall provide redundancy during maintenance or equipment failure. The duty point shall be established through system curve analysis considering both independent and simultaneous operation of the Westhaven and Westwood WWPS.

Pump sizing and operating philosophy shall be developed during detailed design and shall consider:

- Initial staging flows
- Ultimate catchment flows
- Pump cycling frequency
- Rising main retention times
- Energy efficiency
- Operational resilience
- Future maintenance requirements

Variable Speed Drives (VSDs) shall be provided to enable optimisation of pump operation across the full range of anticipated flows and to assist with management of hydraulic transients within the network.

5.2 Rising Main Configuration

The Westhaven WWPS shall discharge to the Edwards Road WWPS via a shared wastewater rising main located within the Selwyn Road corridor.

The rising main arrangement shall be configured such that:

- Westwood WWPS is able to discharge directly to Edwards Road WWPS.
- Westhaven WWPS connects into the shared rising main in the vicinity of the proposed pump station in Selwyn Road.
- The shared rising main is capable of conveying the combined maximum design flows from both the Westwood and Westhaven catchments.
- The system can operate efficiently throughout all stages of development.

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A valving arrangement shall be incorporated within the network to provide operational flexibility and resilience.

The arrangement shall allow:

- Westwood & Westhaven WWPS to discharge directly to Edwards Road WWPS under normal operating conditions.
- Westhaven WWPS to discharge toward the existing Selwyn Road gravity reticulation (Radar WWPS catchment) during maintenance or network outage scenarios.
- Isolation of critical sections of the network to facilitate maintenance and emergency works.

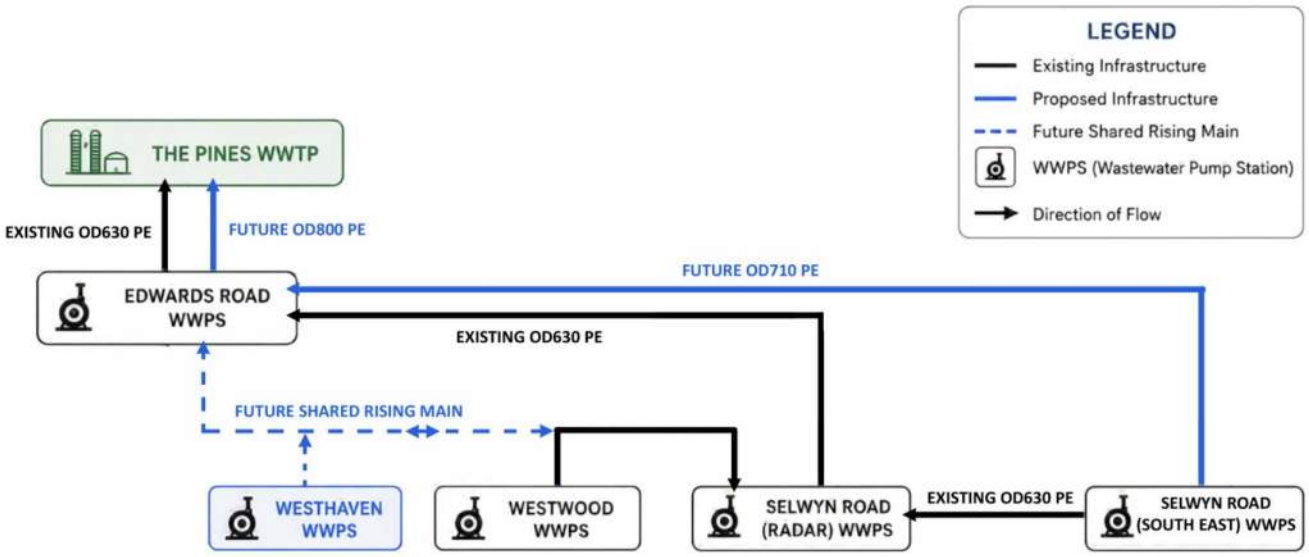

Figure 3- Proposed Network Schematic

The proposed configuration provides several network benefits including:

- Increased resilience through the provision of alternative pumping routes.
- Reduced reliance on a single rising main alignment.
- Improved operational flexibility during maintenance activities.
- Removal of the Westwood catchment from the Radar WWPS catchment under normal operating conditions.
- Increased available capacity within the Radar WWPS catchment for future Selwyn network growth.

The detailed design shall confirm the hydraulic performance of all operating scenarios and demonstrate the proposed network configuration can accommodate both normal and contingency operating conditions.

5.3 Velocity and Retention Time

The detailed design shall assess hydraulic performance across the full range of anticipated operating conditions, from initial development stages through to ultimate catchment build-out.

Particular consideration shall be given to:

- Self-cleansing velocities within the rising main.
- Wastewater retention times.
- Pump cycling frequency.
- Septicity and hydrogen sulphide (H_2S) generation potential.
- Operational performance under low-flow conditions.

During the early stages of development, flows within the Westhaven catchment are expected to be significantly lower than ultimate design conditions. The shared rising main arrangement with the Westwood

WWPS has been adopted to increase flow turnover within the pressure system during these periods and reduce wastewater detention times.

The rising main shall be sized to achieve a minimum self-cleansing velocity of 0.7 m/s at the design duty point to prevent solids deposition and septicity.

Maximum velocity shall not exceed 3.0 m/s under peak wet weather flow (PWWF) conditions to limit friction losses and transient pressures.

The detailed design shall demonstrate that the selected pipe diameter and pump operating strategy provide acceptable performance throughout all stages of development while balancing the requirements for self-cleansing velocity, energy efficiency and future network capacity.

5.4 Surge and Fatigue Considerations

A detailed transient pressure analysis shall be undertaken as part of the detailed design process for the shared rising main system.

The analysis shall assess both normal and abnormal operating scenarios including:

Pump start-up and shutdown events.

- Variable speed drive operation.
- Pump trip and power failure events.
- Simultaneous operation of Westhaven and Westwood WWPS.
- Air valve operation.
- Valve opening and closing events.
- Emergency operating configurations.

The assessment shall confirm that:

- Maximum operating pressures remain within the allowable limits of all pipelines, fittings and appurtenances.
- Negative pressures and column separation do not occur.
- Surge pressures are adequately managed.
- Fatigue loading over the design life of the infrastructure remains within acceptable limits.

Where required, surge mitigation measures shall be incorporated into the detailed design. Such measures may include pump control strategies, surge vessels, non-return valve selection, air valve configuration or other appropriate measures.

The detailed design shall demonstrate compliance with the surge and fatigue requirements of the SDC ECOP and relevant industry standards.

5.5 Air Release Valves

Air release valves shall be provided at all high points along the rising main alignment and at any additional locations where air accumulation may occur.

The detailed design shall utilise Bermad C50-N combination air release valves, or an approved equivalent suitable for wastewater applications. Where surge protection is required, Bermad C50-SP-N units or equivalent shall be adopted.

Air release valves shall:

- Be installed within dedicated access chambers.
- Be readily accessible for inspection and maintenance.
- Provide facilities for isolation and servicing.

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- Incorporate suitable drainage provisions.
- Allow for future flushing and maintenance activities.

To manage odour emissions, each air valve chamber shall be fitted with an approved odour treatment system, such as an Armatec Green Dome Odour Filter or equivalent.

The detailed design shall demonstrate that air release valve sizing, spacing and configuration are appropriate for all operating conditions and transient events within the network.

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6 Rising Main Design

6.1 Alignment and Route Selection

The rising main shall be designed to convey wastewater from the Westhaven WWPS to the Edwards Road WWPS via a new shared rising main within the Selwyn Road corridor.

The alignment shall be confirmed during detailed design and shall:

- Be located within legal road where practicable.
- Minimise the number of high points, low points and unnecessary changes in grade.
- Minimise the potential for air accumulation, septicity and hydraulic inefficiencies.
- Maintain the minimum cover requirements specified within the SDC ECOP.
- Maintain required horizontal and vertical clearances from other utilities and infrastructure.
- Provide suitable access to valves, air release valves and other operational assets.
- Consider future maintenance, replacement and network expansion requirements.

The detailed design shall demonstrate that the selected alignment provides an appropriate balance between hydraulic performance, constructability, maintenance access and whole-of-life asset management.

6.2 Pipe Materials

The rising main shall be designed for a minimum 100-year asset life and be suitable for wastewater service conditions, including exposure to hydrogen sulphide, groundwater and cyclic pressure loading.

The primary pipeline material shall be PE100 polyethylene pipe manufactured in accordance with AS/NZS 4130. Unless otherwise required by detailed surge and fatigue analysis, the minimum pipe specification shall be PE100 PN12.5 and DN100 (OD110) minimum diameter.

Pressure class and pipe diameter shall be confirmed through detailed hydraulic modelling and transient pressure analysis.

PE pipe shall be cream coloured or feature a minimum of four (4) cream identification stripes in accordance with the SDC ECOP colour coding requirements for wastewater pressure mains.

Where mechanical restraint, structural connections, valve assemblies or other site-specific requirements necessitate rigid pipework, ductile iron pipe and fittings may be utilised. Ductile iron components shall:

- Comply with AS/NZS 2280.
- Be a minimum pressure rating of PN16.
- Incorporate corrosion protection suitable for wastewater environments.
- Utilise flanged connections drilled to AS/NZS 4087 PN16 standards.
- All flanges shall be raised face.

6.3 Fittings and Jointing

The detailed design shall minimise the number of mechanical joints within the pipeline system where practicable.

Polyethylene pipework shall be joined using butt fusion or electrofusion methods in accordance with AS/NZS 2033 and manufacturer requirements. Connections between polyethylene and ductile iron systems shall utilise PE stub flanges with stainless steel backing rings capable of accommodating the operational and surge pressures within the network.

Buried metallic fittings, bolts and flanges shall be protected against corrosion using Denso tape wrapping or an approved equivalent corrosion protection system.

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Pipeline fittings shall be selected to:

- Minimise head losses.
- Reduce the risk of leakage.
- Facilitate future maintenance.
- Provide long-term reliability under wastewater service conditions.

6.4 Maintenance and Constructability:

The rising main shall be designed to facilitate efficient construction, operation, maintenance and future renewal.

The detailed design shall:

- Minimise the number of buried fittings and mechanical connections.
- Provide suitable isolation arrangements to allow sections of the network to be maintained without significant service disruption.
- Incorporate dismantling joints at strategic locations including valve assemblies, flow meters and other critical infrastructure.
- Provide access to valves, air release valves and other equipment requiring routine inspection or maintenance.
- Consider future replacement of major equipment and fittings.
- Allow for temporary bypass pumping and operational continuity during maintenance activities where reasonably practicable.

The rising main system shall be configured to provide a resilient and maintainable asset that supports long-term operation of both the Westhaven and Westwood wastewater catchments.

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7 Pump Station Design

7.1 Site Layout Design

The site layout shall be developed to provide safe and practical access for operation, maintenance and renewal activities over the asset life.

As a minimum, the site design shall incorporate:

- All-weather vehicular access suitable for maintenance and emergency response vehicles.
- Sufficient manoeuvring and hardstand areas to enable operation of a Hiab crane, sucker truck and other maintenance equipment.
- Direct access to the wetwell, valve chamber, electrical equipment and odour control systems.
- Washdown facilities adjacent to the wetwell and valve chamber.
- Covers will be located to enhance equipment maintenance and permit the setting up of davits, hiabs or tripods for confined spaces.
- Where standard portable safety tripods cannot be mounted above the wet-well to allow an unconscious person to be winched from the bottom of the wet-well to a safe level outside of the danger area a davit anchor point shall be supplied where hiab access is impractical.
- Any storage tank shall have the ability to be isolated from the network for maintenance purposes.
- Lighting above wetwell for all-hour access and visibility.
- Connection to the SWL reticulated water supply network via a 40mm Wilkins RPZ.
- Low maintenance landscaping.

Washdown areas shall drain to a dedicated sump connected to the wetwell. The sump connection shall include a trapped arrangement to prevent the uncontrolled release of odours.

A groundwater monitoring bore shall be installed adjacent to the pump station site. The bore shall incorporate a piezometer connected to the pump station telemetry and SCADA system to allow long-term groundwater level monitoring and assessment of groundwater interaction with the structure.

The final layout shall minimise operational conflicts and provide sufficient space for future maintenance, equipment replacement and temporary bypass pumping activities.

The site shall be designed in such a way as that it fits in with the surrounding environment and is inconspicuous in nature.

7.2 Wet-Well Design

The wetwell shall be designed to provide safe, reliable and maintainable operation throughout the life of the asset.

The wetwell structure shall:

- Be designed to achieve a minimum structural life of 100 years.
- Be resistant to wastewater corrosion and hydrogen sulphide attack.
- Be designed to resist buoyancy forces based on the assessed groundwater conditions.
- Minimise dead zones and solids accumulation.

Acceptable wetwell materials include:

- Calcium aluminate concrete.
- Polymer concrete.
- Glass reinforced plastic (GRP).
- Polyethylene structures.
- Alternative approved materials demonstrating equivalent durability.

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Where protective coatings are adopted, the selected system shall achieve a minimum design life of 50 years before major refurbishment is required.

The wetwell shall incorporate:

- uPVC drop structure will be provided for wet-well inlet pipework <Ø300mm
- Stainless-steel baffle style drop structure for wet-well inlet pipework >=Ø300mm
- Provision for washdown and cleaning.
- Pump removal systems that avoid the need to dewater the wetwell.
- Isolation of incoming gravity flows.

An isolation valve shall be provided on the inlet pipework within the wetwell to allow the station to be isolated from the gravity network during maintenance or emergency situations. The detailed design shall consider knife gate valves[1] or equivalent wastewater-rated isolation valves suitable for operation in a high solids environment. Valves shall be accessible from surface level without requiring confined-space entry.

Schedule 10 316 stainless steel pipework shall be utilised within the wetwell and configured to facilitate removal, maintenance and replacement of equipment.

No ladders are to be provided within wetwells due to access being via winch and harness systems.

7.3 Access Chambers

Access chambers shall be designed to provide safe access to mechanical equipment whilst minimising maintenance requirements and confined-space entry.

Chambers shall:

- Be sized to permit removal and replacement of all equipment.
- Provide sufficient clearance for dismantling valves, flowmeters and associated fittings.
- Have a base sloped at min. 1:300 to either a 300mm×300mm×300mm minimum sump or sloped to a drain with non-return spring loaded flap valve draining into the wet-well. Where draining to a wet-well a 50mm min. drainpipe is to be used.
- Minimise standing water within the chamber.
- Have a minimum diameter of 1.05m.
- Have an access ladder if the total depth is >1.3m from cover to base. If the chamber is shallower then no access ladder is required.
- Be coated with a protective coating system if they feature an air release valve.

Access covers shall:

- Be lockable using Selwyn Water approved locking arrangements.
- On wet-wells be constructed of aluminium and shall feature 4-sided void protection with a gate.
- On valve chambers greater than 1.5m deep shall be constructed of aluminium and shall feature 3-sided void protection.
- On valve chambers less than 1.5m deep shall be constructed of aluminium. No void protection is required for chambers less than 1.5m deep.
- On underground emergency storage tanks shall be constructed of aluminium and shall feature 3-sided void protection
- Be operable by a single person where practicable.
- Where constructed of aluminium, be equipped with 10mm thick × 20mm wide neoprene or EPDM seal, attached to the cover, which will fully seal the interface between the cover and frame when the lid is closed.
- Be designed to AS3996:2019 load class A for wet-well and valve chambers and be protected from vehicular trafficking.

[1] Note that the SDC ECOP as at 1/7/2026 does not specify the types of valves to be used on the wastewater network.

- Be designed to AS3996:2019 load class A for in-ground tanks and be protected from vehicular trafficking.
- Be designed in accordance with AS3996:2019 Class D where in trafficked areas, or Class A where in areas not subject to vehicular traffic
- Allow access for entry to provide a minimum clear diameter of 600mm or rectangular clearance of 500mm × 700mm.

Wetwell access covers shall provide sufficient clearance for pump removal and maintenance operations.

7.4 Pumps and Mechanical Arrangement

The pump station shall incorporate redundant pumping capacity such that operation can continue following failure or removal of an individual pump.

Detailed design shall consider:

- A Mono Series A muncher unit[2] with a submersible motor is to be provided to macerate incoming flows. The Muncher unit is to be mounted within an inlet manhole in a channel configuration with stainless steel guide-rails.
- All pumps shall be Flygt Pumps
- All pumps >3kw shall be three phase 415 volt pumps with water detection and over temperature detection in the motor housing.
- All pumps <5kw shall be Direct On Line (DOL)
- All pumps <11kw and >5kw shall have soft starters equipped
- All pumps >11kw shall have variable speed drives fitted
- Pumps shall be duty standby for each size of pump (set). Each individual pump shall have its own Motor control equipment.
- Pump motor decibel ratings shall be less than 80dB.
- Where submersible pumps are used the following is to be specified:
    - Automatic slide couplings
    - Stainless chains to lift the pumps from the wet-well
    - Installation that obviates pumping out of the wet-well to permit removal of the pumps
- Where dry-well pumps are used the following is to be specified:
    - Suction pipework one size larger than the pump inlet size
    - Suction pipework with easy access from the dry-well to clear blockages and with access to the pump suction eye without lowering the wet-well level below the suction pipework.
    - The mounting of surface pumps on a plinth 200mm above floor level.
- Any cables to be either below floor level in ducts with suitable removable gratings or fixed above head height.
- Pumps are to be specified with hard metal-to-metal face mechanical seals, high quality stainless steel or high tensile steel shafts and grey iron impellers.
- A Krohne Opitflux flow meter is to be fitted to outgoing pipework with IFC100 transmitter
- Flow meter is to be sited so that it is has at least 20 pipe diameter's clearance from any upstream bends, valves or other fittings and 5 pipe diameters away from any downstream fittings.
- Pressure transducer to be fitted to incoming water supply pipework upstream of the RPZ connection
- Pressure transducer to be fitted to outlet manifold after non-return valves on rising main

Mechanical equipment shall be selected to achieve long-term reliability and minimise life-cycle maintenance costs.

[2] Selwyn's ECOP as at 1/7/2026 does not specify any requirements around muncher units. Historically SDC has used Sulzer/JWC muncher units with Flygt motors fitted. The supplier of Sulzer/JWC munchers is no longer willing to supply with Flygt motors in NZ due to gearbox compatibility issues. The Sulzer/JWC munchers only come with immersible motors not submersible.

7.5 Piping and Fitting Arrangements

Pipework and valve arrangements shall minimise head losses, facilitate maintenance and provide operational flexibility.

The design shall provide:

- Isolation and non-return valves shall be the same diameter as the pipework they are being installed on.
- Isolation valves shall be operable from ground level where buried unless inside a dry well or valve chamber that is accessible.
- Isolation valves on pressure mains shall be of the resilient seated gate type. Isolation valves shall be installed on each pump intake (for wet-well/dry well pumps) and on the pump discharge downstream of the non-return valves.
- Air valves shall be in an accessible chamber that is vented. Air valves must be designed for connection of a suitable air treatment facility and where required and fitted with a vent stack that ensure no noticeable odour at the nearest property boundary.
- Tee fittings for connection of pumped mains is not acceptable. Y-Junctions or manufactured manifolds are to be utilised to reduce vibration.
- All flanges to be drilled in accordance with AS/NZS 4087:2011 PN16 drilling patterns.

The pump station shall incorporate provisions for emergency bypass pumping.

This shall include:

- A permanent connection point located within the valve chamber or on the outgoing rising main.
- Cam-lock or equivalent fittings suitable for temporary pumping operations.
- Isolation valves configured to permit segregation of the pump station from the downstream network.
- Sufficient space for hose connection and operation of temporary pumping equipment.

The arrangement shall enable maintenance or emergency works to be undertaken without significant interruption to network operation.

7.6 Building Requirements

The wastewater pump station building shall provide a secure, durable and maintainable environment for the housing of electrical, control, telemetry and ancillary mechanical equipment associated with the operation of the pump station.

7.6.1 Structural Design Requirements

The building shall be designed in accordance with the New Zealand Building Code and applicable standards, including AS/NZS 1170.5.

The building shall be designed as an Importance Level 3 (IL3) structure and, as a minimum, adopt the following design parameters:

- Importance Level: IL3
- Ultimate Limit State (ULS) annual exceedance probability: 1 in 2,500 years (Ru = 1.8)
- Serviceability Limit State (SLS) annual exceedance probability: 1 in 25 years (Rs = 0.33)
- Seismic Hazard Factor: Z = 0.30

The structure shall be designed to remain operational following design-level serviceability events and to protect critical wastewater infrastructure during and following design-level ultimate limit state events.

7.6.2 Functional Requirements

The building shall be sized to accommodate all electrical, control, telemetry and operational equipment with sufficient space for safe operation, inspection, maintenance and future replacement.

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The building layout shall:

- Provide separation between electrical, control and mechanical equipment where required.
- Allow safe access to all equipment without requiring the removal of adjacent equipment.
- Provide suitable working clearances around switchboards, control panels and generators in accordance with applicable standards and manufacturer recommendations.
- Allow for future expansion of electrical and control systems where practicable.

No on-site toilet facilities are required.

7.6.3 Ventilation and Environmental Control

The building shall be designed to maintain suitable environmental conditions for electrical and electronic equipment throughout the asset life.

The detailed design shall include:

- Mechanical ventilation or air-conditioning systems as required to maintain acceptable operating temperatures.
- A wall-mounted heat pump or equivalent climate control system within the electrical control room.
- Protection against moisture ingress, condensation and dust.
- Adequate air circulation to ensure reliable operation of electrical and SCADA equipment.

7.6.4 Generator Facilities

Where a generator is located within the building, the design shall provide:

- Adequate ventilation and combustion air supply.
- Appropriate exhaust routing and acoustic treatment.
- Safe fuel storage arrangements where applicable.
- Sufficient clearance for routine maintenance and servicing activities.

A removal and replacement path that allows generator replacement without significant building modifications.

Where an outdoor generator is adopted, the design shall provide suitable connection facilities and operational access arrangements.

7.6.5 Access and Maintainability

The building and surrounding infrastructure shall be designed to facilitate safe operation and maintenance throughout the life of the asset.

As a minimum:

- Building doors shall provide sufficient clearance for removal and replacement of major equipment.
- Switchboards, control cabinets and ancillary equipment shall be located to provide safe maintenance access.
- Chamber covers, access hatches and equipment access points shall be arranged to avoid operational conflicts.
- Internal and external working areas shall be configured to allow the use of lifting equipment where required.
- Maintenance activities shall be able to be undertaken without requiring unnecessary confined-space entry or disruption to the operation of the pump station.

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7.6.6 Security Requirements

The building shall be designed to provide appropriate security for critical wastewater infrastructure and associated equipment.

The design shall include:

- Lockable external doors compatible with Selwyn Water requirements.
- Intruder-resistant construction.
- External lighting to facilitate safe access during night-time operation and maintenance activities.

7.7 Electrical Requirements

Electrical systems shall be designed by Selwyn Water's nominated electrical and control systems provider (Nairn Electrical).

The design shall provide:

- Full SCADA integration.
- Remote monitoring and alarm functionality.
- Mobile generator connection facilities.
- Facilities for permanent generator to be connected.
- Provision for future system expansion.

All electrical control equipment shall be a minimum of 500mm above the 0.5% AEP flood event.

The control philosophy shall consider:

- Staged development flows.
- Pump rotation.
- Surge management.
- Power failure events.
- Generator operation.

7.8 Excluded Items

The following items are specifically excluded from the basis of design unless otherwise agreed with Selwyn Water:

- Permanent chemical dosing systems.
- Continuous H_2S monitoring systems.
- Permanent standby generation.

The need for any of the above may be reviewed during detailed design if operational assessments identify a requirement.

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8 Resilience and Reliability

8.1 Design Life and Performance Objectives

Asset Type	Sub-Group	Design Life
Pump Station Buildings	Buildings	100 Years
	Piles & Foundations	100 Years
Electrical Equipment		25 Years
Mechanical Equipment and Plant	Short-life pumps	20 Years
	Long-life pumps	50 Years
	Motors	40 Years
	Stand-by equipment	50 Years
	Valves	50 Years
Emergency Storage	Structure	75 Years
Wet-well	Structure	100 Years
Site pipe work	Reticulation	100 Years

8.2 Redundancy and Backup Systems

Item	Comment
Pumps	Triplex pump system installed within wet-well (Duty-Assist-Standby)
Alternative Discharge Arrangement	Provision for the rising main(s) to discharge into different catchments providing redundancy in the rising main.
Over-pumping Allowance	Allowance will be made for direct overpumping of the wetwell directly into the rising main for temporary works.
Emergency Power Supply	• Provisions for a mobile generator to be plugged into the site in the case of power outage • Provisions for a permanent Emergency Generator to be installed on-site in the future to allow full equipment functionality. • Uninterrupted Power Supply and battery backup on SCADA telemetry systems

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9 Hydrogen Sulphide (H_2S) and Odour Management

9.1 Design Intent

The wastewater pump station and associated rising main shall be designed to manage hydrogen sulphide (H_2S) generation, odour emissions, and corrosion risks through a combination of system configuration, material selection, and targeted mitigation measures.

The design shall prioritise:

- Minimisation of septic conditions within the rising main and wetwell
- Reduction of wastewater retention times, particularly during staged development
- Controlled ventilation and treatment of foul air
- Protection of downstream infrastructure from H_2S-induced corrosion

The detailed design shall demonstrate how these objectives are achieved in accordance with industry best practice and relevant standards.

9.2 H_2S Generation Considerations

The design shall recognise the following primary mechanisms contributing to H_2S generation within the system:

- Septic conditions developing within pressure mains
- Extended retention times due to low-flow conditions during early stages of development
- Reduced velocities resulting in limited flushing of the rising main
- Anaerobic conditions within the wetwell

The detailed design shall assess these factors and incorporate appropriate mitigation measures within the hydraulic, mechanical, and operational configuration of the pump station and network.

9.3 Design Requirements for Odour and H_2S Mitigation

The wastewater system shall be designed to incorporate both passive (design-based) and active (treatment-based) mitigation measures.

9.3.1 Passive Design Measures

The design shall, as a minimum:

- Configure the rising main to minimise high points and dead zones
- Maintain velocities that promote flushing and minimise solids deposition, recognising staged flow conditions
- Incorporate system configuration (including shared rising mains where applicable) to improve turnover and reduce detention time

9.3.2 Active Odour Control Measures

The design shall include:

- Odour control units (e.g. activated carbon or biofilter systems) at:
  - Wastewater Pump Station Wetwell
  - Air release valve chambers, where required
- Sealed structures to ensure foul air is directed through treatment systems
- Venting arrangements designed to prevent uncontrolled odour release

Selection and sizing of odour control systems shall be confirmed at detailed design stage.

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9.4 Network Corrosion Protection Requirements

Targeted corrosion protection measures shall be incorporated within the downstream network to mitigate the effects of H_2S exposure.

Manholes located:

- At the rising main discharge, and
- Within the immediate downstream network where elevated H_2S exposure is anticipated

shall be lined with a fibreglass or equivalent corrosion-resistant coating.

This requirement is included to:

- Protect concrete structures from sulphide-induced corrosion
- Achieve the intended design life of network assets
- Reduce long-term maintenance and renewal requirements

The extent of lined infrastructure shall be confirmed during detailed design based on assessed risk. A targeted, risk-based approach shall be adopted rather than system-wide application.

9.5 Environmental and Performance Requirements

The system shall be designed to achieve the following outcomes:

- No persistent or objectionable odour at the site boundary under normal operating conditions
- Controlled discharge of foul air through designated treatment systems
- Minimisation of H_2S-related corrosion within the network
- Safe operation and maintenance access for all odour control infrastructure

The detailed design shall demonstrate compliance with these performance requirements and align with Council expectations for environmental and operational performance.

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10 Cost Share Agreements

The Developer acknowledges that elements of the proposed wastewater servicing strategy provide benefits extending beyond the immediate Westhaven WWPS catchment. As such, the Developer is willing to enter into one or more cost share agreements with Selwyn Water to facilitate the delivery of infrastructure that provides wider network benefits. This approach is consistent with discussions regarding optimisation of the longer-term wastewater network and the efficient provision of critical infrastructure.

10.1 Shared Rising Main Infrastructure

The proposed shared rising main along Selwyn Road is intended to form part of the wider wastewater network strategy and may provide benefits to future catchments and network upgrades. The Developer is willing to enter into a cost share agreement with Selwyn Water for the design and construction of the shared rising main infrastructure where the works provide capacity or functionality beyond that required solely for the Westhaven WWPS catchment. Discussions regarding the extent of works, allocation of costs, and timing of delivery will be progressed during detailed design.

10.2 Edwards Road WWPS Emergency Storage

In lieu of providing the full ECOP requirement for 8 hours of emergency storage entirely within the Westhaven WWPS site, an alternative servicing approach may involve the provision of additional above-ground storage at Edwards Road WWPS. This approach recognises the operational and economic efficiencies associated with providing emergency storage at an existing regional wastewater facility rather than constructing substantial additional underground storage within the development catchment. The Developer is willing to enter into a cost share agreement with Selwyn Water should this option be progressed.

The specific commercial, operational, and technical details of any cost share arrangements are outside the scope of this Basis of Design and will be determined at a later stage once detailed design has progressed and the final infrastructure requirements have been confirmed.

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11 Departures from SDC ECOP

11.1 Departure D-01 – Rising Main Termination

ECOP Clause – 6.4.16

ECOP Requirement

Pressure Pipelines must terminate in a Council owned 1050mm manhole.

Proposed Departure

Rising main(s) will terminate at the Edwards Road WWPS.

Justification

Edwards Road WWPS has been designed to allow direct connection via pressure main.

Selwyn Water Acceptance			
Accepted by		Date	
Position		Signature	

11.2 Departure D-02 – GRP Valve Chambers

ECOP Clause – 6.4.16

ECOP Requirement

Locate all valves in concrete chambers large enough to provide easy access for maintenance.

Proposed Departure

GRP valve chambers may be used in lieu of Concrete within the WWPS site.

Justification

GRP valve chambers provide an equivalent or improved outcome to concrete chambers through superior corrosion resistance, reduced maintenance requirements, fewer joints, improved operator access, and reduced whole-of-life asset costs. The proposed chamber arrangement achieves the intent of the ECOP by providing safe and maintainable access to all equipment while improving long-term durability within the wastewater environment.

Selwyn Water Acceptance			
Accepted by		Date	
Position		Signature	

11.3 Departure D-03 – Direct Buried Valves

ECOP Clause – 6.4.16

ECOP Requirement

Locate all valves in concrete chambers large enough to provide easy access for maintenance.

Proposed Departure

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Valves located at strategic network junctions (e.g. Selwyn Road) may be direct buried and fitted with surface-access spindle risers and valve boxes in lieu of concrete valve chambers.

Justification

Direct buried valves are proposed at selected road corridor locations where regular inspection or maintenance access is not anticipated. The use of direct buried valves with surface-access spindle risers is considered industry standard for buried water and wastewater pressure reticulation networks and allows operation from ground level without the need for confined-space entry.

The arrangement reduces the footprint required within constrained road corridors, minimises potential conflicts with other underground services, and removes the need for large access chambers within trafficked areas. It also reduces long-term maintenance requirements associated with chamber drainage, sediment accumulation, groundwater ingress and corrosion of chamber components.

Where direct buried valves are adopted, valve locations shall be selected to ensure accessibility for maintenance and replacement activities, and suitable isolation arrangements shall be incorporated within the wider network design to maintain operational flexibility and resilience.

Selwyn Water Acceptance			
Accepted by		Date	
Position		Signature	

11.4 Departure D-04 – No Wetwell Ladder

ECOP Clause – 6.4.17

ECOP Requirement

Install a stainless-steel ladder in the wet well for maintenance

Proposed Departure

No Ladder is to be installed within the wetwell.

Justification

All access to the wetwell will be via winch/harness arrangement. Ladder will cause maintenance issues with accumulation of rags etc.

Selwyn Water Acceptance			
Accepted by		Date	
Position		Signature	

11.5 Departure D-05 – Emergency Storage

ECOP Clause – 6.4.17

ECOP Requirement

Minimum of 8 hours storage of the design ASF (average sewer flow) – note that this can be provided within the reticulation.

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Proposed Departure

Refer to S4 of this report for details.

Justification

Refer to S4 of this report for details.

Selwyn Water Acceptance			
Accepted by		Date	
Position		Signature	

11.6 Departure D-06 – LFVP Lids

ECOP Clause – 6.4.17

ECOP Requirement

Install a stainless-steel ladder in the wet well for maintenance

Proposed Departure

Refer to S7.3 for detailed proposal.

Justification

LFVP covers do not provide access gates and are generally 3-sided or 2-sided void protection. Proposed solution provides a more robust outcome and a higher level of safety.

Selwyn Water Acceptance			
Accepted by		Date	
Position		Signature	

DRAFT

12 Safety in Design

12.1 Design Intent

The wastewater pump station shall be designed to eliminate hazards where reasonably practicable and, where hazards cannot be eliminated, reduce risks through engineering controls, equipment selection and site layout.

Safety in Design shall be considered throughout the life cycle of the asset, including:

- Construction
- Operation
- Inspection
- Maintenance
- Renewal and replacement
- Decommissioning

The design shall seek to minimise reliance on administrative controls and personal protective equipment by prioritising inherently safer design solutions.

12.2 Design Considerations

The design of the WWPS shall incorporate the following principles:

- Safe all-weather access for operation and maintenance activities.
- Minimisation of confined space entry requirements through equipment layout and maintenance access arrangements.
- Safe removal and replacement of pumps, valves and major equipment using suitable lifting equipment.
- Provision of safe access to all structures, chambers, buildings and equipment.
- Safe isolation of electrical, mechanical and hydraulic systems during maintenance.
- Minimisation of operator exposure to wastewater, odours and hazardous gases, including hydrogen sulphide (H_2S).
- Provision of sufficient working areas and clearances for maintenance vehicles, equipment and personnel.
- Protection of operators, contractors and the public from operational hazards and unauthorised access.

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Appendix 1 Wastewater Catchment Plan

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Appendix 6 Utilities Capacity Certificates

Tuatahi First Fibre

PO Box 27050
Garnett Avenue 3257
0800 Fibre LTD
tuatahifibre.co.nz

2nd November 2026

CONDITIONAL ACCEPTANCE BY TUATAHI FIRST FIBRE LIMITED AS TELECOMMUNICATIONS OPERATOR

Development: Westhaven, Rolleston
Legal Name: Section 2 SO Plan 480906 comprised in record of title 686982, Lot 3-4 DP 20007 comprised in record of title CB772/69, Lot 1 DP 82068 comprised in record of title CB47B/859, Lot 1 DP 72132 comprised in record of title CB41D/425, Lot 2 DP 72132 comprised in record of title CB41/426, Part Rural Section 31354, Part Rural Section 31356 and Part Section 4 Reserve 1342 comprised in record of title CB24F/1018, Rural Section 25807 comprised in record of title CB8B/345 and Rural Section 23614 comprised in record of title CB27B/97

1. Tuatahi First Fibre Limited (TFF) confirms that a TFF telecommunications connection will be made available for each lot in the development, with sufficient capacity for over 5,300 lots **and the developer has signed a TFF Installation Agreement.** TFF will undertake to become the telecommunications operator of the telecommunications reticulation in the proposed development (the "**Subdivision**"), to provide network connections to the lots, in the Subdivision (the "**Reticulation**").

2. The Reticulation will be installed in accordance with:

   (a) the requirements and standards set by the Selwyn District Council and advised to TFF via the Council's website; and

   (b) the requirements of the Telecommunications Act 2001 and all other applicable laws, regulations and codes (as amended).

3. The Reticulation will be installed by our preferred provider to TFF's satisfaction.

4. TFF will be the owner, operator and maintainer of the Reticulation.

5. One or more retail service providers will be available to supply telecommunications services over the completed Reticulation when service is available, provided that TFF shall not be responsible if the retail service provider's offer to supply such telecommunications services or the number of such providers varies from time to time.

SIGNED for and on behalf of **TUATAHI FIRST FIBRE LIMITED** by:

Signature: 

Name: Jonathan Campbell
Phone: [redacted]
Email: [redacted]

12.11.2025 **Reference** ORN1022997

Chris Sexton
93 Manchester Street

Christchurch 9011

Dear Chris

Proposed subdivision – 135 Dunns Crossing Road Rolleston Rolleston or Lot No. & DP

Thank you for your request for a letter to confirm there is capacity on the Orion network to service the electrical needs of your proposed subdivision.

This letter is not suitable for 224 clearance purposes.

I confirm:

1. Orion has the capacity on the network to meet your request.

2. There are no specific connections available for this subdivision however:

    a. A connection can be made available for 5300 lots dwellings subject to alteration to the Orion network; and

    b. *It is likely Orion will need to either upgrade existing network or lay new cables to create these connections. We recommend the developer engages an authorised Orion subdivision designer to help you through this process and submit a suitable design proposal so that your development may connect to the Orion network.*

    c. There will be costs associated in providing the connection(s). The costs payable will be in accordance with the Orion [*extensions and connections or subdivision*] policy and will be the responsibility of the property owner.

    d. The next step will be to apply for a connection online at www.oriongroup.co.nz under "get connected".

3. Orion will request an easement in gross for all over boundary existing network not currently secured by way of easement at the developers cost prior to the issuing 224 clearance.

4. To comply with Orion's network security conditions an alternative feed from adjoining developments may also be required.

5. All proposed new structures near or under existing overhead lines (eg house, sheds, carports, garages or any other structures) must comply with the distances stated in the New Zealand Electrical Code of Practice for Electrical Safe Distances 2001 (NZECP34:2001).

Orion New Zealand Ltd
565 Wairakei Road
PO Box 13896
Christchurch 8141
+64 3 363 9898
oriongroup.co.nz

6. **IMPORTANT:** This Capacity Letter will expire upon the earlier of the date upon which a connection for each of the lots for the development has been approved and livened or 6 months from the date of this letter in the case of a residential/rural subdivisions or, 12 months in the case of a commercial/industrial subdivision.

All terms and conditions will be subject to current Orion policies and practices.

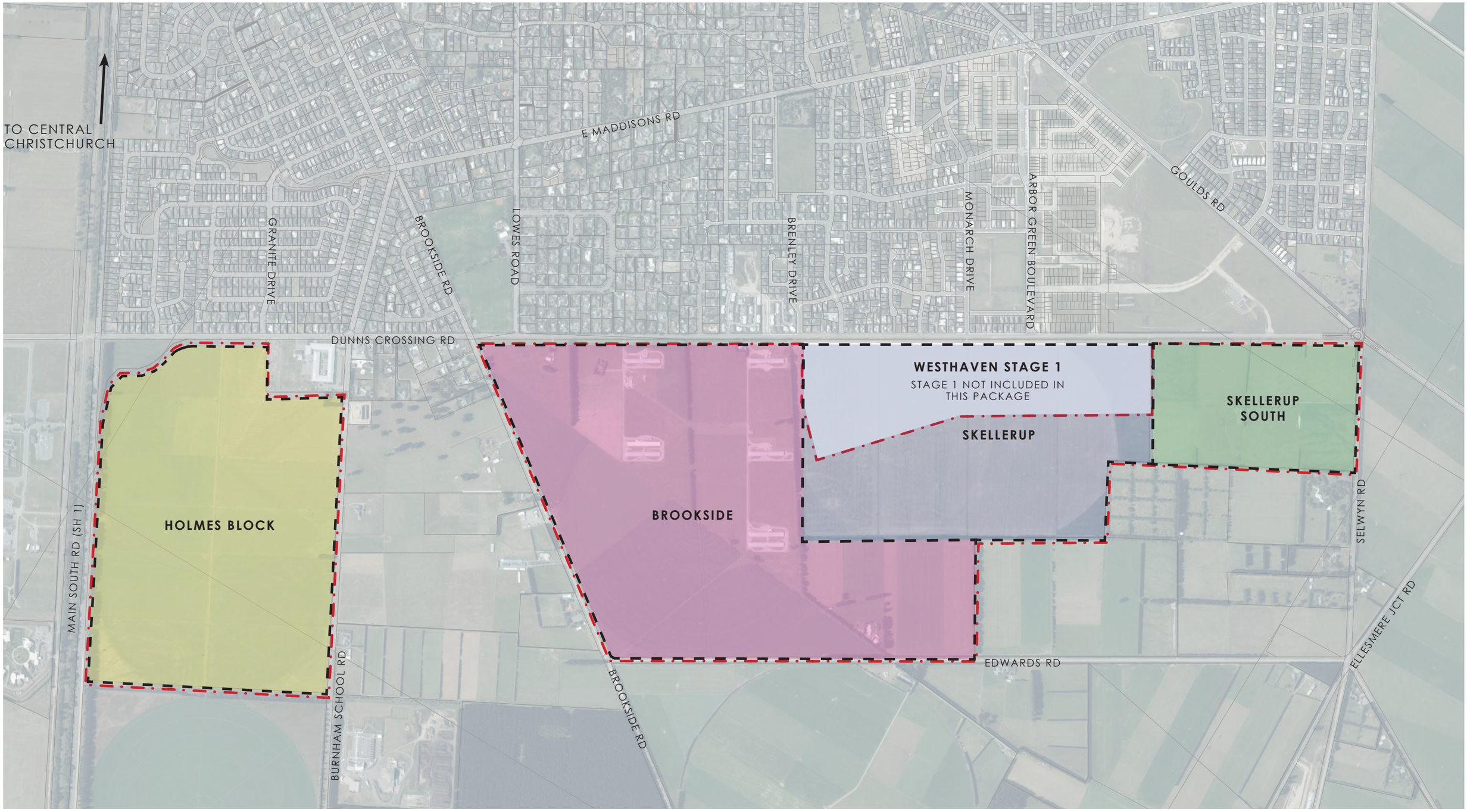
Please contact me if you require any further information.

Yours faithfully



Peter Johnson
Contract Mgr Connections (NS)
[redacted]

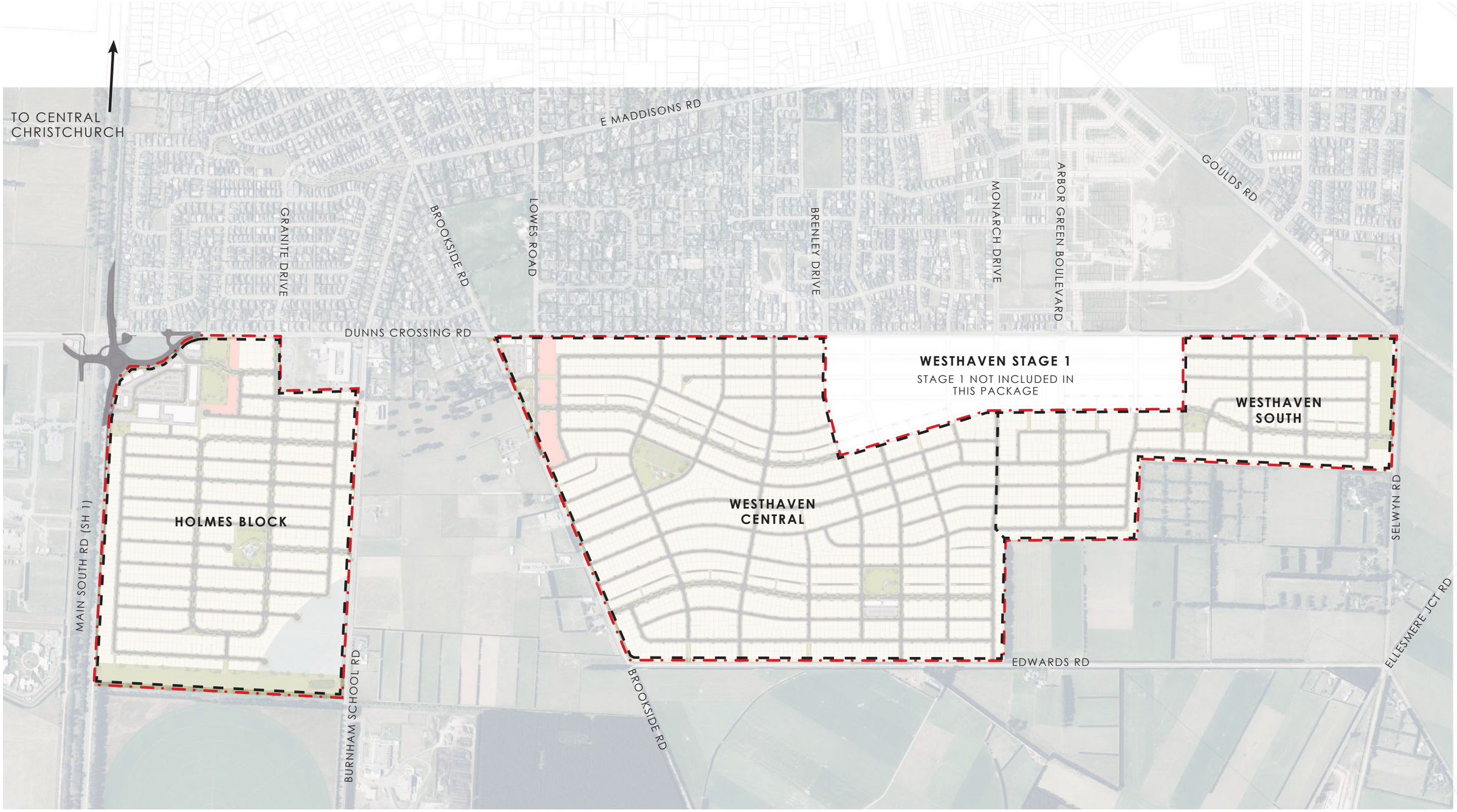
Appendix 7 Scheme Plan Naming Conventions



LEGEND

- Site Boundary
- Block boundary

PROPOSAL - NAMING CONVENTIONS REFERRED TO IN PREVIOUS PLAN CHANGE PROCESSES



LEGEND

- Site Boundary
- Block boundary

PROPOSAL - PROPOSED DEVELOPMENT NAMING CONVENTIONS