JFP URBAN CONSULTANTS

SITE BASED STORMWATER MANAGEMENT PLAN

Revision B

Proposed Development at
673 SILVERWOOD DRIVE, FLAGSTONE
for
THE TRUSTEE FOR CHANG FAMILY T/A ORIS ACCESSORIES PTY LTD



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1. INTRODUCTION

JFP Urban Consultants Pty Ltd has been commissioned by *The Trustee for Chang Family T/A Oris Accessories Pty Ltd* to compile this *Site Based Stormwater Management Plan* ("SBSMP") for the proposed residential subdivision at 673 Silverwood Drive, Flagstone ("the site"). Refer to Appendix A for the reconfiguration plan.

The site is in Logan City Council ("LCC") local government area and the Greater Flagstone Priority Development Area ("PDA"). Therefore, the assessment authority for the development application is the Economic Development Queensland ("EDQ") and the application reference is DEV-2026-FLA-4642.

The flooding, stormwater quantity and stormwater quality assessments presented in this report have been undertaken generally in accordance with the following guidelines:

- *Engineering Standards,* PDA Guideline No. 13 (September 2017);
- *Environmental Values and Sustainable Resource Use*, PDA Guideline No. 14 (May 2015); and
- *Protection from Flood and Storm Tide Inundation*, PDA Guideline No. 15 (May 2015).

The works will be located outside of the 1% AEP Flagstone Creek flooding. Much of the development will discharge stormwater directly into Flagstone Creek in the north-eastern corner. A regional peak flow assessment determined that development peak flow mitigation is only required for a 63% AEP (1 year ARI) storm event. A bioretention and 63% AEP detention basin is proposed prior to the creek discharge. Sufficient erosion control measures will be provided at the headwall and weir outlets, subject to detail design. Small portions of the development will discharge into urban drainage networks in Bloomfield Esplanade to the north-east, and Ross Street / Boomi Avenue to the east. No bioretention and detention basins are proposed for the small catchments discharging into urban drainage networks.

Revision B has been updated specifically to address EDQ Information Request dated 11/5/2026. Refer to Section 1.1 for itemised responses for flooding and stormwater items.

1.1 INFORMATION REQUEST RESPONSE (FLOODING & STORMWATER)

Floodplain management - Restricted development within the high flood risk area

1. *Remove earthworks from the high flood hazard area in and around the tributary of Flagstone Creek. As per the Logan City Council's Flood Portal, and therefore relevant for State Planning Policy requirements, the subject tributary of Flagstone Creek is subject to high flood hazard, where the study also recommended for no or limited development opportunity. According to the Logan City Council Flood Portal (TLPI No. 1/2024), given the location of the tributary within a high flood risk area (see extract below), the applicant is permitted to fill up to 20 m³, as per PO/AO22 of the Logan City Plan flood overlay code.*

   Response: A flood impact assessment has been undertaken, and the results demonstrate that filling eliminates the high flood hazard conditions without creating adverse flood impacts. The runoff from the external catchment "EXT" will be conveyed via internal drainage network (pipe and road). The proposal provides a satisfactory outcome against Logan City Council's *Flood Hazard Overlay Code.* This strategy was presented to EDQ officers in a meeting held on the 3/6/2026. The EDQ team were agreeable to the approach, pending details of the flood impact assessment. Refer to Section 4 for details of the flood impact assessment.

Floodplain management - Flood impact/Overland flow assessment

2. *Submit a flood impact/overland flow assessment report prepared by an RPEQ specialised in flood hydraulics. For better understanding and proper assessment of the application, the applicant is requested to provide the following information:*
    a. *Flood modelling including cumulative filling within the Flagstone Creek corridor and demonstrate no impact to surrounding properties.*
    b. *Section 3.2 of the report indicated that a small external catchment from the rail corridor will be conveyed through the site. Identify the size, extent of the catchment, and the required stormwater infrastructure to cater for the upstream catchment.*

    This is required to ensure that the development has adequately considered the external flow and the proposed development features to demonstrate no hydraulic impacts.

Response:

a. Refer to Section 4 of this report for flood modelling.

b. The size and extent of the external catchment from the rail corridor is identified as "EXT" on catchment plans in Appendix D. The catchment size of "EXT" is 3.26ha in size. The preliminary pipe size for conveying the minor flow is 750mm diameter RCP at 0.15% minimum grade (Section 3.2.2.1). The final pipe size and grade subject to detail design. Overland flow in a major design storm will travel via the road network. Road capacity calculations in Section 3.5 includes flow from this external catchment. The results show compliance with the *QUDM* (2016).

Stormwater Management Plan - Stormwater Quantity

3. *Submit a revised stormwater management plan to address the following aspects:*
    a. *Figure 7 has identified three lawful point of discharges; however, the corresponding contributing catchments are not clear. Provide revised plan showing the contributing sub-catchment for each LPD. This is required to understand the extent of the contributing catchment/s for each LPD.*
    b. *Provide a 1% AEP assessment to demonstrate that Bloomfield Esplanade has adequate capacity to cater for the increased runoff. Compliance with the requirements of QUDM is to be demonstrated. The assessment and further peak flow mitigation measure is required to ensure that the flood overland flow safety at the downstream existing road systems are not compromised.*
    c. *Demonstrate that the proposed "Type 3 – conventional" bioretention design including the flood immunity of the weir and outlet pipes complies with Logan City Plan requirements. The details of the bioretention basin should satisfy the relevant EDQ and Logan City Council standards.*
    d. *Submit a preliminary geotechnical and earthworks stability assessment addressing retaining walls and batters adjoining the stormwater basin, including confirmation of long-term stability and erosion resistance. The design of the proposed retaining walls are to comply with the requirements of Logan Planning Scheme Policy, Schedule 6, Section 3.3.6.2.*

Response:

a. Previous Figure 7 has now been re-numbered to Figure 4 and updated to highlight the contributing catchments to each LPD in separate colours.

b. Refer to Section 3.4.3 for 1% AEP water level assessment in Bloomfield Esplanade. The results demonstrate it has adequate capacity to cater for the increased runoff whilst complying with the requirements of the *QUDM* (2016).

c. All basin components, including filter media, outlet pipes and weir are located above Flagstone Creek 1% AEP flood levels which is approximately 33m AHD. Refer to Appendix J for the preliminary engineering design plans for the basin. It has been undertaken generally in accordance with relevant EDQ, LCC and QUDM (2016) standards.

d. Refer to the separate geotechnical report provided by *Qualtest Laboratory Pty Ltd* that addresses this item.

2. SITE CHARACTERISTICS

2.1 LOCATION

The total site area is 32.949ha. It is in the Logan City Council ("**LCC**" or "**Council**") local government area. The real property description is Lot 1 RP45241. The site is bounded by the interstate rail line to the west, rural properties to the north, and recent developments to the south and east. Refer to **Figure 1** for the site locality.

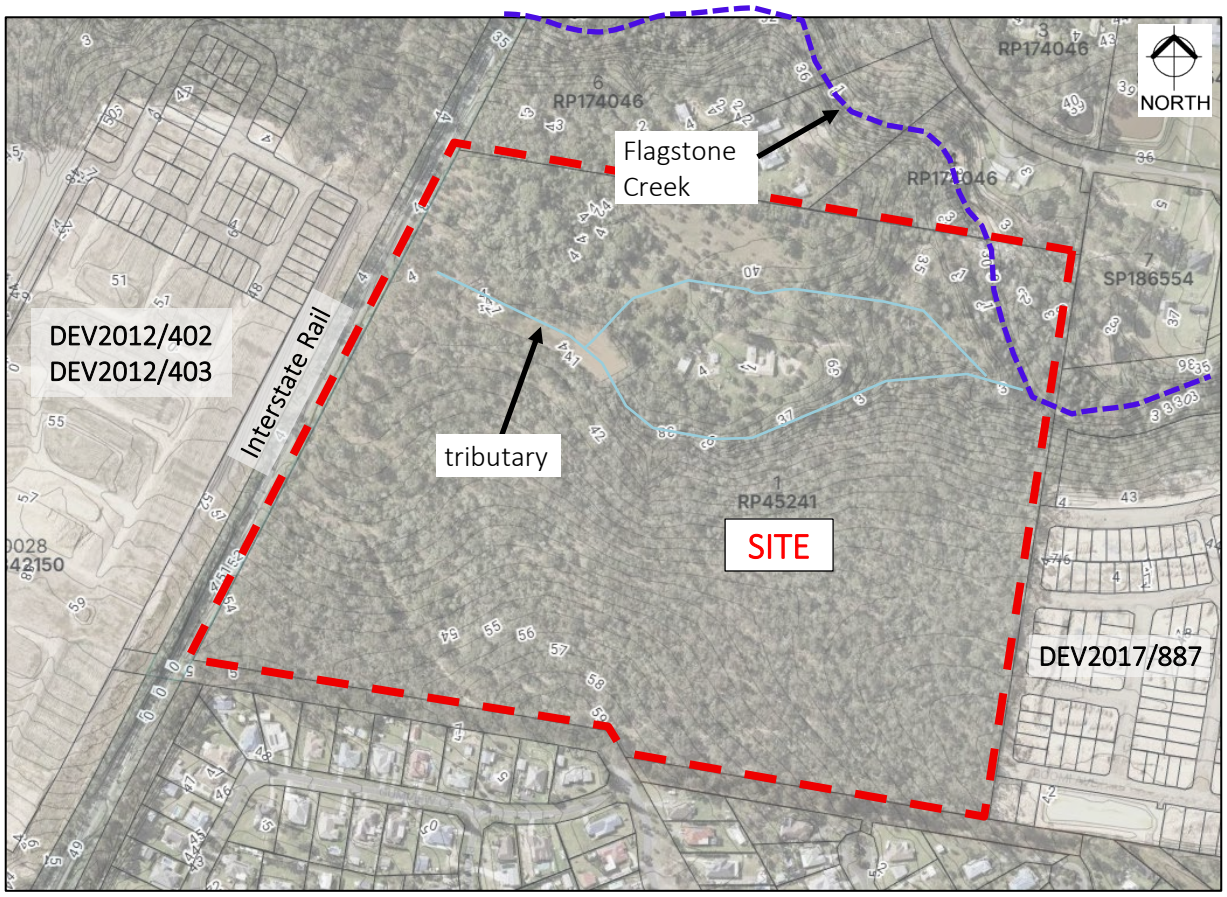


Figure 1 – Site Location & Aerial Imagery

2.2 LAND USE & ZONING

Currently the site is largely pervious with only a single residential dwelling. Under EDQ the site is in the Greater Flagstone PDA. Refer to **Figure 2** for the Greater Flagstone PDA extent.

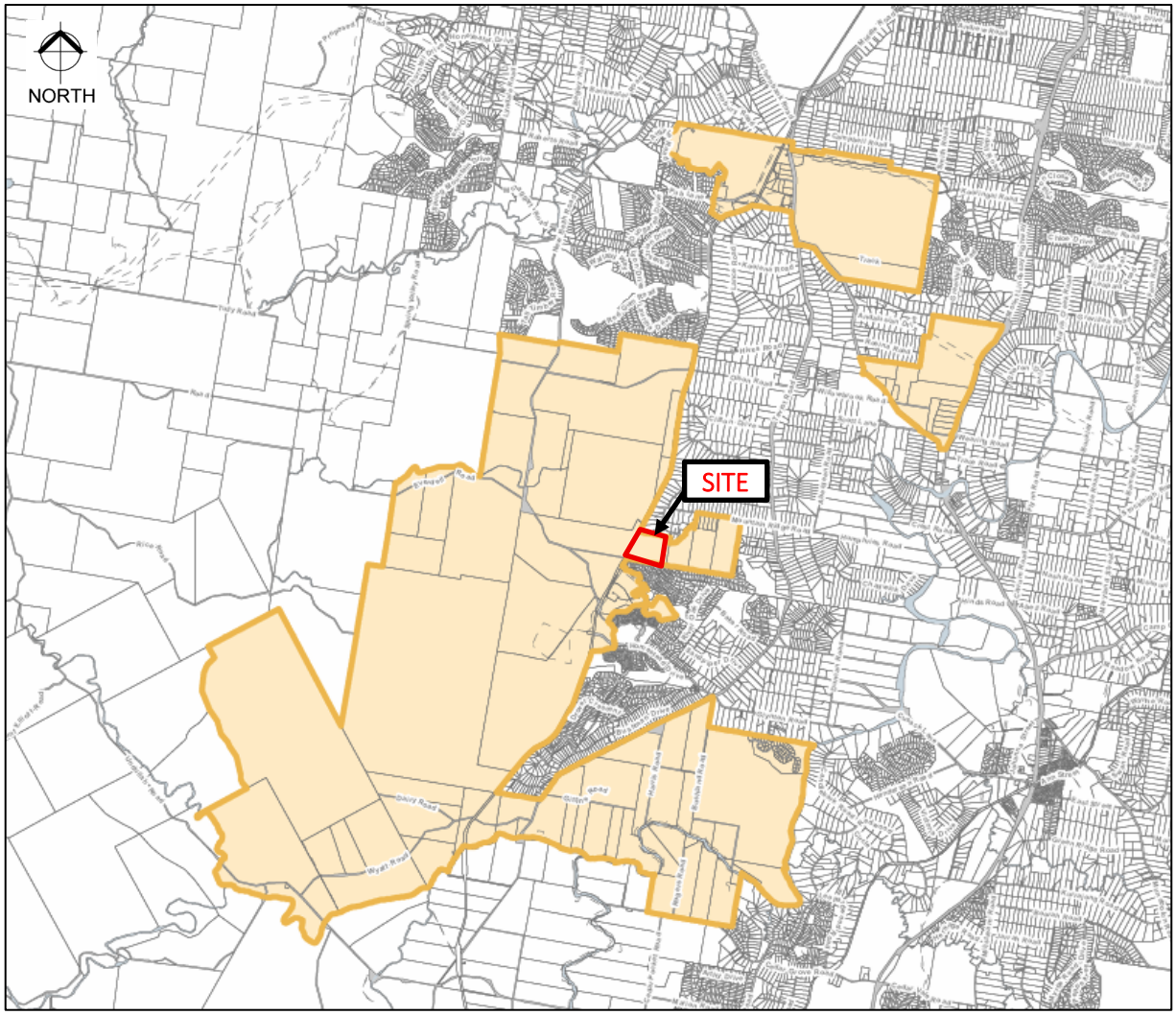


Figure 2 – Greater Flagstone PDA Map (EDQ, 2026)

2.3 EXISTING TOPOGRAPHY & DRAINAGE

The site naturally has a ridge dividing the site drainage essentially in two main directions: to the north-east and to the south-east, at grades in the order of 5.5% and 4% respectively. Existing drainage infrastructure is available in the neighbouring development to the east, DEV2017/887. There is a drainage tributary running through the site from the west and into the Flagstone Creek to the east. Refer to **Figure 3** for schematic drainage patterns and **Section 4** for a detailed hydraulic assessment.

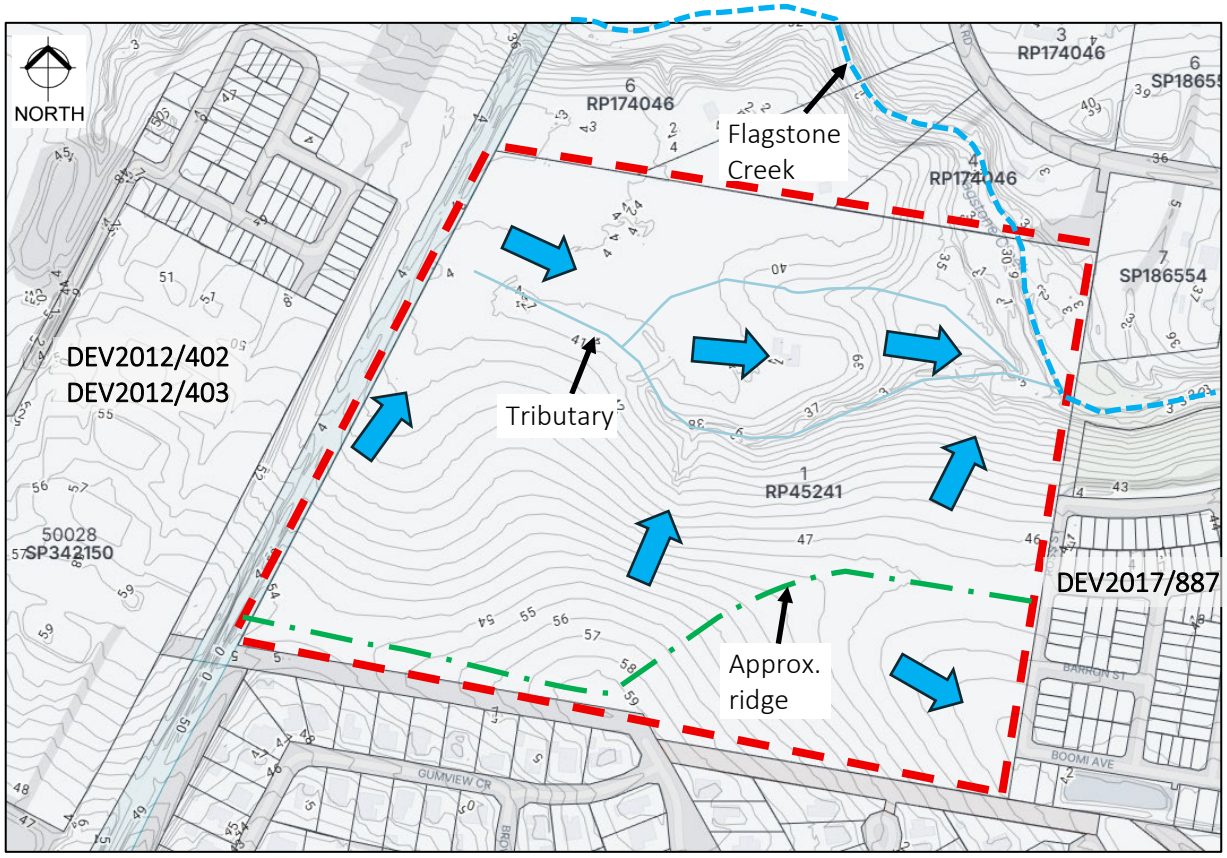


Figure 3 – Existing Drainage Pattern & Contours

3. STORMWATER QUANTITY

3.1 STORMWATER QUANTITY MANAGEMENT STRATEGY

The proposed stormwater quantity management strategy for the development includes three main lawful points of discharge ("LPD"). They are listed below and illustrated on Figure 4.

- LPD 1: Discharging a majority of the development runoff to Flagstone Creek. 63% AEP detention and bioretention basins will be provided prior to this discharge.
- LPD 2: Discharging a small catchment to Ross Street / Boomi Avenue to the south-east, ensuring no adverse impacts to the downstream drainage infrastructure. No basin proposed prior to this discharge point.
- LPD 3: Discharging a small catchment to Bloomfield Esplanade to the east, ensuring no adverse impacts to the downstream drainage infrastructure. No basin proposed prior to this discharge point.

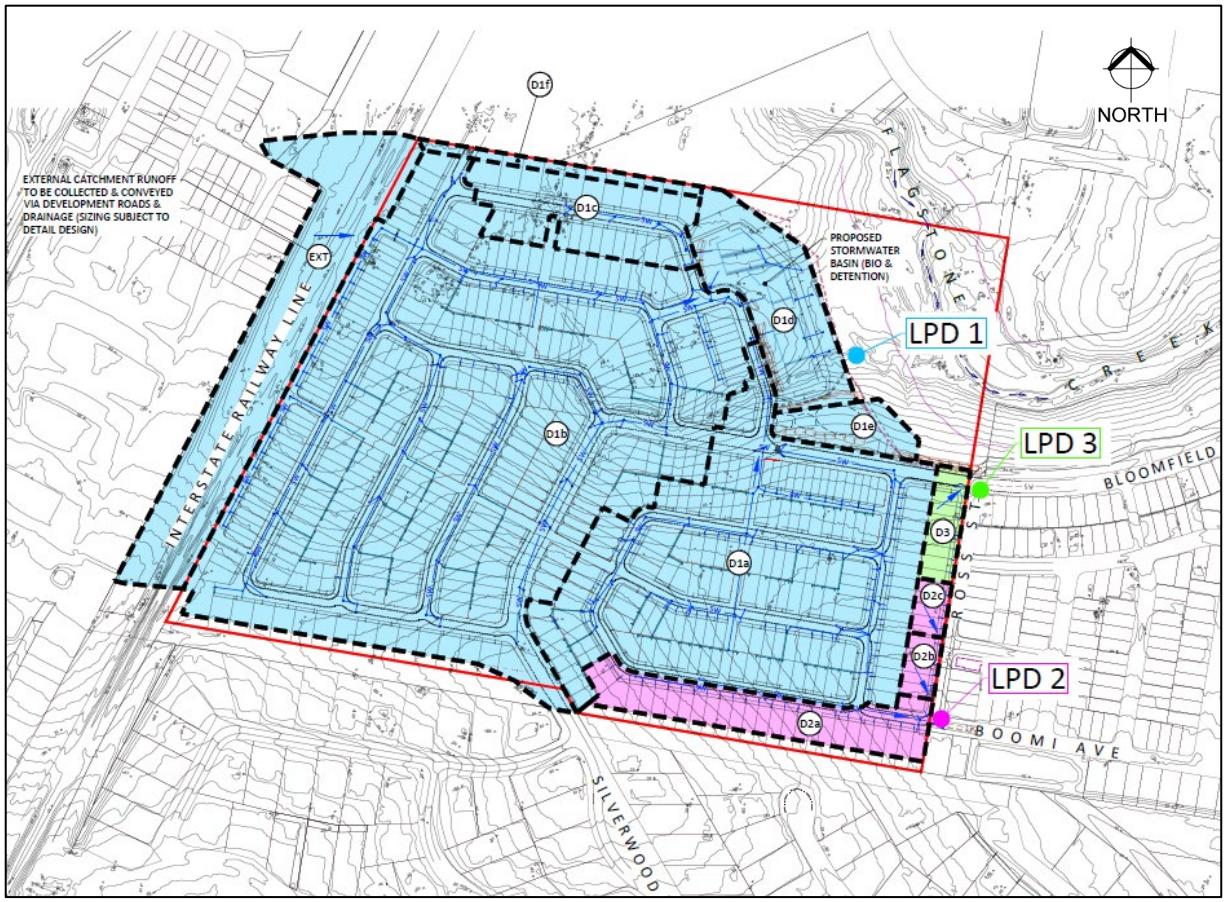


Figure 4 – Lawful Points of Discharge

A regional peak flow assessment, using XP-STORM (2024.2) software, has been undertaken for LPD 1 to determine the development's impact in Flagstone Creek. The results determined detention is required only for a 63% AEP storm event. Refer to Section 3.2.

The stormwater quantity assessments for LPD 2 and LPD 3, presented in Section 3.3 and 3.4, demonstrate no adverse impacts.

3.2 LPD 1 : FLAGSTONE CREEK

3.2.1 REGIONAL PEAK FLOW ASSESSMENT

A stormwater quantity / peak flow analysis has been undertaken using the XP-STORM (version 2024.2) software. The XP-STORM peak flow rates have been calibrated against the results from *Australian Rainfall & Runoff* ("ARR") Regional Flood Frequency Estimation ("RFFE") model and verified Council's *Flagstone and Sandy Creek Flood Study 2025*.

The following three regional peak flow assessment scenarios have been modelled:

- **Calibration Scenario:** prior to any development to the west of the railway corridor.
- **Pre-Development Scenario:** current catchment land use conditions, including the entire development to the west of the railway corridor approved under DEV2012/402 and DEV2012/403. The subject site (673 Silverwood Drive) is represented in its current undeveloped condition.
- **Post-Development Scenario:** same as the pre-development scenario but fraction imperviousness adjusted to reflect the subject site in post-development condition, but no detention.

3.2.1.1 REGIONAL CATCHMENT DATA

The catchments for the three regional peak flow assessment scenarios have been delineated using 2023 LiDAR topographical data. Refer to **Appendix D**.

The fraction imperviousness has been determined using varying zones generally in accordance with *Logan Planning Scheme* 2015. Refer to **Table 1** for the fraction impervious values assigned for each zone. The fraction impervious of 0.70 (70%) for the PDAs external to the site reflects the combined denser development and the open space / creek corridors. The catchment parameters including a summary of the fraction impervious breakdowns are in **Appendix D.**

Table 1 – Fraction Impervious Values

Zone / Land Use	Fraction Impervious
Open Space	0.00
Rural Residential	0.20
Priority Development Areas (external to site)	0.70
Site – pre-development	0.004
Site – proposed development area	0.80

3.2.1.2 XP-STORM INFILTRATION PARAMETERS

The following initial loss, continuous loss and Manning's n values have been adopted globally across all XP-STORM model scenarios and iterations.

Table 2 – Hydrology Infiltration Parameters

	63% to 1% AEP		
	Initial Loss (mm)	Continuing Loss (mm/hr)	Manning's n
Impervious Areas	0	0	0.014
Pervious Areas	15	2	0.035

3.2.1.3 RAINFALL DATA

Site-specific intensity-frequency-duration ("IFD") data was sourced from the Bureau of Meteorology ("BOM") website. Refer to Appendix E. They have been coupled with 1987 temporal patterns (zone 3) to generate flow hydrographs in XP-STORM using the Laurenson runoff routing method. The standard durations from 20-minutes to 6-hours were simulated for the standard storm events from the 63% to 1% AEP.

3.2.1.4 BX FACTOR

The following Bx Factors have been adopted in XP-STORM to calibrate peak flows.

Table 3 – Bx Factors

AEP	Bx
63%	1.3
39%	
10%	
5%	
2%	1.05
1%	

3.2.1.5 UPSLOPE DETENTION

The *Flagstone City – Masterplan Flooding Assessment* (Cardno Report 721743/032/R1V6, dated September 2014) associated with approval DEV2012/402 & 403 note that three detention systems are proposed refer to an excerpt. Unfortunately, we have not been able to find further details regarding these basins, including their locations, the stage or the construction status.

Flagstone City-Masterplan
Flooding Assessment

Cardno

Table 5-4 Proposed Detention Basins

Detention ID	Outlet Structures		Road Level (mAHD)
	Minor Flow Pipe	Major Flow Pipe	
Bas1	750mm RCP, USIL 48.63mAHD, DSIL 48.43mAHD and 750mm RCP, USIL 48.84mAHD, DSIL 48.54mAHD	7m wide weir having crest level of 49.7mAHD And 7m wide weir having crest level of 49.9mAHD	n/a
Bas2	1200mm RCPs, USIL 42.32 mAHD, DSIL 42.085 mAHD	n/a	44.5
Bas3	120mm RCP, USIL 41mAHD, DSIL 40.79Mahd	6m wide weir having crest level of 42.0mAHD	n/a

Figure 5 – Excerpt from *Flagstone City – Masterplan Flooding Assessment* (Cardno Report 721743/032/R1V6, dated September 2014)

For the purposes of this regional peak flow assessment, we have not included any detention within the upslope development. This provides conservative peak flow results as upslope detention would further delay the regional peak allowing more time for the site flows to exit without coinciding with the regional peak.

3.2.1.6 DOWNSTREAM BOUNDARY

Free draining outfall condition has been simulated in XP-STORM.

3.2.1.7 XP-STORM LAYOUT

Refer to **Figure 6** for the regional XP-STORM layout and the peak flow measurement locations.

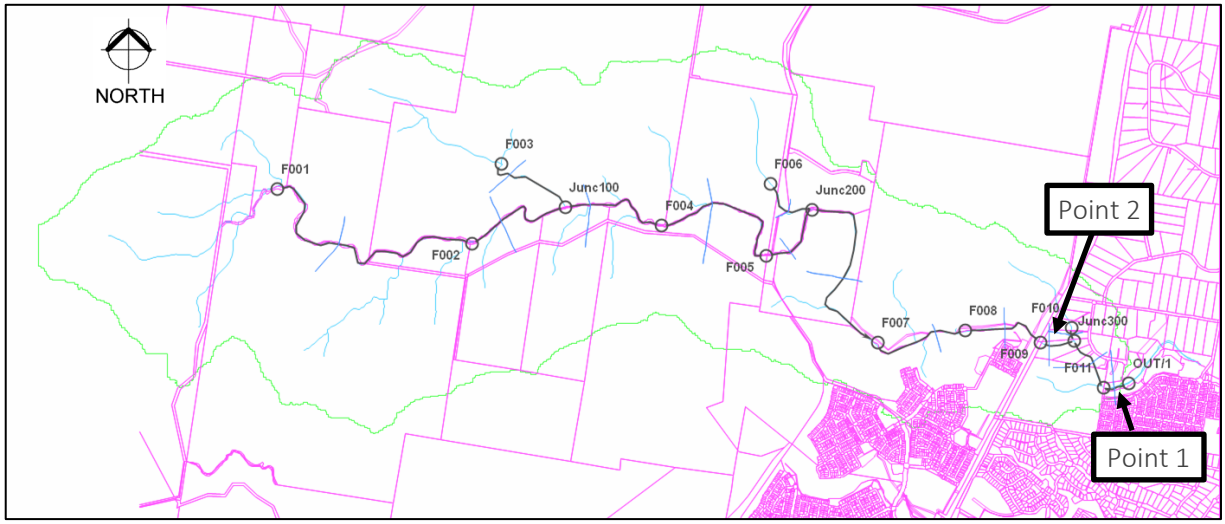


Figure 6 - Regional XP-STORM Layout

3.2.1.8 PEAK FLOW CALIBRATION

RFFE MODEL

The peak flow calibration, as presented in **Table 4**, has been undertaken against the Regional Flood Frequency Estimation ("**RFFE**") model at the downstream site boundary ("Point 1" on **Figure 6**). The RFFE report is included in **Appendix F**.

Table 4 – Peak Flow Calibration to RFFE Model

AEP	POINT 1			
	RFFE Model Peak Flow (m^3/s)	JFP Calibration Scenario XP-STORM Peak Flow (m^3/s)	Difference (m^3/s)	Difference (%)
10%	49.2	51.4	2.2	4%
5%	66.4	65.6	-0.8	-1%
2%	93.7	96.7	3.0	3%
1%	118.0	115.3	-2.7	-2%

The results show generally consistent peak flow rates between the XP-STORM and the RFFE Model. The XP hydrology set up is therefore considered appropriate for the analyses presented herein. No further comparisons against the RFFE Model have been undertaken. The XP Storm parameters will be applied to the pre-development and post-development scenarios to analyse the peak flow mitigation.

COUNCIL FLOOD STUDY

A comparison against Council's flood study's URBS model is presented in **Table 5** at location marked as "Point 2" on **Figure 6**). The extract from Council's flood study is included in **Appendix B.**

Table 5 – Peak Flow Comparison to Council's Flood Study

AEP	POINT 2			
	Council Flood Study URBS Model Flow at "S_1" (m^3/s)	JFP Calibration Scenario XP-STORM Peak Flow (m^3/s)	Difference (m^3/s)	Difference (%)
10%	50	49.9	-0.1	-0.3%
1%	110	113.6	3.6	3%

3.2.1.9 PEAK FLOW RESULTS

Table 6 presents the total peak flow rates in Flagstone Creek at "Point 1".

Table 6 – Flagstone Creek Peak Flow Results

AEP	Pre-Development Scenario (Point 1)		Post-Development Scenario (Point 1)		Difference (m^3/s)	Difference (%)
	Peak Flow (m^3/s)	Critical Duration Storm	Peak Flow (m^3/s)	Critical Duration Storm		
63%	19.6	60-min	20.1	60-min	0.4	2.2%
39%	26.4	360-min	26.4	360-min	0	0%
10%	53.3	360-min	53.3	360-min	0	0%
5%	67.0	360-min	67.1	360-min	0.06	0.1%
2%	95.5	270-min	95.4	270-min	-0.1	-0.1%
1%	113.1	270-min	113.0	270-min	-0.1	-0.1%

The results show that the only notable peak flow increase occur in a 63% AEP storm event. Therefore, on-site detention is proposed to mitigate the 63% AEP at LPD 1 (discharge into Flagstone Creek). Sizing of this detention is presented in **Section 3.2.2.**

3.2.2 LOCAL PEAK FLOW ASSESMENT & DETENTION BASIN SIZING

A local site-based stormwater quantity / peak flow analysis has been undertaken using the XP-STORM (version 2024.2) software for sizing the detention volume required to mitigate a 63% AEP storm event flow discharging into the creek.

3.2.2.1 LOCAL CATCHMENT DATA

Refer to **Appendix D** for the local catchment data and catchment plans. The development to west of the railway (DEV2010/402 & 403) collects and conveys its runoff to Flagstone Creek, however a smaller external catchment consisting of the railway corridor, enters the site from the west (catchment "EXT").

Catchment EXT runoff will be captured by road drainage infrastructure along the western site boundary. The final configuration is subject to detail design however, the preliminary pipe sizing for a minor design storm is as follows. The final pipe size and grade subject to detail design.

- 39% AEP peak flow: 0.30m³/s
- Pipe diameter: 750mm
- Minimum grade: 0.15%
- On-grade pipe capacity: 0.43m³/s

Flows greater than a 39% AEP will travel as overland flow via the road networks. Internal road flow calculations presented in **Section 3.5** considers the runoff from catchment EXT and the results demonstrate road flow complies with the *QUDM* (2016).

3.2.2.2 XP-STORM MODEL SET UP

The model uses the same hydrological parameters (e.g. infiltration, Bx factors, rainfall etc) as the regional model discussed in **Section 3.2.1.**

3.2.2.3 DETENTION BASIN PARAMETERS

Table 7 outlines the detention basin parameters modelled. Refer to **Appendix G** for the stage vs area relationship.

Table 7 – Detention Parameters

Parameter	Value
Available Detention Volume (m³) [A]	5,100
Bioretention RL (m AHD)	36.50
Extended Detention RL (m AHD) [B]	36.80
Min. Embankment RL (m AHD)	37.75
Culvert	2 x 900mm RCP US IL 36.80 @ 0.5% grade
weir	≥ 100m at RL 37.45

[A] Volume between EDD RL 36.80 and Weir RL 37.45

[B] Detention IL = EDD RL

3.2.2.4 XP-STORM LAYOUTS

Refer to **Figure 7** and **8** for the pre and post-development scenario model layouts.

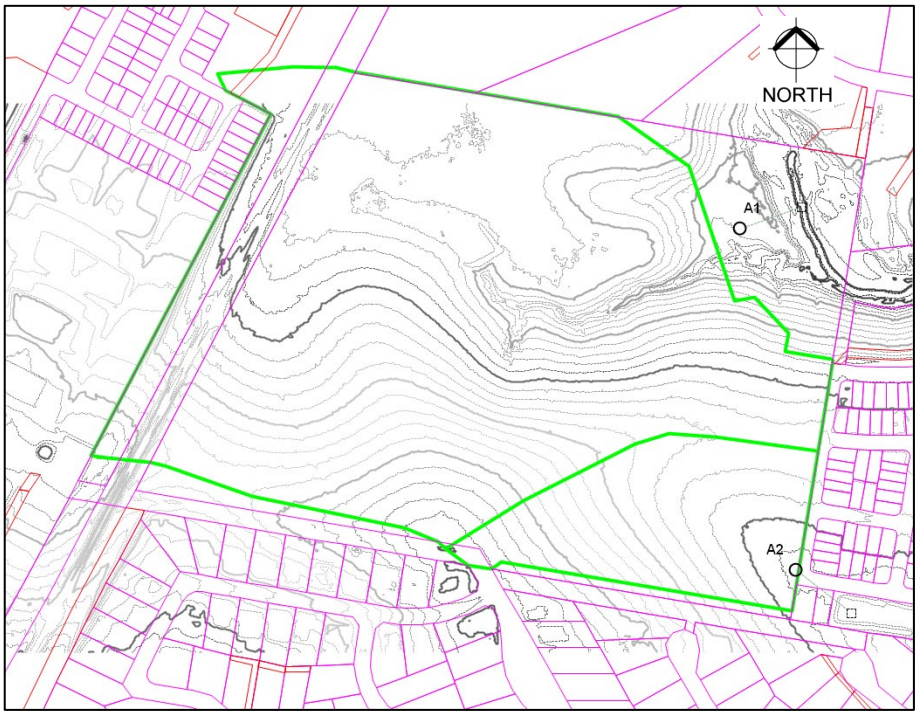


Figure 7 – Local XP-STORM Layout (Pre-Development)

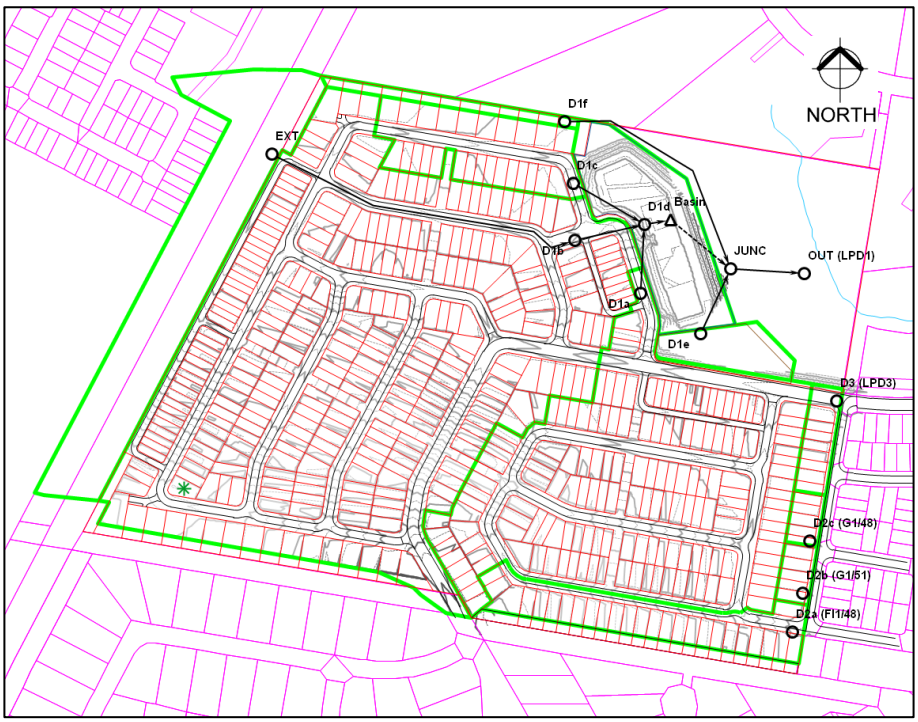


Figure 8 – Local XP-STORM Layout (Post-Development)

3.2.2.5 PEAK FLOW RESULTS AT LPD 1

Table 8 presents site pre and post-development peak flow rates at LPD 1 for a 63% AEP storm event. As can be seen, the proposed detention achieves peak flow mitigation at LPD 1.

Table 8 – LPD 1 Peak Flow Results

AEP	LPD 1 : Discharge to Flagstone Creek			
	Pre-Development Peak Flow (m^3/s)	Post-Development Peak Flow (m^3/s)	Difference (m^3/s)	Difference (%)
63%	1.05	0.97	-0.08	-7%

3.2.2.6 DETENTION BASIN RESULTS

Table 9 presents the detention basin results mitigating a 63% AEP storm event. Larger flows will also enter the basin but will discharge over the weir without additional peak flow mitigation. Refer to Appendix I for filter media scour velocity checks. They demonstrate that the 1% AEP velocities across all four bioretention filter areas are below 1m/s.

Table 9 – Detention Basin Results

AEP	Inflow (m^3/s)	Culvert Outflow (m^3/s)	Weir Outflow (m^3/s)	Detention Volume (m^3)	Water level (m AHD)	Depth of Water [A] (m)
63%	5.62	0.95	-	4,260	37.35	0.85

[A] Depth of water to Bio RL 36.50

3.3 LPD 2 : ROSS STREET / BOOMI AVENUE

The adjoining development to the east (DEV2017/887) has made allowances for stormwater discharge from the current site. It is proposed to connect stormwater from the south-eastern lots to the existing drainage networks in Ross Street and Boomi Avenue without significantly exceeding the design allowances. Refer to **Table 10, Figure 9** and the as-constructed plans included in **Appendix K.**

Table 10 – Proposed Discharge Rates to Ross St & Boomi Ave (LPD 2)

Discharge Location (LPD 2)	Proposed Catchment (SK05)	LPD 2 : Discharge to Ross St & Boomi Ave					
		39% AEP			1% AEP		
		Design Allowance [A] (L/s)	Proposed Discharge [B] (L/s)	Variance (L/s)	Design Allowance [A] (L/s)	Proposed Discharge [B] (L/s)	Variance (L/s)
G1/48	D2c	47	52	+5	135	112	-23
G1/51	D2b	60	59	-1	170	128	-42
FI1/48	D2a	481	398	-83	1020	846	-174

[A] Design flow rates from drainage calculations tables in **Appendix K.**
[B] Proposed flow rates extracted from the XP-STORM.

The results show that a 39% AEP discharge rate is 5L/s higher than the design allowance at gully "G1/48". All other discharge rates, in both a 39% and a 1% AEP storm events, are lower than the design allowances, resulting in cumulative reduction in peak flows. Therefore, the proposed development is not expected to adversely impact the downstream drainage system in Ross Street and Boomi Avenue. No further analyses have been undertaken for LPD 2.

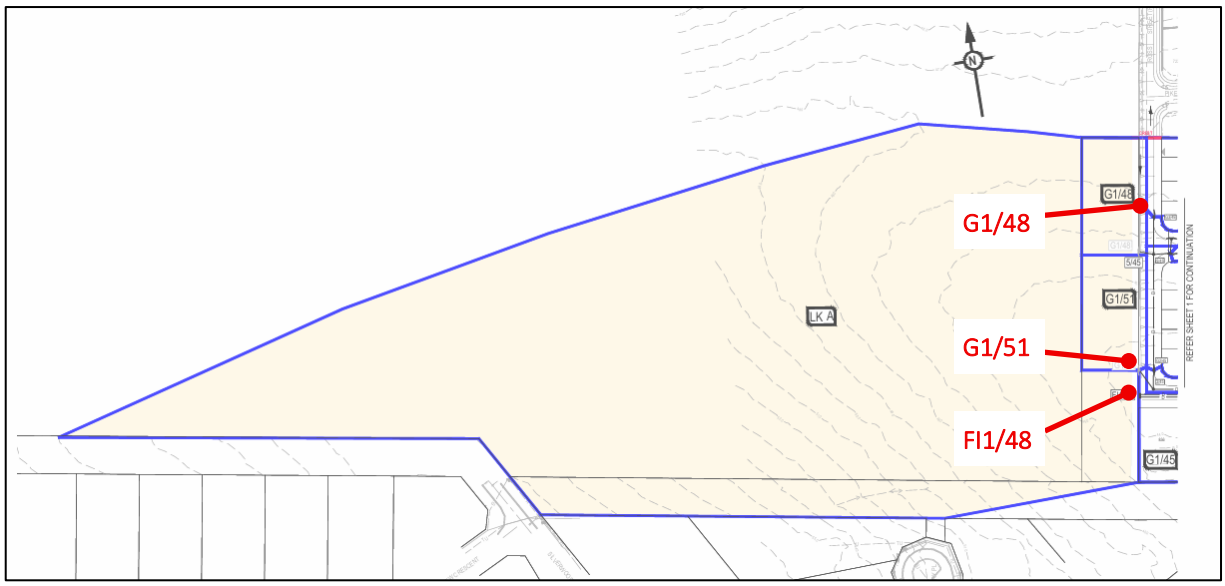


Figure 9 – Downslope Development's Design Catchment Plan
(excerpt of the as-constructed plans)

3.4 LPD 3 : BLOOMFIELD ESPLANADE

The adjoining development to the east (DEV2017/887) also made allowance for stormwater discharge from the current site at Bloomfield Esplanade, however the proposed 39% AEP discharge rate is higher than the design allowance. Refer to **Table 11.**

Table 11 – Proposed Discharge Rates to Bloomfield Esp (LPD 3)

Discharge Location (LPD 3)	Proposed Catchment (SK05)	LPD 3 : Discharge to Bloomfield Esplanade 39% AEP		
		Design Allowance [A] (L/s)	Proposed Discharge [B] (L/s)	Variance (L/s)
G4/38	D3	40	104	64

[A] Design flow rate from drainage longitudinal plan in **Appendix L.**
[B] Proposed flow rates extracted from the XP-STORM.

To ensure that the additional flow does not result in adverse impacts, a 1D steady-state hydraulic assessment has been undertaken of the downstream drainage line in Bloomfield Esplanade using the XP-STORM (version 2024.2).

3.4.1 XP-STORM MODEL SET UP

- The pipe network has been set up using links and nodes.
- The pipe data such as diameters, lengths, invert levels, surface levels, and grades were obtained from the as-constructed plans, included in **Appendix L.**
- A Manning's n roughness value of 0.013 adopted for all the concrete pipes.
- Pipe obvert levels adopted as the downstream boundary condition.
- A 39% AEP storm event has been modelled with constant inflow rates as noted in **Figure 10.** The external flows were obtained from the as-constructed plans.

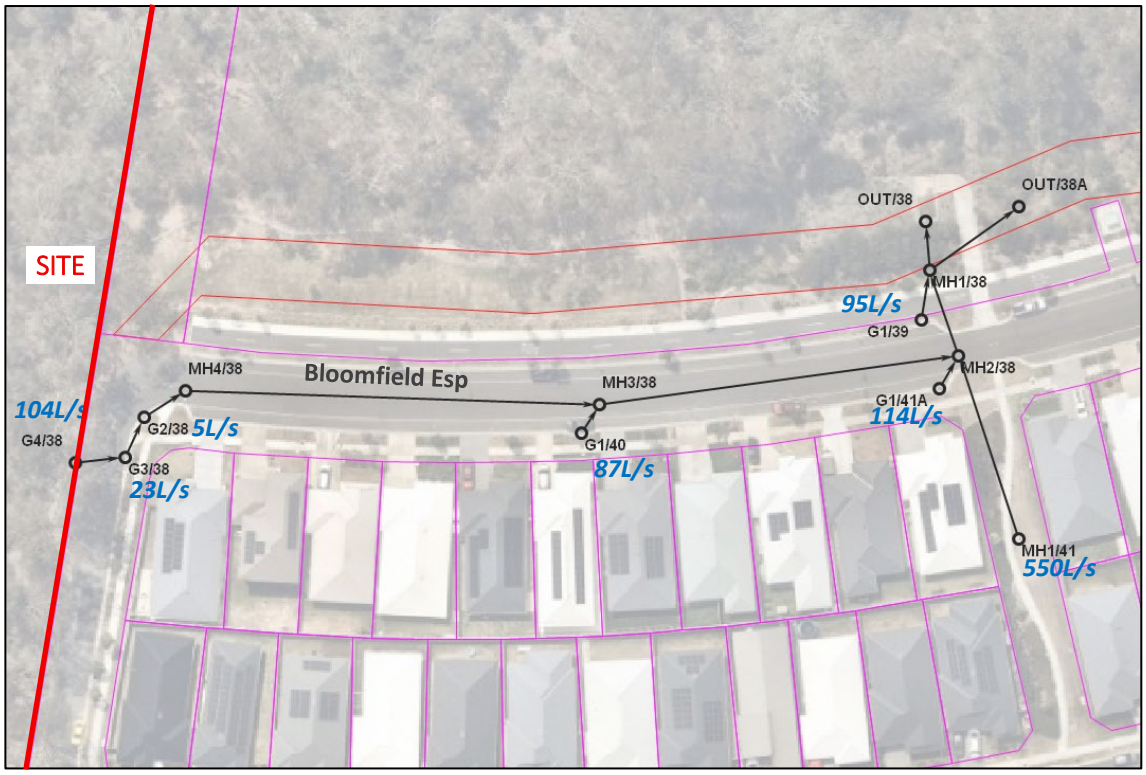


Figure 10 – Bloomfield Esplanade (LPD 3) XP-STORM Layout

3.4.2 RESULTS

Table 12 presents the 39% AEP water level results through downslope drainage infrastructure. As can be seen, the 39% AEP flow is maintained entirely within the subsurface drainage network with well in excess of 0.15m freeboard. On that basis, the proposed development is not expected to result in adverse stormwater impacts in Bloomfield Esplanade.

Table 12 – 39% AEP Water Levels in Bloomfield Esplanade Drainage (LPD 3)

Node Name	Surface Level (m AHD)	Max Water Elevation (m AHD)	Freeboard (m)
G4/38	44.512	43.668	0.844
G3/38	43.996	43.576	0.420
G2/38	43.830	43.446	0.385
MH4/38	43.950	43.320	0.630
MH3/38	43.526	42.803	0.723
MH2/38	43.080	42.320	0.760
MH1/38	43.129	41.966	1.163
Out/38	41.766	41.564	0.202
Out/38A	42.134	41.696	0.438
G1/39	42.938	42.046	0.892
G1/40	43.380	42.859	0.521
MH1/41	43.928	42.874	1.054
G1/41A	42.939	42.431	0.508

3.4.3 1% AEP MAJOR FLOW IN BLOOMFIELD ESPLANADE

A weir flow calculation has been undertaken at the sag in Bloomfield Esplanade to demonstrate that it has adequate capacity to cater for the slightly increased runoff.

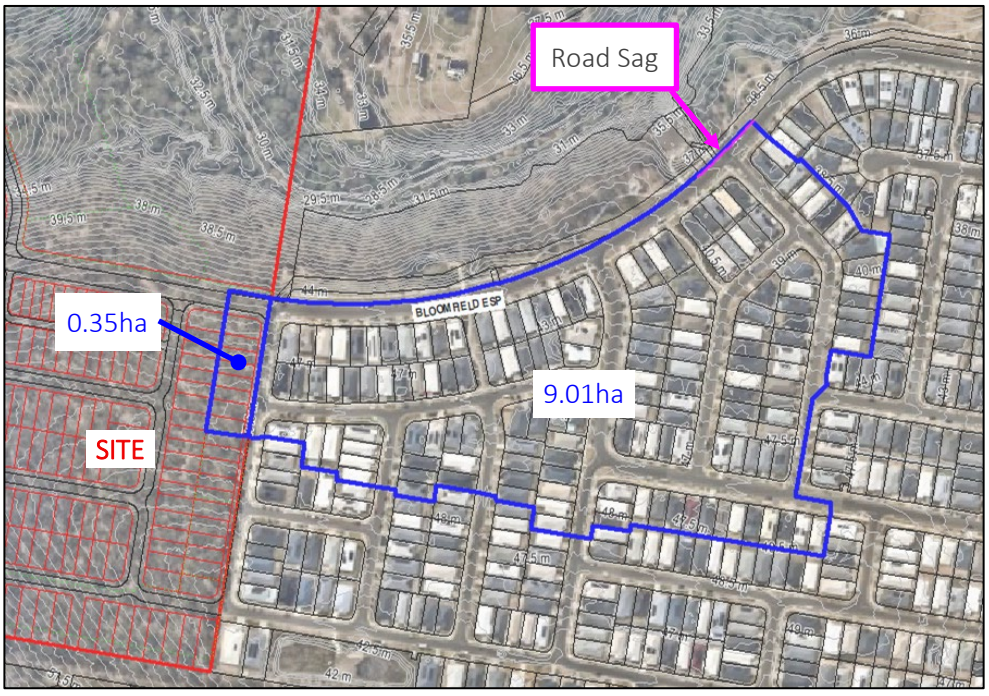


Figure 11 – Bloomfield Esplanade Sag & Contributing Catchment

1% AEP peak road flow at the sag has been calculated using the Rational Method, as presented in **Table 13.** The rainfall intensities are in **Appendix E.**

Table 13 – 1% AEP Peak Road Flow

Scenario	Catchment Area (ha)	Tc (mins)	39% AEP Peak Flow (m^3/s)	1% AEP Peak Flow (m^3/s)	1% AEP Peak Road Flow (m^3/s)
Pre-Dev	9.01	18	1.42	4.46	3.03
Post-Dev	9.36	18	1.48	4.63	3.15

Table 14 presents the pre and post-development road flow at the sag. The sag profile along the top of kerb was draped from 2023 Lidar.

Table 14 – Bloomfield Road Sag - Road Flow Calculation Results

	Pre-Dev	Post-Dev
1% AEP Flow (m^3/s) [A]	3.03	3.15
1% AEP Flow Level (m AHD)	38.096	38.099
Sag RL (m AHD) [B]	37.843	37.843
Max. Flow Depth (mm)	253	256
Velocity (m/s)	0.72	0.72
DV Product (m^2/s)	0.13	0.14

[A] 39% AEP piped.
[B] estimated from 2023 Lidar

The above results demonstrate that the flow depth does not exceed 0.3m and DV product is well below $0.6m^2/s$. These comply with the requirements of the *QUDM* (2016) and the road flow safety is not compromised.

3.5 INTERNAL ROAD FLOW ASSESSMENTS

3.5.1 PEAK FLOW RATES

The following peak flow rates at the road flow calculation locations were extracted from the XP-STORM model.

Table 15 – Internal Road Peak Flow Rates

Road Section	Contributing Local Catchments	1% AEP Design Flow (m^3/s) [A]	1% AEP Blockage Flow (m^3/s)
A	D1a	2.53	4.75
B	D1b, EXT	5.59	10.15
C	D1b, D1c, EXT	6.07	11.05

[A] 1% AEP Design Flow assumes 39% AEP piped.

3.5.2 ROAD FLOW CALCULATIONS

The Manning's Equation and Weir Flow calculations have been used to calculate road flow conveyance. Figure 12 identifies the calculation locations. A 21m wide road reserve is proposed at Section B for maximum road flow capacity.

The Manning's Equation has been used for Section B, while weir flow calculations have been undertaken at Sections A and C, which represents the top of kerb profiles at the sags. Kerb breaks are proposed at the sag locations and reverse cross-fall verge is proposed along the basin frontage. Refer to preliminary engineering plans in Appendix J for concept details.

The section profiles and the longitudinal slopes were determined from the preliminary engineering design. A Manning's n roughness value of 0.015 was adopted for the bitumen pavements and 0.035 for the verge.

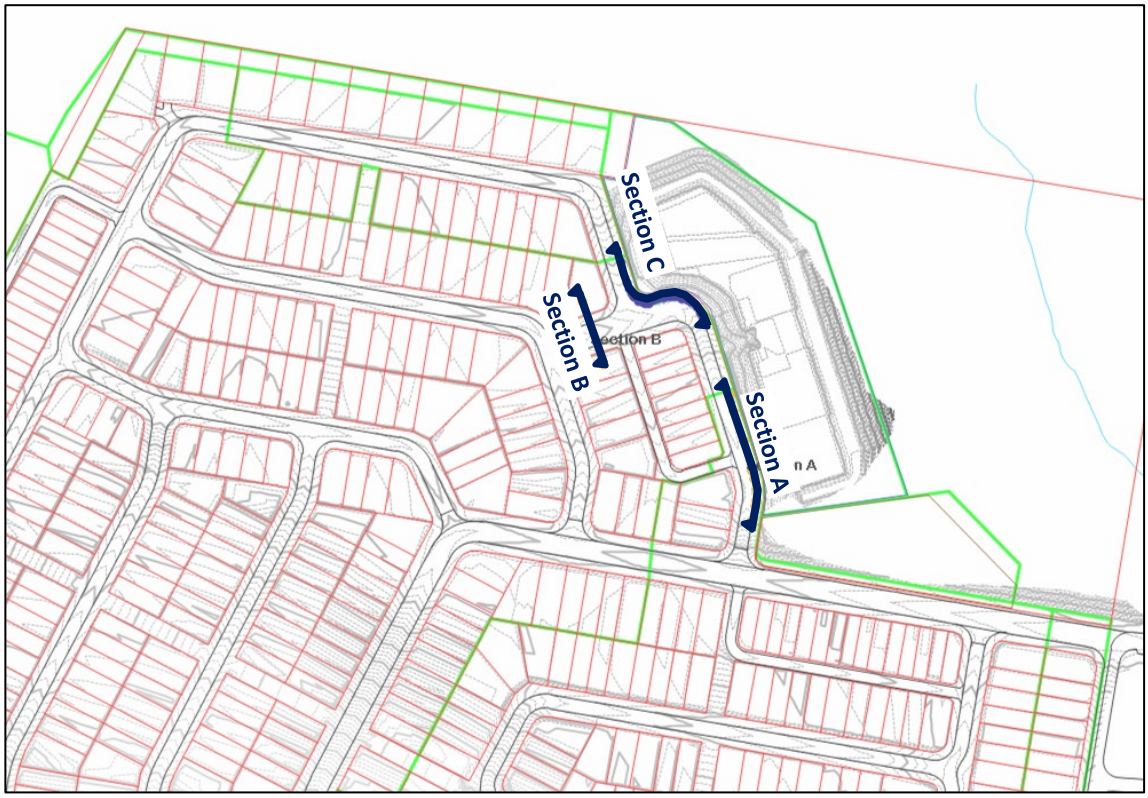


Figure 12 – Internal Road Flow Calculation Locations

Table 16 provides the road flow calculation results for the standard design scenario. Refer to Appendix H for calculation details.

Table 16 – Road Flow Calculation Results – Design Scenario

	SECTION A (Weir Flow)	SECTION B (Manning's Flow)	SECTION C (Weir Flow)
1% AEP Flow (m^3/s) [A]	2.53	5.59	6.07
1% AEP Flow Level (m AHD)	40.59	39.25	38.62
Max. Flow Depth (mm)	253	280	300
Velocity (m/s)	0.83	1.79	0.91
DV Product (m^2/s)	0.21	0.50	0.27

[A] Design Scenario assumes 39% AEP piped.

The above results demonstrate that the flow depths do not exceed 300mm in the design scenario at either sag on the esplanade road. The transverse flow conditions comply with *Table 7.4.5* of the *QUDM* (2016).

The longitudinal flow depth is slightly above 250mm at Section B (*Table 7.4.4, QUDM* 2016). This is minor and not expected to be detrimental. Further investigations can be undertaken during detailed design and additional flow piped to ensure 1% AEP flow depth is kept at 250mm.

Table 17 presents blockage scenario results and the preliminary engineering plans associated with the application show that all surrounding lots are above the corresponding 1% AEP levels.

Table 17 – Road Flow Calculation Results – Blockage Scenario

	SECTION A (Weir Flow)	SECTION B (Manning's Flow)	SECTION C (Weir Flow)
1% AEP Flow (m^3/s)	4.75	10.15	11.05
1% AEP Flow Level (m AHD)	40.65	39.33	38.72
Max. Flow Depth (mm)	317	359	406
Velocity (m/s)	0.93	2.07	1.06
DV Product (m^2/s)	0.30	0.74	0.43

4. FLOOD IMPACT ASSESSMENT

A flood impact assessment has been undertaken for the Flagstone Creek and its tributary using single precision (iSP_w64) TUFLOW version 2025.1.2. The following scenarios have been modelled:

- **Pre-Development Scenario:** 1% AEP for the existing catchment condition.
- **Post-Development Scenario:** 1% AEP for the post-development site, including post-development site catchment parameters and design topography.

  NOTE: *A separate post-development scenario without development topography was undertaken to confirm no backwater effect from the creek in a 1% AEP. This is discussed in **Section 4.2**.*
- **Sensitivity Scenario:** Post-development scenario with a 20% increase rainfall intensity and Manning's n roughness of 0.15 for the creek corridor.

4.1 TUFLOW MODEL SET UP

4.1.1 HYDROLOGY

1% AEP inflows for the TUFLOW model were extracted from the regional XP model used for the peak flow assessment (**Section 3.2.1**). Standard duration storms from 60-minute to 360-minute were simulated in TUFLOW.

4.1.2 TOPOGRAPHY

2023 Lidar (1m resolution) formed the base topography of the TUFLOW model. An Z shape polygon was used to represent the existing dam in the pre-development scenario while the 12d design tin was referenced in post-development scenario A and the sensitivity scenario.

4.1.3 2D GRID

A 2m grid with 0.5m sub-grid sampling ("**SGS**") was simulated using Heavily Parallelised Compute ("**HPC**") adaptive timestep solver for a 6-hour period with an initial timestep set of 0.1 second and a maximum timestep of 1 second.

4.1.4 SURFACE ROUGHNESS

A default Manning's n value of 0.08 was adopted for the model. Materials polygons were used to identify areas with differing Manning's n values. Refer to **Section 4.1.7**.

4.1.5 1D ELEMENTS

1D network elements were used in the post-development scenario to model key drainage infrastructure in the development. A Manning's n roughness value of 0.013 was assigned for all concrete pipes and culverts. Refer to post-development model layout in **Section 4.1.7.**

4.1.6 BOUNDARY CONDITIONS

A QT (time vs flow) inflow boundaries were adopted at the upslope end of the hydraulic model. Site catchments and the local external catchments were entered using "SA" polygons.

A HQ (head vs flow) boundary line with a frictional slope of 0.01m/m was adopted at the downslope end of the hydraulic model.

4.1.7 TUFLOW MODEL LAYOUTS

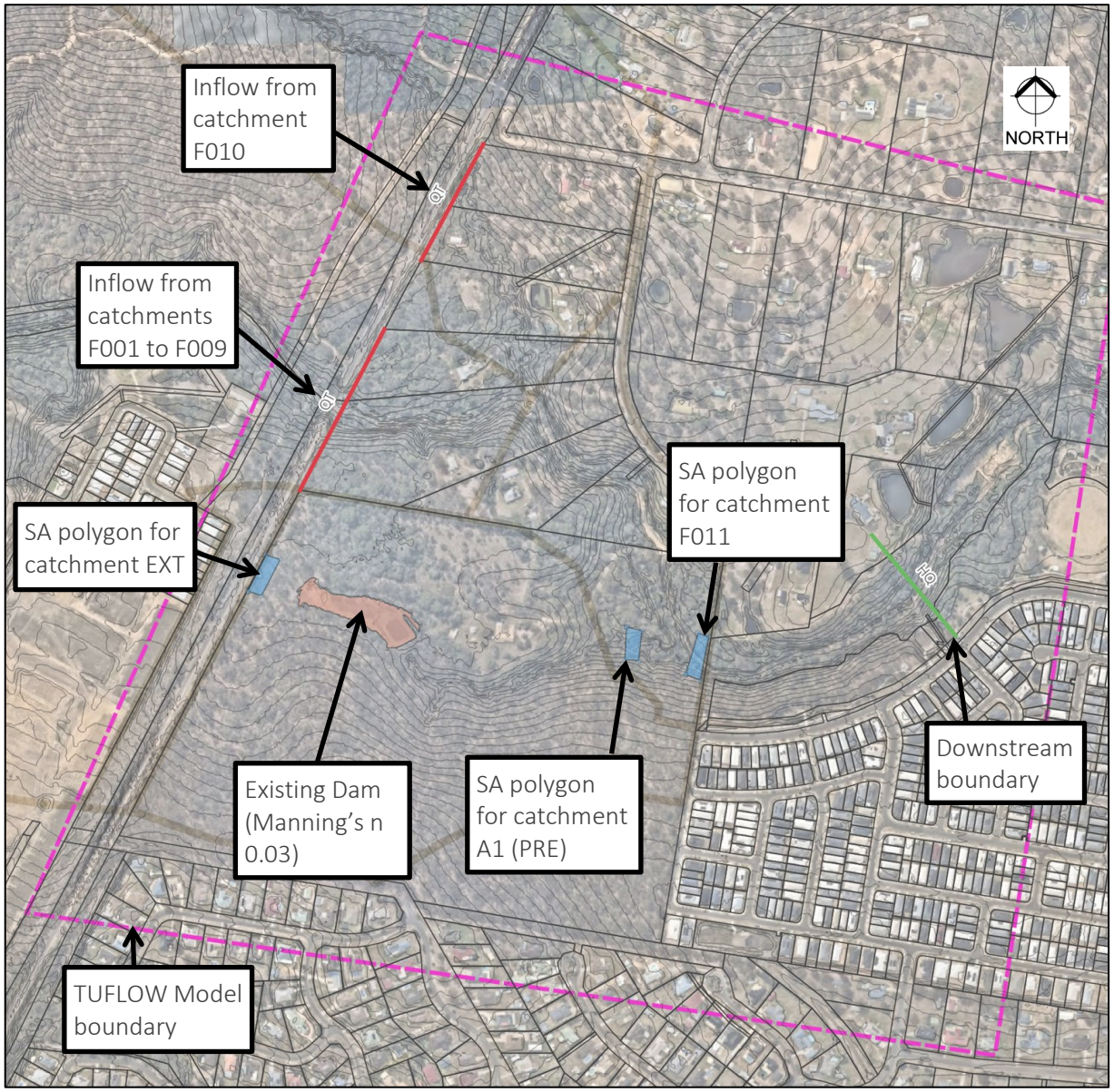


Figure 13 – TUFLOW model layout (Pre-Development Scenario)

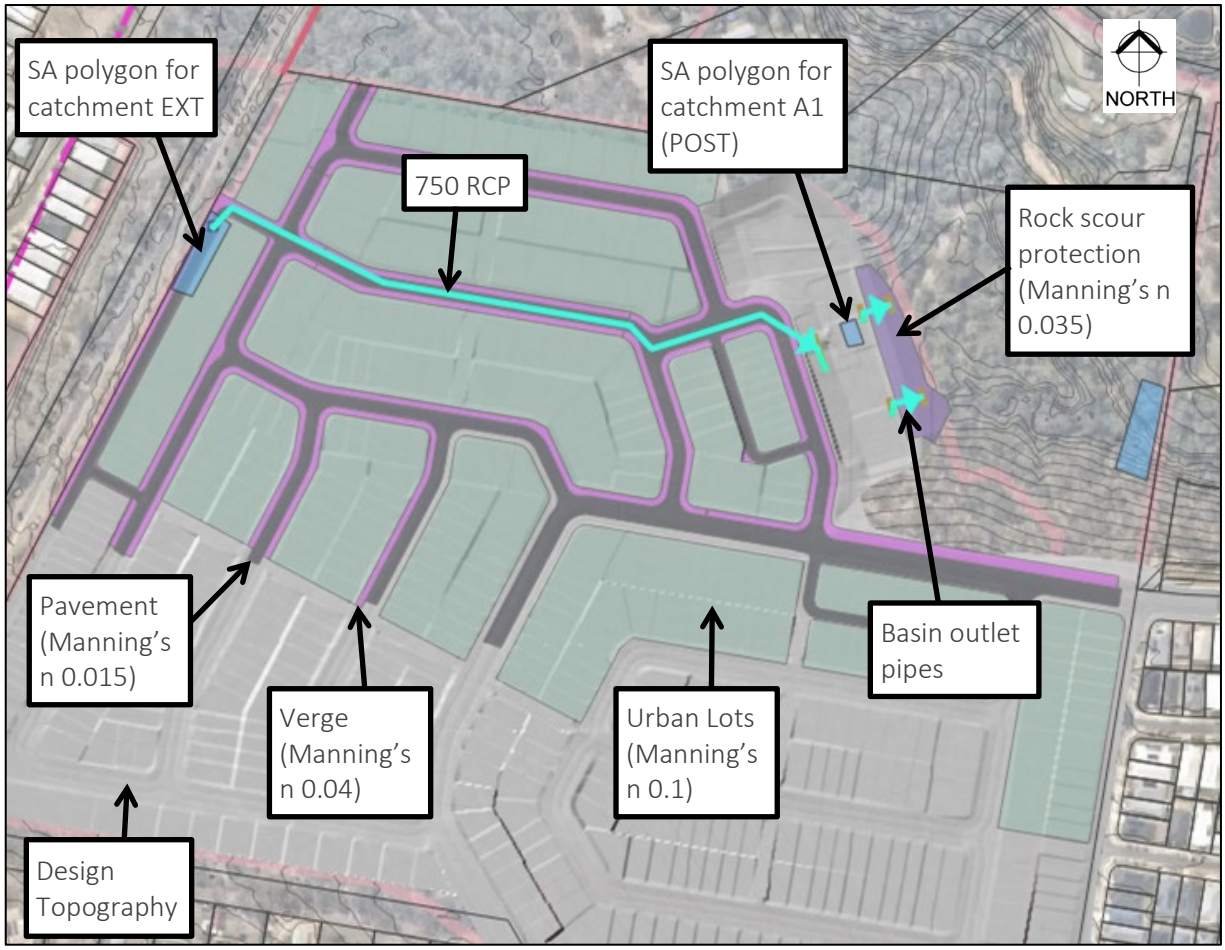


Figure 14 – TUFLOW model layout (Post-Development Scenario)

4.2 FLOOD IMPACT RESULTS

Pre and post-development 1% AEP flood plans are included in **Appendix M** and **N.** Flood impact plans are included in **Appendix O.** The results demonstrate no adverse impact to 1% AEP flooding. It confirms that filling the tributary within the site does not create material adverse flood impacts to areas external to the site.

In response to item 1 of the Information Request we note:

- The fact that filling of the tributary does not cause material adverse flood impacts confirms that it provides a flow conveyance function and not a storage function. To further confirm this, we have run a separate post-development scenario without the design topography. Refer to **Figure 15.** The design layout has only been shown in **Figure 15** to provide context of the development location. The results show no flood water from the main Flagstone Creek backing into the tributary. This confirms the conveyance functionality of the tributary.

- The filling eliminates the high flood hazard conditions without creating adverse flood impacts. This provides a satisfactory outcome against Logan City Council's Flood Hazard Overlay Code.

- The above outcomes were presented to EDQ officers at a meeting held on the 3/6/2026. The EDQ team were receptive to the approach. Electronic TUFLOW model files are enclosed with the Information Request Response package for reference.

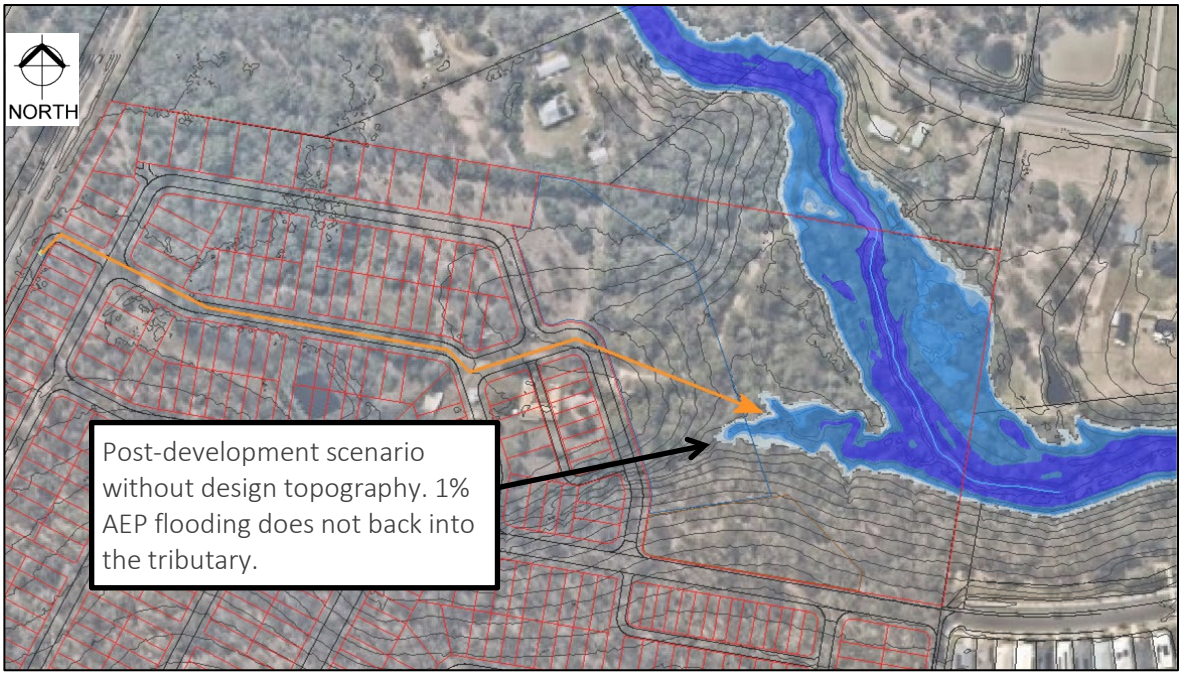


Figure 15 – 1% AEP Post-Development Scenario with no design topography

4.3 SENSITIVITY SCENARIO

Figure 16 presents the sensitivity scenario 1% AEP flooding which combines climate change provisions and a high Manning's n roughness of 0.15 for the creek corridor. The results from this scenario have been used for nominating the minimum flood planning levels.

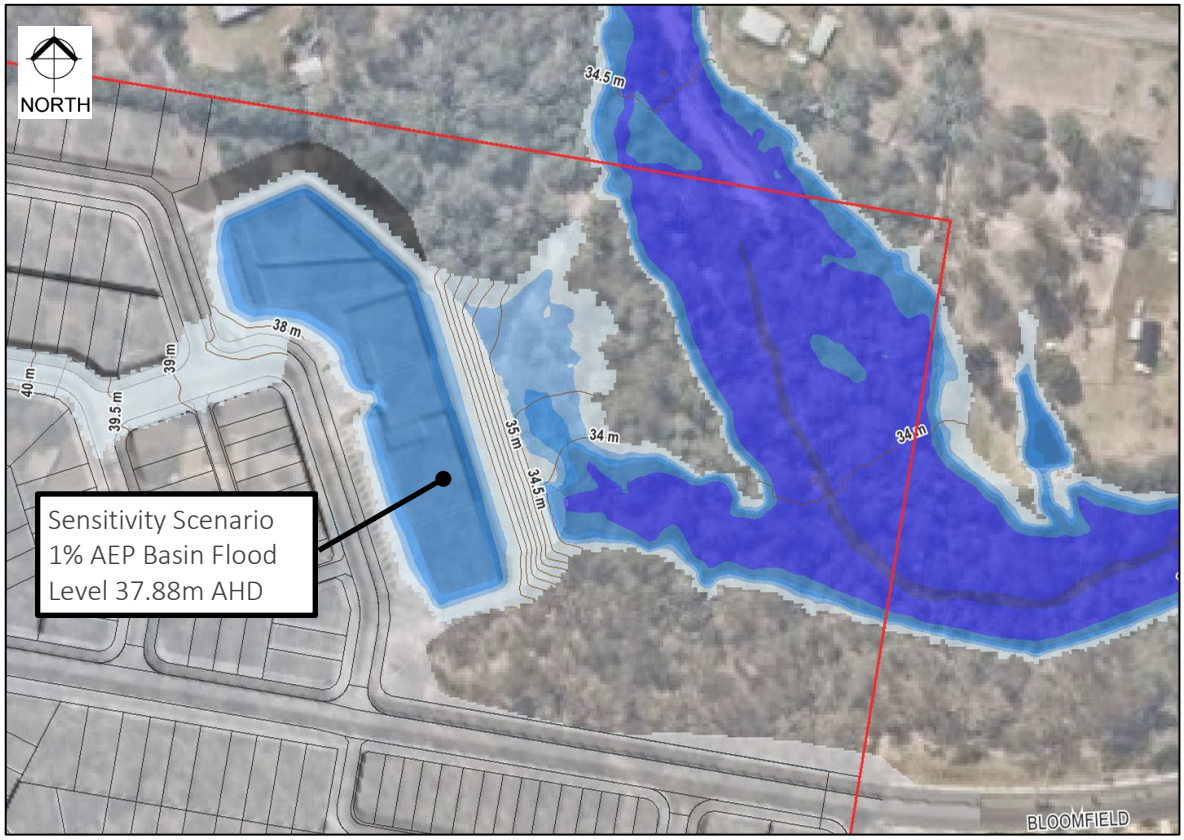


Figure 16 – Climate Change 1% AEP Flooding

4.4 MINIMUM FLOOD PLANNING LEVELS

Table 18 presents the recommended minimum development levels based on the Sensitivity Scenario 1% AEP in the basin.

Table 18 – Minimum Flood Planning Levels

	Pad RL & Non habitable Floors	Any Basement Entry/Exit	Habitable Floors & Essential Building Services
Minimum Flood Planning Standard [A]	DFE	DFE + 300mm freeboard	DFE + 500mm freeboard
Minimum Flood Planning Level (m AHD)	37.88	38.18	38.38

[A] *Table 8.2.5.3.3, Flood Hazard Overlay Code, Logan Planning Scheme 2015*

The preliminary earthworks plan associated with the application show that the proposed development levels are above the minimum flood immunity levels noted above.

5. STORMWATER QUALITY

5.1 CONSTRUCTION PHASE STORMWATER QUALITY MANAGEMENT

5.1.1 POLLUTANTS

Typical pollutants expected to be generated during the construction phase of an urban development are shown in Table 19. These are based on *Table C4.1* BCC's *Subdivision & Development Guidelines Part C Section 4.1.1* (2008).

Table 19 – Construction Phase Pollutants

Pollutant	Potential Source
Litter	Paper, construction packaging, food packaging, cement bags, off-cuts.
Sediment	Unprotected exposed soils and stockpiles during earthworks and building works.
Hydrocarbons	Fuel/oil spills, leaks from construction equipment, and temporary car park areas.
Toxic Materials	Cement Slurry, asphalt primer, solvents, cleaning agents, and washwaters etc.
pH altering substances	Cement slurry, acid sulfate soils, and washwaters

5.1.2 WATER QUALITY OBJECTIVES

Table 20 presents an extract from *Table A, Appendix 2* of the *State Planning Policy* (2017) objectives for construction phase stormwater quality management.

Table 20 – Construction Phase Performance Criteria

Issue	Desired Outcomes
Erosion control	1. Staged clearing and construction work to minimise the area of exposed soil at any one time. 2. Effectively cover or stabilise exposed soils prior to predicted rainfall. 3. Prior to completion of works for the development, and prior to removal of sediment controls, all site surfaces must be effectively stabilised using methods which will achieve effective short-term stabilisation.
Sediment Control	1. Direct runoff from exposed site soils to sediment controls that are appropriate to the extent of disturbance and level of erosion risk. 2. All exposed areas greater than 2500m² must be provided with sediment controls which are designed, implemented and maintained to a standard which would achieve at least 80% of the average annual runoff volume of the contributing catchment treated (i.e. 80% hydrological effectiveness) to 50mg/L Total Suspended Solids (TSS) or less, and pH in the range (6.5–8.5).

5.1.3 STORMWATER QUALITY MANAGEMENT STRATEGY

Detailed erosion and sediment control ("ESC") management plans will be prepared during detail design and implemented during the construction phases of the project. A staged approach will be adopted, and the ESC measures may include, but not limited to, devices such as sediment basins, catch drains, diversion drains, silt fences, construction entry/exit pads, and the like. Considerations will be required for the construction and establishment of the stormwater basin, which is discussed below.

5.1.4 CONSTRUCTION & ESTABLISHMENT OF THE STORMWATER BASIN

The development is divided into seven (7) stages, as depicted in **Appendix A.** It is understood that the stages will be delivered in chronological order. The stormwater basin lies within Stage 1. It is recommended that:

- the entire basin footprint is established, and detention outlet structures (i.e. culverts and weir) constructed in Stage 1.
- Bioretention systems be progressively constructed and established with each subsequent stage.

For the bioretention components, it is recommended that the stormwater basin follows the step-by-step guidance and methodologies outlined in Water by Design *Guidelines for the Construction and Establishment of Bioretention and Wetlands* (2022).

In general, there are two approaches to the construction and establishment of bioretention systems. The preferred approach is to be decided at detailed design phase of the relevant stage.

- **High efficiency sediment ("HES") basin**: This includes bulking out, installing hydraulic structures and allowing the basin to operate as a HES basin (Type A or B) during the construction phase. When the catchment is 90% complete (i.e. 90% of houses and surrounding landscapes and surfaces built), the bioretention system/s can be cleaned and profiled, the under-drainage, filter materials, plants installed and established. This approach provides a high level of protection to the bioretention system, receiving water, and stormwater network.

- **Temporary surface protection:** This includes the installation of all civil components such as the hydraulic structures, under-drainage and filter media for the bioretention system/s with protective layers (such as filter cloth, topsoil or sacrificial turf) installed over the filter media surfaces. The basin will operate as a shallower sediment basin during construction. When the catchment is 90% complete, the protective layers are removed, filter media topped up, plants installed and established. This approach has a higher level of amenity compared to the HES basin approach.

5.1.5 GENERAL MONITORING & MAINTENANCE

The general requirements of monitoring during the construction phase are:

- Work activities to be restricted to designated construction areas.
- ESC devices to be constructed in accordance with the plans prepared during detailed design phase.
- Earthwork and site clearing to be undertaken in accordance with the ESC management plans.
- Inspect sediment fences and ESC devices on a weekly basis as well as after any rainfall event exceeding 25mm in 24hrs.
- Stormwater discharges from the site are not to have any adverse effect on the downstream environment.
- Monitor and record of the performance of the drainage control devices, such as sediment basin/s, including water quality testing where required.
- Any failure in the stormwater system to be immediately rectified to prevent uncontrolled discharge from the site.
- Any failure to the stormwater system causing damage to surroundings should implement immediate remedial work to the damaged area.

5.1.6 RESPONSIBILITY & REPORTING

- The contractor will be responsible for monitoring and performance of all drainage and ESC devices.
- Records of any failures to devices should be kept and reported to the Construction Manager.
- Regular inspections of the devices shall be reported to the Construction Manager.
- Inspections of the devices after heavy rainfall shall be reported to the Construction Manager.

5.2 OPERATIONAL PHASE STORMWATER QUALITY MANAGEMENT

The development triggers compliance with the *State Planning Policy* (2017) with respect to operational phase stormwater quality management. The following section present stormwater quality analysis undertaken for the development.

5.2.1 POLLUTANTS

The main pollutants typically generated during the operational phase of an urban development are shown below (source: *Table C4.2 BCC's 2008 Subdivision & Development Guidelines Part C Section 4.1.1*).

- **Litter (gross pollutants)**
- **Sediment (total suspended solids)**
- Oxygen demanding substances (organic & chemical matter)
- **Nutrients (nitrogen & phosphorus)**
- Pathogens / Faecal coliforms (bacteria & viruses)
- Heavy metals (often associated with fine sediment)
- Surfactants (e.g. detergents from car washing)
- Organochlorines & organophosphates
- Thermal pollution
- pH altering substances.

This report only addresses the pollutants highlighted in **bold text** above. Although not modelled, the proposed stormwater quality management devices will provide some treatment to other pollutants also. For instance, as heavy metals are predominately associated with fine sediment, devices that reduce total suspended solids will also reduce loads of heavy metals.

5.2.2 WATER QUALITY OBJECTIVES

The site is located within Southeast Queensland climatic region. **Table 21** presents the WQOs required for the site in accordance with the *State Planning Policy* (2017).

Table 21 – Operational Phase Water Quality Objectives

Pollutant	Load Based Pollutant Reduction Target (%)
Total Suspended Solids (TSS)	80
Total Phosphorus (TP)	60
Total Nitrogen (TN)	45
Gross Pollutants (GP)	90

5.2.3 STORMWATER QUALITY MANAGEMENT STRATEGY

Operational phase stormwater quality treatment will be provided by the bioretention systems located at the base of the proposed stormwater basin. The drainage profile proposed for the bioretention systems is "Type 3 – conventional" as per Water by Design *Bioretention Technical Design Guidelines* (2014). This includes providing subsoil drainage with a permeable liner. An impermeable liner is also acceptable as no infiltration has been modelled in the subsequent MUSIC analysis.

Figure 17 shows a typical bioretention profile. Refer to concept engineering plans in Appendix J for site specific concept plans.

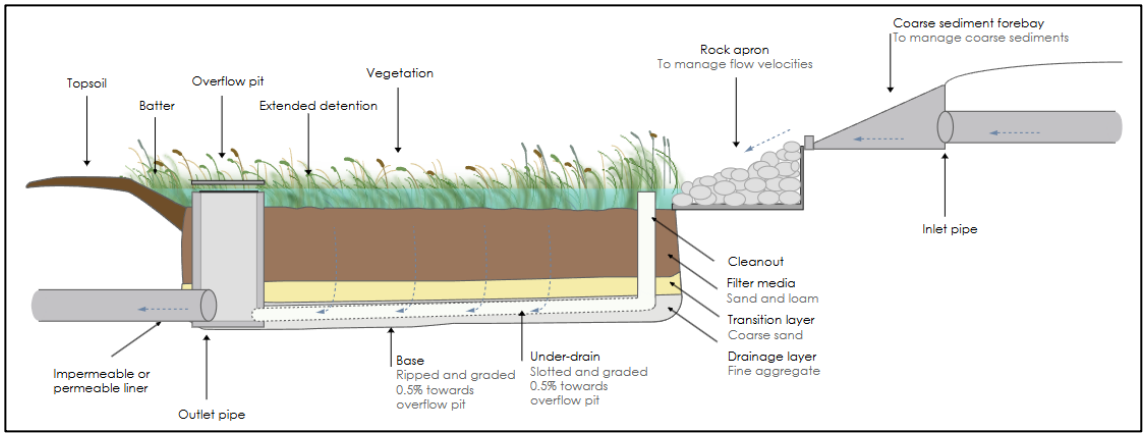


Figure 17 – Typical Bioretention Profile
(*Guidelines for the Construction and Establishment of Bioretention Systems and Wetlands,* 2022)

5.2.4 MUSIC MODELLING

Operational phase stormwater quality analysis has been undertaken using the MUSICX version 1.50, generally in accordance with Water by Design *MUSIC Modelling Guidelines V3 draft* (2018).

5.2.4.1 RAINFALL PARAMETERS

- Rainfall station: Greenbank-Thompson Rd (Station No. 40659)
- Modelling Period: 1/01/1980 to 31/12/1989
- Modelling Time Step: 6-minute
- The mean evapo-transpiration: from *Table A1.1* of the *MUSIC Modelling Guidelines* (2018).

5.2.4.2 SOURCE NODES

The split catchment approach has been adopted. Refer to Drawing No. B4942EA1_DA1_SK06 in Appendix D for the MUSIC catchment plan and Table 22 for the source node data. The following parameters have been adopted:

- The rainfall-runoff parameters for source nodes were adopted from *Table A1.2* of the *MUSIC Modelling Guidelines* (2018) for "urban residential" with stochastic flow generation.
- The base flow and storm flow parameters for source nodes were taken from *Table B3.3* of the *MUSIC Modelling Guidelines* (2018) for "urban residential" with stochastic flow generation.
- Road area has been measured from the layout in Appendix A.
- Roof area calculated at 250m² per lot.

Table 22 – Source Nodes

MUSIC Catchment	Treatment Device	Node Name	Area (ha)	Fi
M1	M1. Basin (800m² bio)	M1. Roof	3.875	100%
		M1. Road	2.426	62%
		M1. Ground	1.219	22%
M2	M2a. Basin (800m² bio)	M2a. Roof	3.775	100%
		M2a. Road	2.442	62%
		M2a. Ground	1.490	22%
	M2b. Basin (500m² bio) & M3. Basin (500m² bio) *Modelled in a single node with 1000m² filter area*	M2b. Roof	3.775	100%
		M2b. Roof	2.442	62%
		M2b. Roof	1.490	22%
M3		M3. Roof	0.650	100%
		M3. Road	0.375	62%
		M3. Ground	0.433	22%
M4	No on-site treatment	M4. Roof	1.100	100%
		M4. Road	0.468	62%
		M4. Ground	0.498	22%

5.2.4.3 LINKS

The default settings with no routing have been adopted for the links.

5.2.4.4 TREATMENT NODE

Table 23 presents the Bioretention basins. "M2b" & "M3" basin have been modelled in a combined single node.

Table 23 – Bioretention Treatment Nodes

Parameter	M1. Basin	M2a. Basin	M2b. Basin	M3. Basin
Contributing Catchment Area (ha)	7.52	7.71	4.58	4.58
High Flow Bypass (m³/s) [A]	0.87	0.89	0.53	0.53
Surface Area (m²)	800	800	500	500
Filter Area (m²)	800	800	500	500
Extended Detention Depth (m)	0.3	0.3	0.3	0.3
Filter Media Depth (m)	0.5	0.5	0.5	0.5
Saturated Hydraulic Conductivity of Filter Media (mm/hr)	200	200	200	200
Filter Median Particle Dia (mm)	0.45	0.45	0.45	0.45
TN Content of Filter Media (mg/kg)	400	400	400	400
Orthophosphate Content of Filter Media (mg/kg)	30	30	30	30
Exfiltration Rate (mm/hr)	0	0	0	0
Overflow Weir (m)	80	80	50	50

[A] Q3-month flow



Figure 18 – Bioretention Areas

SEDIMENT FOREBAYS & FILTER MEDIA SCOUR VELOCITY CHECK

While not included in MUSIC, sediment forebays will be provided at the basin inlets, similarly to the adjoining development to the east. Refer to **Appendix I** for preliminary sediment forebay sizing, which will be confirmed and refined during detail design phase if required.

As major 1% AEP from the development will also discharge through the basin, filter media scour velocity checks have been undertaken in accordance with *Section 3.5.4* of the *Bioretention Technical Design Guidelines* (2014). The calculation included in **Appendix I** demonstrate that the 1% AEP velocities across all four bioretention filter areas are below 1m/s.

5.2.4.5 MUSIC LAYOUT

The MUSIC model layout incorporating source nodes, links and treatment node is shown in **Figure 19.**

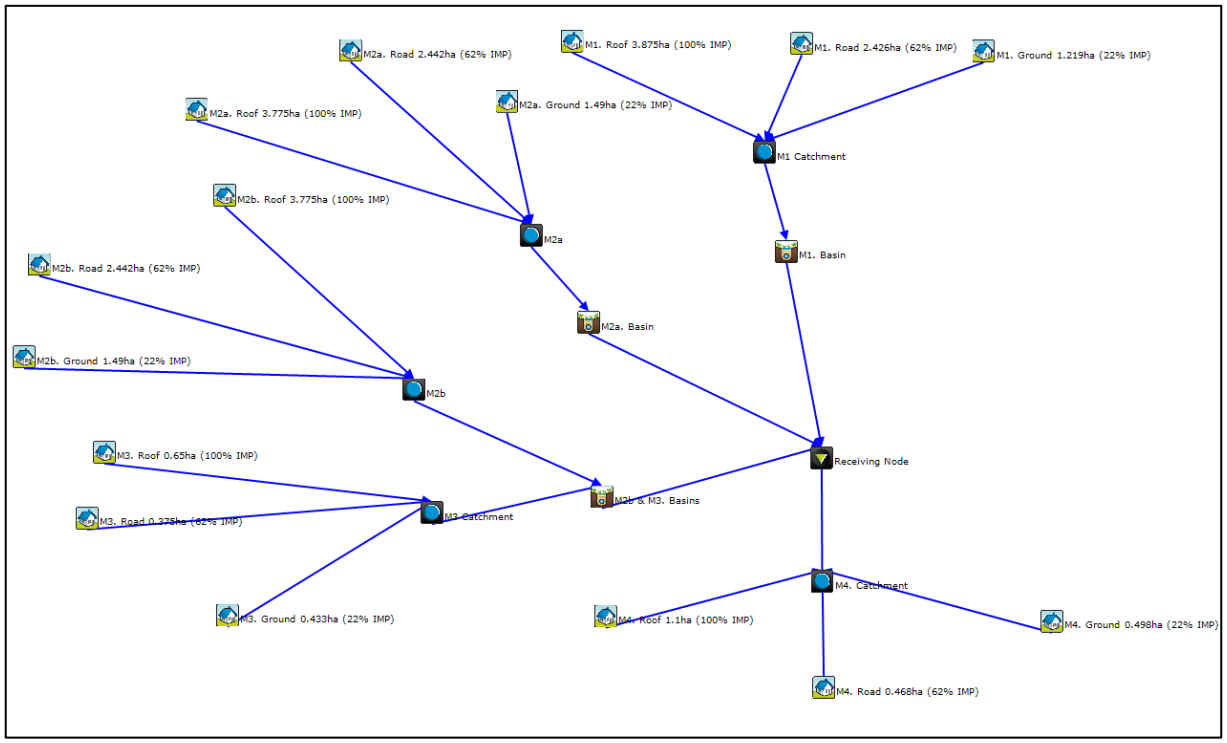


Figure 19 – MUSIC Layout

5.2.4.6 MUSIC RESULTS

MUSIC results at "Receiving Node" are shown below.

Table 24 – MUSIC Results (Receiving Node)

Pollutant	WQO (%)	Reduction Achieved (%)	Reduction Achieved ≥ WQO?
TSS	80	80	Y
TP	60	71	Y
TN	45	50	Y
GP	90	91	Y

The results demonstrate that the development achieves the required WQOs and complies with the *State Planning Policy* (2017) with respect to operational phase stormwater quality.

5.3 WATERWAY STABILITY MANAGEMENT

The waterway stability management design objective, as set out in the *State Planning Policy* (2017), has been achieved through the implementation of the detention basin which mitigates 63% AEP (1-year ARI) peak flow to the pre-development scenario.

6. CONCLUSION & RECOMMENDATIONS

JFP Urban Consultants Pty Ltd has prepared this *Site Based Stormwater Management Plan* for the proposed subdivision at 673 Silverwood Drive, Flagstone. The following outcomes are noted:

Stormwater Quantity

- Most of the development stormwater runoff will discharge into Flagstone Creek to the north-east.
    - A regional stormwater quantity assessment has been undertaken using the XP-STORM (version 2024.2). The XP model was calibrated against the RFFE model and compared against Council's URBS model (*Flagstone and Sandy Creek Flood Study* 2025).
    - The results of the regional assessment determined that peak flow mitigation is required only for a 63% AEP event. All other storm events modelled (39% - 1% AEP) showed no notable increase in peak flow rates in the creek.
    - The 63% AEP detention volume is 4,260m³, which is proposed in a combined bioretention & detention basin located near the north-eastern corner of the site, located sufficiently outside of the main Flagstone Creek 1% AEP flood extent.
    - No upright kerb to be incorporated at sag locations adjacent to the basin; and reverse cross-fall verge is proposed along the full frontage of the basin to assist with flow conveyance into the basin.

- Some development runoff is proposed to discharge into the existing drainage networks in Ross Street and Boomi Avenue to the east. A comparison of proposed stormwater discharge rates against design allowances determined that the proposed rates are generally lower than the design allowances. The development is therefore not expected to adversely impact the downstream drainage networks in Ross Street and Boomi Avenue.

- A small catchment is proposed to discharge stormwater into the existing drainage network in Bloomfield Esplanade to the east. The proposed discharge rate is slightly higher than the design allowance at this location. A steady-state hydraulic assessment of the downstream pipe network was undertaken in XP-STORM to demonstrate that the 39% AEP (minor design storm) hydraulic grade line remains fully contained within the subsurface pipe network. A road flow assessment at the sag confirms that road flow depths do not exceed 0.3m at the sag in a 1% AEP and therefore complies with the requirements of the *QUDM* (2016). The development is not expected to compromise the road flow safety at the downstream existing road system.

Flood Impact Assessment

- Flagstone Creek traverses the north-eastern corner of the site with a local tributary running west to east through the site.

- It is proposed to fill the local tributary. Runoff from the external catchment "EXT" to the west of the development to be conveyed via urban drainage networks within the development. No works are proposed within the Flagstone Creek corridor to the north-east.

- A flood impact assessment has been undertaken using TUFLOW. The results confirm filling the tributary does not create material adverse flood impacts to areas external to the site in a 1% AEP storm event. It was determined that the tributary was performing an overland flow conveyance function, not a flood storage function. The filling eliminates the high flood hazard conditions without

creating adverse flood impacts and thus providing a satisfactory outcome against Logan City Council's *Flood Hazard Overlay Code.*

- A sensitivity scenario has been simulated for a 1% AEP combining the provisions for climate change and a high Manning's n roughness of 0.15 for the creek corridor. The results from this scenario have been used for nominating the minimum flood planning levels, which are:
    - Pad RL & non-habitable floors ≥ 37.88m AHD
    - Any basement entry/exits ≥ 38.18m AHD
    - Habitable floors & essential building services ≥ 38.38m AHD

Stormwater Quality

- A staged erosion and sediment control ("ESC") management strategy will be adopted for the construction phase. Appropriate ESC plans will be prepared during detail design and implemented during construction. The stormwater basin shall be bulked out and detention outlet control structures installed in Stage 1. The bioretention components can proceed progressively, generally in accordance with Water by Design *Guidelines for the Construction and Establishment of Bioretention Systems and Wetlands* (2022).

- Operational Phase stormwater quality management is proposed via four bioretention cells located within the combined bioretention & detention basin. The 'cell' size is limited to 800m² as per the *Bioretention Technical Design Guidelines* (2014). Each cell will have an inflow headwall and sediment forebay, subject to detail design.
    - M1 = 800m²
    - M2a = 800m²
    - M2b = 500m²
    - M3 = 500m²

- MUSIC modelling demonstrates that with the above bioretention filter areas, the overall development meets the WQOs required under the *State Planning Policy (2017).*

- The development achieves the waterway stability management requirement set out in the *State Planning Policy (2017)* by mitigating the 63% AEP peak flow discharge into the creek.

7. DISCLAIMER

This report has been prepared for the purpose and exclusive use of The Trustee for Chang Family T/A Oris Accessories Pty Ltd as an investigation into the stormwater management issues related for the proposed development of the land described in the report. The information presented in this report is not to be used for any other purpose or by any other person or corporation.

JFP Urban Consultants Pty Ltd accepts no responsibility for any loss or damage suffered howsoever arising to any person or corporation who may use or rely on this report without further input and/or advice from JFP Urban Consultants Pty Ltd.

The investigations, calculations, analysis and recommendations presented in this report rely on information sourced from third-parties. JFP Urban Consultants Pty Ltd accepts no responsibility for the accuracy of the information sourced from third-parties.

8. APPENDICES

- Appendix A – Proposed Layout
- Appendix B – Logan Flagstone & Sandy Creek Flood Study 2025 (extract)
- Appendix C – Logan Property Flood Report
- Appendix D – JFP Catchment Plans & Catchment Data
- Appendix E – Rainfall Intensity Data
- Appendix F – ARR Regional Flood Frequency Estimation Mode
- Appendix G – Detention Basin Stage vs Storage
- Appendix H – Internal Road Flow Calculations
- Appendix I – JFP Bioretention Basin Calculations
- Appendix J – JFP Preliminary Engineering Plans - Basin
- Appendix K – Ross Street / Boomi Avenue Drainage As-Constructed Plans
- Appendix L – Bloomfield Esplanade Drainage As-Constructed Plans
- Appendix M – Pre-Development 1% AEP Flood Plans
- Appendix N – Post-Development 1% AEP Flood Plans
- Appendix O – Post-Development 1% AEP Flood Impact Plans

APPENDIX A

PROPOSED LAYOUT

STATISTICS	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	STAGE 6	STAGE 7	TOTAL
RESIDENTIAL LOTS								
LANEWAY TERRACE (7.5m-9.99m)	24	0	0	0	0	0	40	64
VILLA (10.0m-12.49m)	27	38	31	28	48	40	23	235
PREMIUM VILLA (12.5m-13.99m)	14	19	12	20	18	11	9	103
COURTYARD (14.0m-15.99m)	7	6	17	3	10	8	2	53
PREMIUM COURTYARD (16.0m min.)	2	1	4	3	3	7	1	21
INTERFACE LOT	0	14	9	11	0	10	7	51
TOTAL LOTS	74	78	73	65	79	76	82	527
LENGTH OF NEW								
10.0m PATHWAY (m)	0	39	177	90	210	0	30	546
4.0m ROAD WIDENING (m)	200	14	0	0	0	0	0	214
7.0m-10.0m LANEWAY (m)	255	0	0	0	0	0	425	680
16.0m ROAD (m)	268	570	526	647	436	440	410	3297
22.0m-23.0m ROAD (m)	408	0	0	0	147	157	0	712
OPEN SPACE AREA (ha)	5.448	0	0	0	0	0	0	5.448
TOTAL AREA (ha)	9.403	3.758	3.848	3.874	3.962	4.052	4.027	32.924
DEVELOPABLE AREA*								27.366ha
DENSITY*								19.3 lots/ha

* Excludes Open Space

LEGEND

- SUBJECT SITE
- CORE KOALA HABITAT AREA
- VEGETATION RETENTION AREA
- FLAGSTONE CREEK CENTRELINE
- 50m CREEK OFFSET LINE
- 100m CREEK OFFSET LINE
- 10m NEW ROAD (BUFFER)
- OPEN SPACE (5.448ha) (Major Linear Park)
- NEIGHBOURHOOD RECREATION PARK (0.5ha)
- STORMWATER BASIN (1.585ha)
- LOCAL RECREATION PARK (500m²)
- 400m PARK RADIUS
- 10m-11m LANDSCAPE BUFFER (INTERFACE LOTS)

PROPERTY DESCRIPTION
LOT 1 ON RP45241
TOTAL AREA 32.924 ha (Survey)
32.949 ha (Deed)
LOGAN CITY COUNCIL

NOTES

(1) This plan was prepared for the purpose and exclusive use of THE TRUSTEE FOR CHANG FAMILY TRUST T/A ORIS ACCESSORIES PTY LTD to accompany an application to LOGAN CITY COUNCIL for a Development Permit to Reconfigure the land described in the plan and is not to be used for any other purpose or by any other person or corporation. JFP URBAN CONSULTANTS PTY LTD accepts no responsibility for any loss or damage suffered howsoever arising to any person or corporation who may use or rely on this plan in contravention to the terms of this clause or clauses 2, 3, 4, 5, 6 or 7 hereof.

(3) The dimensions, areas, size and location of improvements, flood information (if shown) and number of lots shown on this plan are approximate only and may vary.

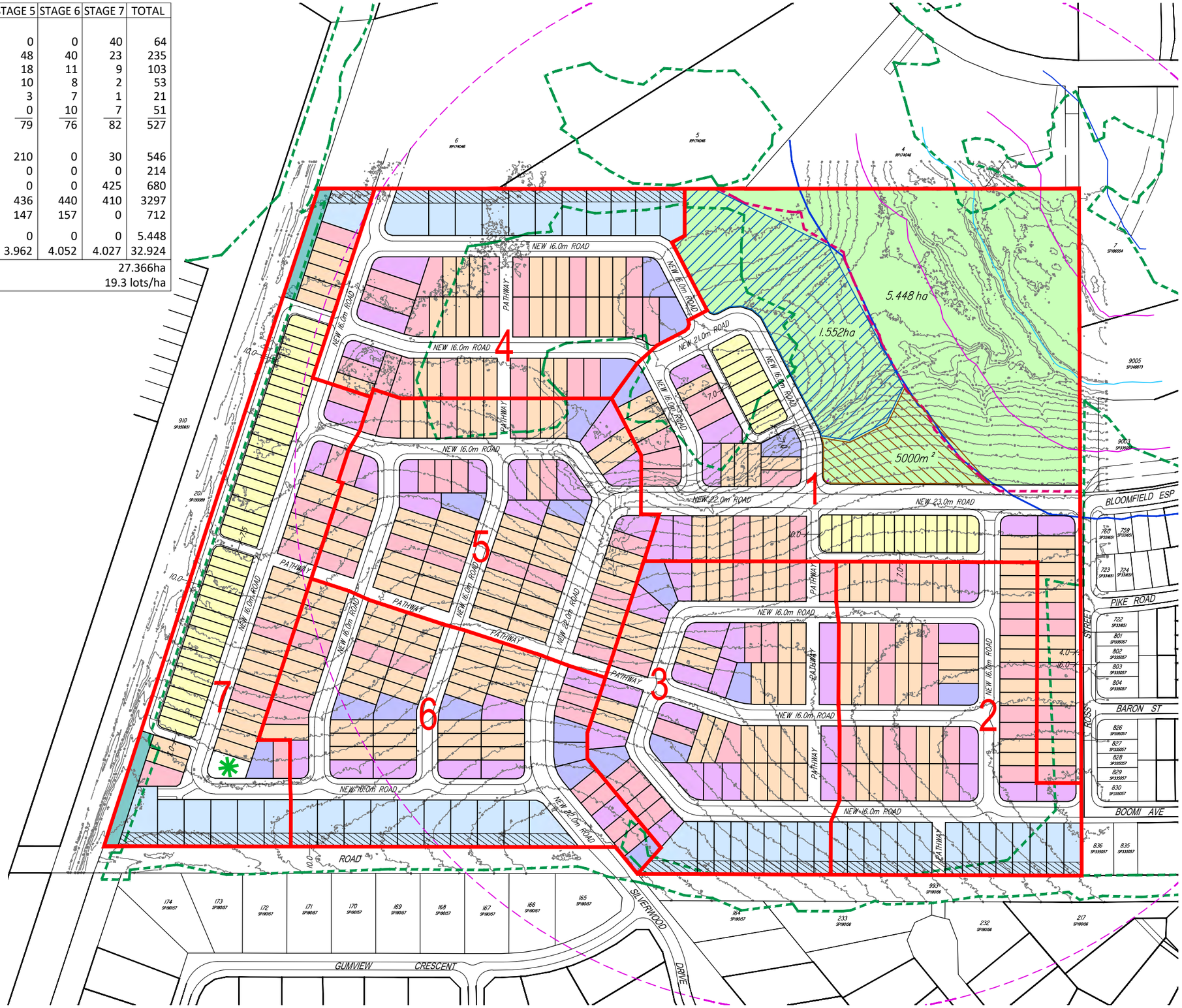
(4) The base information shown on this plan is from JFP detail survey plan (B4942SA1 01A) dated 11/12/2025.

(5) Safety in Design
The Urban Design for the layout proposal has been developed to meet the stated project brief, as expressed in JFP Urban Consultants Offer for the works, and the Design Standards stipulated by the Local Authority named on this plan.
Non-standard design solutions adopted in the preparation of the layout are listed as follows;

- **None**

(6) The State Government proposes changes to the Queensland Development Code to reflect the provisions of the National Construction Code 2022. These changes once implemented will have an impact on the design of the future dwellings on the proposed allotments identified on this plan. The amendments to the QDC may also be subject to transitional provisions and we would strongly recommend that you discuss these matters further with your preferred Building Certifier.

(7) This plan may not be reproduced unless these notes are included.


NEW 16.0m ROAD
NEW 16.0m ROAD
NEW 16.0m ROAD

APPENDIX B

LOGAN FLAGSTONE & SANDY CREEK FLOOD STUDY 2025 (EXTRACT)

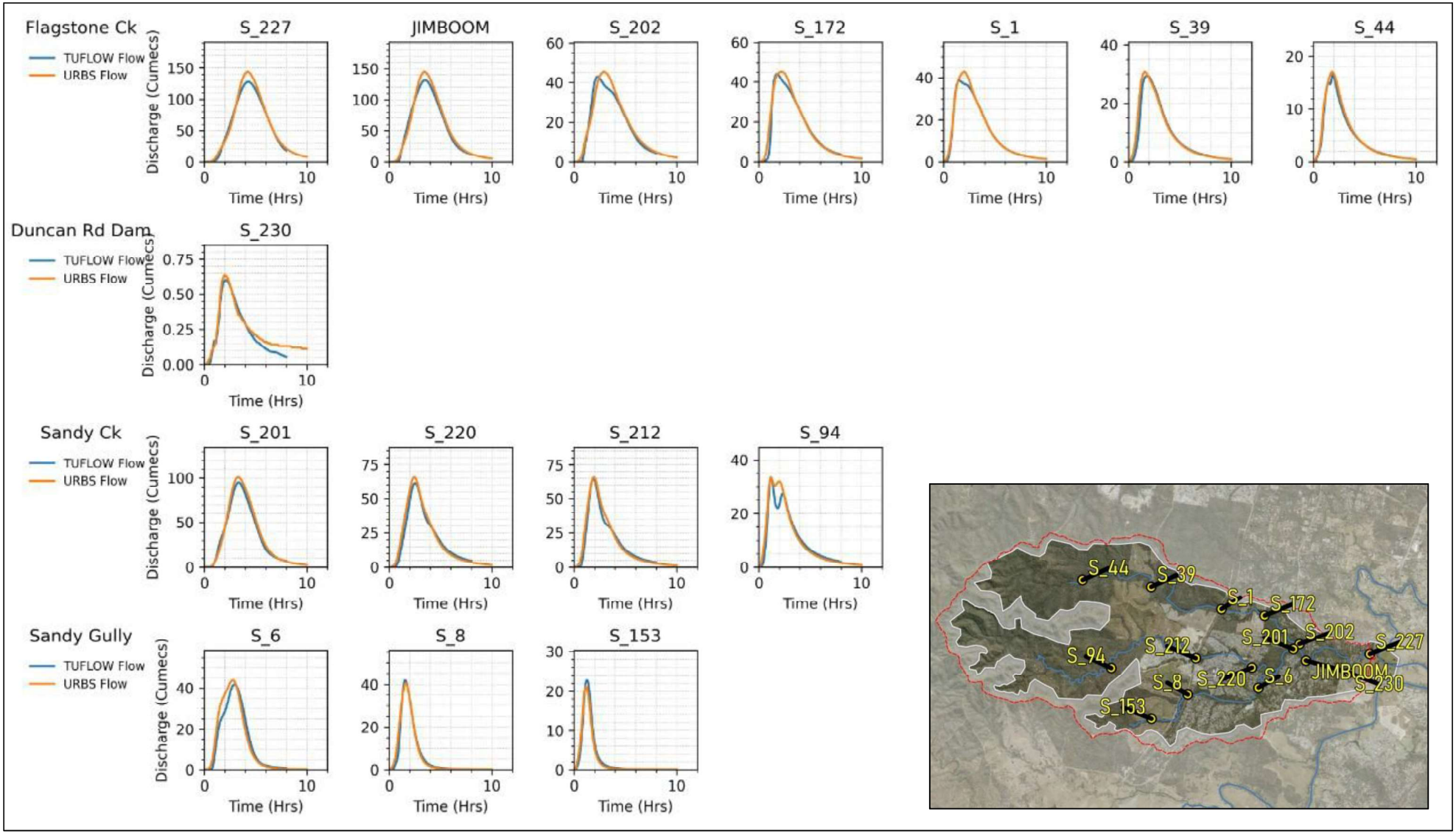


Figure 4-13 10% 1-Hour Event Joint Calibration

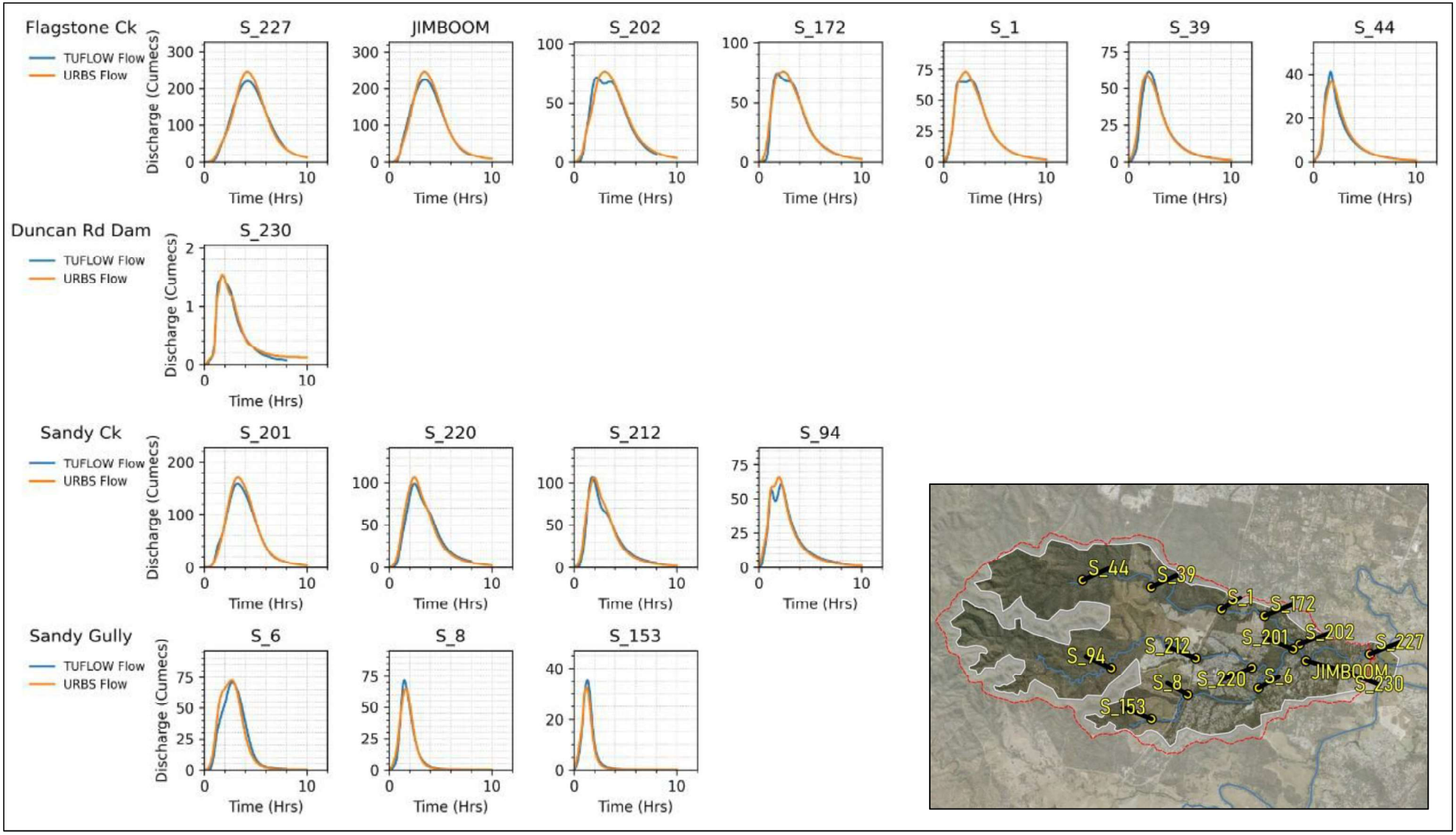


Figure 4-14 1%AEP 1-Hour Event Joint Calibration

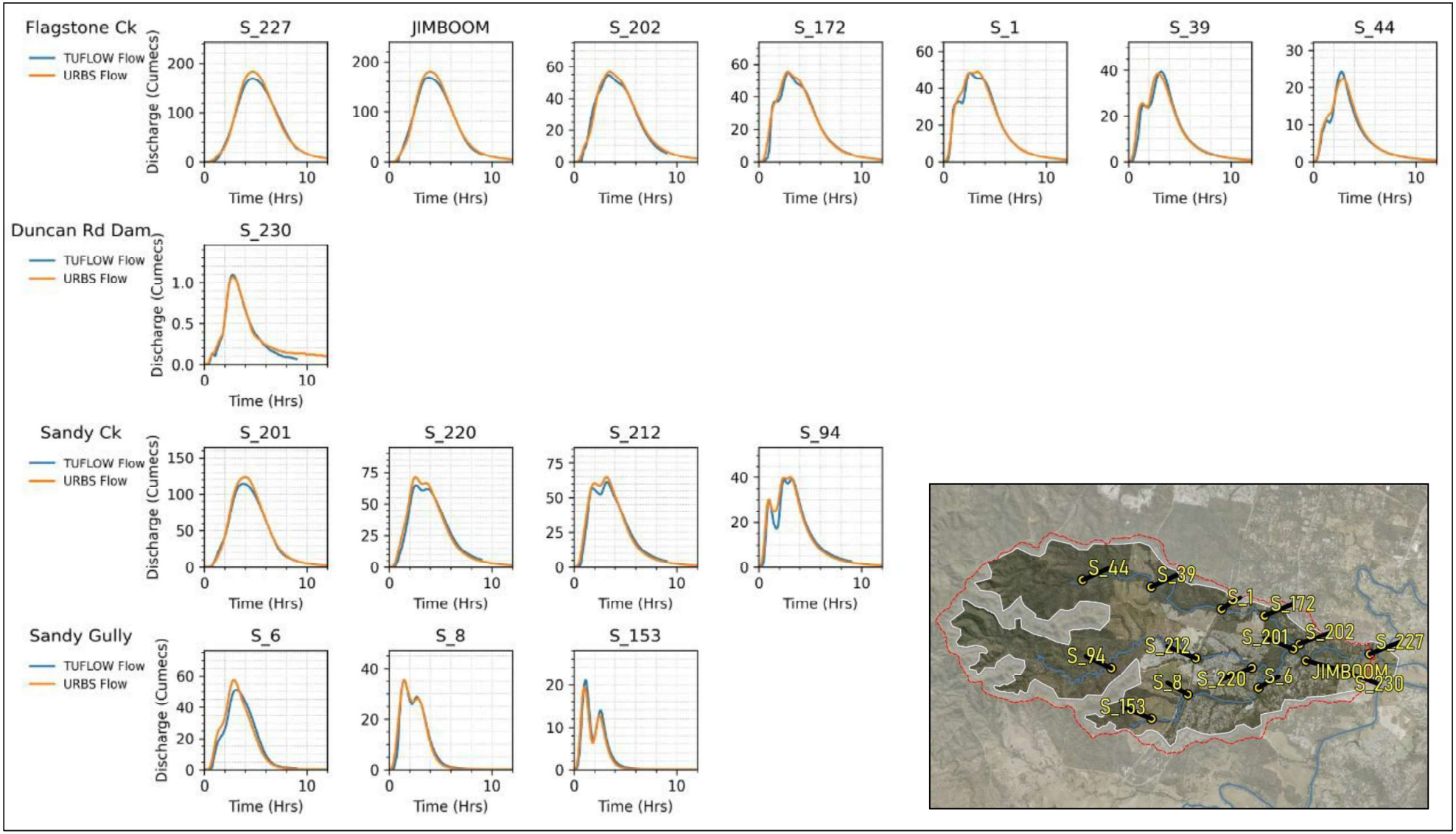


Figure 4-15 10%AEP 3-Hour Event Joint Calibration

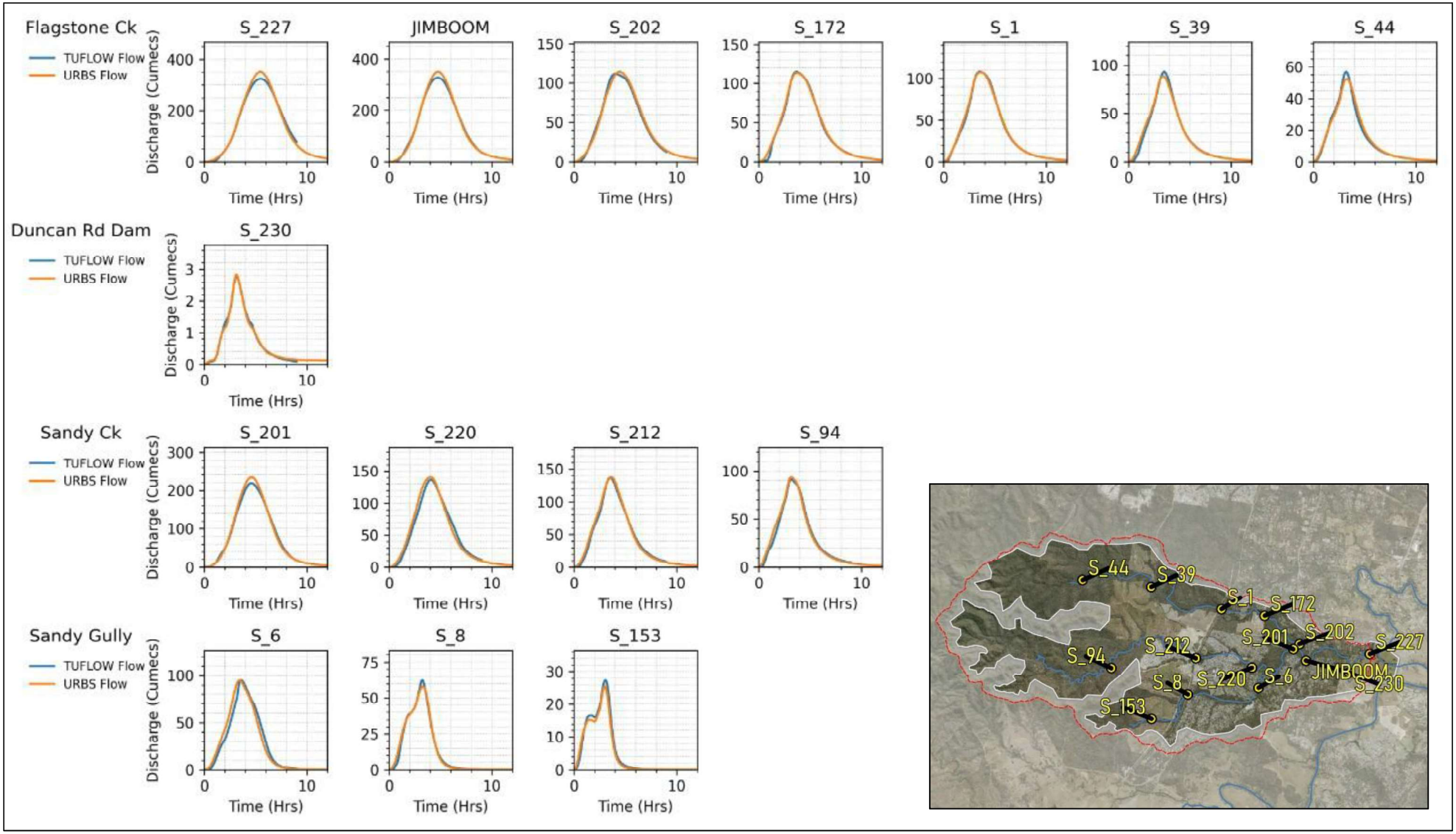


Figure 4-16 1% AEP 3-Hour Event Joint Calibration

5.8.3 Design Event Discharges

Design discharges (extracted from the TUFLOW hydraulic model) at the locations shown in Figure 5-13 are presented in Table 5-10 and Table 5-11 for present day conditions and 2100 RCP 4.5 conditions respectively.

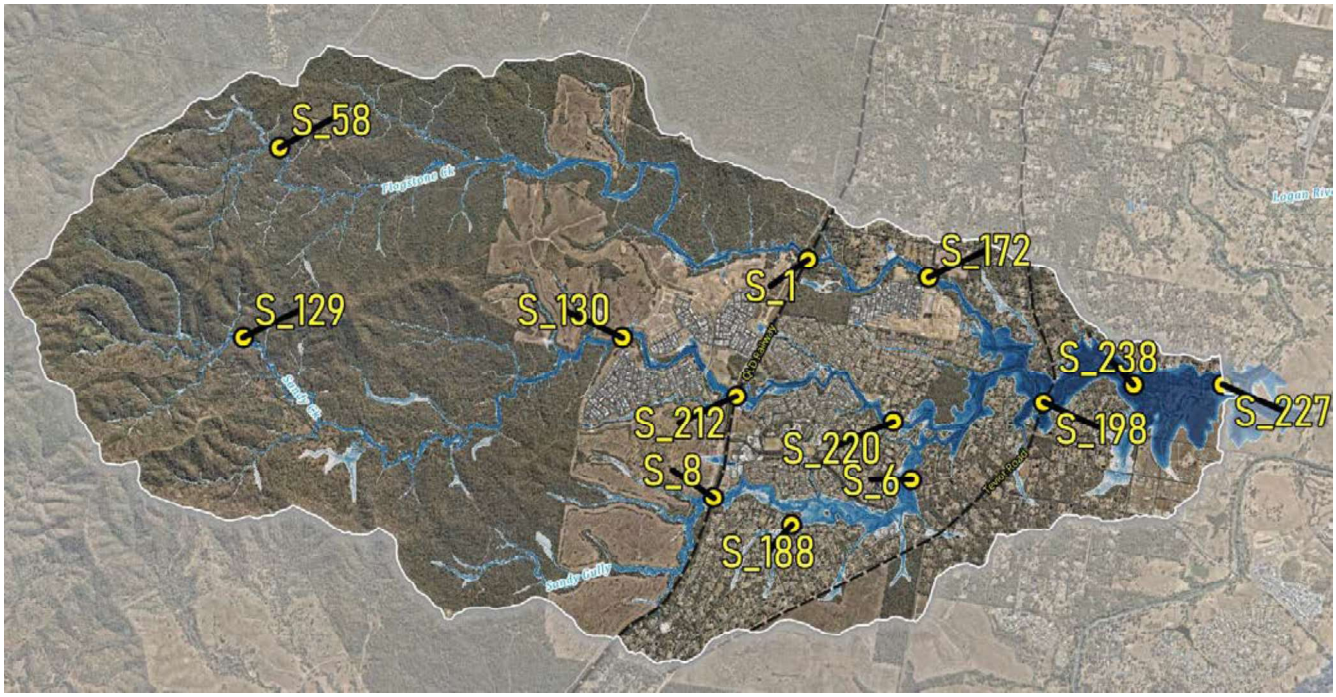


Figure 5-13 Critical Locations for Design Discharges

Table 5-10 Present Day Design Discharge at Critical Locations (m^3/s)

Reporting Location	Location ID	50% AEP	20%AEP	10% AEP	5% AEP	2%AEP	1% AEP	0.5%AEP	0.2% AEP	0.05%AEP	PMF
Flagstone Creek Catchment Total Outlet	S_227	106.36	168.64	218.42	268.15	341.18	412.14	467.71	543.65	573.48	2089.21
Flagstone Creek @ Five Oak Green Ct	S_238	104.63	164.99	215.41	262.81	333.72	402.98	458.85	533.17	679.82	2493.15
Flagstone Creek @ Teviot Road	S_198	104.24	164.21	216.08	262.38	331.95	398.62	453.94	527.43	681.44	2570.35
Flagstone Creek @ Pebble Creek Way	S_172	33.40	53.89	73.21	90.06	115.64	134.04	153.18	181.28	228.71	849.72
Flagstone Creek @ QLD Railway	S_1	31.49	50.58	68.98	84.76	109.75	127.20	145.02	171.40	216.04	810.71
Far Upstream Flagstone Creek	S_58	6.97	12.02	15.07	19.04	25.49	31.17	37.61	45.02	56.97	164.78
Sandy Creek @ River Oak Drive	S_220	42.12	63.82	85.08	104.90	131.53	151.04	170.05	194.80	246.23	1036.90
Sandy Creek @ QLD Railway	S_212	41.56	64.10	82.41	100.21	127.34	145.63	163.34	188.16	244.68	786.61
Sandy Creek @ Darling Ct	S_130	38.34	59.02	73.23	88.93	115.67	136.57	163.28	194.82	247.78	868.76
Far Upstream Sandy Creek	S_129	11.82	19.95	24.71	31.23	41.90	51.18	61.48	73.60	93.69	257.27
Sandy Gully @ Sandpiper Drive	S_6	31.50	48.01	61.38	73.51	94.96	117.19	140.77	168.48	219.19	723.35
Sandy Gully @ QLD Railway	S_8	26.00	39.92	50.95	61.25	76.55	88.82	102.43	119.44	151.73	488.56
Downstream of Drover Crescent	S_188	5.02	9.14	11.94	15.15	17.61	20.36	24.46	29.35	37.35	103.36

Table 5-11 2100 RCP 4.5 Design Discharge at Critical Locations (m^3/s)

Reporting Location	Location ID	50% AEP	20%AEP	10% AEP	5% AEP	2%AEP	1% AEP	0.5%AEP	0.2% AEP
Flagstone Creek Catchment Total Outlet	S_227	120.69	187.00	242.74	297.12	384.37	451.90	512.56	594.03
Flagstone Creek @ Five Oak Green Ct	S_238	118.85	182.61	239.21	290.95	375.85	449.95	510.73	591.31
Flagstone Creek @ Teviot Road	S_198	118.52	181.69	239.85	289.90	373.14	444.54	504.62	584.05
Flagstone Creek @ Pebble Creek Way	S_172	38.45	59.92	81.66	100.06	128.47	148.64	169.60	200.25
Flagstone Creek @ QLD Railway	S_1	36.23	56.30	76.92	94.13	121.93	140.78	160.36	189.32
Far Upstream Flagstone Creek	S_58	8.12	13.56	17.17	21.39	28.47	34.80	41.79	49.89
Sandy Creek @ River Oak Drive	S_220	47.22	70.68	95.17	116.46	145.12	165.44	186.42	211.74
Sandy Creek @ QLD Railway	S_212	46.86	71.55	91.50	110.86	140.13	159.11	179.01	206.64
Sandy Creek @ Darling Ct	S_130	43.27	65.87	81.23	98.41	127.60	152.09	180.66	215.73
Far Upstream Sandy Creek	S_129	13.68	22.48	28.07	35.14	46.91	57.07	68.41	81.73
Sandy Gully @ Sandpiper Drive	S_6	35.63	52.57	68.29	87.23	108.81	133.30	158.54	189.46
Sandy Gully @ QLD Railway	S_8	29.21	45.02	56.71	68.07	84.79	98.24	113.01	132.23
Downstream of Drover Crescent	S_188	5.80	10.57	13.71	16.98	19.44	22.74	27.27	32.54

5.8.4 Design Water Levels

Peak design water levels are presented for critical locations, as shown in Figure 5-14, with the results tabulated in Table 5-12. Longitudinal section plots are also presented for Flagstone Creek, Sandy Creek and Sandy Gully in Figure 5-15, Figure 5-16, and Figure 5-17. The modelling 2100 RCP 4.5 climate change projection indicates considerable increases to design event water levels, varying in magnitude throughout the catchment (see Table 5-13). The maximum climate change difference is observed in the lower reach of Flagstone Creek (+0.9m) largely sourced from increased Logan River tailwater levels in the climate change scenario. Upstream of flagstone creek at Teviot Road, increases generally fall below 300mm.

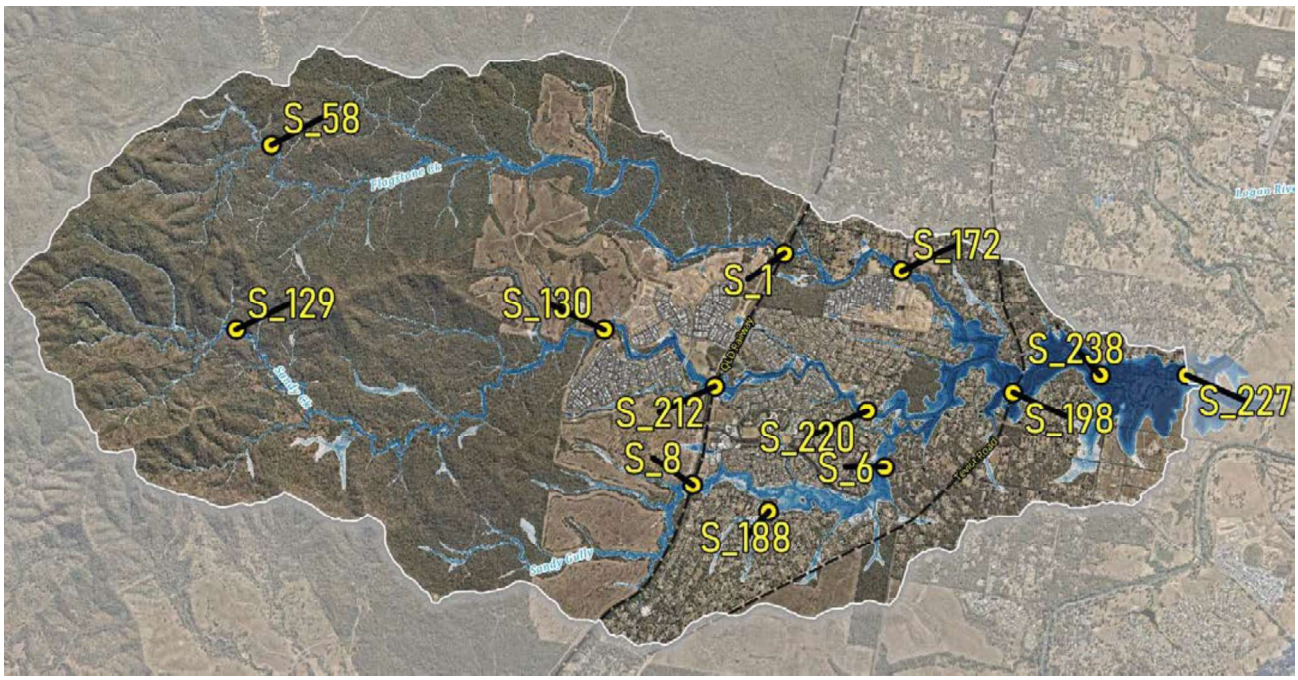


Figure 5-14 Critical Locations for Results Summary

Table 5-12 Present Day Design Water Levels at Critical Locations

Reporting Location	Location ID	50% AEP (mAHD)	20% AEP (mAHD)	10% AEP (mAHD)	5% AEP (mAHD)	2% AEP (mAHD)	1% AEP (mAHD)	0.5% AEP (mAHD)	0.2% AEP (mAHD)	0.05% AEP (mAHD)	PMF (mAHD)
Flagstone Creek Catchment Total Outlet	S_227	13.22	16.69	16.87	21.01	23.86	26.13	26.14	26.16	28.82	29.01
Flagstone Creek @ Five Oak Green Ct	S_238	17.40	18.53	19.06	21.35	23.94	26.16	26.18	26.21	28.83	29.19
Flagstone Creek @ Teviot Road	S_198	20.54	21.37	21.93	22.71	24.35	26.29	26.35	26.43	28.92	30.03
Flagstone Creek @ Pebble Creek Way	S_172	26.52	27.22	27.69	28.04	28.50	28.85	29.12	29.50	30.40	34.21
Flagstone Creek @ QLD Railway	S_1	34.54	34.99	35.35	35.62	36.02	36.28	36.52	36.85	37.36	41.26
Far Upstream Flagstone Creek	S_58	90.05	90.40	90.59	90.80	91.07	91.28	91.49	91.70	92.01	93.88
Sandy Creek @ River Oak Drive	S_220	27.90	28.35	28.72	29.02	29.38	29.63	29.82	30.02	30.48	33.24
Sandy Creek @ QLD Railway	S_212	36.06	36.37	36.59	36.80	37.10	37.29	37.47	37.69	38.11	41.29
Sandy Creek @ Darling Ct	S_130	41.96	42.39	42.64	42.88	43.26	43.50	43.80	44.12	44.59	47.04
Far Upstream Sandy Creek	S_129	81.36	81.87	82.11	82.40	82.77	83.05	83.31	83.55	83.90	85.73
Sandy Gully @ Sandpiper Drive	S_6	28.27	28.86	29.30	29.80	29.97	30.09	30.20	30.32	30.55	32.83
Sandy Gully @ QLD Railway	S_8	39.99	40.33	40.56	40.75	41.00	41.19	41.37	41.58	41.94	43.36
Downstream of Drover Crescent	S_188	35.96	36.07	36.12	36.18	36.22	36.25	36.30	36.36	36.45	37.07

Table 5-13 2100 RCP4.5 Design Water Levels at Critical Locations

Reporting Location	Location ID	50% AEP (mAHD)	20% AEP (mAHD)	10% AEP (mAHD)	5% AEP (mAHD)	2% AEP (mAHD)	1% AEP (mAHD)	0.5% AEP (mAHD)	0.2% AEP (mAHD)
Flagstone Creek Catchment Total Outlet	S_227	13.50	17.53	17.68	21.89	24.76	26.73	26.74	26.75
Flagstone Creek @ Five Oak Green Ct	S_238	17.64	18.93	19.46	22.11	24.81	26.75	26.77	26.79
Flagstone Creek @ Teviot Road	S_198	20.76	21.59	22.17	23.15	25.11	26.87	26.91	26.98
Flagstone Creek @ Pebble Creek Way	S_172	26.72	27.39	27.87	28.23	28.72	29.11	29.38	29.76
Flagstone Creek @ QLD Railway	S_1	34.66	35.11	35.49	35.78	36.20	36.46	36.71	37.06
Far Upstream Flagstone Creek	S_58	90.14	90.50	90.70	90.91	91.19	91.41	91.61	91.83
Sandy Creek @ River Oak Drive	S_220	28.01	28.48	28.88	29.19	29.55	29.79	29.96	30.14
Sandy Creek @ QLD Railway	S_212	36.14	36.46	36.70	36.92	37.23	37.43	37.62	37.84
Sandy Creek @ Darling Ct	S_130	42.07	42.51	42.77	43.02	43.41	43.68	43.98	44.32
Far Upstream Sandy Creek	S_129	81.49	82.00	82.27	82.54	82.93	83.19	83.45	83.70
Sandy Gully @ Sandpiper Drive	S_6	28.43	29.01	29.53	29.92	30.05	30.17	30.27	30.40
Sandy Gully @ QLD Railway	S_8	40.08	40.44	40.67	40.87	41.13	41.32	41.51	41.74
Downstream of Drover Crescent	S_188	35.98	36.10	36.15	36.21	36.24	36.28	36.34	36.40

APPENDIX C

LOGAN PROPERTY FLOOD REPORT

CITY OF LOGAN

PROPERTY FLOOD REPORT

PRINT

Property Details

Address: 673 Silverwood Drive FLAGSTONE QLD 4280
Lot/Plan: Lot 1 RP 45241
Size/Area: 328,953 m^2
Property Key: 281708
Catchment(s): Flagstone Creek, Logan River, Sandy Creek
View Logan's catchments and waterways map (PDF)

Summary Flood Assessment

The table below presents the flood risks applicable to the selected property. There may be multiple studies and flood scenarios affecting the property, particularly for larger sites.

Assessment	Details
Other information	GREATER FLAGSTONE - This property is in the Greater Flagstone Priority Development Area (PDA). Please contact Economic Development Queensland Development for advice about development. This report is for flood risk awareness only. EDQ PDA - Greater Flagstone
Risk area(s)	High, Moderate, Low
Investigation area	Not applicable
Isolation risk	Low flood island Low flood islands may be isolated and then inundated as floodwater rises and High flood islands may be surrounded by floodwater and lose access to safe evacuation routes, services and supplies. Please refer to the Isolated Islands map in the Planning Scheme Maps section of the Property Flood Report.
River flooding	Not applicable
Creek flooding	20% chance of a flood this size or larger happening in any given year
Overland flow	Applies. It is possible that flooding from a local waterway which has not yet been studied may also impact the property. Please contact Council for further advice. Overland flow is water (stormwater run-off) that travels overland during heavy rainfall events. It generally occurs quickly and for short durations.

CITY OF LOGAN

Latest Flood Risk

The extract below comes from the flood risk map based on the latest (most recent) flood studies accepted by Council applicable for this property.



LEGEND

High	Floodwaters may be deep or fast flowing, or have a relatively high chance of occurrence (e.g. 80% chance in 30 years). Conditions may pose a risk to life and cause damage to buildings, possibly severe. Limited development may be considered if not increasing the flood risk exposure for people or property. These areas are generally better suited to environmental, recreational and some agricultural uses.
Moderate	Less frequently affected by flooding or if more frequent, with shallow or slower moving floodwater. Conditions may pose an unacceptable risk to people or property if not mitigated. Development may be tolerable if measures are taken to address flood impacts, protect people and limit damage.
Low	Extremely unlikely chance of flooding (1% chance or less over a 30 year period) and/or relatively shallow or benign flooding conditions. Development is generally acceptable except for essential community infrastructure (e.g. emergency services). Vulnerable uses (e.g. childcare, aged care) may be ok subject to building, site access and safe shelter mitigation measures. Shows the full floodplain under the largest flood that could conceivably occur.
Investigation area	Locations where a current flood study has not been delivered and information to determine flood risk is not available. The approximation of the floodplain in these areas is based on a citywide overland flow study. Development should avoid these areas until further investigation (updated flood study or localised risk assessment) is completed.

The flood studies this map is based on consider the impacts of climate change, as required by Queensland's planning legislation and policies. The map considers the whole floodplain for Logan and reflects a risk-based approach that takes into account:

- How likely a flood of a given size is in any given year, and
- What the impact or level of danger of that flood is.

This information was extracted on 21/01/2026, 09:36:55

Flood Levels

The table below displays flood levels from the most recently accepted flood studies affecting this property. To view the flood study documents please see the Flood page on Council's website.

The levels are measured in Australian Height Datum (AHD), where sea level is approximately zero (0) metres. The level displayed in the table below is the maximum flood level on the property for that event (likelihood). For some properties, particularly large properties or those on a significant slope, flood levels can vary significantly.

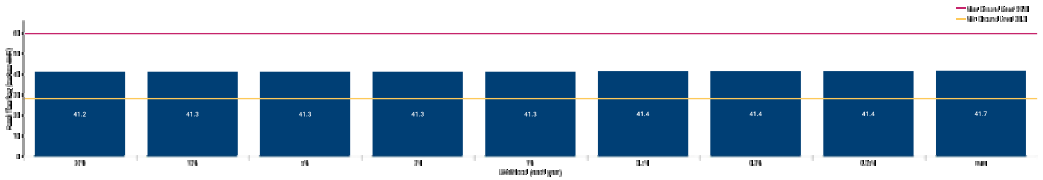
The most likely flood scenarios is shown at the top of the table, with the Probable Maximum Flood (PMF) at the bottom, being the least likely but most serious flood scenario.

Some properties may be impacted by only river flooding or only creek flooding, and some may be impacted by both. There may also be other sources of inundation that may impact the property and affect flood levels, based on overland flow or local creeks where studies have not yet been completed.

Study: Flagstone & Sandy Creeks Flood Study 2025

Likelihood (each year)	Creek flooding
20% chance	41.2 metres AHD
10% chance	41.3 metres AHD
5% chance	41.3 metres AHD
2% chance	41.3 metres AHD
1% chance	41.3 metres AHD
0.5% chance	41.4 metres AHD
0.2% chance	41.4 metres AHD
0.05% chance	41.4 metres AHD
PMF	41.7 metres AHD

Flood and Ground Levels in metres AHD



Ground Levels

Ground levels are based on an aerial LiDAR (Light Detection and Ranging) survey, which uses millions of laser point measurements to build a model of the ground surface. The source of the data is displayed in the table below so that you know when the survey was conducted.

Ground level	Details
Minimum ground level	28.3 metres AHD
Maximum ground level	59.8 metres AHD

Source: 2021 Digital elevation model (1 metre grid)

The projected flood depth (how deep the water may be above ground, in metres) is the difference between the flood levels in the section above and the ground levels in this table. The diagram below provides an example (land elevation is ground level).



Overland Flow

Overland flow is water (stormwater/rainfall run-off) that exceeds the capacity of drains, pipes and channels during heavy rainfall events and travels over land towards waterways. It generally occurs quickly and for shorter periods of time. The impact of overland flow is dependent on local conditions, so the mapping is a guide only. It is possible that flooding from a local waterway which has not yet been studied may also impact the property. Please contact Council for further advice.



LEGEND

Overland flow extent (areas possibly impacted)

This information was extracted on 21/01/2026, 09:36:55

CITY OF LOGAN

Future Climate Scenarios

This extract comes from the map showing the projected extent of flooding (affected areas) for multiple flood scenarios for all relevant flood studies, **including the projected impacts of climate change**. This map corresponds with the flood levels provided in the table above for the 5%, 2%, 1%, 0.5%, 0.05% and Probable Maximum Flood (PMF) scenarios.



LEGEND

5% chance	The areas modelled to be impacted by a flood that has a 5% (or 1 in 20) chance of happening in any given year, or 80% chance over a 30 year period, which is the common term of a mortgage. This modelling **includes the impacts of climate change** and represents our understanding of future risk.
2% chance	The areas modelled to be impacted by a flood that has a 2% (or 1 in 50) chance of happening in any given year, or 45% chance over a 30 year period, which is the common term of a mortgage. This modelling **includes the impacts of climate change** and represents our understanding of future risk.
1% chance	The areas modelled to be impacted by a flood that has a 1% (or 1 in 100) chance of happening in any given year, or 25% chance over a 30 year period, which is the common term of a mortgage. This modelling **includes the impacts of climate change** and represents our understanding of future risk.
0.5% chance	The areas modelled to be impacted by a flood that has a 0.5% (or 1 in 200) chance of happening in any given year, or 15% chance over a 30 year period, which is the common term of a mortgage. This modelling **includes the impacts of climate change** and represents our understanding of future risk.
0.05% chance	The areas modelled to be impacted by a flood that has a 0.05% (or 1 in 2000) chance of happening in any given year. This is an extremely unlikely flood event with a 1% chance of happening over a 30 year period, not including the impacts of climate change.
PMF	The PMF or probable maximum flood scenario represents the full extent of the floodplain, or the most serious flood that could be expected to occur. This is usually estimated based on the probable maximum rainfall, not including the impacts of climate change.
Investigation area	Locations where a current flood study has not been delivered and information to determine flood risk is not available. The approximation of the floodplain in these areas is based on a citywide overland flow study. Further investigation is needed.

CITY OF LOGAN

Current Climate Scenarios

This extract comes from the map showing flood affected areas **without** considering the impacts of climate change. This map represents modelled flooding under current conditions, and can be used for insurance purposes.



LEGEND

5% chance	The areas modelled to be impacted by a flood that has a 5% (or 1 in 20) chance of happening in any given year, or 80% chance over a 30 year period, which is the common term of a mortgage. This modelling is based on **current (present day) conditions** and does not take into account the impacts of climate change.
2% chance	The areas modelled to be impacted by a flood that has a 2% (or 1 in 50) chance of happening in any given year, or 45% chance over a 30 year period, which is the common term of a mortgage. This modelling is based on **current (present day) conditions** and does not take into account the impacts of climate change.
1% chance	The areas modelled to be impacted by a flood that has a 1% (or 1 in 100) chance of happening in any given year, or 25% chance over a 30 year period, which is the common term of a mortgage. This modelling is based on **current (present day) conditions** and does not take into account the impacts of climate change.
0.5% chance	The areas modelled to be impacted by a flood that has a 0.5% (or 1 in 200) chance of happening in any given year, or 15% chance over a 30 year period, which is the common term of a mortgage. This modelling is based on **current (present day) conditions** and does not take into account the impacts of climate change.
0.05% chance	The areas modelled to be impacted by a flood that has a 0.05% (or 1 in 2000) chance of happening in any given year. This is an extremely unlikely flood event with a 1% chance of happening over a 30 year period, not including the impacts of climate change.
PMF	The PMF or probable maximum flood scenario represents the full extent of the floodplain, or the most serious flood that could be expected to occur. This is usually estimated based on the probable maximum rainfall, not including the impacts of climate change
Investigation area	Locations where a current flood study has not been delivered and information to determine flood risk is not available. The approximation of the floodplain in these areas is based on a citywide overland flow study. Further investigation is needed.

Historic Flood Events

Based on the best information available to Council, the table below indicates whether or not the selected property may have been impacted by significant historic flood events. It is possible that other creek flooding or overland flow, which is not included in Council's mapping of these events, may have impacted the property.

Flood event	Property impacted
1974	No
2017 (after ex Tropical Cyclone Debbie)	No
2022 (late February / early March)	No

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CITY OF LOGAN

Planning Scheme Maps

The selected property is shown below on an extract of the Flood Overlay Maps from the Logan Planning Scheme 2015 V9.2 with TLPI No. 1/2024. Various provisions of the planning scheme which refer to properties affected by the Flood Overlay Maps will apply to the flood affected areas for the purposes of planning and development. This may include, for example, raised building floor levels and achieving safe vehicle access to the road network.

OM-05.01 Isolated islands



OM-05.02 High flow area



OM-05.04 Flood risk areas



MAP LEGEND

High	Floodwaters may be deep or fast flowing, or have a relatively high chance of occurrence (e.g. 80% chance in 30 years). Conditions may pose a risk to life and cause damage to buildings, possibly severe. Limited development may be considered if not increasing the flood risk exposure for people or property. These areas are generally better suited to environmental, recreational and some agricultural uses.
Moderate	Less frequently affected by flooding or if more frequent, with shallow or slower moving floodwater. Conditions may pose an unacceptable risk to people or property if not mitigated. Development may be tolerable if measures are taken to address flood impacts, protect people and limit damage.
Low	Extremely unlikely chance of flooding (1% chance or less over a 30 year period) and/or relatively shallow or benign flooding conditions. Development is generally acceptable except for essential community infrastructure (e.g. emergency services). Vulnerable uses (e.g. childcare, aged care) may be ok subject to building, site access and safe shelter mitigation measures. Shows the full floodplain under the largest flood that could conceivably occur.
Investigation area	Locations where a current flood study has not been delivered and information to determine flood risk is not available. The approximation of the floodplain in these areas is based on a citywide overland flow study. Development should avoid these areas until further investigation (updated flood study or localised risk assessment) is completed.

MAP LEGEND

High flow area	High hazard areas of flooding where significant (deeper, faster) flow of water occurs and in which a building is vulnerable to structural damage or failure from floodwater. Classified as H5 or H6 in the Australian Institute of Disaster Resilience (AIDR) Guideline 7-3 'Flood Hazard'.
High flood island	Areas which are isolated from flood-free land (surrounded by floodwater) but retain a portion of the area as flood free in a probable maximum flood (PMF).
Low flood island	Areas which are surrounded by floodwater and at first isolated from flood-free land, then completely inundated by floodwater (submerged) as the flood continues to rise.
Meadowbrook flood assessment area	Area where the function of important community infrastructure needs to be maintained. Flood mitigation measures and comprehensive emergency management planning is required to adequately manage the risk for flood events.

CITY OF LOGAN

If more recent flood studies have been completed and accepted by Council, the Latest Flood Risk Map shown at the top of this report may be different from the planning scheme map. The latest flood information should be used to inform development decisions and will be incorporated into the planning scheme in a future amendment.

Further Information

1. Floods are highly unpredictable and variable, and properties may be affected by other sources of potential flooding. Each flood and its impact is different. Areas that were not flooded previously may be affected by future events. Areas that have been previously flooded may be impacted in different ways. This online report cannot take all of this into account.
2. The flood mapping and levels in this report are based on data from flood studies undertaken at a particular time and are subject to change. For example, if the method for calculating flood levels is updated, industry guidelines are updated or more recent information becomes available, this may result in changes to the information in this report. In areas where development is ongoing, the flood mapping and levels may not reflect developed conditions.
3. Flood studies do not create risk. They help us to understand the risk, based on relevant legislation and Queensland Government policies and guidelines. Flood studies also consider a range of other factors such as rainfall and river level information from recent events, climate change and trends, the impacts of development, changes to catchment conditions, new technologies and industry best practice (which help to improve accuracy).
4. Flood studies and models are developed from the best information available at the time. They do not tell you how the flood waters might behave, how quickly they may rise, or how dangerous the flooding will be. The models also cannot represent changes that have occurred since they were developed which may impact flood behaviour, such as earthworks, new developments or road infrastructure.
5. This report is not a substitute for independent professional advice. You should engage the services of a Registered Professional Engineer of Queensland (RPEQ) to get site specific information regarding the flood risk to your property, and how that might affect any proposed building or development work.
6. While Logan City Council takes reasonable care in producing this report, it does not guarantee that the information is accurate, complete or current. Logan City Council does not accept any responsibility for any loss or damage (however it was caused) in connection with the use of or reliance on the information in this report.

Contact Information

Where to go for further information depends on the type of information you need. Please refer to the Flood Risk Fact Sheet or contact Council using the details below.

Topic	Contact Details
Flood studies and modelling information, and the flood risk on your property	Contact Council on 07 3412 3412 or email council@logan.qld.gov.au. Further information about flooding and flood studies is available on the Flood page on Council's website.
Planning and development enquiries or proposals	Contact Council on 07 3412 3412 or email development@logan.qld.gov.au. Before lodging a development application, pre-lodgement advice is recommended.
Building information	Contact Council on 07 3412 3412 or email council@logan.qld.gov.au. You can also contact a private building certifier.
Properties in Priority Development Areas	Contact Economic Development Queensland. Council is not the planning authority for these properties.
Independent advice about flooding on your property	Contact a registered engineer through the Board of Professional Engineers of Queensland: Phone: 07 3210 3100 Email: admin@bpeq.qld.gov.au Web: Home - Board of Professional Engineers Queensland (bpeq.qld.gov.au)

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CITY OF LOGAN

PROPERTY FLOOD REPORT

PRINT

Property Details

Address: 47-63 Paula Road SOUTH MACLEAN QLD 4280
Lot/Plan: Lot 4 RP 174046
Size/Area: 19,979 m^2
Property Key: 294311
Catchment(s): Flagstone Creek, Logan River
View Logan's catchments and waterways map (PDF)

Summary Flood Assessment

The table below presents the flood risks applicable to the selected property. There may be multiple studies and flood scenarios affecting the property, particularly for larger sites.

Assessment	Details
Risk area(s)	High, Moderate, Low
Investigation area	Not applicable
Isolation risk	Not applicable
River flooding	Not applicable
Creek flooding	20% chance of a flood this size or larger happening in any given year
Overland flow	Applies. It is possible that flooding from a local waterway which has not yet been studied may also impact the property. Please contact Council for further advice. Overland flow is water (stormwater run-off) that travels overland during heavy rainfall events. It generally occurs quickly and for short durations.

CITY OF LOGAN

Latest Flood Risk

The extract below comes from the flood risk map based on the latest (most recent) flood studies accepted by Council applicable for this property.



LEGEND

High	Floodwaters may be deep or fast flowing, or have a relatively high chance of occurrence (e.g. 80% chance in 30 years). Conditions may pose a risk to life and cause damage to buildings, possibly severe. Limited development may be considered if not increasing the flood risk exposure for people or property. These areas are generally better suited to environmental, recreational and some agricultural uses.
Moderate	Less frequently affected by flooding or if more frequent, with shallow or slower moving floodwater. Conditions may pose an unacceptable risk to people or property if not mitigated. Development may be tolerable if measures are taken to address flood impacts, protect people and limit damage.
Low	Extremely unlikely chance of flooding (1% chance or less over a 30 year period) and/or relatively shallow or benign flooding conditions. Development is generally acceptable except for essential community infrastructure (e.g. emergency services). Vulnerable uses (e.g. childcare, aged care) may be ok subject to building, site access and safe shelter mitigation measures. Shows the full floodplain under the largest flood that could conceivably occur.
Investigation area	Locations where a current flood study has not been delivered and information to determine flood risk is not available. The approximation of the floodplain in these areas is based on a citywide overland flow study. Development should avoid these areas until further investigation (updated flood study or localised risk assessment) is completed.

The flood studies this map is based on consider the impacts of climate change, as required by Queensland's planning legislation and policies. The map considers the whole floodplain for Logan and reflects a risk-based approach that takes into account:

- How likely a flood of a given size is in any given year, and
- What the impact or level of danger of that flood is.

This information was extracted on 16/02/2026, 14:21:32

Flood Levels

The table below displays flood levels from the most recently accepted flood studies affecting this property. To view the flood study documents please see the Flood page on Council's website.

The levels are measured in Australian Height Datum (AHD), where sea level is approximately zero (0) metres. The level displayed in the table below is the maximum flood level on the property for that event (likelihood). For some properties, particularly large properties or those on a significant slope, flood levels can vary significantly.

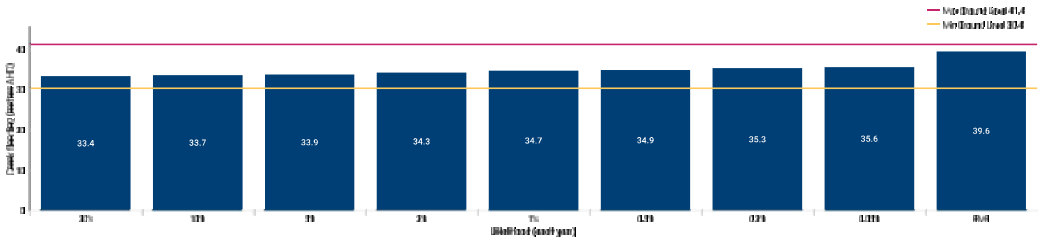
The most likely flood scenarios is shown at the top of the table, with the Probable Maximum Flood (PMF) at the bottom, being the least likely but most serious flood scenario.

Some properties may be impacted by only river flooding or only creek flooding, and some may be impacted by both. There may also be other sources of inundation that may impact the property and affect flood levels, based on overland flow or local creeks where studies have not yet been completed.

Study: Flagstone & Sandy Creeks Flood Study 2025

Likelihood (each year)	Creek flooding
20% chance	33.4 metres AHD
10% chance	33.7 metres AHD
5% chance	33.9 metres AHD
2% chance	34.3 metres AHD
1% chance	34.7 metres AHD
0.5% chance	34.9 metres AHD
0.2% chance	35.3 metres AHD
0.05% chance	35.6 metres AHD
PMF	39.6 metres AHD

Flood and Ground Levels in metres AHD



Ground Levels

Ground levels are based on an aerial LiDAR (Light Detection and Ranging) survey, which uses millions of laser point measurements to build a model of the ground surface. The source of the data is displayed in the table below so that you know when the survey was conducted.

Ground level	Details
Minimum ground level	30.4 metres AHD
Maximum ground level	41.4 metres AHD

Source: 2021 Digital elevation model (1 metre grid)

The projected flood depth (how deep the water may be above ground, in metres) is the difference between the flood levels in the section above and the ground levels in this table. The diagram below provides an example (land elevation is ground level).



Overland Flow

Overland flow is water (stormwater/rainfall run-off) that exceeds the capacity of drains, pipes and channels during heavy rainfall events and travels over land towards waterways. It generally occurs quickly and for shorter periods of time. The impact of overland flow is dependent on local conditions, so the mapping is a guide only. It is possible that flooding from a local waterway which has not yet been studied may also impact the property. Please contact Council for further advice.



LEGEND

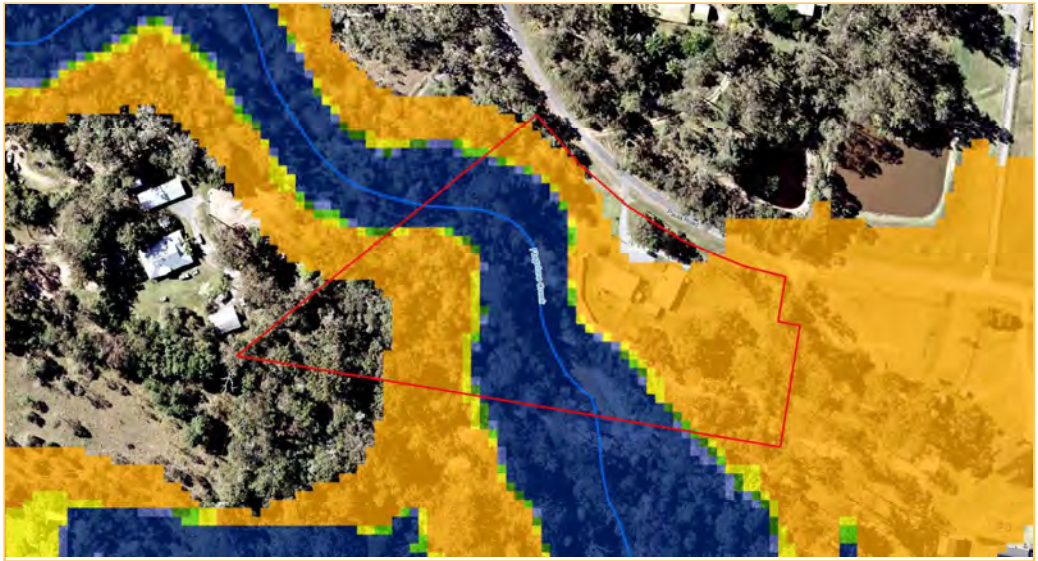
Overland flow extent (areas possibly impacted)

This information was extracted on 16/02/2026, 14:21:32

CITY OF LOGAN

Future Climate Scenarios

This extract comes from the map showing the projected extent of flooding (affected areas) for multiple flood scenarios for all relevant flood studies, **including the projected impacts of climate change**. This map corresponds with the flood levels provided in the table above for the 5%, 2%, 1%, 0.5%, 0.05% and Probable Maximum Flood (PMF) scenarios.



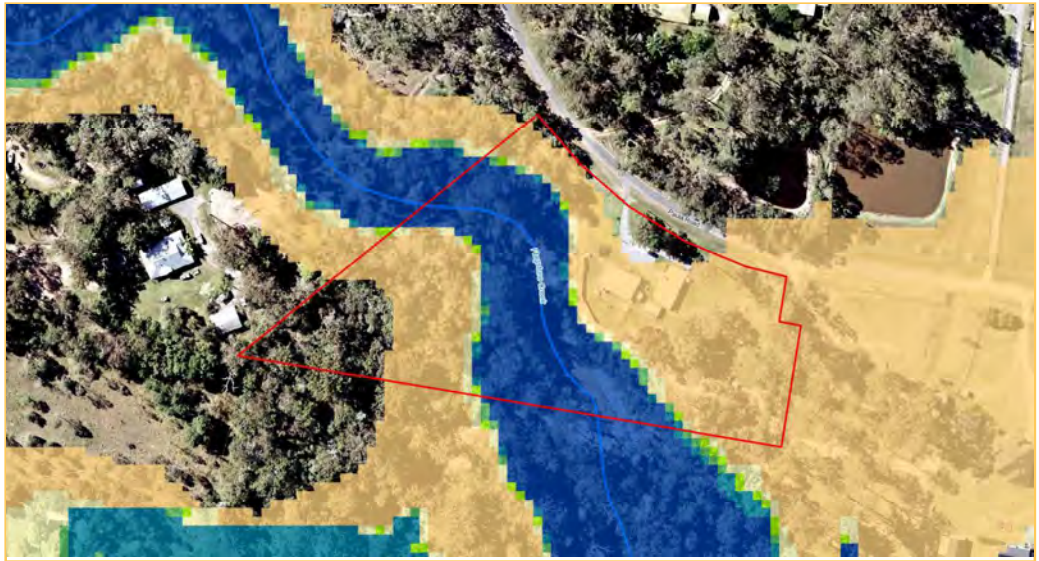
LEGEND

5% chance	The areas modelled to be impacted by a flood that has a 5% (or 1 in 20) chance of happening in any given year, or 80% chance over a 30 year period, which is the common term of a mortgage. This modelling **includes the impacts of climate change** and represents our understanding of future risk.
2% chance	The areas modelled to be impacted by a flood that has a 2% (or 1 in 50) chance of happening in any given year, or 45% chance over a 30 year period, which is the common term of a mortgage. This modelling **includes the impacts of climate change** and represents our understanding of future risk.
1% chance	The areas modelled to be impacted by a flood that has a 1% (or 1 in 100) chance of happening in any given year, or 25% chance over a 30 year period, which is the common term of a mortgage. This modelling **includes the impacts of climate change** and represents our understanding of future risk.
0.5% chance	The areas modelled to be impacted by a flood that has a 0.5% (or 1 in 200) chance of happening in any given year, or 15% chance over a 30 year period, which is the common term of a mortgage. This modelling **includes the impacts of climate change** and represents our understanding of future risk.
0.05% chance	The areas modelled to be impacted by a flood that has a 0.05% (or 1 in 2000) chance of happening in any given year. This is an extremely unlikely flood event with a 1% chance of happening over a 30 year period, not including the impacts of climate change.
PMF	The PMF or probable maximum flood scenario represents the full extent of the floodplain, or the most serious flood that could be expected to occur. This is usually estimated based on the probable maximum rainfall, not including the impacts of climate change.
Investigation area	Locations where a current flood study has not been delivered and information to determine flood risk is not available. The approximation of the floodplain in these areas is based on a citywide overland flow study. Further investigation is needed.

CITY OF LOGAN

Current Climate Scenarios

This extract comes from the map showing flood affected areas **without** considering the impacts of climate change. This map represents modelled flooding under current conditions, and can be used for insurance purposes.



LEGEND

5% chance	The areas modelled to be impacted by a flood that has a 5% (or 1 in 20) chance of happening in any given year, or 80% chance over a 30 year period, which is the common term of a mortgage. This modelling is based on **current (present day) conditions** and does not take into account the impacts of climate change.
2% chance	The areas modelled to be impacted by a flood that has a 2% (or 1 in 50) chance of happening in any given year, or 45% chance over a 30 year period, which is the common term of a mortgage. This modelling is based on **current (present day) conditions** and does not take into account the impacts of climate change.
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PMF	The PMF or probable maximum flood scenario represents the full extent of the floodplain, or the most serious flood that could be expected to occur. This is usually estimated based on the probable maximum rainfall, not including the impacts of climate change
Investigation area	Locations where a current flood study has not been delivered and information to determine flood risk is not available. The approximation of the floodplain in these areas is based on a citywide overland flow study. Further investigation is needed.

Historic Flood Events

Based on the best information available to Council, the table below indicates whether or not the selected property may have been impacted by significant historic flood events. It is possible that other creek flooding or overland flow, which is not included in Council's mapping of these events, may have impacted the property.

Flood event	Property impacted
1974	No
2017 (after ex Tropical Cyclone Debbie)	No
2022 (late February / early March)	No

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CITY OF LOGAN

Planning Scheme Maps

The selected property is shown below on an extract of the Flood Overlay Maps from the Logan Planning Scheme 2015 V9.2 with TLPI No. 1/2024. Various provisions of the planning scheme which refer to properties affected by the Flood Overlay Maps will apply to the flood affected areas for the purposes of planning and development. This may include, for example, raised building floor levels and achieving safe vehicle access to the road network.

OM-05.01 Isolated islands



OM-05.02 High flow area



OM-05.04 Flood risk areas



MAP LEGEND

High	Floodwaters may be deep or fast flowing, or have a relatively high chance of occurrence (e.g. 80% chance in 30 years). Conditions may pose a risk to life and cause damage to buildings, possibly severe. Limited development may be considered if not increasing the flood risk exposure for people or property. These areas are generally better suited to environmental, recreational and some agricultural uses.
Moderate	Less frequently affected by flooding or if more frequent, with shallow or slower moving floodwater. Conditions may pose an unacceptable risk to people or property if not mitigated. Development may be tolerable if measures are taken to address flood impacts, protect people and limit damage.
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Investigation area	Locations where a current flood study has not been delivered and information to determine flood risk is not available. The approximation of the floodplain in these areas is based on a citywide overland flow study. Development should avoid these areas until further investigation (updated flood study or localised risk assessment) is completed.

CITY OF LOGAN

MAP LEGEND

High flow area	High hazard areas of flooding where significant (deeper, faster) flow of water occurs and in which a building is vulnerable to structural damage or failure from floodwater. Classified as H5 or H6 in the Australian Institute of Disaster Resilience (AIDR) Guideline 7-3 'Flood Hazard'.
High flood island	Areas which are isolated from flood-free land (surrounded by floodwater) but retain a portion of the area as flood free in a probable maximum flood (PMF).
Low flood island	Areas which are surrounded by floodwater and at first isolated from flood-free land, then completely inundated by floodwater (submerged) as the flood continues to rise.
Meadowbrook flood assessment area	Area where the function of important community infrastructure needs to be maintained. Flood mitigation measures and comprehensive emergency management planning is required to adequately manage the risk for flood events.

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1. Floods are highly unpredictable and variable, and properties may be affected by other sources of potential flooding. Each flood and its impact is different. Areas that were not flooded previously may be affected by future events. Areas that have been previously flooded may be impacted in different ways. This online report cannot take all of this into account.
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Contact Information

Where to go for further information depends on the type of information you need. Please refer to the Flood Risk Fact Sheet or contact Council using the details below.

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Building information	Contact Council on 07 3412 3412 or email council@logan.qld.gov.au. You can also contact a private building certifier.
Properties in Priority Development Areas	Contact Economic Development Queensland. Council is not the planning authority for these properties.
Independent advice about flooding on your property	Contact a registered engineer through the Board of Professional Engineers of Queensland: Phone: 07 3210 3100 Email: admin@bpeq.qld.gov.au Web: Home - Board of Professional Engineers Queensland (bpeq.qld.gov.au)

This information was extracted on 16/02/2026, 14:21:32

APPENDIX D

JFP CATCHMENT PLANS & CATCHMENT DATA

REGIONAL CATCHMENTS

Calibration Scenario

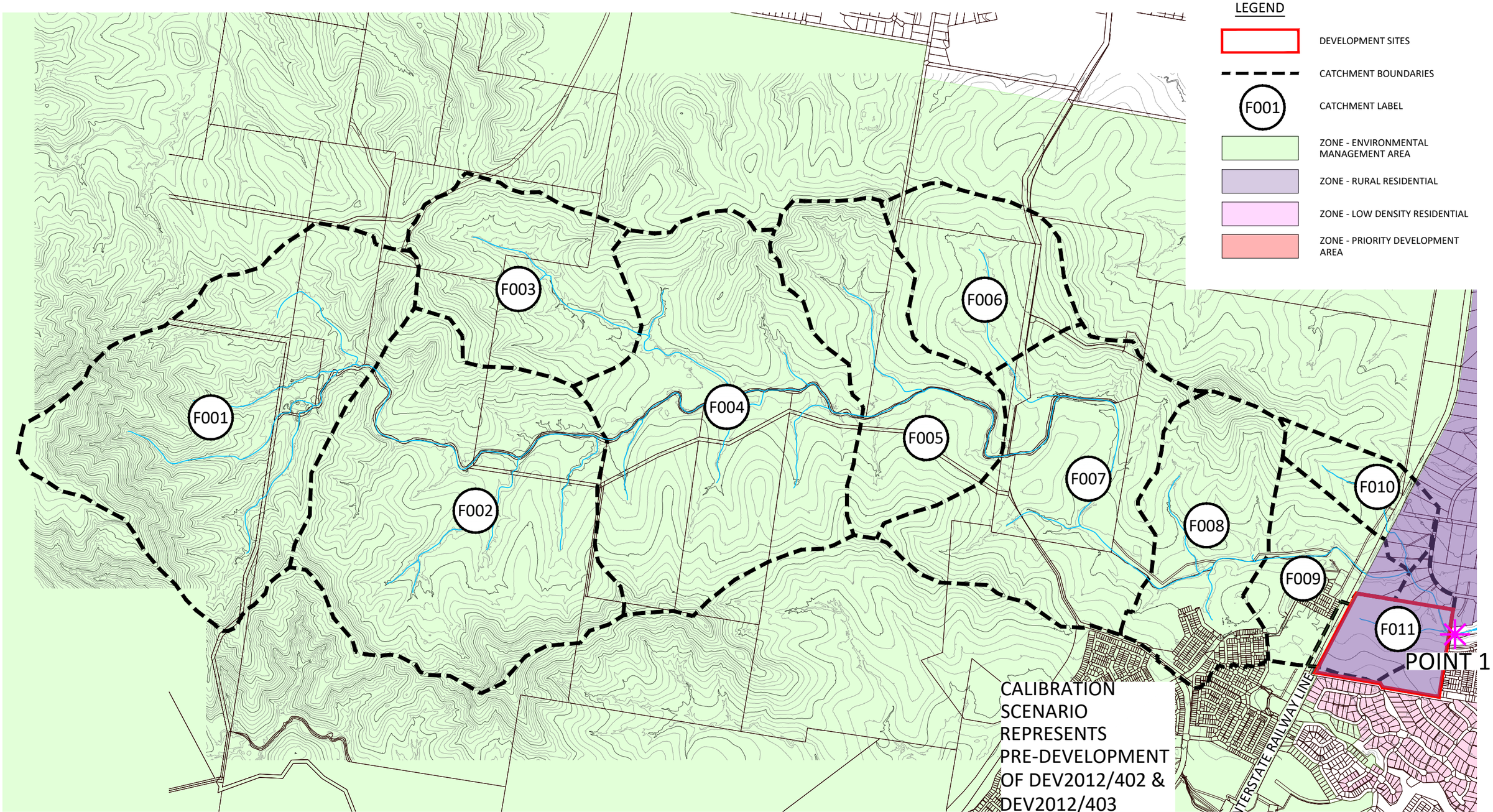
CATCHMENT NAME	Land Zone Breakdown						TOTAL AREA (HA)	WEIGHTED Fi (%)	PERVIOUS AREA (HA)	IMPERVIOUS AREA (HA)	SLOPE (%)
	Open Space (0% fi)	Rural Residential (20% fi)	External PDAs (70% fi)	Undeveloped Site (0.4% fi)	Post-Dev Site basin & park (5%)	Proposed Site Development (80% fi)					
F001	279.0						279.0	0%	278.953	0.000	1.5
F002	284.7						284.7	0%	284.672	0.000	1.2
F003	117.1						117.1	0%	117.126	0.000	5.2
F004	268.6						268.6	0%	268.573	0.000	0.5
F005	133.0						133.0	0%	132.981	0.000	0.4
F006	86.0						86.0	0%	85.952	0.000	5.9
F007	175.1						175.1	0%	175.093	0.000	0.5
F008	109.5						109.5	0%	109.533	0.000	0.5
F009	52.9	5.2					58.1	2%	57.059	1.047	0.2
F010	25.3	9.3					34.6	5%	32.770	1.869	6.4
F011		5.7		29.6			35.3	4%	34.085	1.263	0.7
TOTAL	**1531.1**	**20.3**	**0.0**	**29.6**			**1581.0**	**0.3%**	**1576.798**	**4.178**	

Pre-Development Scenario

CATCHMENT NAME	Land Zone Breakdown						TOTAL AREA (HA)	WEIGHTED Fi (%)	PERVIOUS AREA (HA)	IMPERVIOUS AREA (HA)	SLOPE (%)
	Open Space (0% fi)	Rural Residential (20% fi)	External PDAs (70% fi)	Undeveloped Site (0.4% fi)	Post-Dev Site basin & park (5%)	Proposed Site Development (80% fi)					
F001	279.0						279.0	0%	278.953	0.000	1.5
F002	276.4		8.2				284.7	2%	278.912	5.760	1.2
F003	117.1						117.1	0%	117.126	0.000	5.2
F004	117.4		151.2				268.6	39%	162.743	105.830	0.5
F005	52.7		80.3				133.0	42%	76.798	56.183	0.4
F006	34.2		51.8				86.0	42%	49.707	36.245	5.9
F007	85.7		89.4				175.1	36%	112.537	62.556	0.5
F008			109.5				109.5	70%	32.860	76.673	0.5
F009	3.2	5.2	49.1				57.5	62%	22.117	35.414	0.2
F010	3.0	9.3	22.3				34.6	51%	17.138	17.501	6.4
F011		5.7		3.3			9.1	13%	7.907	1.158	0.7
EXT_PRE	3.2						3.2	1%	3.168	0.032	4.5
A1_PRE				23.7			23.7	0.4%	23.629	0.095	2.5
TOTAL	**971.9**	**20.3**	**561.8**	**27.1**	**0.0**		**1581.0**	**25%**	**1183.60**	**397.45**	

Post-Development Scenario

CATCHMENT NAME	Land Zone Breakdown						TOTAL AREA (HA)	WEIGHTED Fi (%)	PERVIOUS AREA (HA)	IMPERVIOUS AREA (HA)	SLOPE (%)
	Open Space (0% fi)	Rural Residential (20% fi)	External PDAs (70% fi)	Undeveloped Site (0.4% fi)	Post-Dev Site basin & park (5%)	Proposed Site Development (80% fi)					
F001	278.953						278.953	0%	278.953	0.000	1.5
F002	276.444		8.228				284.672	2%	278.912	5.760	1.2
F003	117.126						117.126	0%	117.126	0.000	5.2
F004	117.387		151.186				268.573	39%	162.743	105.830	0.5
F005	52.720		80.261				132.981	42%	76.798	56.183	0.4
F006	34.174		51.778				85.952	42%	49.707	36.245	5.9
F007	85.728		89.365				175.093	36%	112.537	62.556	0.5
F008			109.533				109.533	70%	32.860	76.673	0.5
F009	3.2	5.2	49.1				57.5	62%	22.117	35.414	0.2
F010	3.0	9.3	22.3				34.6	51%	17.138	17.501	6.4
F011		5.7		3.3			9.1	13%	7.907	1.158	0.7
EXT_POST	3.3						3.3	1%	3.268	0.032	4.5
A1_POST					2.5	24.7	27.2	73%	7.270	19.891	2.5
TOTAL	**972.0**	**20.3**	**561.8**	**3.3**	**2.5**	**24.7**	**1584.6**	**26%**	**1167.336**	**417.242**	



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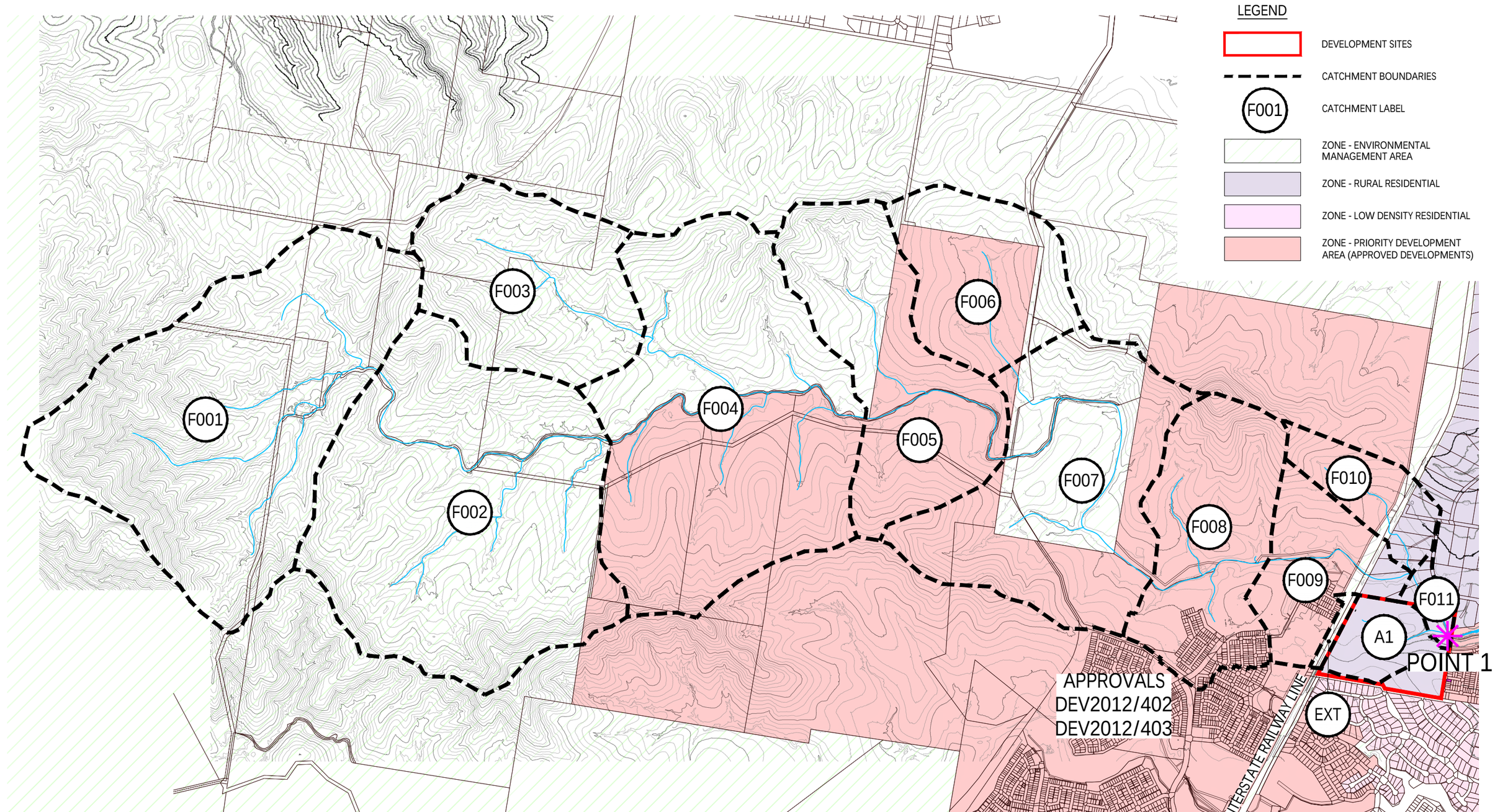
REGIONAL CATCHMENT PLAN - CALIBRATION SCENARIO

673 SILVERWOOD DRIVE, FLAGSTONE
THE TRUSTEE FOR CHANG FAMILY TRUST T/A ORIS ACCESSORIES PTY LTD

JOB NO:	PLAN:	ISSUE:
B4942EA1_DA1	SK01	A

SCALE: -
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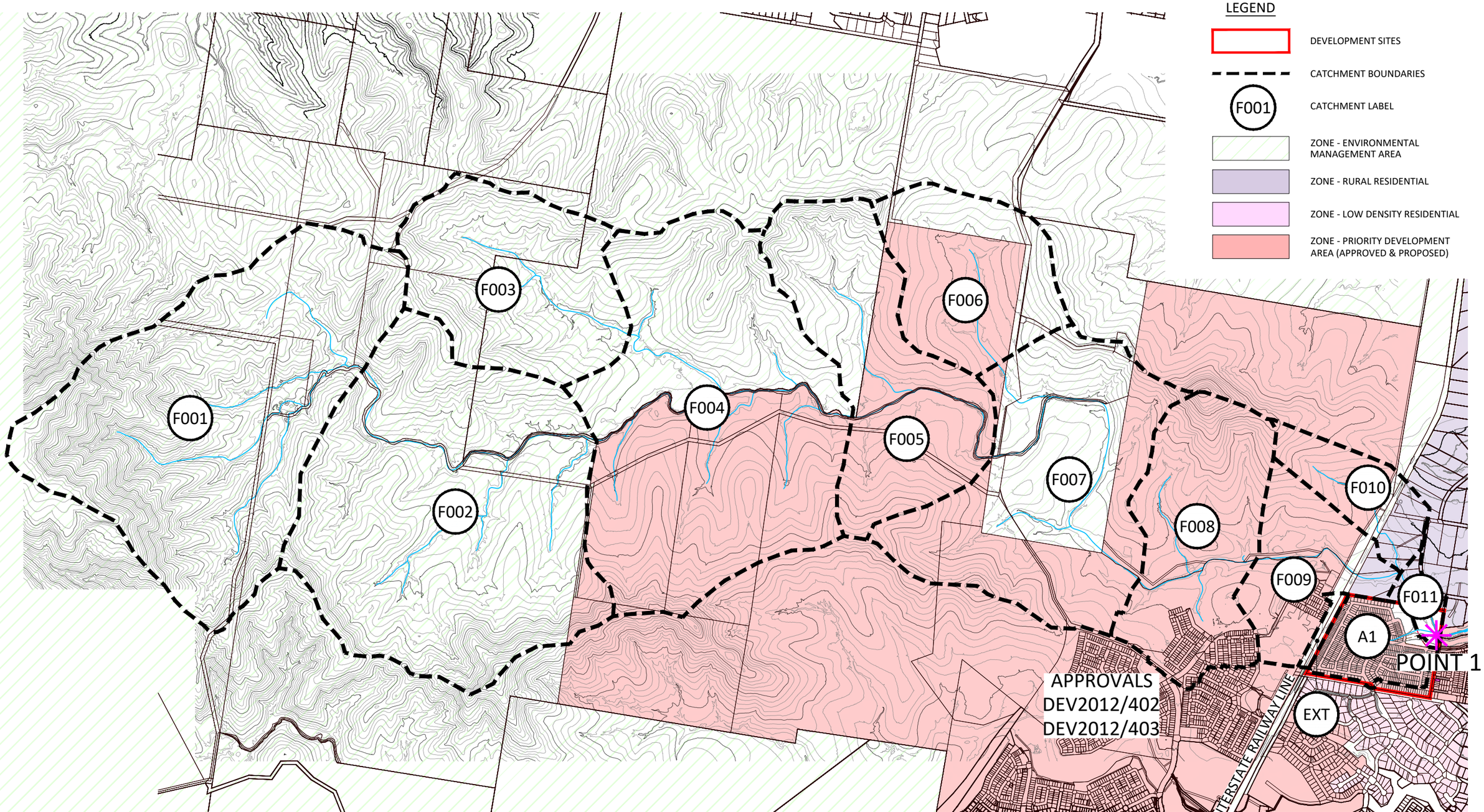
REGIONAL CATCHMENT PLAN - PRE-DEVELOPMENT SCENARIO

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REGIONAL CATCHMENT PLAN - POST-DEVELOPMENT SCENARIO

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SCALE: -
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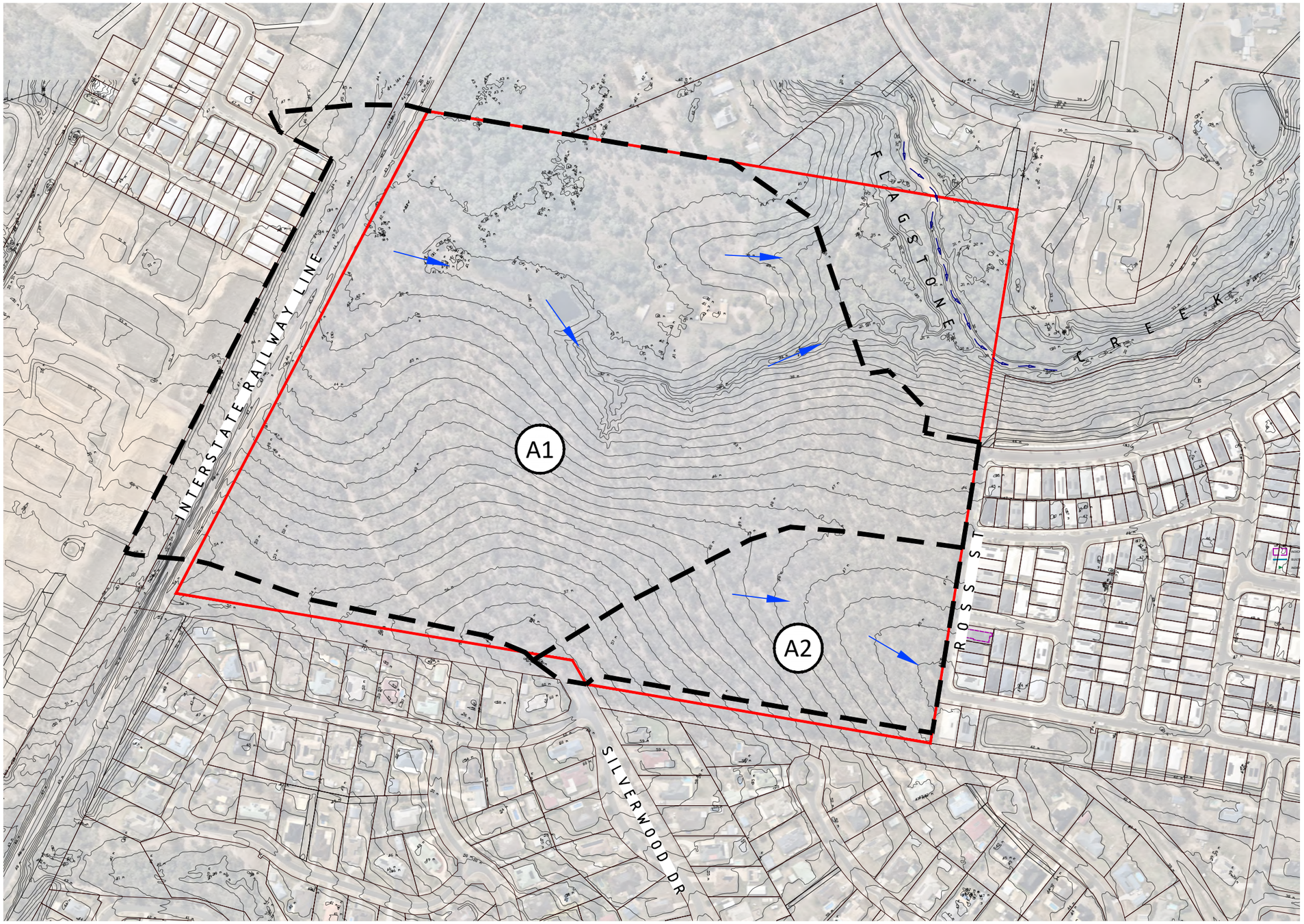
LOCAL CATCHMENTS

Pre-Development Scenario

Catchment Name	Area (ha)	Fi (%)	Pervious Area (ha)	Impervious Area (ha)	Slope (%)
A1	26.91	0.4%	26.81	0.10	5.5
A2	5.03	0.0%	5.03	0.00	4.0
TOTAL	**31.9**	**100%**	**31.838**	**0.100**	

Post-Development Scenario

Catchment Name	Area (ha)	Fi (%)	Pervious Area (ha)	Impervious Area (ha)	Slope (%)
EXT	3.26	1%	3.227	0.033	4.5
D1a	7.52	80%	1.504	6.018	1.5
D1b	15.44	80%	3.087	12.350	1.0
D1c	1.40	80%	0.280	1.119	1.0
D1d	1.68	5%	1.591	0.084	0.5
D1e	0.52	10%	0.468	0.052	0.5
D1f	0.26	0%	0.257	0.000	1.0
D2a	1.35	80%	0.269	1.077	0.5
D2b	0.20	80%	0.040	0.158	0.5
D2c	0.17	80%	0.034	0.138	0.5
D3	0.35	80%	0.070	0.280	0.5
TOTAL	**32.14**	**66%**	**10.828**	**21.308**	



LEGEND

- DEVELOPMENT SITES
- CATCHMENT BOUNDARIES
- FLOW DIRECTION
- A1 CATCHMENT LABEL

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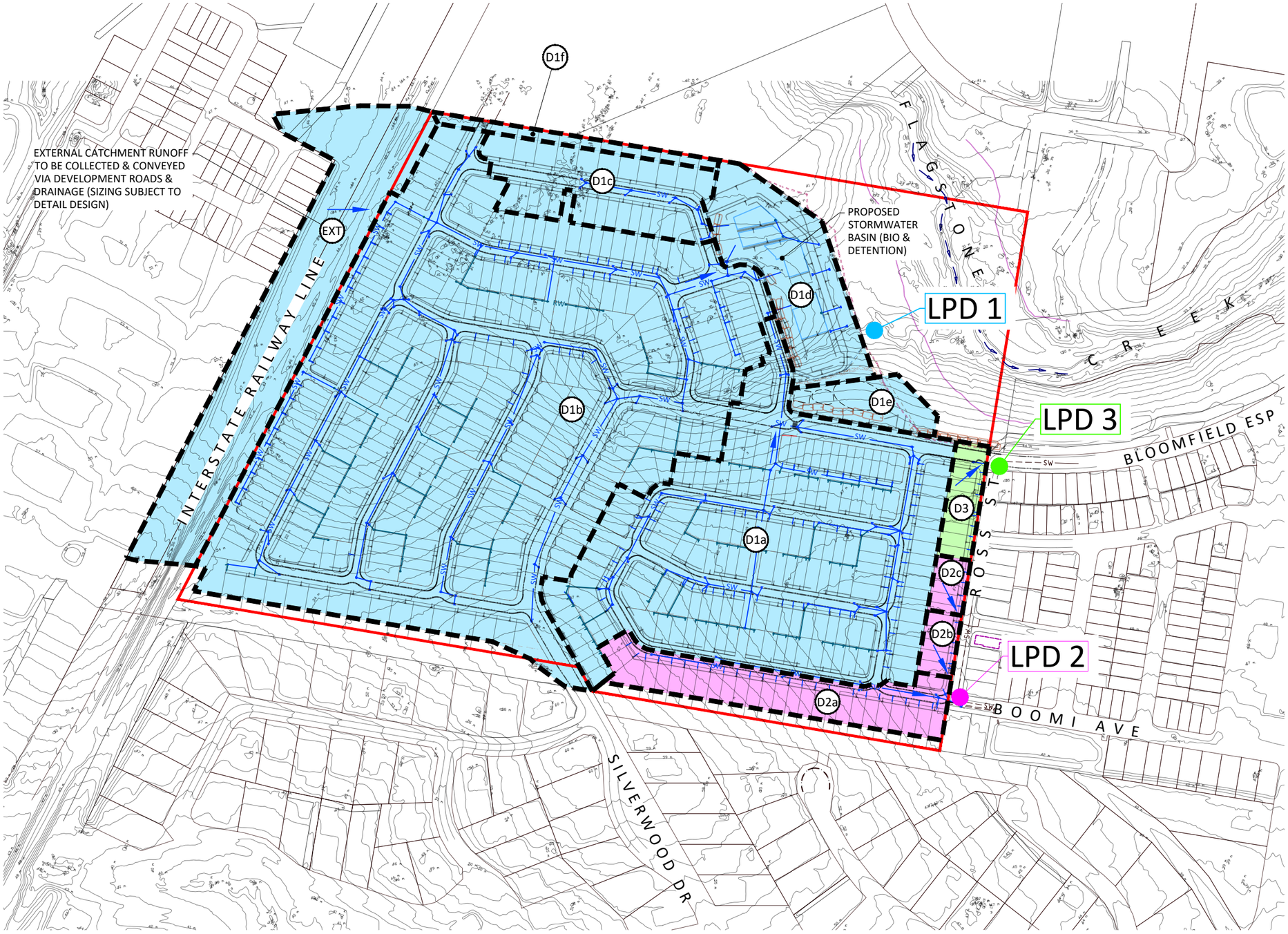
LOCAL CATCHMENT PLAN - PRE-DEVELOPMENT SCENARIO

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SCALE: 1:2000 (A1)
DATE: 8/6/2026
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FILE NAME: B4942EA1_DA1_SK04.DWG

15/04/2026 N:\B4942\A1\DA1\STORMWATER MANAGEMENT\REV B\CAD\B4942EA1_DA1_SK04



LEGEND

- DEVELOPMENT SITES
- CATCHMENT BOUNDARIES
- FLOW DIRECTION
- D1a — CATCHMENT LABEL

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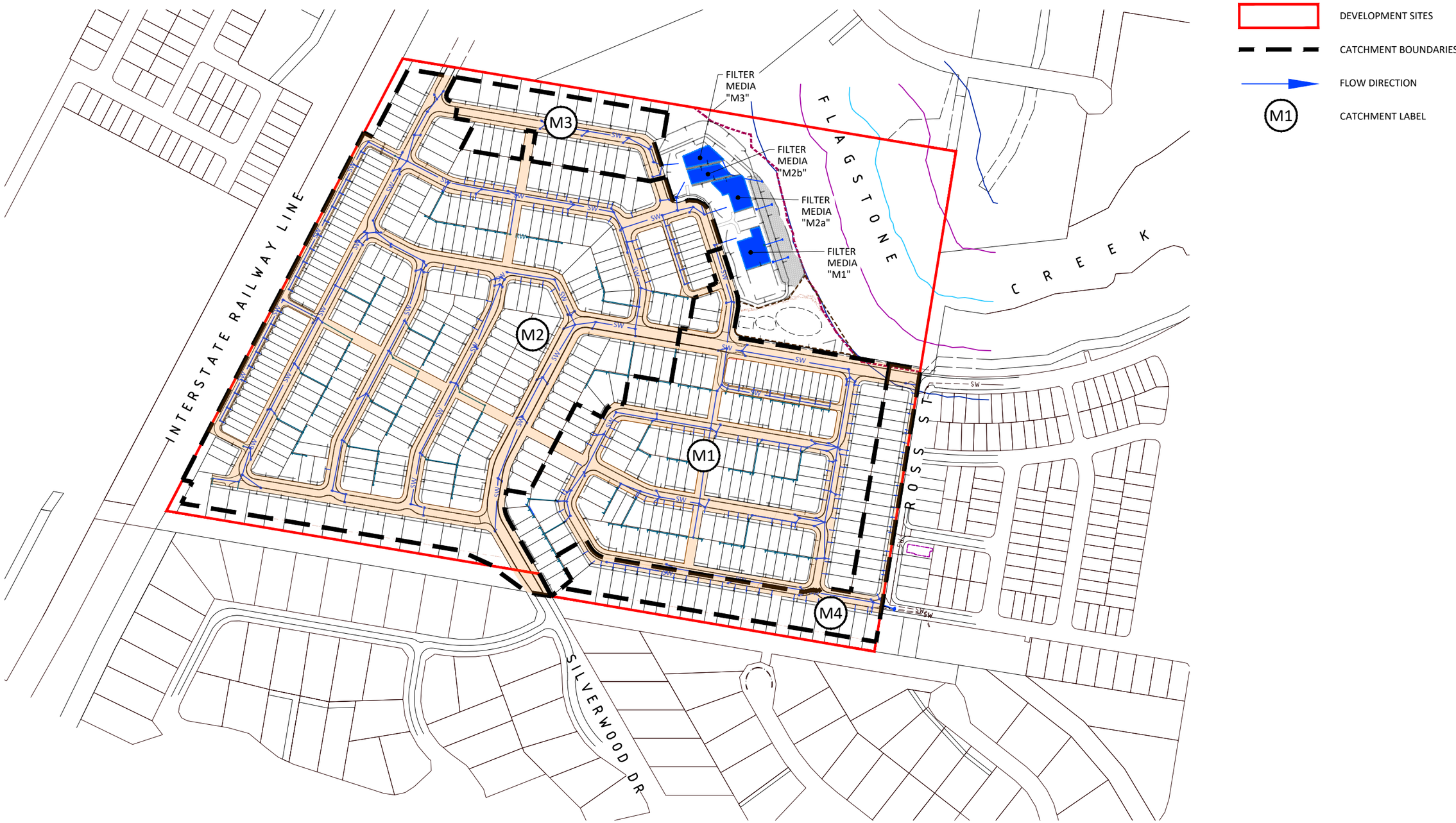
LOCAL CATCHMENT PLAN - POST-DEVELOPMENT SCENARIO

673 SILVERWOOD DRIVE, FLAGSTONE
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JOB NO:	PLAN:	ISSUE:
B4942EA1_DA1	SK05	B

SCALE: 1:2000 (A1)
DATE: 29/6/2026
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MUSIC CATCHMENT

673 SILVERWOOD DRIVE, FLAGSTONE
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JOB NO:	PLAN:	ISSUE:
B4942EA1_DA1	SK06	B

SCALE: 1:2000 (A1)
DATE: 29/6/2026
DRAFTED BY: CB
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APPENDIX E

RAINFALL INTENSITY DATA

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IFD Design Rainfall Intensity (mm/h)

Issued:	21-Jan-26			
Location Label:	Flagstone			
Requested coord:	Latitude:	-27.7944	Longitude:	152.9561
Nearest grid cell:	Latitude:	27.7875 (S)	Longitude:	152.9625 (E)

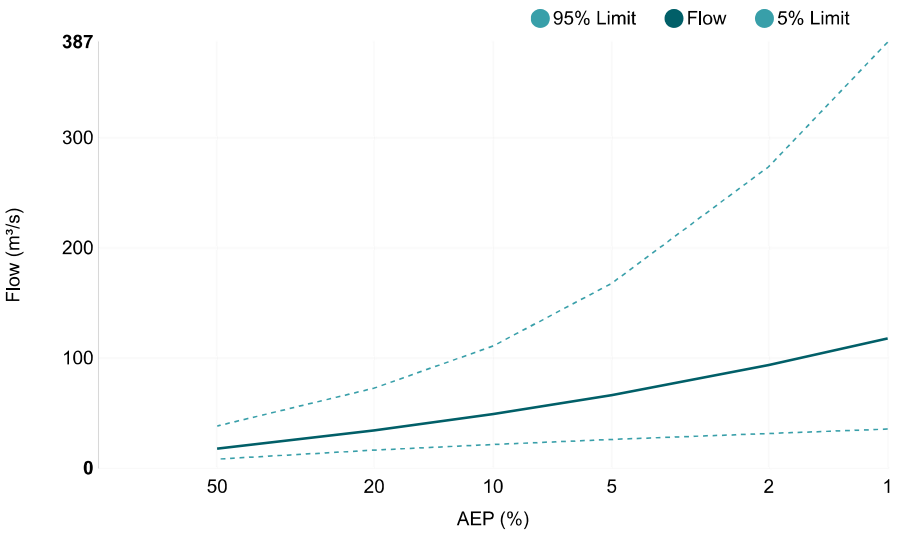
Annual Exceedance Probability (AEP)

Duration (min)	63%	39%	18%	10%	5%	2%	1%
	mm/hr	mm/hr	mm/hr	mm/hr	mm/hr	mm/hr	mm/hr
1	139	177	226	263	304	357	397
2	112	142	182	214	250	298	336
3	106	134	171	201	234	278	313
4	102	129	165	193	224	265	297
5	98.1	124	159	185	214	253	282
10	81.6	104	132	154	177	207	230
15	69.2	87.9	112	130	150	176	195
20	60	76.2	97.3	113	130	153	170
21	58.4	74.2	94.8	110	127	149	166
22	56.9	72.3	92.4	108	124	146	162
23	55.5	70.5	90.2	105	121	142	158
24	54.2	68.8	88	103	118	139	154
25	52.9	67.2	86	100	116	136	151
26	51.7	65.7	84	98	113	133	148
27	50.6	64.2	82.2	95.8	111	130	145
28	49.5	62.9	80.4	93.8	108	127	142
29	48.4	61.5	78.7	91.8	106	125	139
30	47.4	60.3	77.1	90	104	122	136
45	36.4	46.2	59.3	69.3	80.4	95.2	107
60	29.8	37.8	48.5	56.9	66.2	78.7	88.5
90	22.3	28.2	36.2	42.6	49.8	59.6	67.3
120	18.1	22.9	29.4	34.6	40.5	48.7	55.2
180	13.5	17.1	21.9	25.9	30.4	36.7	41.8
270	10.2	12.8	16.5	19.5	23	27.8	31.8
360	8.38	10.6	13.6	16.1	19	23	26.3
540	6.44	8.14	10.5	12.5	14.7	17.9	20.4
720	5.39	6.82	8.82	10.5	12.4	15.1	17.2
1080	4.21	5.34	6.96	8.29	9.8	11.9	13.7

APPENDIX F

ARR REGIONAL FLOOD FREQUENCY ESTIMATION MODE

Results | Regional Flood Frequency Estimation Model



AEP (%)	Discharge (m^3/s)	Lower Confidence Limit (5%) (m^3/s)	Upper Confidence Limit (95%) (m^3/s)
50	17.9	8.32	38.4
20	34.5	16.5	72.8
10	49.2	21.6	111
5	66.4	26.2	168
2	93.7	31.6	274
1	118	35.6	387

Input Data	
Date/Time	2026-01-29 11:20
Catchment Name	Flagstone Creek
Latitude (Outlet)	-27.793
Longitude (Outlet)	152.962
Latitude (Centroid)	-27.785
Longitude (Centroid)	152.92
Catchment Area (km^2)	15.80975
Distance to Nearest Gauged Catchment (km)	7.02
50% AEP 6 Hour Rainfall Intensity (mm/h)	9.597052
2% AEP 6 Hour Rainfall Intensity (mm/h)	22.943232
Rainfall Intensity Source (User/Auto)	Auto
Region	East Coast
Region Version	RFFE Model 2016 v1
Region Source (User/Auto)	Auto
Shape Factor	1.06
Interpolation Method	Natural Neighbour
Bias Correction Value	-0.574

Statistics

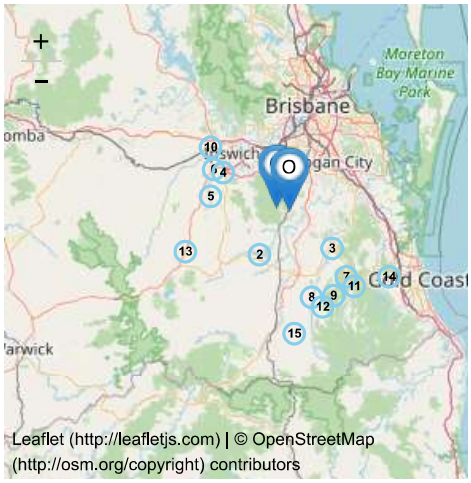
Variable	Value	Standard Dev
Mean	2.938	0.472
Standard Dev	0.687	0.312
Skew	0.111	0.030

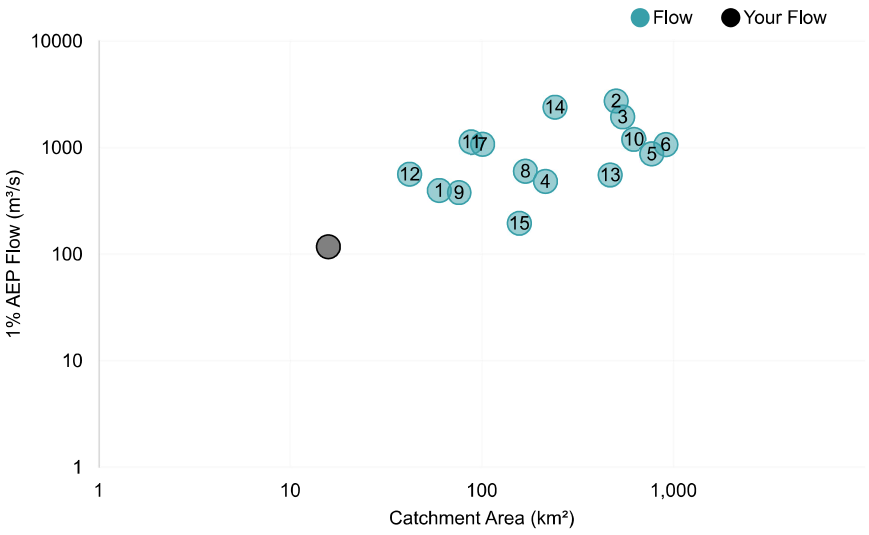
Note: These statistics come from the nearest gauged catchment. Details.

Correlation		
1.000		
-0.330	1.000	
0.170	-0.280	1.000

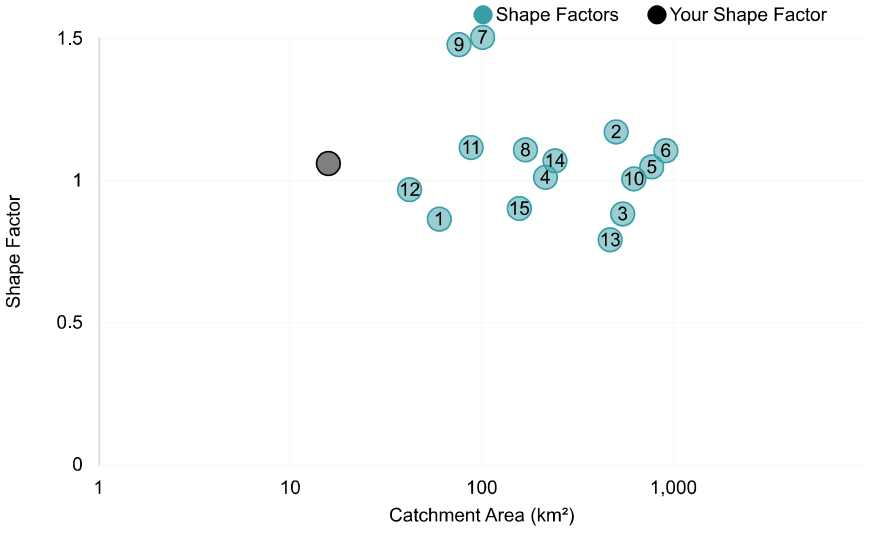
Note: These statistics are common to each region. Details.

1% AEP Flow vs Catchment Area

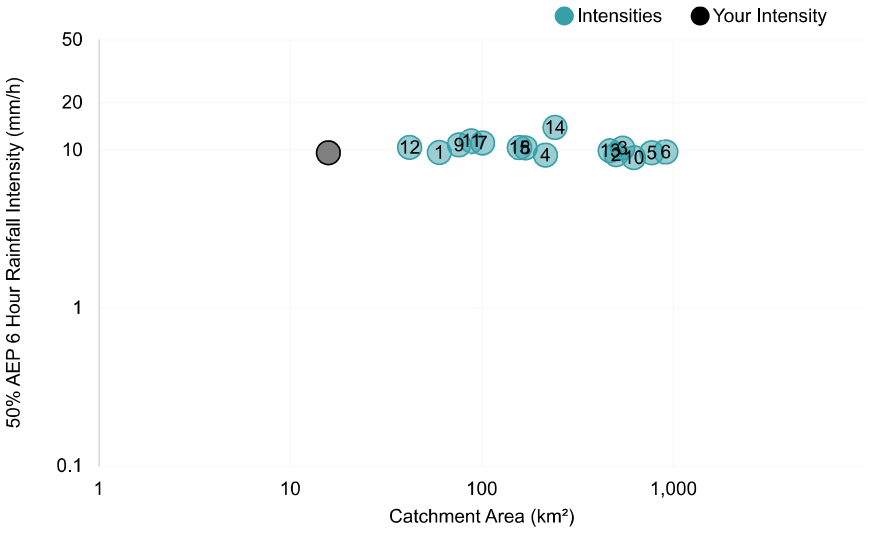




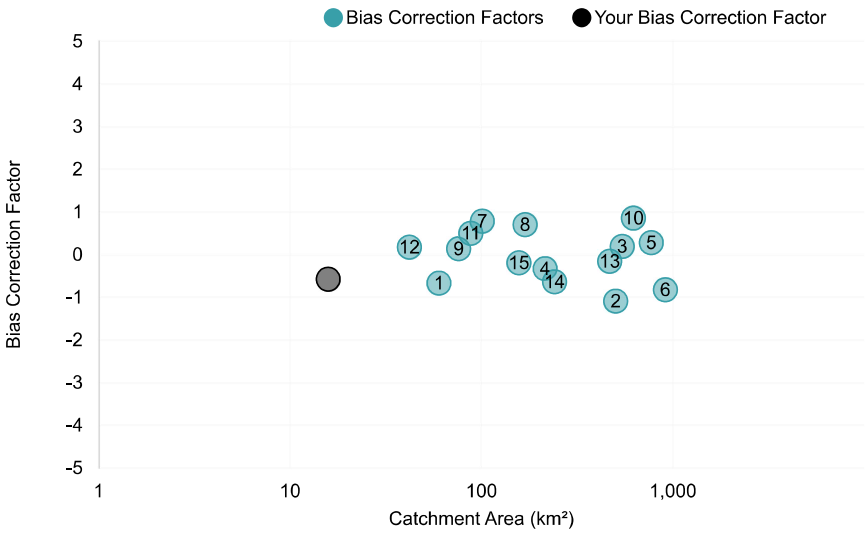
Shape Factor vs Catchment Area



Intensity vs Catchment Area



Bias Correction Factor vs Catchment Area



Download

TXT Nearby JSON

Method by Dr Ataur Rahman and Dr Khaled Haddad from Western Sydney University for the Australian Rainfall and Runoff Project. Full description of the project can be found at the project page (http://arr.ga.gov.au/revision-projects/project-list/projects/project-5) on the ARR website. Send any questions regarding the method or project here (mailto:admin@arr-software.org).

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WESTERN SYDNEY UNIVERSITY
(http://www.uws.edu.au)

APPENDIX G

DETENTION BASIN STAGE VS STORAGE

DETENTION BASIN

Based on Extents of Works #2026-02-20.12da

RL (m AHD)	Depth (m)	Area (m^2)	Area (ha)	Incremental Vol. (m^3)	Accum. Vol. (m^3)
36.80	0.00	5301.84	0.5301840	0	0
36.85	0.05	6988.44	0.6988439	307	307
36.90	0.10	7159.14	0.7159135	354	661
36.95	0.15	7324.67	0.7324666	362	1023
37.00	0.20	7490.99	0.7490992	370	1393
37.05	0.25	7656.76	0.7656759	379	1772
37.10	0.30	7822.31	0.7822306	387	2159
37.15	0.35	7987.86	0.7987857	395	2554
37.20	0.40	8153.70	0.8153704	404	2958
37.25	0.45	8319.93	0.8319928	412	3370
37.30	0.50	8486.60	0.8486599	420	3790
37.35	0.55	8653.79	0.8653793	429	4218
37.40	0.60	8821.57	0.8821570	437	4655
37.45	0.65	8989.95	0.8989950	445	5101
37.50	0.70	9821.18	0.9821175	470	5571
37.55	0.75	9937.67	0.9937665	494	6065
37.60	0.80	10054.24	1.0054235	500	6565
37.65	0.85	10170.90	1.0170902	506	7070
37.70	0.90	10287.82	1.0287817	511	7582
37.75	0.95	10410.20	1.0410200	517	8099

APPENDIX H

INTERNAL ROAD FLOW CALCULATIONS

- Section A – Weir Flow Calculation
- Section B – Manning's Flow Calculation
- Section C – Weir Flow Calculation

ROAD FLOW CALCULATION
Weir Equation
Bloomfield Rd Sag

USER INPUTS	
Weir Coefficient	1.66

RESULTS	1% AEP PRE	1% AEP POST
Target Flow (m^3/s)	3.03	3.15
Calculated Flow (m^3/s)	3.03	3.15
WSL (m AHD)	38.096	38.099
Sag RL (m AHD)	37.843	37.843
Max. Road Flow Depth (m)	0.253	0.256
Velocity (m/s)	0.72	0.72
DV Prodcut (m^2/s)	0.13	0.14

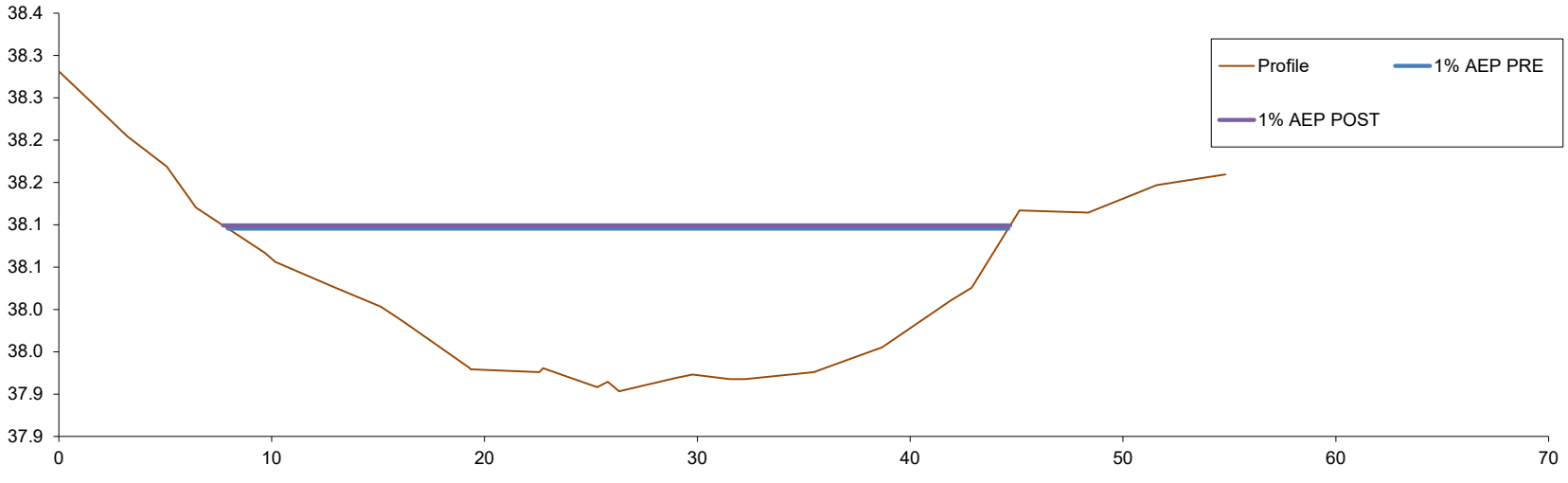
(i) Under weir flow conditions:

$$Q_g = BF \times 1.66\ L.h^{3/2} \qquad (7.4)$$

where:

Q_g = flow into field inlet (m^3/s)
BF = blockage factor = 0.5
1.66 = weir coefficient
L = weir length (m) (see note below)
h = depth of water upstream of inlet (relative to weir crest) where flow velocity is low (i.e. velocity head is insignificant) otherwise use the height of energy level above the weir crest (m)

	Weir Profile		1% AEP PRE						1% AEP POST					
	Chainage	RL (m)	P (m)	D (m)	Q (m^3/s)	wA (m^2)	V (m/s)	VD (m^2/s)	P (m)	D (m)	Q (m^3/s)	wA (m^2)	V (m/s)	VD (m^2/s)
1	0	38.281												
2	3.224	38.204												
3	5.072	38.169												
4	6.449	38.120												
5	9.673	38.067	1.73	0.01	0.005	0.02	0.20	0.00	1.96	0.02	0.007	0.03	0.21	0.00
6	10.176	38.056	0.50	0.03	0.005	0.02	0.31	0.01	0.50	0.04	0.006	0.02	0.32	0.01
7	12.897	38.027	2.72	0.05	0.057	0.15	0.39	0.02	2.72	0.06	0.063	0.16	0.40	0.02
8	15.129	38.003	2.23	0.08	0.085	0.18	0.47	0.04	2.23	0.08	0.091	0.19	0.48	0.04
9	16.122	37.987	0.99	0.10	0.052	0.10	0.53	0.05	0.99	0.10	0.055	0.10	0.54	0.06
10	19.306	37.931	3.18	0.14	0.267	0.44	0.61	0.08	3.18	0.14	0.278	0.45	0.62	0.09
11	19.346	37.929	0.04	0.17	0.004	0.01	0.68	0.11	0.04	0.17	0.005	0.01	0.68	0.12
12	22.57	37.926	3.22	0.17	0.368	0.54	0.68	0.11	3.22	0.17	0.381	0.55	0.69	0.12
13	22.759	37.931	0.19	0.17	0.021	0.03	0.68	0.11	0.19	0.17	0.022	0.03	0.69	0.12
14	25.297	37.908	2.54	0.18	0.312	0.45	0.70	0.12	2.54	0.18	0.322	0.46	0.70	0.13
15	25.795	37.915	0.50	0.18	0.065	0.09	0.71	0.13	0.50	0.19	0.067	0.09	0.72	0.14
16	26.325	37.903	0.53	0.19	0.071	0.10	0.72	0.13	0.53	0.19	0.073	0.10	0.72	0.14
17	29.019	37.919	2.69	0.18	0.354	0.50	0.71	0.13	2.69	0.19	0.365	0.51	0.72	0.14
18	29.782	37.923	0.76	0.17	0.092	0.13	0.69	0.12	0.76	0.18	0.095	0.14	0.70	0.12
19	31.532	37.918	1.75	0.18	0.213	0.31	0.69	0.12	1.75	0.18	0.220	0.31	0.70	0.13
20	32.243	37.918	0.71	0.18	0.088	0.13	0.70	0.12	0.71	0.18	0.091	0.13	0.71	0.13
21	35.468	37.926	3.23	0.17	0.388	0.56	0.69	0.12	3.23	0.18	0.400	0.57	0.70	0.12
22	38.692	37.955	3.22	0.15	0.326	0.50	0.65	0.10	3.22	0.16	0.338	0.51	0.66	0.10
23	41.916	38.011	3.22	0.11	0.202	0.36	0.56	0.06	3.22	0.12	0.212	0.37	0.57	0.07
24	42.89	38.026	0.97	0.08	0.035	0.08	0.46	0.04	0.97	0.08	0.037	0.08	0.47	0.04
25	45.14	38.117	1.72	0.03	0.019	0.06	0.31	0.01	1.82	0.04	0.021	0.07	0.32	0.01
26	48.365	38.114												
27	51.589	38.147												
28	54.813	38.159												
29														
30														
				Depth (m)	Flow (m^3/s)		Velocity (m/s)	DV (m^2/s)		Depth (m)	Flow (m^3/s)		Velocity (m/s)	DV (m^2/s)
	Results			0.187	3.03		0.72	0.13		0.190	3.15		0.72	0.14



ROAD FLOW CALCULATION
Weir Equation
Section A

USER INPUTS	
Weir Coefficient	1.66

RESULTS	1% AEP Design Scenario	1% AEP Blockage Scenario
Target Flow (m^3/s)	2.53	4.75
Calculated Flow (m^3/s)	2.53	4.75
WSL (m AHD)	40.59	40.65
Max. Depth (m)	0.253	0.317
Velocity (m/s)	0.83	0.93
DV Prodcut (m^2/s)	0.21	0.30

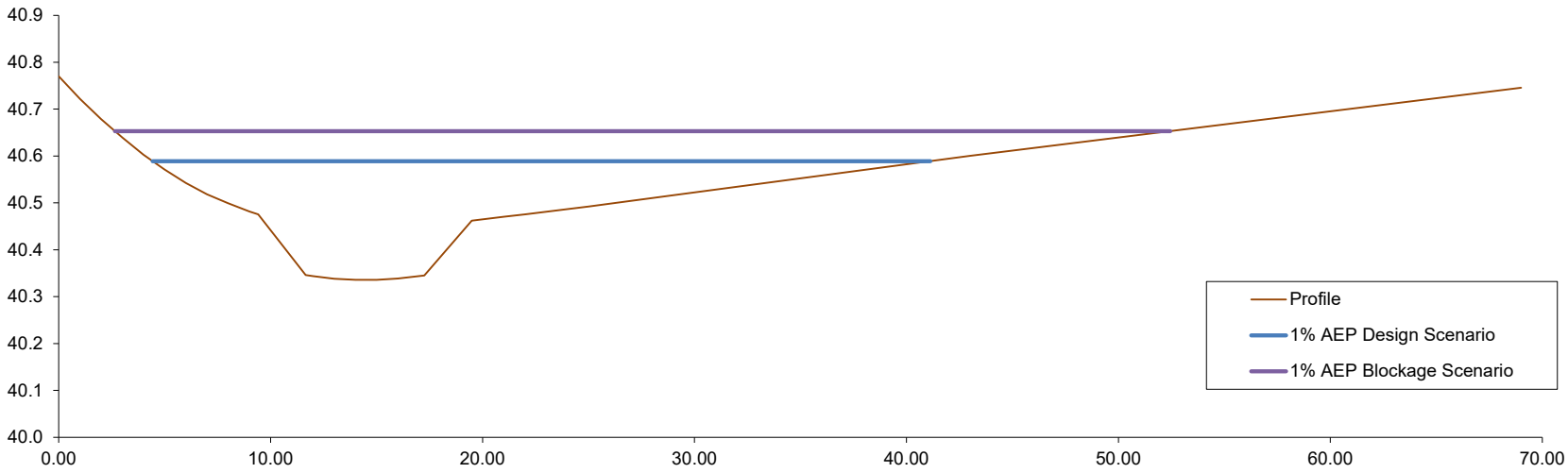
(i) Under weir flow conditions:

$$Q_g = BF \times 1.66\ L.h^{3/2} \qquad (7.4)$$

where:

- Q_g = flow into field inlet (m^3/s)
- BF = blockage factor = 0.5
- 1.66 = weir coefficient
- L = weir length (m) (see note below)
- h = depth of water upstream of inlet (relative to weir crest) where flow velocity is low (i.e. velocity head is insignificant) otherwise use the height of energy level above the weir crest (m)

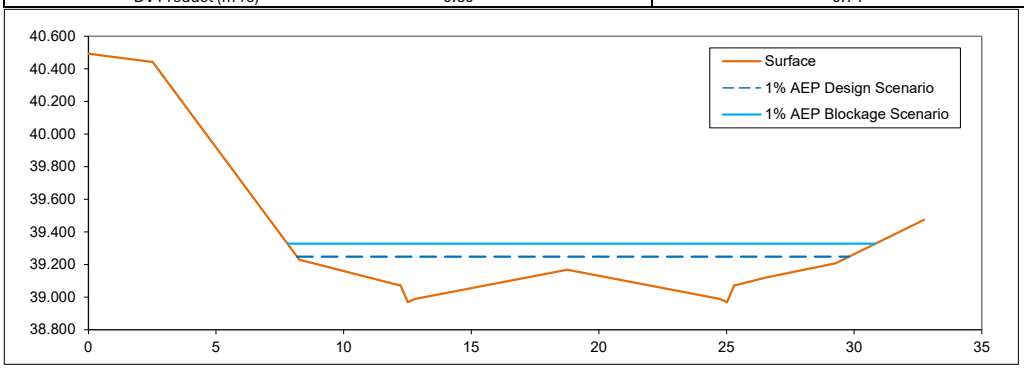
	Weir Profile		1% AEP Design Scenario						1% AEP Blockage Scenario					
	Chainage	RL (m)	P (m)	D (m)	Q (m^3/s)	wA (m^2)	V (m/s)	VD (m^2/s)	P (m)	D (m)	Q (m^3/s)	wA (m^2)	V (m/s)	VD (m^2/s)
1	0.00	40.770												
2	1.00	40.722												
3	2.00	40.679												
4	3.00	40.639							0.35	0.01	0.000	0.00	0.14	0.00
5	4.00	40.603							1.00	0.03	0.009	0.03	0.30	0.01
6	5.00	40.571	0.57	0.01	0.001	0.01	0.16	0.00	1.00	0.07	0.028	0.07	0.43	0.03
7	6.00	40.542	1.00	0.03	0.010	0.03	0.30	0.01	1.00	0.10	0.050	0.10	0.52	0.05
8	7.00	40.518	1.00	0.06	0.024	0.06	0.40	0.02	1.00	0.12	0.071	0.12	0.58	0.07
9	8.00	40.499	1.00	0.08	0.038	0.08	0.47	0.04	1.00	0.14	0.091	0.14	0.63	0.09
10	9.00	40.482	1.00	0.10	0.051	0.10	0.52	0.05	1.00	0.16	0.109	0.16	0.67	0.11
11	9.41	40.476	0.41	0.11	0.025	0.05	0.55	0.06	0.41	0.17	0.049	0.07	0.69	0.12
12	11.65	40.346	2.24	0.18	0.280	0.40	0.70	0.12	2.24	0.24	0.443	0.54	0.82	0.20
13	12.00	40.344	0.35	0.24	0.070	0.09	0.82	0.20	0.35	0.31	0.100	0.11	0.92	0.28
14	13.00	40.338	1.00	0.25	0.205	0.25	0.83	0.20	1.00	0.31	0.289	0.31	0.93	0.29
15	14.00	40.336	1.00	0.25	0.210	0.25	0.83	0.21	1.00	0.32	0.295	0.32	0.93	0.29
16	15.00	40.336	1.00	0.25	0.211	0.25	0.83	0.21	1.00	0.32	0.296	0.32	0.93	0.30
17	16.00	40.339	1.00	0.25	0.209	0.25	0.83	0.21	1.00	0.32	0.294	0.32	0.93	0.29
18	17.25	40.345	1.25	0.25	0.254	0.31	0.82	0.20	1.25	0.31	0.359	0.39	0.93	0.29
19	19.49	40.462	2.24	0.19	0.296	0.41	0.71	0.13	2.24	0.25	0.462	0.56	0.83	0.21
20	21.00	40.470	1.51	0.12	0.108	0.19	0.58	0.07	1.51	0.19	0.203	0.28	0.72	0.13
21	22.00	40.476	1.00	0.12	0.065	0.12	0.56	0.07	1.00	0.18	0.127	0.18	0.70	0.13
22	23.00	40.481	1.00	0.11	0.061	0.11	0.55	0.06	1.00	0.17	0.121	0.17	0.69	0.12
23	24.00	40.487	1.00	0.11	0.057	0.11	0.54	0.06	1.00	0.17	0.115	0.17	0.68	0.12
24	25.00	40.492	1.00	0.10	0.052	0.10	0.52	0.05	1.00	0.16	0.110	0.16	0.67	0.11
25	26.00	40.498	1.00	0.09	0.048	0.09	0.51	0.05	1.00	0.16	0.104	0.16	0.66	0.10
26	27.00	40.504	1.00	0.09	0.043	0.09	0.49	0.04	1.00	0.15	0.098	0.15	0.65	0.10
27	28.00	40.510	1.00	0.08	0.039	0.08	0.47	0.04	1.00	0.15	0.092	0.15	0.63	0.09
28	29.00	40.516	1.00	0.08	0.035	0.08	0.46	0.03	1.00	0.14	0.087	0.14	0.62	0.09
29	43.00	40.600	12.12	0.04	0.140	0.44	0.32	0.01	14.00	0.09	0.678	1.33	0.51	0.05
30	69.00	40.746							9.44	0.03	0.067	0.25	0.27	0.01
				Depth (m)	Flow (m^3/s)		Velocity (m/s)	DV (m^2/s)		Depth (m)	Flow (m^3/s)		Velocity (m/s)	DV (m^2/s)
	Results			0.253	2.53		0.83	0.21		0.317	4.75		0.93	0.30



ROAD FLOW CALCULATION
Manning's Equation
Section B

Cross Section Details				1% AEP Design Scenario			1% AEP Blockage Scenario		
Point	CH	Z	n	wA	wP	n x wA	wA	wP	n x wA
1	0	40.493	0.100						
2	2.515	40.443	0.100						
3	8.265	39.230	0.100	0.00	0.09	0.00	0.02	0.48	0.00
4	12.165	39.074	0.035	0.38	3.90	0.01	0.69	3.90	0.02
5	12.225	39.074	0.015	0.01	0.06	0.00	0.02	0.06	0.00
6	12.515	38.969	0.015	0.07	0.31	0.00	0.09	0.31	0.00
7	12.785	38.989	0.015	0.07	0.27	0.00	0.09	0.27	0.00
8	18.765	39.168	0.015	1.02	5.98	0.02	1.49	5.98	0.02
9	24.745	38.989	0.015	1.02	5.98	0.02	1.49	5.98	0.02
10	25.015	38.969	0.015	0.07	0.27	0.00	0.09	0.27	0.00
11	25.305	39.074	0.015	0.07	0.31	0.00	0.09	0.31	0.00
12	25.365	39.074	0.015	0.01	0.06	0.00	0.02	0.06	0.00
13	26.525	39.120	0.035	0.18	1.16	0.01	0.27	1.16	0.01
14	29.275	39.208	0.035	0.23	2.75	0.01	0.45	2.75	0.02
15	30.385	39.293	0.100	0.01	0.53	0.00	0.09	1.11	0.01
16	32.744	39.475	0.100				0.01	0.45	0.00
17									
18									
19									
20									
21									
22									
23									
24									
25									
				wA	**wP**	**n x wA**	**wA**	**wP**	**n x wA**
				3.125	21.677	0.064	4.906	23.101	0.112
	Slope (m/m)								
Slope	**1.75%**			**R**	**n**	**Q**	**R**	**n**	**Q**
				0.144	0.020	**5.59**	0.212	0.023	**10.15**
				Design Flow (m^3/s)		**5.59**		**10.15**	
				WSL (m AHD)		**39.25**		**39.33**	

Results		
Flow (m^3/s)	5.590	10.150
WSL (m AHD)	39.248	39.328
Max. Depth (m)	0.280	0.359
Flow Width (m)	21.62	23.04
Velocity (m/s)	1.79	2.07
DV Product (m^2/s)	0.50	0.74



ROAD FLOW CALCULATION
Weir Equation
Section C

USER INPUTS	
Weir Coefficient	1.66

RESULTS	1% AEP Design Scenario	1% AEP Blockage Scenario
Target Flow (m^3/s)	6.07	11.05
Calculated Flow (m^3/s)	6.07	11.05
WSL (m AHD)	38.62	38.72
Max. Depth (m)	0.300	0.406
Velocity (m/s)	0.91	1.06
DV Prodcut (m^2/s)	0.27	0.43

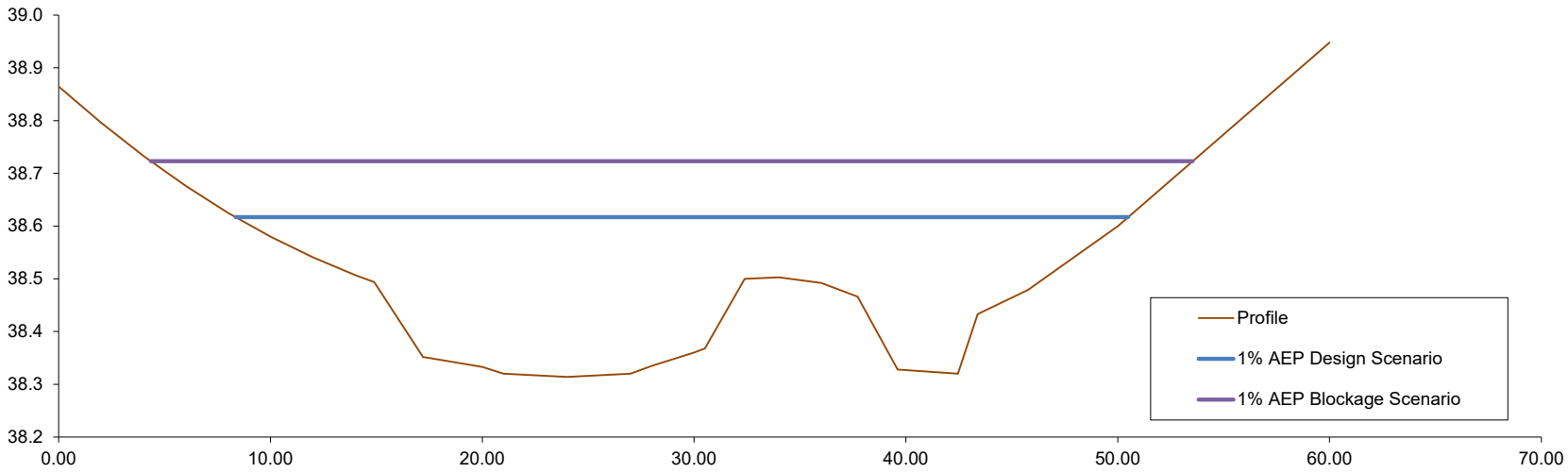
(i) Under weir flow conditions:

$$Q_g = BF \times 1.66\, L.h^{3/2} \qquad (7.4)$$

where:

- Q_g = flow into field inlet (m^3/s)
- BF = blockage factor = 0.5
- 1.66 = weir coefficient
- L = weir length (m) (see note below)
- h = depth of water upstream of inlet (relative to weir crest) where flow velocity is low (i.e. velocity head is insignificant) otherwise use the height of energy level above the weir crest (m)

	Weir Profile		1% AEP Design Scenario						1% AEP Blockage Scenario					
	Chainage	RL (m)	P (m)	D (m)	Q (m^3/s)	wA (m^2)	V (m/s)	VD (m^2/s)	P (m)	D (m)	Q (m^3/s)	wA (m^2)	V (m/s)	VD (m^2/s)
1	0.00	38.865												
2	2.00	38.796												
3	4.00	38.733												
4	6.00	38.676							1.65	0.02	0.010	0.04	0.25	0.01
5	8.00	38.625							2.00	0.07	0.065	0.15	0.45	0.03
6	10.00	38.580	1.64	0.02	0.007	0.03	0.23	0.00	2.00	0.12	0.139	0.24	0.58	0.07
7	12.00	38.541	2.00	0.06	0.045	0.11	0.39	0.02	2.00	0.16	0.218	0.33	0.67	0.11
8	14.00	38.507	2.00	0.09	0.094	0.19	0.51	0.05	2.00	0.20	0.295	0.40	0.74	0.15
9	14.90	38.494	0.90	0.12	0.059	0.10	0.57	0.07	0.90	0.22	0.157	0.20	0.78	0.17
10	17.20	38.352	2.30	0.19	0.326	0.45	0.73	0.14	2.30	0.30	0.628	0.69	0.91	0.27
11	20.00	38.333	2.80	0.27	0.668	0.77	0.87	0.24	2.80	0.38	1.091	1.07	1.02	0.39
12	21.00	38.320	1.00	0.29	0.260	0.29	0.89	0.26	1.00	0.40	0.415	0.40	1.05	0.41
13	24.00	38.314	3.00	0.30	0.818	0.90	0.91	0.27	3.00	0.41	1.289	1.22	1.06	0.43
14	27.00	38.320	3.00	0.30	0.818	0.90	0.91	0.27	3.00	0.41	1.289	1.22	1.06	0.43
15	28.00	38.335	1.00	0.29	0.259	0.29	0.89	0.26	1.00	0.40	0.413	0.40	1.04	0.41
16	30.00	38.360	2.00	0.27	0.464	0.54	0.86	0.23	2.00	0.38	0.764	0.75	1.02	0.38
17	30.50	38.368	0.50	0.25	0.106	0.13	0.83	0.21	0.50	0.36	0.180	0.18	0.99	0.36
18	32.39	38.500	1.89	0.18	0.245	0.35	0.71	0.13	1.89	0.29	0.487	0.55	0.89	0.26
19	34.00	38.503	1.61	0.12	0.105	0.19	0.56	0.07	1.61	0.22	0.279	0.36	0.78	0.17
20	36.00	38.492	2.00	0.12	0.137	0.24	0.57	0.07	2.00	0.23	0.356	0.45	0.79	0.18
21	37.72	38.466	1.72	0.14	0.146	0.24	0.62	0.09	1.72	0.24	0.344	0.42	0.82	0.20
22	39.61	38.328	1.89	0.22	0.324	0.42	0.78	0.17	1.89	0.33	0.584	0.62	0.95	0.31
23	42.45	38.320	2.84	0.29	0.748	0.83	0.90	0.26	2.84	0.40	1.188	1.13	1.05	0.42
24	43.39	38.433	0.94	0.24	0.184	0.23	0.81	0.20	0.94	0.35	0.318	0.33	0.98	0.34
25	45.76	38.479	2.37	0.16	0.254	0.38	0.67	0.11	2.37	0.27	0.543	0.63	0.86	0.23
26	50.00	38.600	4.24	0.08	0.152	0.33	0.46	0.04	4.24	0.18	0.554	0.78	0.71	0.13
27	60.00	38.948	0.49	0.01	0.001	0.00	0.15	0.00	3.54	0.06	0.090	0.22	0.41	0.03
28														
29														
30														
				Depth (m)	Flow (m^3/s)		Velocity (m/s)	DV (m^2/s)		Depth (m)	Flow (m^3/s)		Velocity (m/s)	DV (m^2/s)
	Results			0.300	6.069		0.91	0.27		0.406	11.05		1.06	0.43



APPENDIX I

JFP BIORETENTION BASIN CALCULATIONS

- Sediment Forebay Calculations
- Bioretention Filter Scour Velocity Checks

SEDIMENT FOREBAY CALCULATION

Section 3.4.3.2, Bioretention Technical Design Guidelines (2014)

Min. Sediment Forebay Volume (Equation 3)	***M1***	***M2a***	***M2b & M3***
Catchment Area, A_c (ha)	7.52	7.71	9.17
Capture Efficiency, R	0.8	0.8	0.8
Sediment Loading Rate, Lo (m^3/ha/yr)	0.6	0.6	0.6
Cleanout Frequency, F_c (yr)	1	1	1
Minimum Volume, V_s (m^3)	3.61	3.70	4.40

Min. Sediment Forebay Area (Equation 4)	***M1***	***M2a***	***M2b & M3***
Fraction of Target Seidment Remove, R	0.8	0.8	0.8
Turbulence, n	0.5	0.5	0.5
Settling Velocity, v_s (m/s)	0.1	0.1	0.1
3-month ARI Flow, Q_{3mth} (m^3/s)	0.87	0.89	1.06
Minimum Forebay Area, A_f (m^2)	105	107	127

Max. Forebay Depth (≤300mm) (Equation 5)	***M1***	***M2a***	***M2b & M3***
Minimum Volume, V_s (m^3)	3.61	3.70	4.40
Minimum Forebay Area, A_f (m^2)	105	107	127
Forebay Depth, D_s (mm)	34	35	35

BIO BASIN SCOUR VELOCITY CHECK

Section 3.4.5, Bioretention Technical Design Guidelines (2014)

	M1	M2a	M2b	M3
Total 1% AEP Flow, Q (m^3/s)	4.75	-	11.05	11.05
Narrowest width of the bioretention, w (m)	29.35	-	14.3	11.7
Depth of flow, d (m)	1.05	-	1.05	1.05
velocity, v (m/s)	0.15	-	0.74	0.90

NOTE: 1% AEP will spread across M2b & M3 filter areas. However this calculation applied the full flow to each filter area.

3.4.4.3 Distributed surface flow

RECOMMENDED APPROACH

Distributed surface flow typically has low flow velocities and, therefore, minimal requirements for energy dissipation or scour protection. Stabilised turf or densely vegetated zones are likely to provide sufficient protection.

3.4.5 Filter media scour velocity check

PERFORMANCE OUTCOMES

Bioretention system design must ensure that flows across the filter media surface do not cause scouring of the filter media or damage to plants.

calculation method.

Equation 6

$$v = \frac{Q}{w \times d}$$

Where: v = velocity of flow over filter media surface (m/s)

Q = flow rate in the design storm event (m^3/s)

w = bioretention basin width at narrowest point (m)

d = depth of flow in accordance with Table 14 (m)

The bioretention system should be configured so that the maximum velocities across the filter media, under minor and major storms, calculated using the flow depths in Table 14, is less than 1 m/s. This velocity limit is based on advice in Fischenich (2001) for surfaces covered in 'short native and bunch grasses'. Where more detailed information on flow depth in given design storms is available, this information can be used in lieu of the flow depths in Table 14.

Table 14 Scour velocity limits over the surface of the bioretention system

Design flow	Depth of flow over surface
Minor storm (2–10 year ARI)	Extended detention depth + 0.1 m
Major storm (50–100 year ARI)	Lesser of the bypass weir level + 0.1 m or the maximum water level

APPENDIX J

JFP PRELIMINARY ENGINEERING PLANS - BASIN

PRELIMINARY SERVICES LEGEND:

- FINISHED CONTOURS — 32
- EXISTING WATER — W
- EXISTING SEWERAGE — S
- EXISTING DRAINAGE — SW
- EXISTING ROOFWATER — RW
- EXISTING COMMUNICATIONS — T
- EXISTING ELECTRICAL (U/GROUND) — E
- PRELIMINARY DRAINAGE — SW
- PRELIMINARY ROOFWATER — RW
- PRELIMINARY SEWERAGE — S
- PRELIMINARY WATER — W
- PRELIMINARY SLEEPER WALL
- PRELIMINARY BOULDER WALL
- MAJOR OVERLAND FLOW PATH FOR MAJOR STORMWATER FLOWS

BIORETENTION PIPED OUTLET
ø900 PIPED OUTLET
ROCK PROTECTION
BIORETENTION PIPED OUTLET
ø900 PIPED OUTLET
SPILLWAY RC37.45
IL 36.80
IL 36.80
VARIES 1 in 4 MAX
VARIES 1 in 4 MAX
1 in 4
1 in 4
3.0m WIDE ACCESS RL37.80
VARIES 1 in 4 MAX
1 in 4
BIORETENTION BASIN
BIO MEDIA RL36.50
AREA 800m² MIN.
0.5% FALL
0.5% FALL
COARSE SEDIMENT FOREBAY
BIORETENTION BASIN
BIO MEDIA RL36.50
AREA 800m² MIN.
0.5% FALL
1 in 6
3.0m WIDE ACCESS RL37.80
1 in 4
BIORETENTION BASIN
BIO MEDIA RL36.50
AREA 500m² MIN.
BIORETENTION BASIN
BIO MEDIA RL36.50
AREA 500m² MIN.
COARSE SEDIMENT FOREBAY
COARSE SEDIMENT FOREBAY
PROPOSED RETAINING WALL
PROPOSED RETAINING WALL
PROPOSED RETAINING WALL
VARIES 1 in 6 MAX
VARIES 1 in 6 MAX
VARIES 1 in 6 MAX
1 in 6 MAX
1 in 6 MAX
1 in 4
1 in 5
FALL
A CE28
B CE28
C CE28
D CE28
E CE28
ROAD 3
ROAD 7
18m WIDE KERB OUTLET TO SAG FOR MAJOR STORMWATER FLOWS
2.0m WIDE KERB OUTLET TO SAG FOR MAJOR STORMWATER FLOWS
5.0m WIDE KERB OUTLET TO SAG FOR MAJOR STORMWATER FLOWS
174
173

PLANTING AS SPECIFIED
VEGETATED BATTER
BIORETENTION FILTER MEDIA - LOAMY SAND
IMPERMEABLE PROPRIETARY LINER MEMBRANE TO EXTEND 500mm UP BATTER SLOPE UNDER 200mm DEPTH TOPSOIL PINNED TO BATTER
TRANSITION LAYER - COARSE SAND
DRAINAGE LAYER - FINE AGGREGATE
ø100 SLOTTED RIGID PIPE (PVC) OR APPROVED EQUIVALENT 1 in 200(0.5%) MINIMUM GRADE AT MAXIMUM 2.5m CENTRES CONNECTED TO STORMWATER DRAINAGE SYSTEM
500
100
200
50
50

BIORETENTION FILTER MEDIA MATERIAL DETAIL

NOT TO SCALE

0 2.5 5 7.5 10 12.5 (A1) 1:250 25 Metres
(A3) 1:500

ENGINEERING CONCEPT - BIORETENTION BASIN LAYOUT PLAN

673 SILVERWOOD DRIVE, FLAGSTONE
THE TRUSTEE FOR CHANG FAMILY TRUST T/A ORIS ACCESSORIES PTY LTD

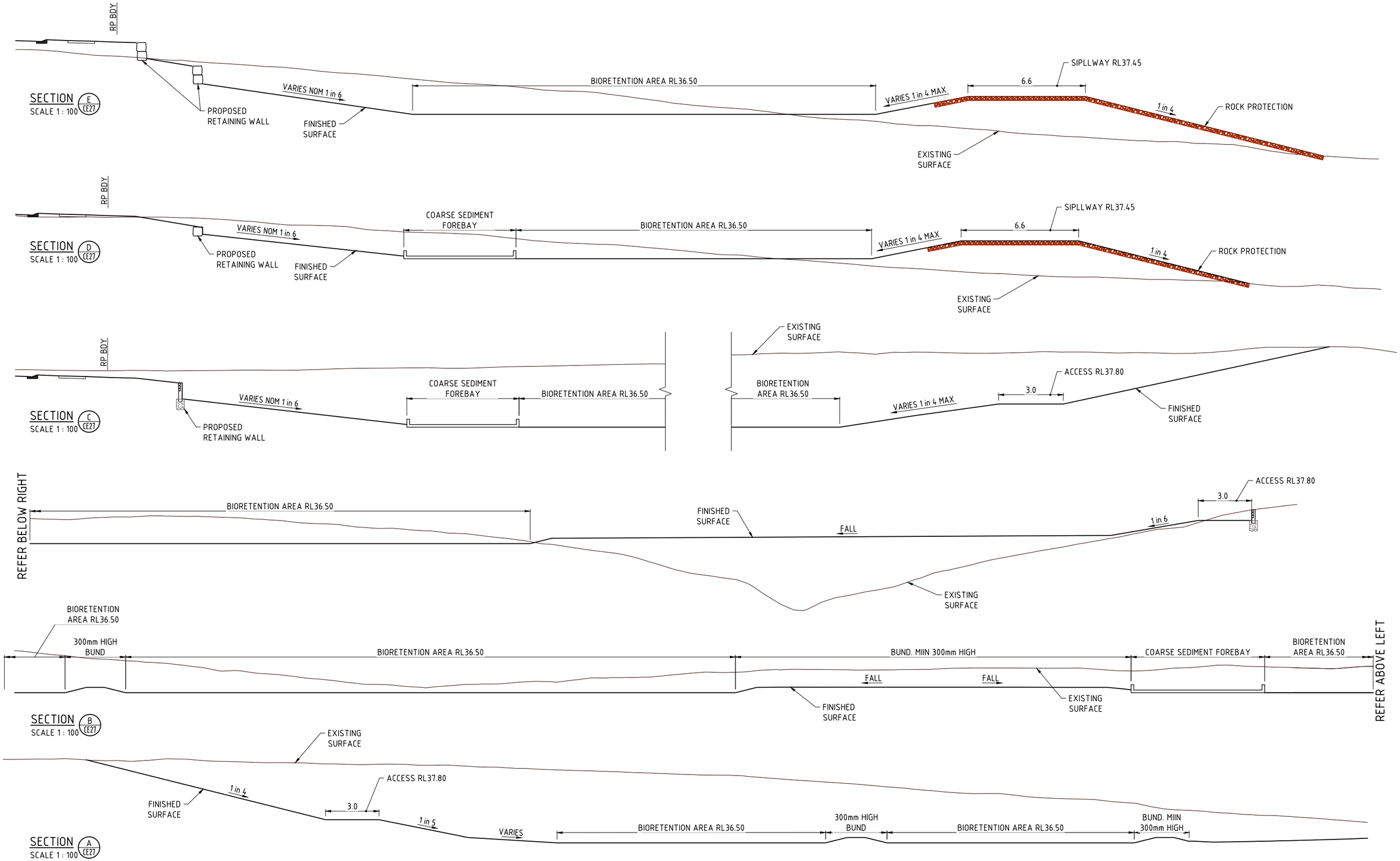
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B4942EA1_DA1	CE27	B

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DATE: 24/06/2026
DRAFTED BY: LK
FILE NAME: B4942EA1_DA1 EW PLANS.DWG

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JFP URBAN CONSULTANTS PTY. LTD. A.C.N. 050 414 045
BRISBANE - SUNSHINE COAST - CENTRAL QLD
BRISBANE
JFP House - 76 Ernest Street,
South Brisbane Qld 4101
P 07 3012 0100 W www.jfp.com.au
PLANNERS
URBAN DESIGNERS
SURVEYORS
ENGINEERS
LANDSCAPE ARCHITECTS

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26/06/2026 N:\B4942\VA1\DA1\DESIGN\CIVIL\DRAWINGS\B4942EA1_DA1 EW PLANS



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ENGINEERING CONCEPT - BIORETENTION BASIN DETAILS PLAN

673 SILVERWOOD DRIVE, FLAGSTONE
THE TRUSTEE FOR CHANG FAMILY TRUST T/A ORIS ACCESSORIES PTY LTD

0 1 2 3 4 5 (A1) 1:100 10 Metres
(A3) 1:200

JOB NO:	PLAN:	ISSUE:
B4942EA1_DA1	CE28	B

SCALE: 1:100 @ A1
DATE: 24/06/2026
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FILE NAME: B4942EA1_DA1 EW PLANS.DWG

26/06/2026 N:\B4942\DA1\DESIGN\WORKING DRAWINGS\B4942EA1_DA1 EW PLANS

APPENDIX K

ROSS STREET / BOOMI AVENUE DRAINAGE AS-CONSTRUCTED PLANS

PEBBLE CREEK RESIDENTIAL DEVELOPMENT - STAGE 8

122 MOUNTAIN RIDGE ROAD, SOUTH MACLEAN

FOR 'ORCHARD PEBBLE CREEK DEVELOPMENTS P.L'

DRAWING LIST

EARTHWORKS, ROADWORKS AND DRAINAGE

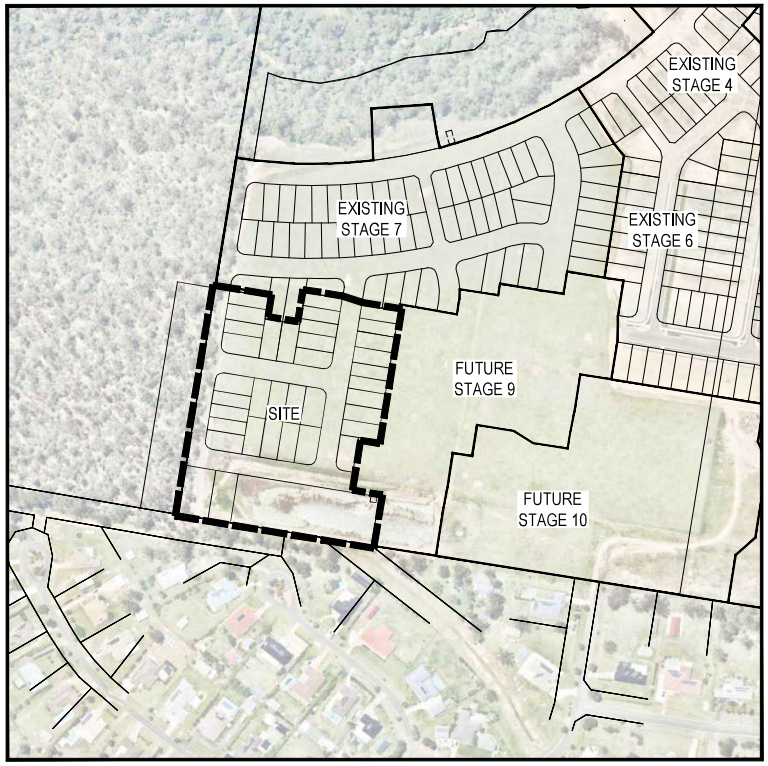
21-0174-100 COVER PLAN
21-0174-101 GENERAL NOTES
21-0174-102 BULK EARTHWORKS LAYOUT PLAN SHEET 1 OF 2
21-0174-103 BULK EARTHWORKS LAYOUT PLAN SHEET 2 OF 2
21-0174-104 BULK EARTHWORKS TYPICAL SECTIONS
21-0174-105 BULK EARTHWORKS FUTURE STAGES 1 OF 3
21-0174-106 BULK EARTHWORKS FUTURE STAGES 2 OF 3
21-0174-107 BULK EARTHWORKS FUTURE STAGES 3 OF 3
21-0174-108 ROADWORKS AND DRAINAGE LAYOUT PLAN
21-0174-109 SURVEY SETOUT AND KERB TYPES LAYOUT PLAN
21-0174-110 ROAD 17 LONG SECTION AND CROSS SECTIONS
21-0174-111 ROAD 19 LONG SECTION AND CROSS SECTIONS
21-0174-112 ROAD 20 & BASIN STH ACCESS DRIVEWAY LONG SECTION AND CROSS SECTIONS
21-0174-113 ROAD 21 LONG SECTION AND CROSS SECTIONS
21-0174-114 INTERSECTION DETAILS LAYOUT PLAN SHEET 1 OF 2
21-0174-115 INTERSECTION DETAILS LAYOUT PLAN SHEET 2 OF 2
21-0174-116 SIGNS AND LINEMARKING LAYOUT PLAN
21-0174-117 STORMWATER DRAINAGE CATCHMENT LAYOUT PLAN SHEET 1 OF 3
21-0174-118 STORMWATER DRAINAGE CATCHMENT LAYOUT PLAN SHEET 2 OF 3
21-0174-119 STORMWATER DRAINAGE CATCHMENT LAYOUT PLAN SHEET 3 OF 3

STORMWATER QUALITY

21-0174-200 BIO RETENTION BASIN LAYOUT PLAN
21-0174-201 BIO RETENTION BASIN TYPICAL SECTIONS
21-0174-202 BIO RETENTION BASIN TYPICAL NOTES AND DETAILS
21-0174-203 OUTLET DRAINAGE DETAILES

SEWER AND WATER RETICULATION

21-0174-300 SEWERAGE COVER PLAN
21-0174-301 SEWERAGE LAYOUT PLAN
21-0174-302 SEWERAGE LONGITUDINAL SECTIONS SHEET 1 OF 3
21-0174-303 SEWERAGE LONGITUDINAL SECTIONS SHEET 2 OF 3
21-0174-304 SEWERAGE LONGITUDINAL SECTIONS SHEET 3 OF 3
21-0174-305 WATER RETICULATION COVER PLAN
21-0174-306 WATER RETICULATION LAYOUT PLAN



LOCALITY PLAN
SCALE 1:2000 (A1)
SCALE 1:4000 (A3)

PEBBLE CREEK
SOUTH MACLEAN

PROJECT INFORMATION SUMMARY:
No. OF LOTS = 36
AREA OF SITE = 2.80 ha
DATUM LEVEL AND LOCATION P.S.M. 165225 RL 38.006 AHD
RP DESCRIPTION 9601 ON SP322404
LOCAL AUTHORITY: LOGAN CITY COUNCIL
EDQ REFERENCE NUMBER: DEV2017/887

NOTE:
THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH:
- VEGETATION MANAGEMENT PLAN
- LANDSCAPE ARCHITECT'S PLANS
- ELECTRICAL, COMMUNICATIONS AND GAS CONSULTANT'S PLANS
- SEDIMENT AND EROSION HAZARD ASSESSMENT
- SAFETY IN DESIGN REPORT

AS-CONSTRUCTED CERTIFICATION
Signature: ..... Date: 20/07/2023
TROY SCHULTZ RPEQ No. 20631
For and on behalf of Colliers International Engineering & Design PTY LTD

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
A	11.01.23	DC	DC	ISSUED FOR CONSTRUCTION
B	07.07.23	DC	JL	AS CONSTRUCTED

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STATUS: AS CONSTRUCTED
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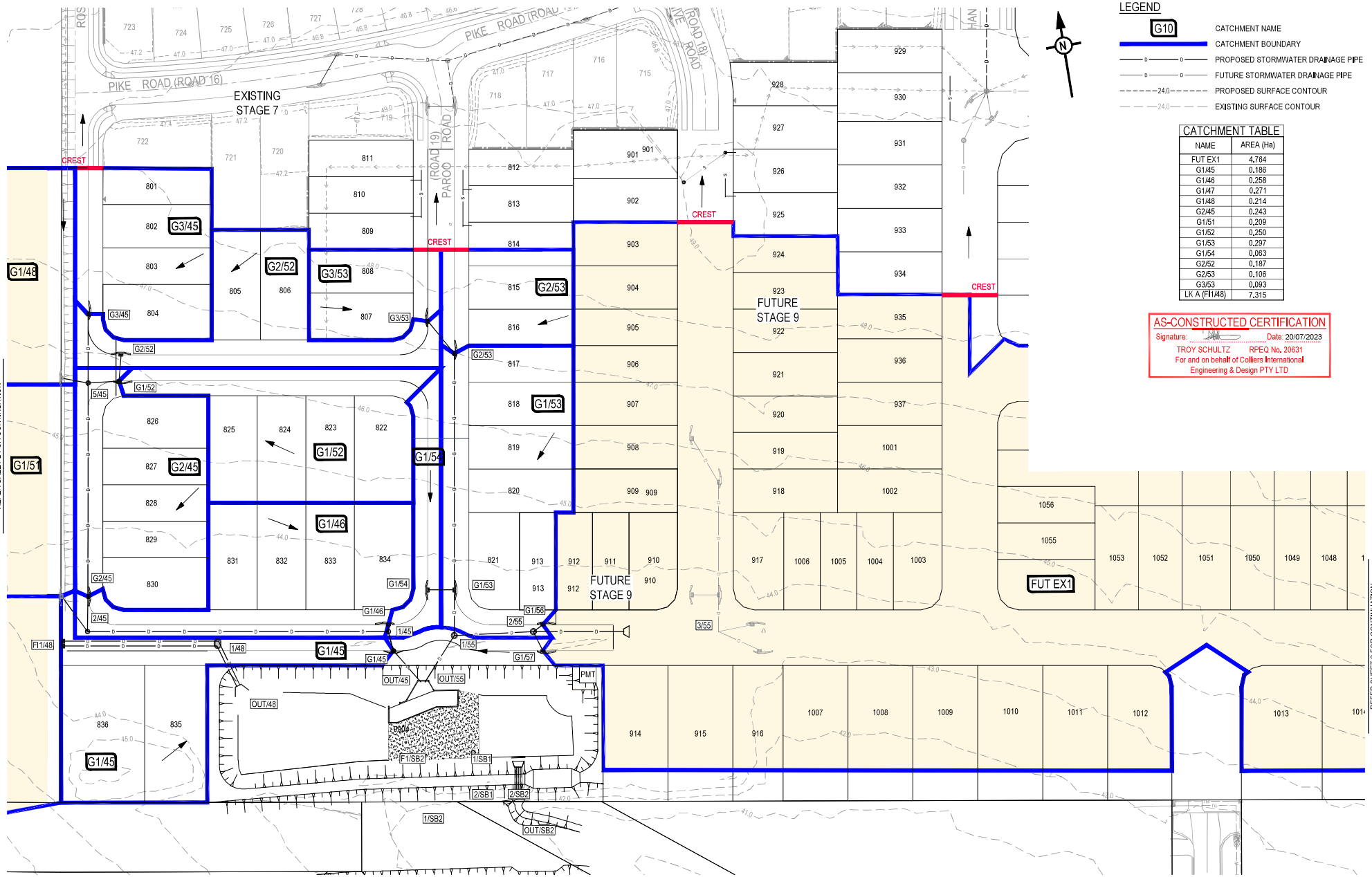
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CLIENT: ORCHARD (PEBBLE CREEK) DEVELOPMENTS P.L.
ASSOCIATED CONSULTANT: SURVEYOR: LANDPARTNERS PH: (07) 3842 1032

PROJECT NAME: PEBBLE CREEK RESIDENTIAL DEVELOPMENT STAGE 8
MOUNTAIN RIDGE ROAD, SOUTH MACLEAN

DRAWING TITLE: COVER PLAN

PROJECT No.	DRAWING No.	REVISION
21-0174	100	B



REV	DATE	DESIGN	DRAWN	REVISION DETAILS
A	11.01.23	DC	DC	ISSUED FOR CONSTRUCTION
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DESIGN

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SCALE: 1:500 10 5 0 10 20 A1; 1:1000 A3

CLIENT: ORCHARD (PEBBLE CREEK) DEVELOPMENTS P.L.

ASSOCIATED CONSULTANT: SURVEYOR: LANDPARTNERS PH: (07) 3842 1032

PROJECT NAME: PEBBLE CREEK RESIDENTIAL DEVELOPMENT STAGE 8

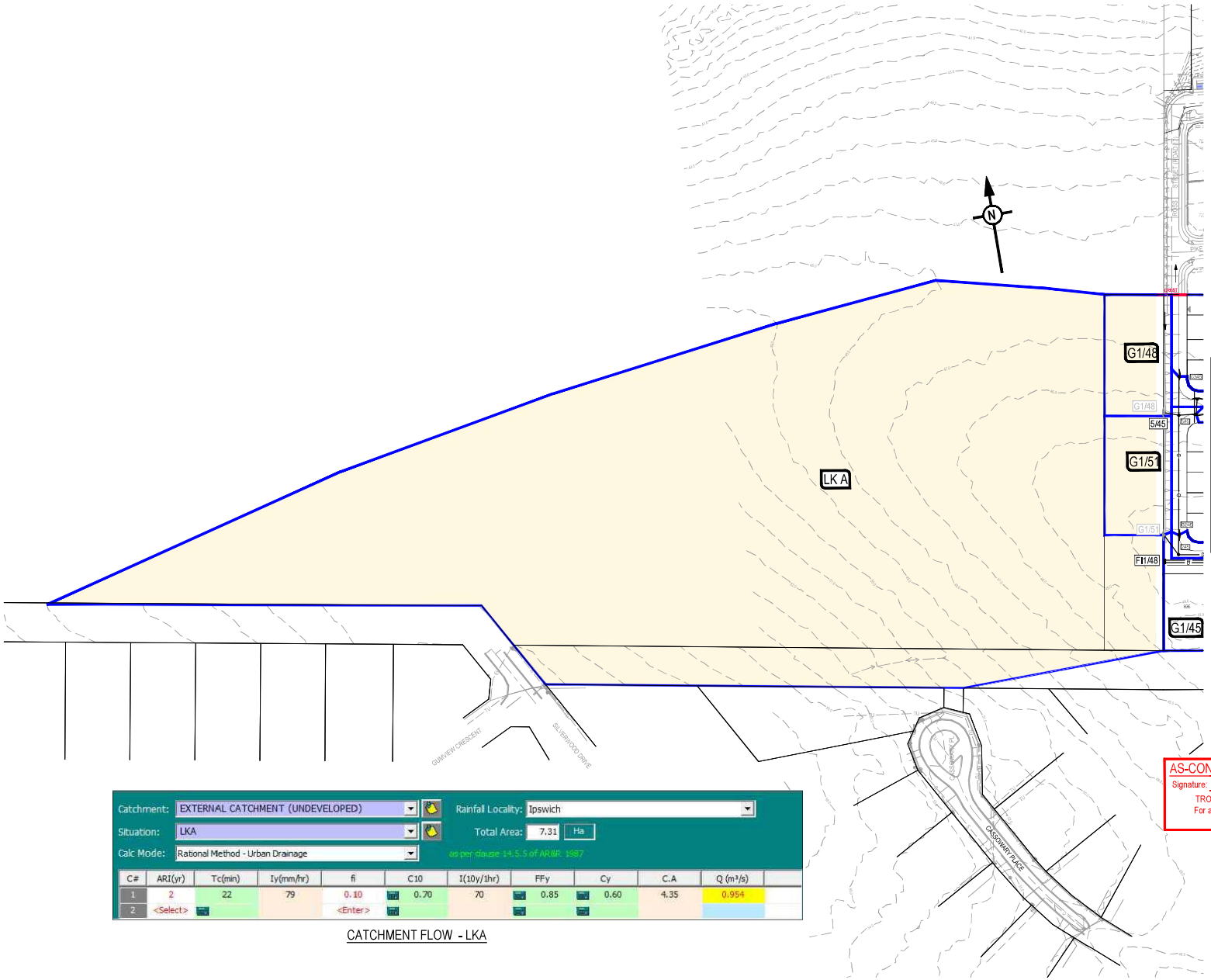
MOUNTAIN RIDGE ROAD, SOUTH MACLEAN

DRAWING TITLE: STORMWATER DRAINAGE CATCHMENT LAYOUT PLAN SHEET 1 OF 3

PROJECT No. 21-0174

DRAWING No. 117

REVISION B



Catchment: EXTERNAL CATCHMENT (UNDEVELOPED) Rainfall Locality: Ipswich

Situation: LKA Total Area: 7.31 Ha

Calc Mode: Rational Method - Urban Drainage as per clause 14.5.5 of ARWR 1987

C#	ARI(yr)	Tc(min)	Iy(mm/hr)	fi	C10	I(10y/1hr)	FFy	Cy	C.A	Q (m³/s)
1	2	22	79	0.10	0.70	70	0.85	0.60	4.35	0.954
2	<Select>			<Enter>						

CATCHMENT FLOW - LKA

AS-CONSTRUCTED CERTIFICATION
Signature: Date: 20/07/2023
TROY SCHULTZ RPEQ No. 20631
For and on behalf of Colliers International Engineering & Design PTY LTD

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SCALE: 1:1000 10 0 10 20 30 40 50 A1; 1:2000 A3

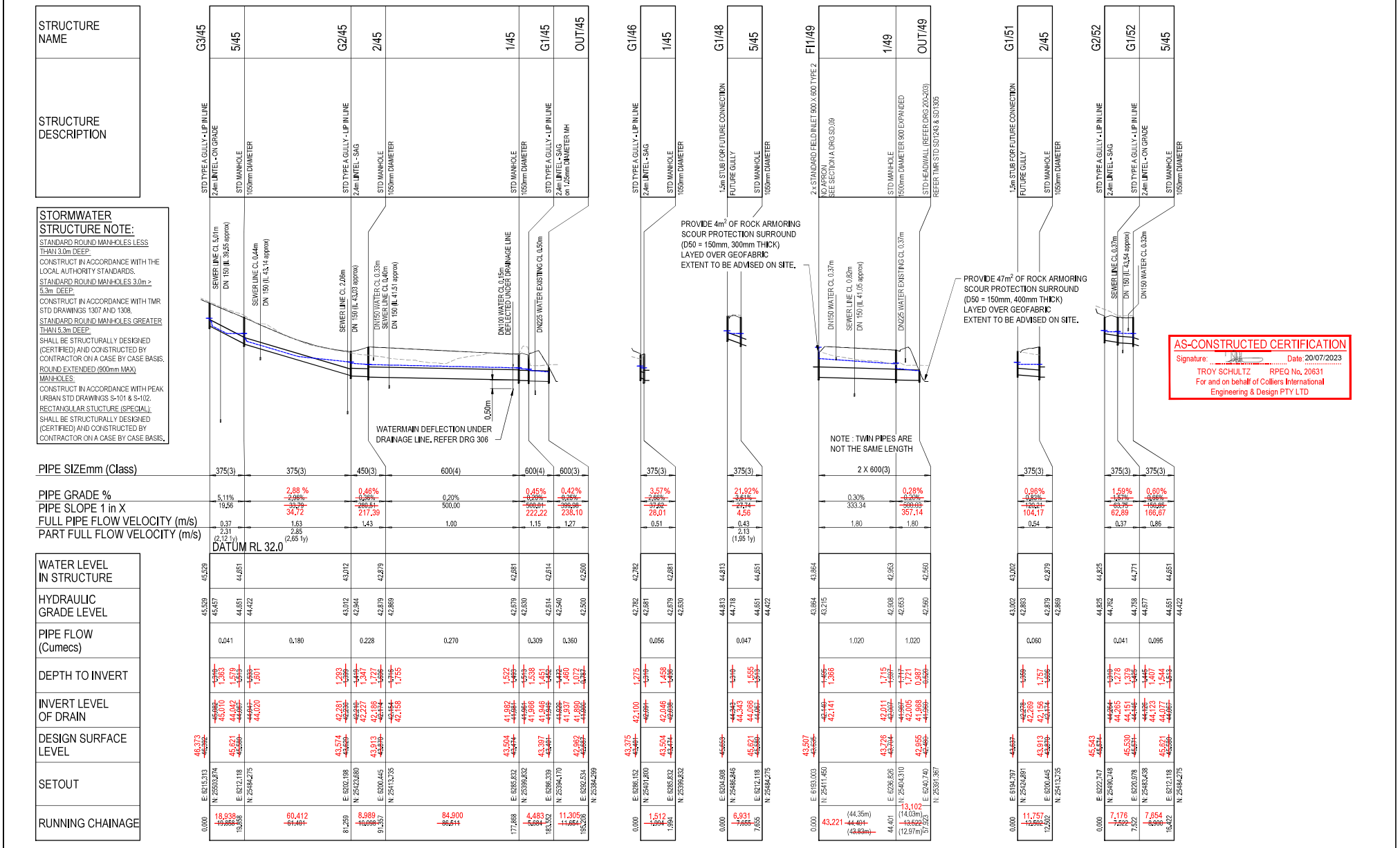
CLIENT: ORCHARD (PEBBLE CREEK) DEVELOPMENTS P.L.

ASSOCIATED CONSULTANT: SURVEYOR: LANDPARTNERS PH: (07) 3842 1032

PROJECT NAME: PEBBLE CREEK RESIDENTIAL DEVELOPMENT STAGE 8
MOUNTAIN RIDGE ROAD, SOUTH MACLEAN

DRAWING TITLE: STORMWATER DRAINAGE CATCHMENT LAYOUT PLAN SHEET 2 OF 3

PROJECT No.	DRAWING No.	REVISION
21-0174	118	B



REV	DATE	DESIGN	DRAWN	REVISION DETAILS
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DESIGN

STATUS: AS CONSTRUCTED

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SCALE
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1:100 1:200 VERTICAL 2 1 0 2 4 A1 A3

CLIENT: ORCHARD (PEBBLE CREEK) DEVELOPMENTS P.L.

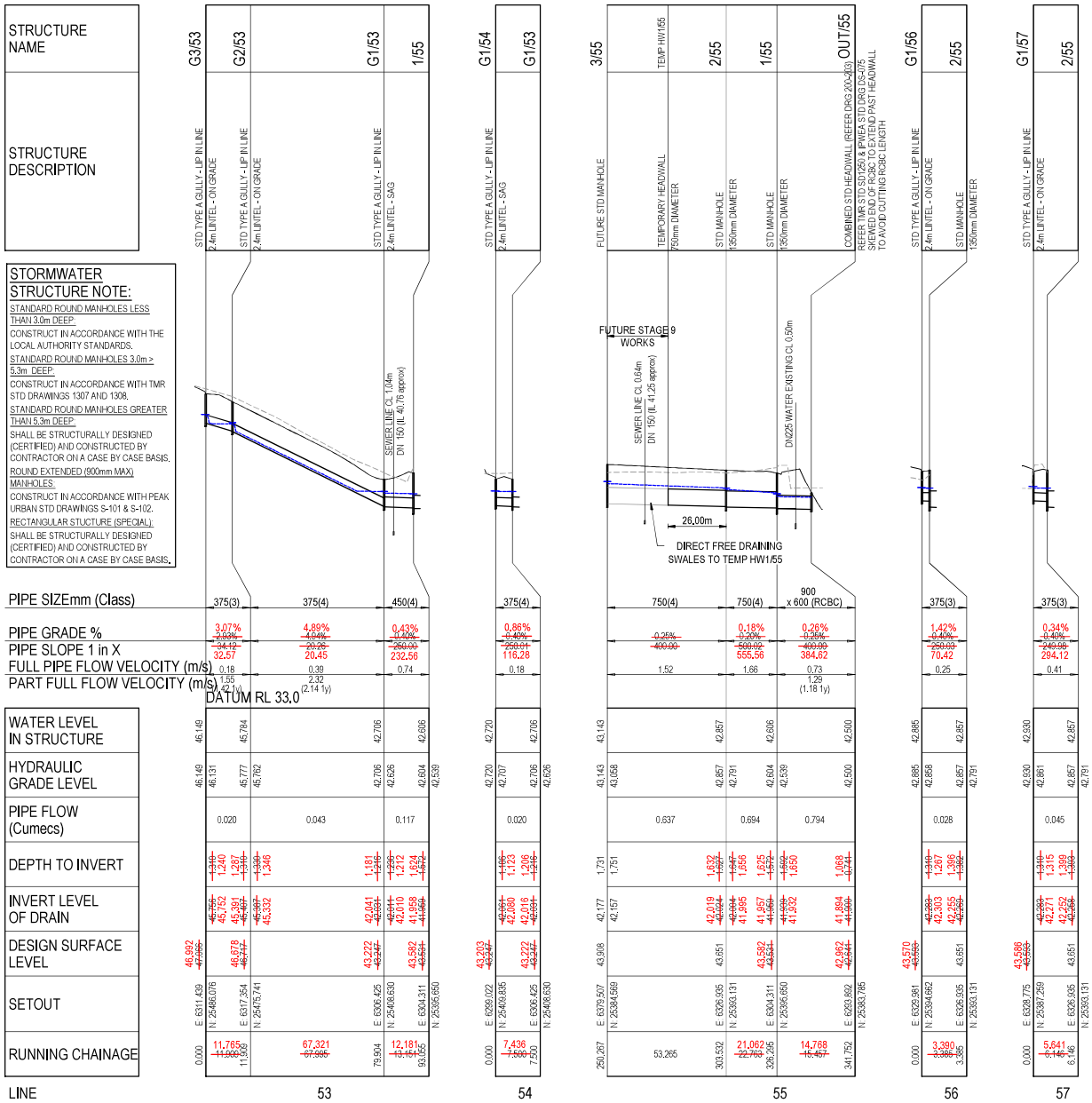
ASSOCIATED CONSULTANT: SURVEYOR: LANDPARTNERS PH: (07) 3842 1032

PROJECT NAME: PEBBLE CREEK RESIDENTIAL DEVELOPMENT STAGE 8

MOUNTAIN RIDGE ROAD, SOUTH MACLEAN

DRAWING TITLE: STORMWATER DRAINAGE LONGITUDINAL SECTIONS SHEET 1 OF 2

PROJECT No.	DRAWING No.	REVISION
21-0174	120	B



STRUCTURE SETOUT REFERENCE POINT

STRUCTURE TYPE	HORIZONTAL	VERTICAL
MANHOLE	℄ MAIN SHAFT	FINISHED SURFACE LEVEL
GULLY PIT	INTERSECTION OF ℄ PIT AND KERB INVERT LINE # (INCLUDING MANHOLES UNDER GULLIES)	KERB INVERT LEVEL
HEADWALL	INTERSECTION OF HEADWALL FACE & PIPE CENTRE LINE	TOP OF HEADWALL

NOTE:
WITHIN GULLY PIT CHAMBER, CONTRACTOR TO ENSURE STORMWATER PIPES ARE OFFSET AS REQUIRED SO THAT PIPES ENTER WHOLLY WITHIN A SIDE WALL

AS-CONSTRUCTED CERTIFICATION
Signature: Date: 20/07/2023
TROY SCHULTZ RPEQ No. 20631
For and on behalf of Colliers International Engineering & Design PTY LTD

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
A	11.01.23	DC	DC	ISSUED FOR CONSTRUCTION
B	07.07.23	DC	JL	AS CONSTRUCTED

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DESIGN
STATUS: AS CONSTRUCTED
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FOR AND ON BEHALF OF COLLIERS INTERNATIONAL ENGINEERING & DESIGN PTY LTD

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SCALE
1:1000 10 0 10 20 30 40 50 A1
1:2000 A3 HORIZONTAL
1:100 2 1 0 2 4 A1
1:200 A3 VERTICAL

CLIENT: ORCHARD (PEBBLE CREEK) DEVELOPMENTS P.L.
ASSOCIATED CONSULTANT: SURVEYOR: LANDPARTNERS PH: (07) 3842 1032

PROJECT NAME: PEBBLE CREEK RESIDENTIAL DEVELOPMENT STAGE 8
MOUNTAIN RIDGE ROAD, SOUTH MACLEAN

DRAWING TITLE: STORMWATER DRAINAGE LONGITUDINAL SECTIONS SHEET 2 OF 2

PROJECT No.	DRAWING No.	REVISION
21-0174	121	B

LOCATION			SUB AREA TIME OF CONCENTRATION							RUNOFF COEFFICIENT AND RAINFALL INTENSITY									FLOWS					PIPE LOSSES								JUNCTION LOSSES										DESIGN LEVELS							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
			OVERLAND			KERB & CHANNEL																																												
STRUCTURE No.	DRAIN SECTION	SUB-CATCHMENT/S CONTRIBUTING	LENGTH	SLOPE	ROUGHNESS	TIME	LENGTH	SLOPE	TIME	SUB-CATCHMENT TIME OF CONC.	AREA OF SUB AREA	COEFFICIENT OF RUNOFF	EQUIVALENT IMPERVIOUS AREA	CRITICAL TIME OF CONCENTRATION	RAINFALL INTENSITY	CALCULATED SUB AREA DISCHARGE	FLOW IN K&C (INCL BYPASS)	ROAD GRADE AT INLET	INLET TYPE	AMOUNT BYPASSED	RAINFALL INTENSITY	INLET (Qg)	FIRST UPSTREAM PIPE (Qu)	SECOND UPSTREAM PIPE (Ql)	DOWNSTREAM PIPE (Qo)	PIPE DIAMETER	PIPE LENGTH	PIPE GRADIENT	HYDRAULIC GRADIENT	HEAD LOSS	VELOCITY FULL (PIPE GRADE VEL)	VELOCITY HEAD	TIME OF FLOW IN REACH	CHART No.	S/Do Dhv/Do	Qg/Qo Dhv/Dv	Du/Do (Qw/Qo)^(D+Dh)	Qu/Qo Dl/Do	D/Do (Q/Qo)^(D+Dl)	PIPE AND FLOW RATIOS	US HEADLOSS COEFFICIENT	US PIPE STRUCT. HEADLOSS	W.S.E COEFFICIENT	CHANGE IN W.S.E	DOWN STREAM H.G.L	PROJECTED H.G.L	OBVERT LEVEL	UPSTREAM H.G.L	STRUCTURE H.G.L	STRUCTURE W.S.E.	SURFACE LEVEL	STRUCTURE No.
										tc	A	C	C*A	tc	I	Q					I	Qg	Qu	Ql	Qo		L	S				V2/2g	T								Ku	hu	Kw	hw							
No.			m	%		min	m	%	min	min	ha		ha	min	mm/h	l/sec	l/sec	l/sec	l/sec	%	Type	l/sec	mm/h	l/sec	l/sec	l/sec	l/sec	mm	m	%	%	m	m/sec	m	min	No										m	m	m	m	m	m	m	m	No.
5/25	5/25 to 4/25	G8/25;G1/34;G7/25;G1/36,G1/33;G1/35								10,00 10,00				10,00 10,00					27		116 236				578	600(3) Total Area Major flow1042 Overland Capacity 1603 (Pipe flow set by user)	47,929	1,80	0,89	0,425	2,04 (2,91)	0,212	0,39							Qo 0,578 Do 600 Routine 4,1 Routine 2,15 Join Pipes: Eqv 1/26 & G1/33 & G1/35 and 6/25 Val1 0,939 Val2 1,400	0,94	0,199	0,98	0,207	44,371 Eq Dia 810 CHART 50 Du/Do 1,00 K'w 0,11 Ku 0,94	44,796 Angle 179 Vu 1,17 Kw 0,98	45,155 FRA 45,004 alpha 1 WSE 0,21	45,155	45,354	45,362	46,267	5/25
G2/52	G2/52 to G1/52	G2/52								10,00 10,00	0,186 0,186	0,68 0,96	0,126 0,179	10,00 10,00	116 236	41 117	41 FLOW WIDTH Dv 0,00	0,00	13SI 0,087 m	0	116 236	41			41 Total Area Major flow117 (Pipe flow= Grate flow)	375(3)	7,522	1,57	0,05	0,004	0,37 (1,99)	0,007	0,13							Qg 0,041 Qo 0,041 Do 375 CHRT 32: Vo2/2gDo 0,02 H/Do 0,33 Kg side flow 9,03 end flow 6,39	9,03	0,063	9,03	0,063	44,758	44,762	44,639 44,521	44,762	44,825	44,825	45,574	G2/52
G1/52	G1/52 to 5/45	G2/52,G1/52								10,00 10,00	0,250 0,250	0,68 0,96	0,170 0,240	10,13 10,13	116 236	55 157	55 FLOW WIDTH Dv 2,04	0,45	7 m	0	115 235	55			95 Total Area Major flow274 Overland Capacity 2069 (Pipe flow= Sum upstr atten flows)	375(3)	8,900	0,66	0,29	0,026	0,86 (1,29)	0,038	0,15							Qg 0,054 Qo 0,095 Do 375 Angle 96 Chart 47 S/Do 2,5 chart deg Du/Do 1,00 K0 1,92 K0,5 2,12 Qu/Qo 0,43 Cg 1,09 K 2,14 S/Do 2,0 K0 2,44 K0,5 2,40 K 2,40 S/Do 1,5 K0 2,67 K0,5 2,58 K 2,58	2,14	0,081	2,50	0,094	44,651 Interp val for S/Do 1,72 CHART 48 S/Do 2,0 K0 2,04 K0,5 1,92 K 1,98 S/Do 1,5 K0 2,09 K0,5 2,31 K 2,38 Interp val for S/Do 1,72	44,677 Kw 0,20 Ku 2,14	44,501	44,677	44,758	44,771	45,571	G1/52
G1/48	G1/48 to 5/45	G1/48								10,00 10,00	0,214 0,214	0,68 0,96	0,146 0,205	10,00 10,00	116 236	47 135	47	0,00	7	0	116 236	47			47 Total Area Major flow134 (Pipe flow= Grate flow)	375(3)	7,655	3,61	0,07	0,006	0,43 (3,01)	0,009	0,13							Qg 0,047 Qo 0,047 Do 375 CHRT 32: Vo2/2gDo 0,03 H/Do 0,00 Kg side flow 10,10 end flow 7,18	10,10	0,095	10,10	0,095	44,651	44,657	44,718 44,442	44,718	44,813	44,813	45,653	G1/48
G3/45	G3/45 to 5/45	G3/45								10,00 10,00	0,186 0,186	0,68 0,96	0,126 0,179	10,00 10,00	116 236	41 117	41 FLOW WIDTH Dv 4,06	4,25	7 m	0	116 236	41			41 Total Area Major flow117 Overland Capacity 3399 (Pipe flow= Grate flow)	375(3)	19,858	5,11	0,05	0,011	0,37 (3,59)	0,007	0,33							Qg 0,041 Qo 0,041 Do 375 CHRT 32: Vo2/2gDo 0,02 H/Do 0,00 Kg side flow 10,31 end flow 7,28	10,31	0,072	10,31	0,072	44,651	44,662	45,457 44,442	45,457	45,529	45,529	46,392	G3/45
5/45	5/45 to G2/45	G2/52,G1/52,G1/48,G3/45								10,33 10,33				10,33 10,33					24		114 233				180 Total Area Major flow520 Overland Capacity 3399 (Pipe flow= Sum upstr atten flows)	375(3)	61,401	2,96	1,05	0,647	1,63 (2,73)	0,135	0,63							Qo 0,180 Do 375 Routine 3,1 Join Pipes: G1/48 and G3/45 Val1 0,419 Val2 0,361 Eq Dia 526 Angle 137 Flow 0,086 Routine 2,12 CHART 49 High vel lat G1/52 Dhv 375 Qhv 0,094 Dhv/Dv 0,7 Dhv/Do 1,00 Qhv/Qo 0,52 H 2,09 Low vel lat Eqv G1/48 & G3/45 Dlv 528 Qlv 0,086 Dlv/Do 1,41	1,69	0,229	1,69	0,229	43,012 Qlv/Qo 0,48 No grate flow H-L=0,2 = 1,71 Ku=Kw= 1,71 CHART 52 In line Latl Determine Kl Dl/Do 1,00 B/Do 2,40 Qu/Qo 0,46 Do/Du 0,71 Do/Dl 1,00 Kl 1,70 M 0,88 Kl+(1-M)= 1,50 Determine Ku K'u 1,91 Mu 0,88 Ku=K'u*Mu= 1,68 Kw=Ku= 1,68 Interpolated Ku= 1,69 Kw= 1,69	43,659 H-L=0,2 = 1,71	44,422 H-L=0,2 = 1,71	44,422	44,651	44,651	45,580	5/45
G2/45	G2/45 to 2/45	G2/52,G1/52,G1/48,G2/45,G3/45								10,00 10,00	0,243 0,243	0,68 0,96	0,165 0,233	10,96 10,96	116 236	53 153	53 FLOW WIDTH Dv 0,00	0,00	13SI 0,087 m	0	112 228	53			228 Total Area Major flow656 (Pipe flow= Sum upstr atten flows)	450(3)	10,098	0,36	0,64	0,065	1,43 (1,07)	0,104	0,12							Qg 0,051 Qo 0,228 Do 450 CHART 33 Angle 0 S/Do 2,5 Du/Do 0,83 Qg/Qo 0,23 K 0,50 S/Do 1,78 cor 0,16 Ku 0,66 Kw 0,66	0,66	0,068	0,66	0,068	42,879	42,944	42,660 42,624	42,944	43,012	43,012	43,629	G2/45
G1/51	G1/51 to 2/45	G1/51								5,00 5,00	0,209 0,209	0,68 0,96	0,142 0,201	5,00 5,00	151 305	60 170	60 FLOW WIDTH Dv 0,00	0,00	16SI 0,087 m	0	151 305	60			60 Total Area Major flow170 (Pipe flow= Grate flow)	375(3)	12,502	0,83	0,12	0,014	0,54 (1,45)	0,015	0,21							Qg 0,060 Qo 0,060 Do 375 CHRT 32: Vo2/2gDo 0,04 H/Do 0,64 Kg side flow 7,27 end flow 5,31	7,27	0,109	7,27	0,109	42,879	42,893	42,653 42,549	42,893	43,002	43,002	43,637	G1/51
2/45	2/45 to 1/45	G2/52,G1/52,G1/48,G2/45,G3/45,G1/51								11,08 11,08				11,08 11,08					24		111 227				270 Total Area Major flow780 Overland Capacity 2181 (Pipe flow= Sum upstr atten flows)	600(4)	86,511	0,20	0,22	0,190	1,00 (0,96)	0,051	1,44							Qo 0,270 Do 600 Routine 2,15 Join Pipes: G2/45 and G1/51 Val1 1,421 Val2 0,396	0,20	0,010	0,20	0,010	42,679 Eq Dia 523 CHART 50 Du/Do 0,87 K'w 0,14 Ku -0,30	42,869 Angle 183 Vu 1,26 Kw -0,08	42,740 FRA 42,670 alpha 3 WSE 0,00	42,869	42,879	42,879	43,870	2/45
G1/46	G1/46 to 1/45	G1/46								10,00 10,00	0,258 0,258	0,68 0,96	0,175 0,248	10,00 10,00	116 236	56 162	56 FLOW WIDTH Dv 0,00	0,00	13SI 0,087 m	0	116 236	56			56 Total Area Major flow163 (Pipe flow= Grate flow)	375(3)	1,994	2,65	0,10	0,002	0,51 (2,59)	0,013	0,03							Qg 0,056 Qo 0,056 Do 375 CHRT 32: Vo2/2gDo 0,04 H/Do 0,57 Kg side flow 7,64 end flow 5,54	7,64	0,101	7,64	0,101	42,679	42,681	42,466 42,413	42,681	42,782	42,782	43,401	G1/46
1/45	1/45 to G1/45	G2/52,G1/52,G1/48,G2/45,G3/45,G1/51 G1/46								12,52 12,52				12,52 12,52					24		106 216				309 Total Area Major flow891 Overland Capacity 2181 (Pipe flow= Sum upstr atten flows)	600(4)	5,684	0,20	0,29	0,016	1,15 (0,96)	0,067	0,08							Qo 0,309 Do 600 Routine 2,15 Join Pipes: 2/45 and G1/46 Val1 0,911 Val2 0,467	0,72	0,049	0,75	0,051	42,614 Eq Dia 685 CHART 50 Du/Do 1,14 K'w 0,05 Ku 0,72	42,630 Angle 180 Vu 0,84 Kw 0,75	42,547 FRA 42,509 alpha 0 WSE 0,05	42,630	42,679	42,681	43,474	1/45
G1/45	G1/45 to OUT/45	G2/52,G1/52,G1/48,G2/45,G3/45,G1/51 G1/46, G1/45								5,00 5,00	0,271 0,271	0,68 0,96	0,184 0,260	12,60 12,60	151 305	77 220	77 FLOW WIDTH Dv 0,00	0,00	16SI 0,087 m	0	105 216	77			360 Total Area Major flow1047 (Pipe flow= Sum upstr atten flows)	600(3)	11,654	0,25	0,34	0,040	1,27 (1,09)	0,082	0,15							Qg 0,054 Qo 0,360 Do 600 CHART 33 Angle 0 S/Do 2,5 Du/Do 1,00 Qg/Qo 0,15 K 0,66 S/Do 1,14 cor 0,24 Ku 0,90 Kw 0,90	0,90	0,074	0,90	0,074	42,500	42,540	42,529 42,500	42,540	42,614	42,614	43,401	G1/45
LKA	LKA to FI1/49	EX1								22,00 22,00	7,130	0,30	2,139	22,00 22,00	81 169	481 0			1020 Total Area Major flow1020		81 169				1020 Total Area Major flow1020																												LKA
FI1/49	FI1/49 to 1/49	EX1								22,00 22,00				22,00 22,00					16SI 0,087		81 169				1020 Total Area Major flow1020 (Pipe flow= Sum upstr atten flows)	600(3)	44,401	0,30	0,69	0,307	1,80 (1,19)	0,165	0,41							Qo 1,020 Do 848 CHRT 32: Vo2/2gDo 0,28 H/Do 0,79 Kg side flow 3,93 end flow 3,36	3,93	0,649	3,93	0,649	42,908	43,215	42,740 42,607	43,215	43,864	43,864	43,635	FI1/49
1/49	1/49 to OUT/49	EX1								22,41 22,41				22,41 22,41					25		81 167				1020 Total Area Major flow2028 (Pipe flow= Sum upstr atten flows)	600(3)	13,522	0,20	0,69	0,093	1,80 (0,97)	0,165	0,13							Qo 1,020 Do 848 CHART 50 Du/Do 1,00 alpha 64 K'w 0,28 Vu 1,81 WSE 0,30 Ku 1,54 Kw 1,82	1,54	0,255	1,82	0,300	42,560	42,653	42,587 42,560	42,653	42,908	42,953	43,704	1/49

AS-CONSTRUCTED CERTIFICATION
Signature: Date: 20/07/2023
TROY SCHULTZ RPEQ No. 20631
For and on behalf of Colliers International Engineering & Design PTY LTD

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
A	11.01.23	DC	DC	ISSUED FOR CONSTRUCTION
B	07.07.23	DC	JL	AS CONSTRUCTED

DRAWN

DESIGN

STATUS: AS CONSTRUCTED

APPROVED: TROY SCHULTZ RPEQ 20631
FOR AND ON BEHALF OF COLLIERS INTERNATIONAL ENGINEERING & DESIGN PTY LTD

Colliers

SCALE
1:1000 10 0 10 20 30 40 50 A1
1:2000 A3
HORIZONTAL
1:100 2 1 0 2 4 A1
1:200 A3
VERTICAL

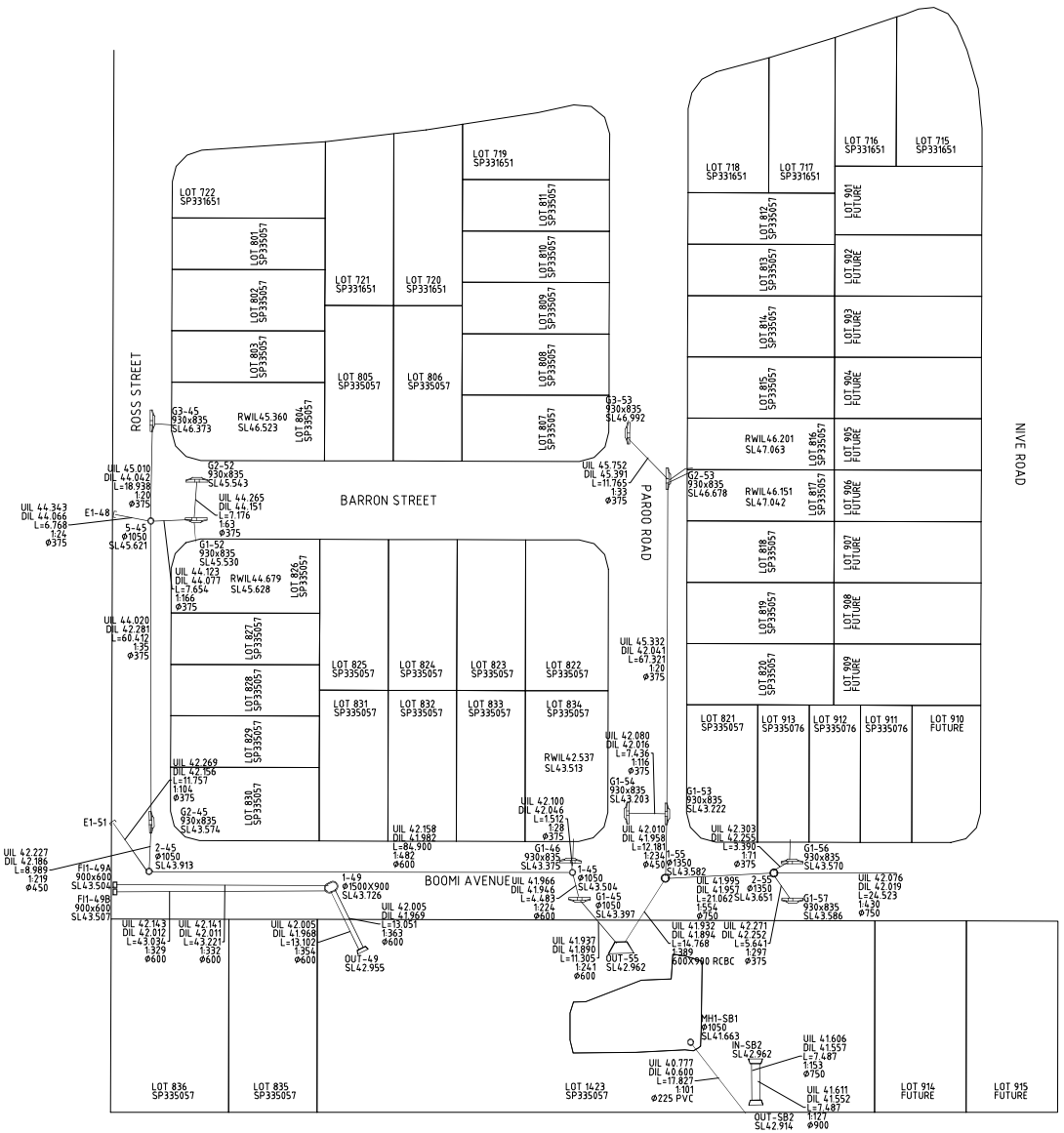
CLIENT: ORCHARD (PEBBLE CREEK) DEVELOPMENTS P.L.

ASSOCIATED CONSULTANT: SURVEYOR: LANDPARTNERS PH: (07) 3842 1032

PROJECT NAME: PEBBLE CREEK RESIDENTIAL DEVELOPMENT STAGE 8
MOUNTAIN RIDGE ROAD, SOUTH MACLEAN

DRAWING TITLE: STORMWATER DRAINAGE CALCULATIONS TABLE SHEET 1 OF 2

PROJECT No.	DRAWING No.	REVISION
21-0174	124	B



Works As Constructed

It is certified that the locations, Levels and dimensions of the infrastructure shown herein are a true representation of the constructed works and that the As-Constructed survey was performed to the prescribed accuracy standards.

Authorised Delegate..... C. Walter .....

Date..... 19/07/2023 .....

LandPartners Pty Ltd (ACN 118 146 008) Surveyor No. S4118

Works As Constructed

It is certified that works herein have been constructed to Local Government standards, relevant approved specifications and the operational works approval. The As-Constructed Drawings for these works constitutes a true and correct record of the works constructed and complies with the design intent.

Signature..... .....RPEQ No..... 20631 .....

Date of Practical Completion..... 27/06/2023 .....

Engineering Consultant..... Troy Schultz - Colliers Engineering & Design .....

A1

ISSUE	DATE	AUTHOR	COMMENTS	ISSUE	DATE	AUTHOR	COMMENTS
1	30/06/23	VO	INITIAL ISSUE				
2	19/07/23	VO	AMENDMENT OF DETAILS				

LANDPARTNERS surveyors and planners
Brisbane Office
Level 1
18 Little Cribb Street
Milton Qld 4064
PO Box 1369
Milton Qld 4064
p: (07) 3842 1000
e: info@landpartners.com.au
w: www.landpartners.com.au

CLIENT	ORCHARD DEVELOPMENT QUEENSLAND PTY LTD
ENGINEERING CONSULTANT	COLLIERS ENGINEERING & DESIGN PTY LTD
PROJECT	PEBBLE CREEK STAGE 8 AS CONSTRUCTED STORMWATER
LGA/SERVICE PROVIDER	ECONOMIC DEVELOPMENT QUEENSLAND

SCALE 1:500 (0, 10, 25, 55m)

SHEET	1 of 1		
DATUM	AHD	LEVEL ORIGIN	-
CONTOURS	N/A	FILE NO.	BRSS7455-008-52-2
DRAWN	VO	DATE	19/07/2023
CHECKED	RA	DATE	19/07/2023
APPROVED	CW	DATE	19/07/2023
PLAN NUMBER	BRSS7455-008-53-2		

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APPENDIX L

BLOOMFIELD ESPLANADE DRAINAGE AS-CONSTRUCTED PLANS

PEBBLE CREEK RESIDENTIAL DEVELOPMENT - STAGE 7

122 MOUNTAIN RIDGE ROAD, SOUTH MACLEAN

FOR 'ORCHARD PEBBLE CREEK DEVELOPMENTS P.L'

DRAWING LIST

EARTHWORKS, ROADWORKS AND DRAINAGE

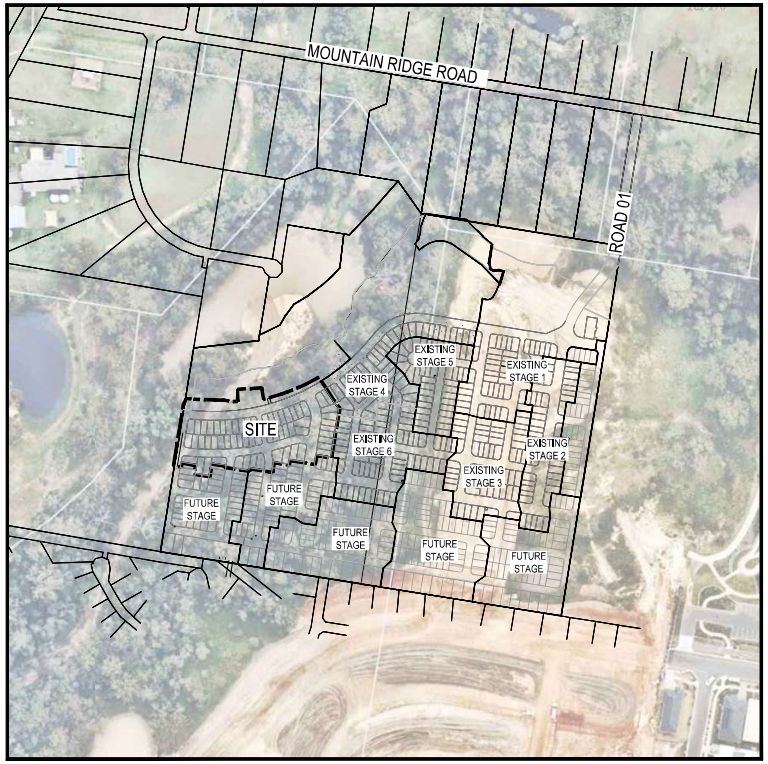
21-0173-100 COVER PLAN
21-0173-101 GENERAL NOTES
21-0173-102 BULK EARTHWORKS LAYOUT PLAN
21-0173-103 RETAINING WALL TYPICAL SECTIONS, NOTES AND DETAILS
21-0173-104 BULK EARTHWORKS TYPICAL SECTIONS
21-0173-105 ROADWORKS AND DRAINAGE LAYOUT PLAN
21-0173-106 SURVEY SETOUT AND KERB TYPES LAYOUT PLAN
21-0173-107 CONTROL LINE SETOUT TABLES
21-0173-108 ROAD 2 LONGITUDINAL SECTION
21-0173-109 ROAD 2 CROSS SECTIONS SHEET 1 OF 2
21-0173-110 ROAD 2 CROSS SECTIONS SHEET 2 OF 2
21-0173-111 ROAD 15 LONGITUDINAL SECTION AND CROSS SECTIONS
21-0173-112 ROAD 16 LONGITUDINAL SECTION
21-0173-113 ROAD 16 CROSS SECTIONS
21-0173-114 ROAD 17 LONGITUDINAL SECTION AND CROSS SECTIONS
21-0173-115 ROAD 18 & 19 LONGITUDINAL SECTIONS AND CROSS SECTIONS
21-0173-116 ACCESSWAY 1 LONG SECTION AND CROSS SECTIONS
21-0173-117 INTERSECTION DETAILS LAYOUT PLAN SHEET 1 OF 2
21-0173-118 INTERSECTION DETAILS LAYOUT PLAN SHEET 2 OF 2
21-0173-119 SIGNS AND LINEMARKING LAYOUT PLAN
21-0173-120 STORMWATER DRAINAGE CATCHMENT LAYOUT PLAN
21-0173-121 STORMWATER DRAINAGE LONGITUDINAL SECTIONS SHEET 1 OF 3
21-0173-122 STORMWATER DRAINAGE LONGITUDINAL SECTIONS SHEET 2 OF 3
21-0173-123 STORMWATER DRAINAGE LONGITUDINAL SECTIONS SHEET 3 OF 3
21-0173-124 STORMWATER DRAINAGE CALCULATIONS TABLE SHEET 1 OF 4
21-0173-125 STORMWATER DRAINAGE CALCULATIONS TABLE SHEET 2 OF 4
21-0173-126 STORMWATER DRAINAGE CALCULATIONS TABLE SHEET 3 OF 4
21-0173-127 STORMWATER DRAINAGE CALCULATIONS TABLE SHEET 4 OF 4
21-0173-128 STORMWATER DRAINAGE STRUCTURE DETAILS SHEET 1 OF 2
21-0173-129 STORMWATER DRAINAGE STRUCTURE DETAILS SHEET 2 OF 2

STORMWATER QUALITY

21-0173-200 BIORETENTION BASIN BN LAYOUT PLAN
21-0173-201 BIORETENTION BASIN BN TYPICAL SECTIONS
21-0173-202 BIORETENTION BASIN BN TYPICAL NOTES AND DETAILS

SEWER AND WATER RETICULATION

21-0173-300 SEWERAGE COVER PLAN
21-0173-301 SEWERAGE LAYOUT PLAN
21-0173-302 SEWERAGE LONGITUDINAL SECTIONS SHEET 1 OF 7
21-0173-303 SEWERAGE LONGITUDINAL SECTIONS SHEET 2 OF 7
21-0173-304 SEWERAGE LONGITUDINAL SECTIONS SHEET 3 OF 7
21-0173-305 SEWERAGE LONGITUDINAL SECTIONS SHEET 4 OF 7
21-0173-306 SEWERAGE LONGITUDINAL SECTIONS SHEET 5 OF 7
21-0173-307 SEWERAGE LONGITUDINAL SECTIONS SHEET 6 OF 7
21-0173-308 SEWERAGE LONGITUDINAL SECTIONS SHEET 7 OF 7
21-0173-309 WATER RETICULATION COVER PLAN
21-0173-310 WATER RETICULATION LAYOUT PLAN



LOCALITY PLAN
SCALE 1:5000 (A1)
SCALE 1:10000 (A3)

PEBBLE CREEK
SOUTH MACLEAN

PROJECT INFORMATION SUMMARY:
No. OF LOTS = 60
AREA OF SITE = 5.92 ha
RP DESCRIPTION LOT 6 ON RP 193185 & LOT 9 ON SP203507
DATUM LEVEL AND LOCATION P.S.M. 165225 RL 38.006 AHD
LOCAL AUTHORITY: LOGAN CITY COUNCIL
EDQ REFERENCE NUMBER: DEV2017/887

NOTE:
THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH:
- VEGETATION MANAGEMENT PLAN
- LANDSCAPE ARCHITECT'S PLANS
- ELECTRICAL, COMMUNICATIONS AND GAS CONSULTANT'S PLANS
- SAFETY IN DESIGN REPORT

AS-CONSTRUCTED CERTIFICATION
Signature: Date: 24/02/2023
TROY SCHULTZ RPEQ No. 20631
For and on behalf of Peakurban PTY LTD

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
A	15.06.22	DC	DC	ISSUED FOR CONSTRUCTION
B	21.02.23	DC	JR	AS CONSTRUCTED

DRAWN
DESIGN
STATUS: AS CONSTRUCTED
APPROVED: TROY SCHULTZ RPEQ 20631
FOR AND ON BEHALF OF PEAKURBAN PTY LTD

PEAKURBAN Achieve more.
ENQUIRIES@PEAKURBAN.COM.AU

SCALE
1:5000 100 50 0 100 200 A1
1:10000 A3

CLIENT: ORCHARD (PEBBLE CREEK) DEVELOPMENTS P.L.
ASSOCIATED CONSULTANT: SURVEYOR: LANDPARTNERS PH: (07) 3842 1032

PROJECT NAME: PEBBLE CREEK RESIDENTIAL DEVELOPMENT STAGE 7
MOUNTAIN RIDGE ROAD, SOUTH MACLEAN

DRAWING TITLE: COVER PLAN

PROJECT No.	DRAWING No.	REVISION
21-0173	100	B

KERB TYPES NOTE:

REFER TO THE SURVEY SETOUT ENGINEERING DRAWING FOR KERB TYPES AND TRANSITION LOCATIONS

ROOFWATER CONNECTION NOTE:

THE CONTRACTOR SHALL INSTALL A ROOFWATER CONNECTION TO EACH PROPERTY BY ONE OF THE FOLLOWING METHODS, AS SHOWN ON THE LAYOUT PLAN:

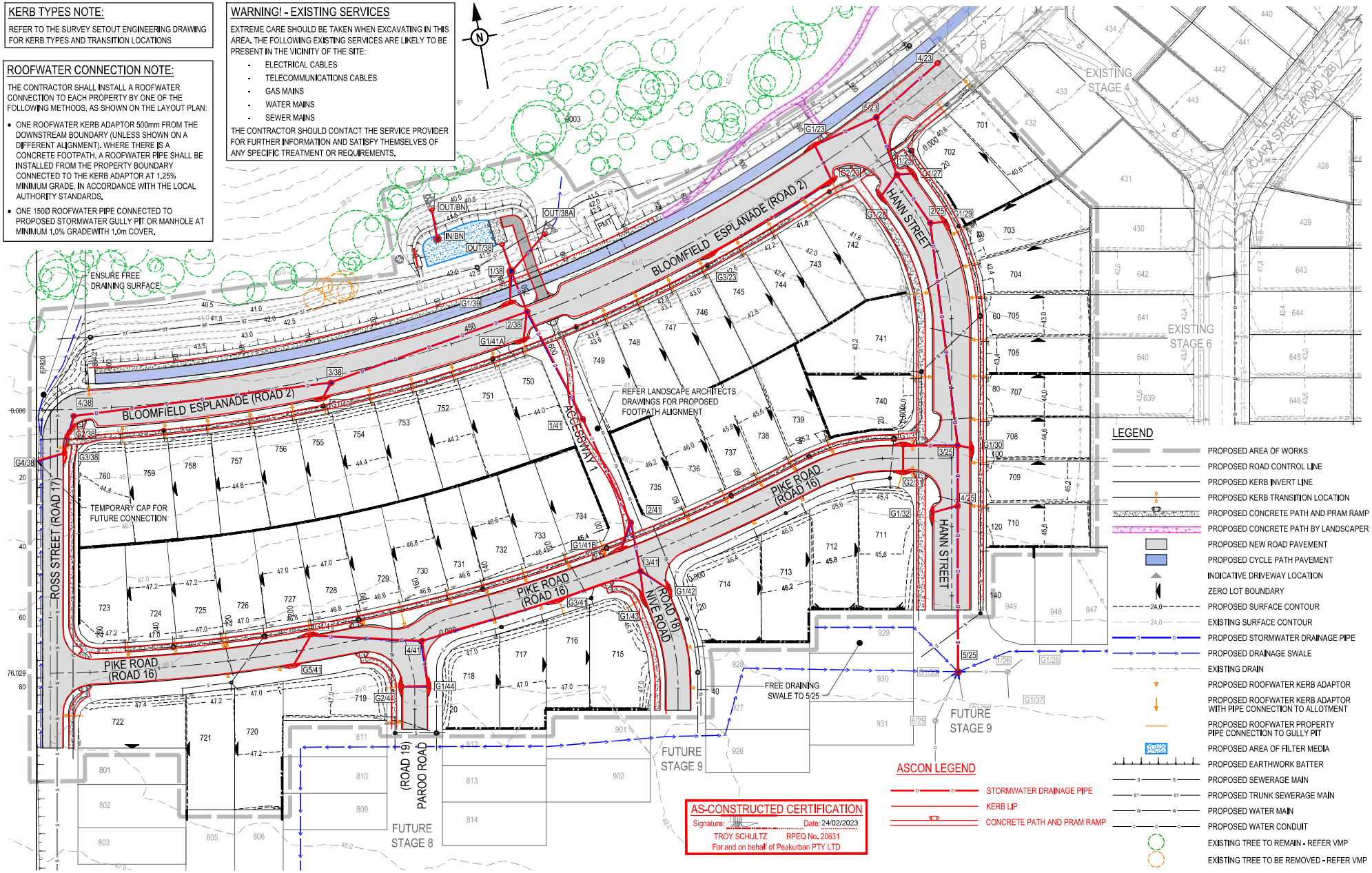
- ONE ROOFWATER KERB ADAPTOR 500mm FROM THE DOWNSTREAM BOUNDARY (UNLESS SHOWN ON A DIFFERENT ALIGNMENT). WHERE THERE IS A CONCRETE FOOTPATH, A ROOFWATER PIPE SHALL BE INSTALLED FROM THE PROPERTY BOUNDARY CONNECTED TO THE KERB ADAPTOR AT 1.25% MINIMUM GRADE, IN ACCORDANCE WITH THE LOCAL AUTHORITY STANDARDS.
- ONE 150Ø ROOFWATER PIPE CONNECTED TO PROPOSED STORMWATER GULLY PIT OR MANHOLE AT MINIMUM 1.0% GRADEWITH 1.0m COVER.

WARNING! - EXISTING SERVICES

EXTREME CARE SHOULD BE TAKEN WHEN EXCAVATING IN THIS AREA. THE FOLLOWING EXISTING SERVICES ARE LIKELY TO BE PRESENT IN THE VICINITY OF THE SITE:

- ELECTRICAL CABLES
- TELECOMMUNICATIONS CABLES
- GAS MAINS
- WATER MAINS
- SEWER MAINS

THE CONTRACTOR SHOULD CONTACT THE SERVICE PROVIDER FOR FURTHER INFORMATION AND SATISFY THEMSELVES OF ANY SPECIFIC TREATMENT OR REQUIREMENTS.



LEGEND

- PROPOSED AREA OF WORKS
- PROPOSED ROAD CONTROL LINE
- PROPOSED KERB INVERT LINE
- PROPOSED KERB TRANSITION LOCATION
- PROPOSED CONCRETE PATH AND PRAM RAMP
- PROPOSED CONCRETE PATH BY LANDSCAPER
- PROPOSED NEW ROAD PAVEMENT
- PROPOSED CYCLE PATH PAVEMENT
- INDICATIVE DRIVEWAY LOCATION
- ZERO LOT BOUNDARY
- PROPOSED SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- PROPOSED STORMWATER DRAINAGE PIPE
- PROPOSED DRAINAGE SWALE
- EXISTING DRAIN
- PROPOSED ROOFWATER KERB ADAPTOR
- PROPOSED ROOFWATER KERB ADAPTOR WITH PIPE CONNECTION TO ALLOTMENT
- PROPOSED ROOFWATER PROPERTY PIPE CONNECTION TO GULLY PIT
- PROPOSED AREA OF FILTER MEDIA
- PROPOSED EARTHWORK BATTER
- PROPOSED SEWERAGE MAIN
- PROPOSED TRUNK SEWERAGE MAIN
- PROPOSED WATER MAIN
- PROPOSED WATER CONDUIT
- EXISTING TREE TO REMAIN - REFER VMP
- EXISTING TREE TO BE REMOVED - REFER VMP

ASCON LEGEND

- STORMWATER DRAINAGE PIPE
- KERB LIP
- CONCRETE PATH AND PRAM RAMP

AS-CONSTRUCTED CERTIFICATION

Signature: ..... Date: 24/02/2023

TROY SCHULTZ RPEQ No. 20631

For and on behalf of Peakurban PTY LTD

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
A	15.06.22	DC	DC	ISSUED FOR CONSTRUCTION
B	11.08.22	DC	RR	ROOFWATER KERB ADAPTERS ADDED TO FUTURE LOTS 927, 928
C	15.08.22	DC	DC	MH4/23 ADDED
D	21.02.23	DC	JR	AS CONSTRUCTED

DRAWN

DESIGN

STATUS: AS CONSTRUCTED

APPROVED: TROY SCHULTZ RPEQ 20631

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

PEAKURBAN Achieve more.

ENQUIRIES@PEAKURBAN.COM.AU

SCALE: 1:500 10 5 0 10 20 A1; 1:1000 A3

CLIENT: ORCHARD (PEBBLE CREEK) DEVELOPMENTS P.L.

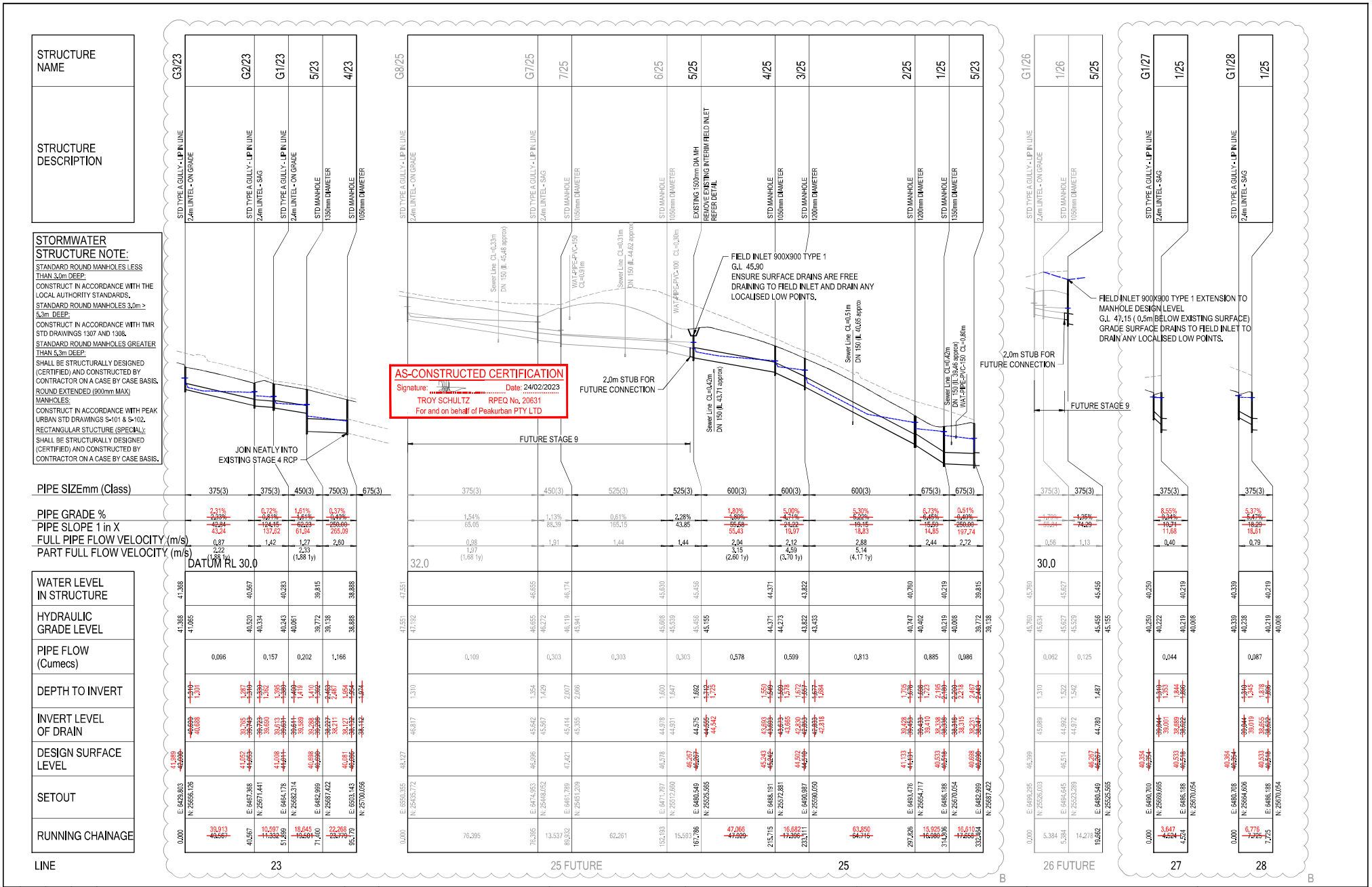
ASSOCIATED CONSULTANT: SURVEYOR: LANDPARTNERS PH: (07) 3842 1032

PROJECT NAME: PEBBLE CREEK RESIDENTIAL DEVELOPMENT STAGE 7

MOUNTAIN RIDGE ROAD, SOUTH MACLEAN

DRAWING TITLE: ROADWORKS AND DRAINAGE LAYOUT PLAN

PROJECT No.	DRAWING No.	REVISION
21-0173	105	D



REV	DATE	DESIGN	DRAWN	REVISION DETAILS
A	15.06.22	DC	DC	ISSUED FOR CONSTRUCTION
B	15.08.22	DC	DC	MH#23 ADDED
C	21.02.23	DC	JR	AS CONSTRUCTED

DRAWN

STATUS: AS CONSTRUCTED

DESIGN

APPROVED: TROY SCHULTZ RPEQ 20631

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

PEAKURBAN Achieve more.

ENQUIRIES@PEAKURBAN.COM.AU

SCALE
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1:2000 A3
HORIZONTAL
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1:200 A3
VERTICAL

CLIENT: ORCHARD (PEBBLE CREEK) DEVELOPMENTS P.L.

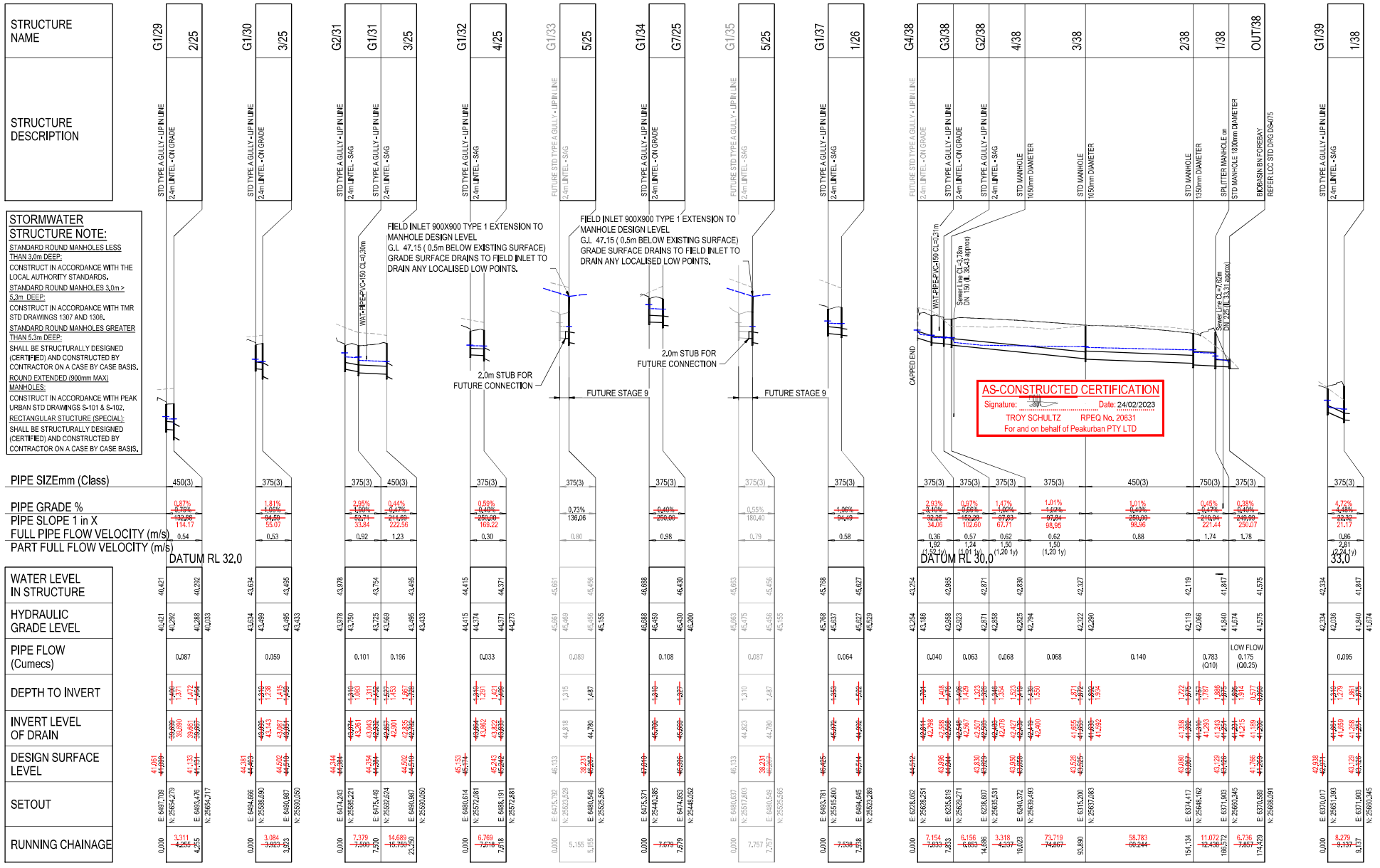
ASSOCIATED CONSULTANT: SURVEYOR: LANDPARTNERS PH: (07) 3842 1032

PROJECT NAME: PEBBLE CREEK RESIDENTIAL DEVELOPMENT STAGE 7

MOUNTAIN RIDGE ROAD, SOUTH MACLEAN

DRAWING TITLE: STORMWATER DRAINAGE LONGITUDINAL SECTIONS SHEET 1 OF 3

PROJECT No.	DRAWING No.	REVISION
21-0173	121	C



REV	DATE	DESIGN	DRAWN	REVISION DETAILS
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B	29.06.22	DC	DC	DRAINAGE MH038 SIZE AMENDED
C	21.02.23	DC	JR	AS CONSTRUCTED

DRAWN

DESIGN

STATUS: AS CONSTRUCTED

APPROVED: TROY SCHULTZ RPEQ 20631

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

PEAKURBAN Achieve more.

ENQUIRIES@PEAKURBAN.COM.AU

SCALE
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1:100 2 1 0 2 4 A1
1:200 A3 VERTICAL

CLIENT: ORCHARD (PEBBLE CREEK) DEVELOPMENTS P.L.

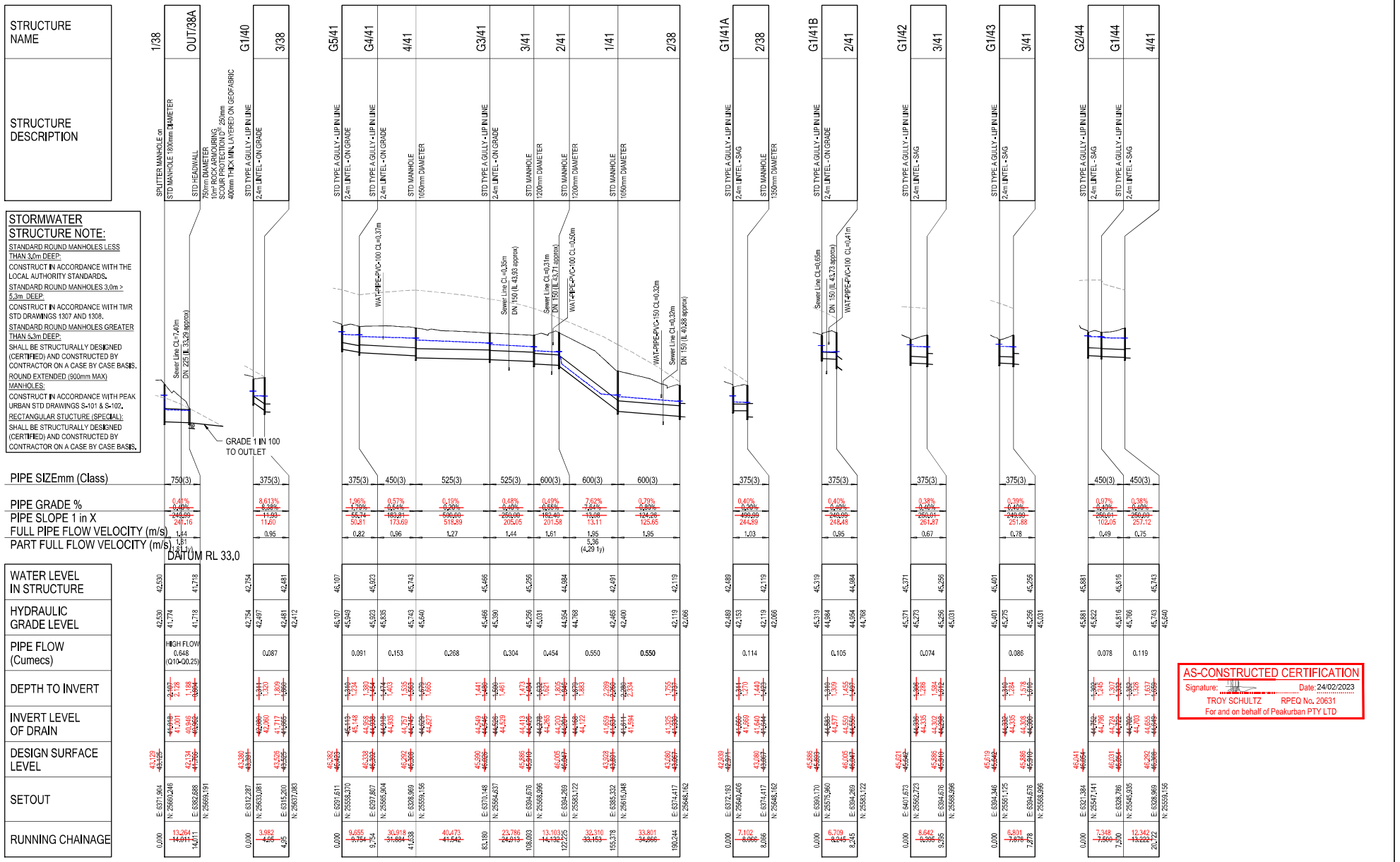
ASSOCIATED CONSULTANT: SURVEYOR: LANDPARTNERS PH: (07) 3842 1032

PROJECT NAME: PEBBLE CREEK RESIDENTIAL DEVELOPMENT STAGE 7

MOUNTAIN RIDGE ROAD, SOUTH MACLEAN

DRAWING TITLE: STORMWATER DRAINAGE LONGITUDINAL SECTIONS SHEET 2 OF 3

PROJECT No.	DRAWING No.	REVISION
21-0173	122	C



AS-CONSTRUCTED CERTIFICATION
Signature: Date: 24/02/2023
TROY SCHULTZ RPEQ No. 20631
For and on behalf of Peakurban PTY LTD

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
A	15.06.22	DC	DC	ISSUED FOR CONSTRUCTION
B	21.02.23	DC	JR	AS CONSTRUCTED

DRAWN
DESIGN
STATUS: AS CONSTRUCTED
APPROVED: TROY SCHULTZ RPEQ 20631
FOR AND ON BEHALF OF PEAKURBAN PTY LTD

PEAKURBAN Achieve more.
ENQUIRIES@PEAKURBAN.COM.AU

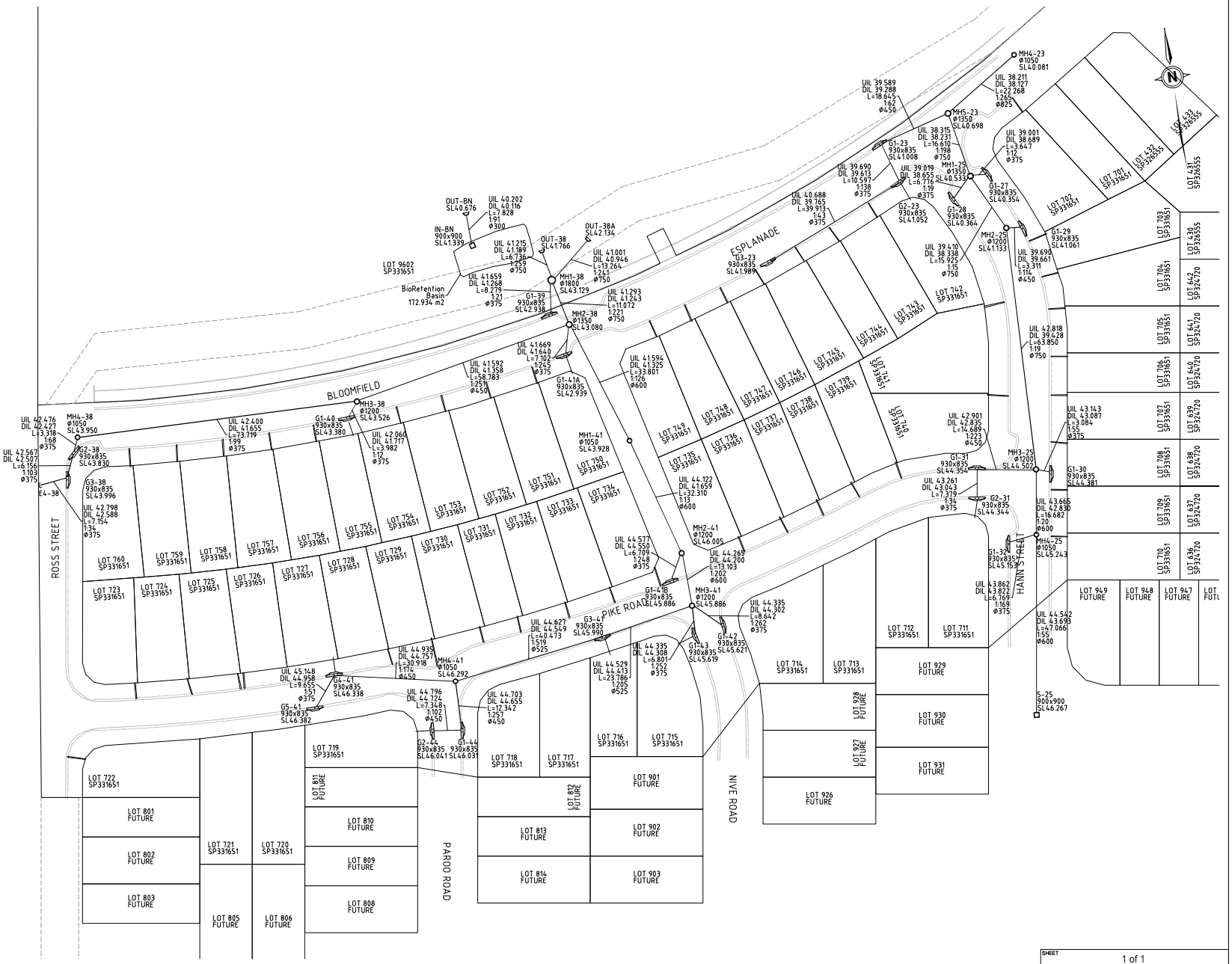
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CLIENT: ORCHARD (PEBBLE CREEK) DEVELOPMENTS P.L.
ASSOCIATED CONSULTANT: SURVEYOR: LANDPARTNERS PH: (07) 3842 1032

PROJECT NAME: PEBBLE CREEK RESIDENTIAL DEVELOPMENT STAGE 7
MOUNTAIN RIDGE ROAD, SOUTH MACLEAN

DRAWING TITLE: STORMWATER DRAINAGE LONGITUDINAL SECTIONS SHEET 3 OF 3

PROJECT No.	DRAWING No.	REVISION
21-0173	123	B



NOTES

- ALL STORMWATER PIPES ARE RCP '3' U.N.O.
- SURFACE LEVEL FOR STRUCTURE 5-25 IS PER DESIGN AND TO BE LOCATED IN FUTURE STAGE

Works As Constructed

It is certified that the locations, Levels and dimensions of the infrastructure shown herein are a true representation of the constructed works and that the As-Constructed survey was performed to the prescribed accuracy standards.

Authorised Delegate..... R. G. Anders .....

Date..... 8/02/2023 .....

LandPartners Pty Ltd (ACN 118 146 008) Surveyor No. S4118

Works As Constructed

It is certified that works herein have been constructed to Local Government standards, relevant approved specifications and the operational works approval. The As-Constructed Drawings for these works constitutes a true and correct record of the works constructed and complies with the design intent.

Signature..... RPEQ No.....

Date of Practical Completion.....

Engineering Consultant.....

A1

ISSUE	DATE	AUTHOR	COMMENTS	ISSUE	DATE	AUTHOR	COMMENTS
1	08/02/2023	BJB	INITIAL ISSUE				

LANDPARTNERS built environment consultants

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PO Box 1390
t (07) 3842 1000
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e info@landpartners.com.au
w www.landpartners.com.au

CLIENT: ORCHARD DEVELOPMENT QUEENSLAND

PROJECT: PEBBLE CREEK STAGE 7 AS CONSTRUCTED STORMWATER DEV2017/887

ENGINEERING CONSULTANT: PEAK URBAN PTY LTD

LGA/SERVICE PROVIDER: ECONOMIC DEVELOPMENT QUEENSLAND

0 10 25 55m

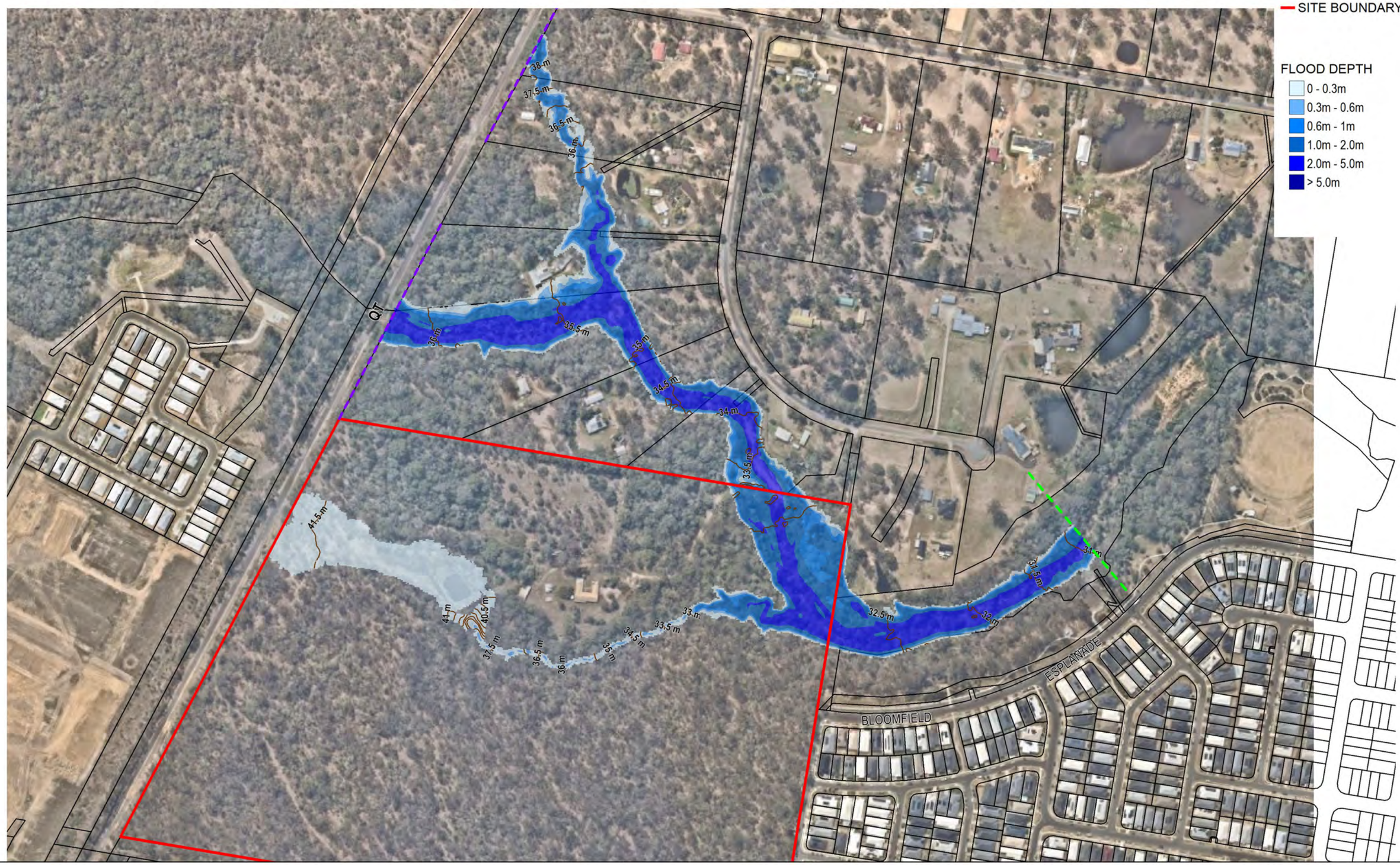
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CONTOURS	N/A	FILE NO.	BRSS7455-007-83-1
DRAWN	BJB	DATE	08/02/2023
CHECKED	RA	DATE	08/02/2023
APPROVED	RA	DATE	08/02/2023
PLAN NUMBER	BRSS7455-007-84-1		

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APPENDIX M

PRE-DEVELOPMENT 1% AEP FLOOD PLANS



URBAN CONSULTANTS

PRE-DEVELOPMENT SCENARIO 1% AEP FLOOD DEPTH & FLOOD LEVEL

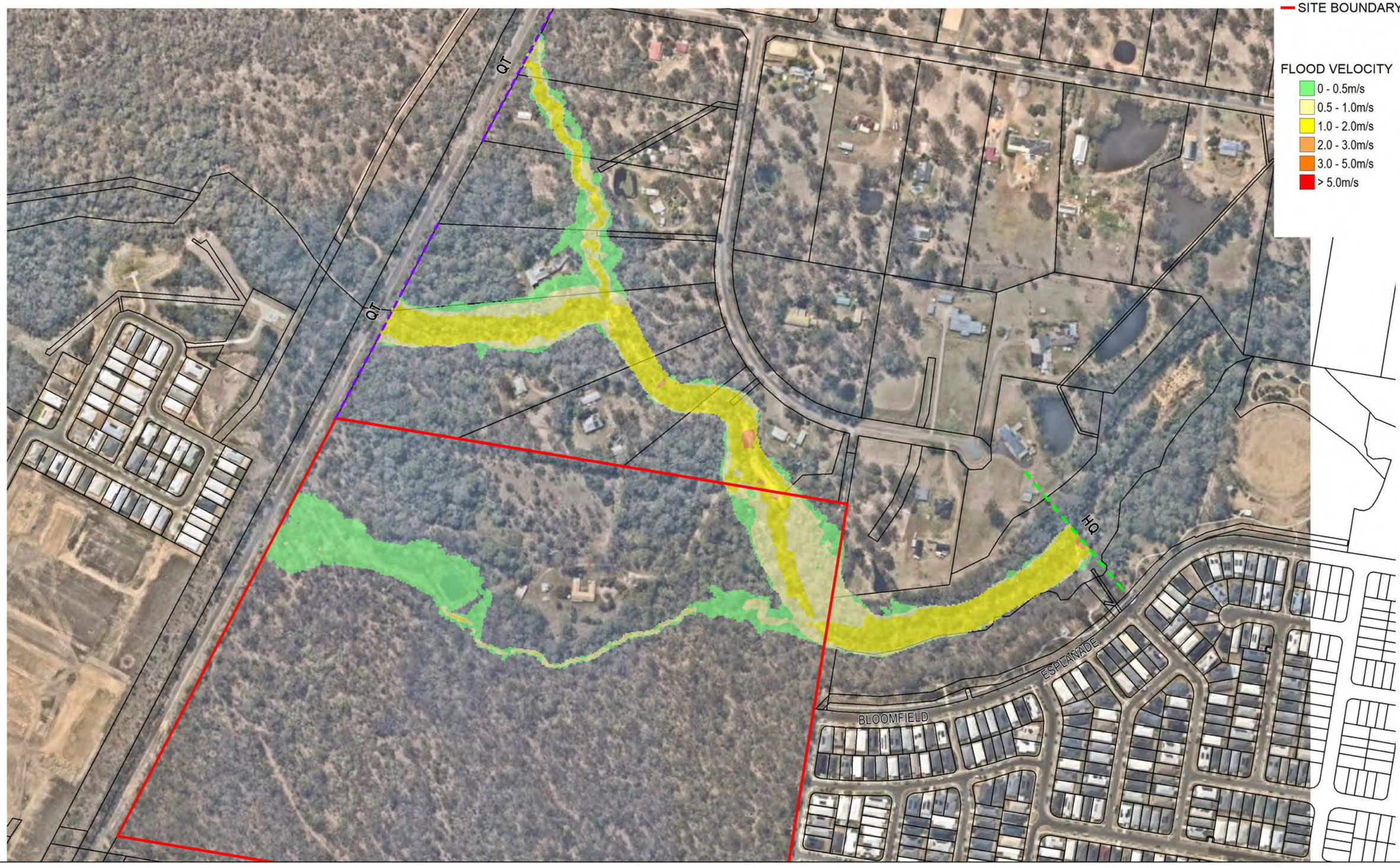
673 SILVERWOOD DRIVE, FLAGSTONE

THE TRUSTEE FOR CHANG FAMILY TRUST T/A ORIS ACCESSORIES PTY LTD

DRAWING N0.	ISSUE
B4942EA1_DA1_GIS101	A

SCALE: 1:4000 @ A3

DATE: 22/6/2026



URBAN CONSULTANTS

PRE-DEVELOPMENT SCENARIO 1% AEP FLOOD VELOCITY

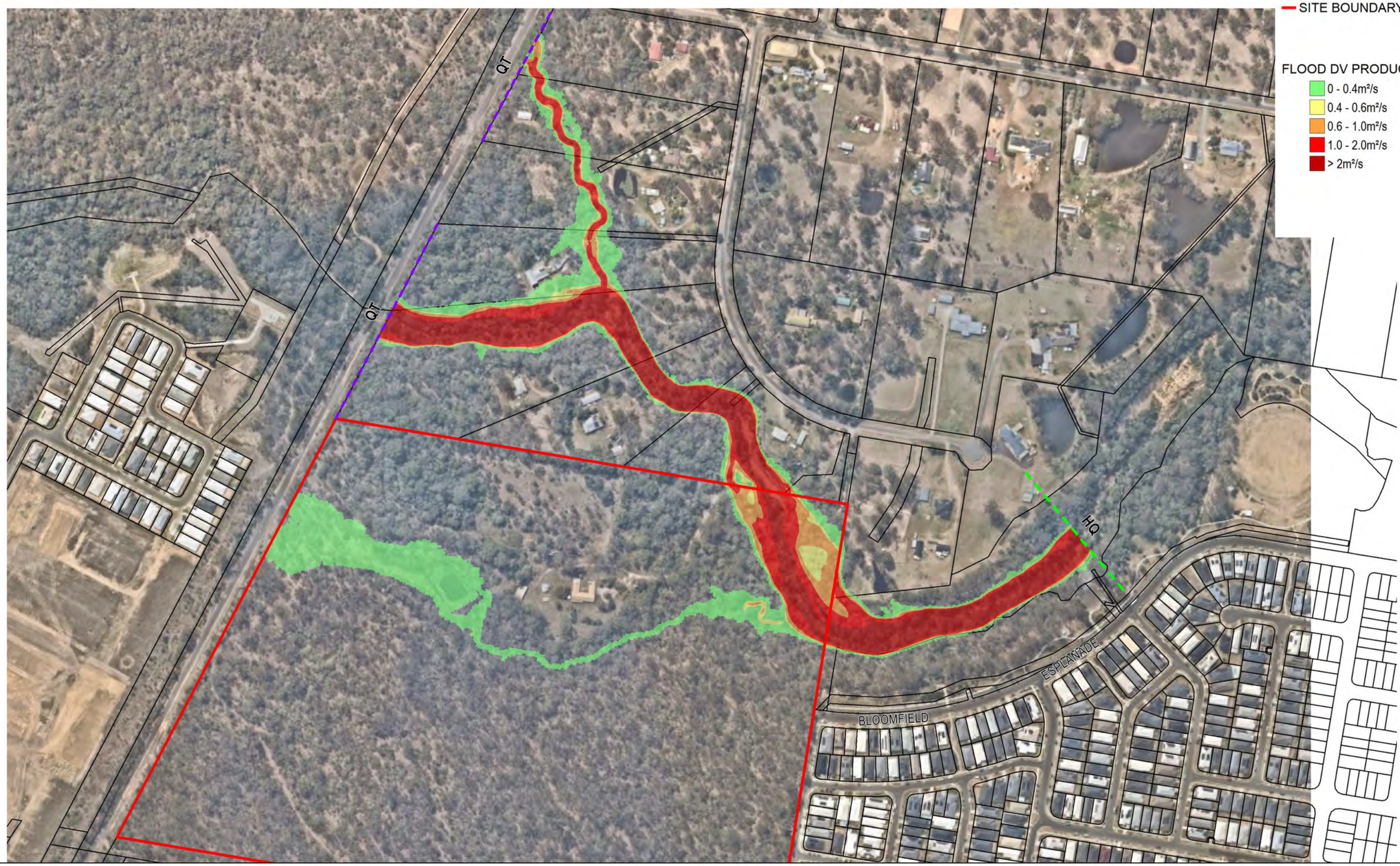
673 SILVERWOOD DRIVE, FLAGSTONE

THE TRUSTEE FOR CHANG FAMILY TRUST T/A ORIS ACCESSORIES PTY LTD

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SCALE: 1:4000 @ A3

DATE: 22/6/2026



URBAN CONSULTANTS

PRE-DEVELOPMENT SCENARIO 1% AEP DV PRODUCT

673 SILVERWOOD DRIVE, FLAGSTONE

THE TRUSTEE FOR CHANG FAMILY TRUST T/A ORIS ACCESSORIES PTY LTD

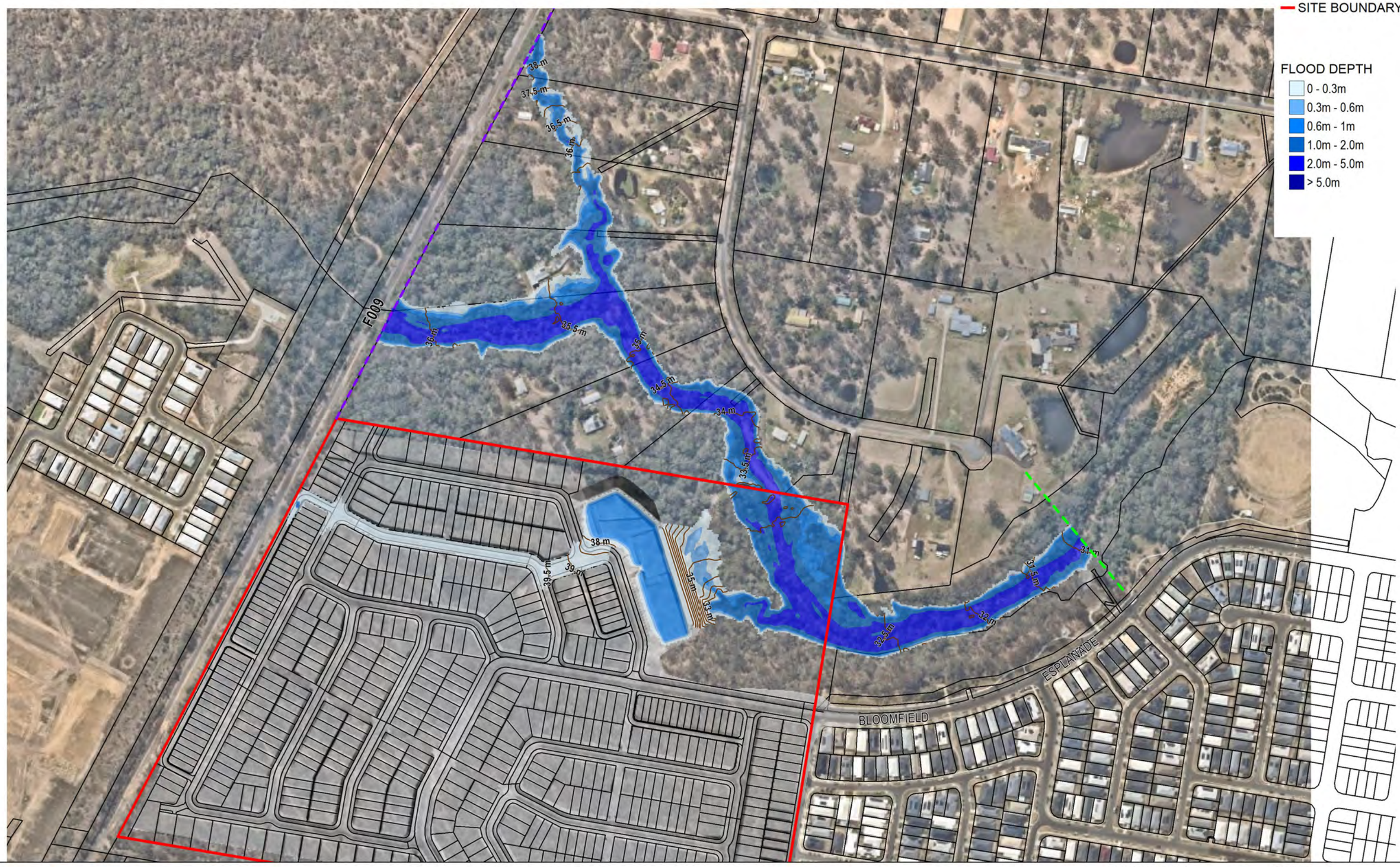
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SCALE: 1:4000 @ A3

DATE: 22/6/2026

APPENDIX N

POST-DEVELOPMENT 1% AEP FLOOD PLANS



POST-DEVELOPMENT SCENARIO 1% AEP FLOOD DEPTH & FLOOD LEVEL

673 SILVERWOOD DRIVE, FLAGSTONE

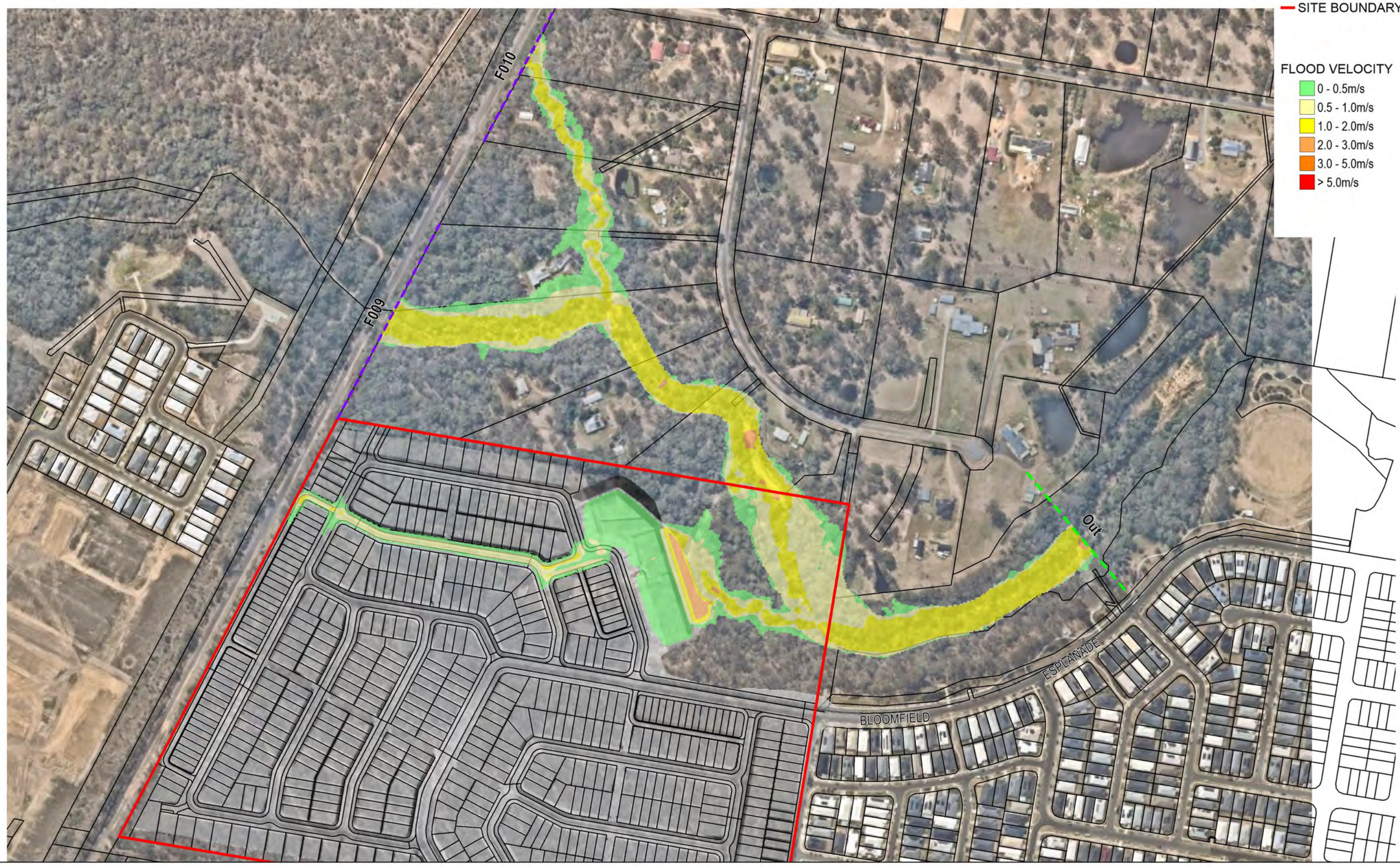
THE TRUSTEE FOR CHANG FAMILY TRUST T/A ORIS ACCESSORIES PTY LTD

URBAN CONSULTANTS

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SCALE: 1:4000 @ A3

DATE: 29/6/2026



URBAN CONSULTANTS

POST-DEVELOPMENT SCENARIO 1% AEP FLOOD VELOCITY

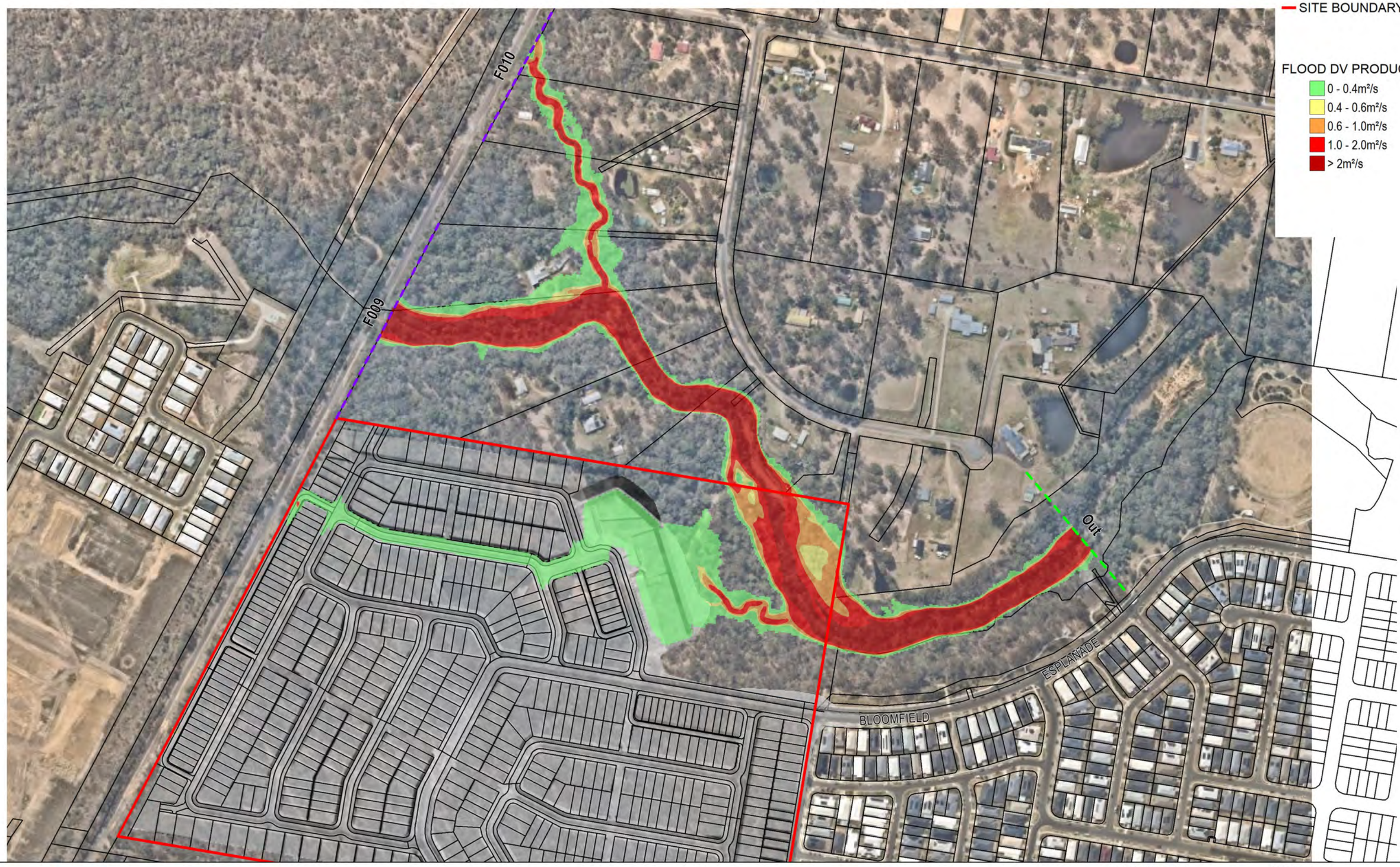
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THE TRUSTEE FOR CHANG FAMILY TRUST T/A ORIS ACCESSORIES PTY LTD

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SCALE: 1:4000 @ A3

DATE: 29/6/2026



URBAN CONSULTANTS

POST-DEVELOPMENT SCENARIO 1% AEP DV PRODUCT

673 SILVERWOOD DRIVE, FLAGSTONE

THE TRUSTEE FOR CHANG FAMILY TRUST T/A ORIS ACCESSORIES PTY LTD

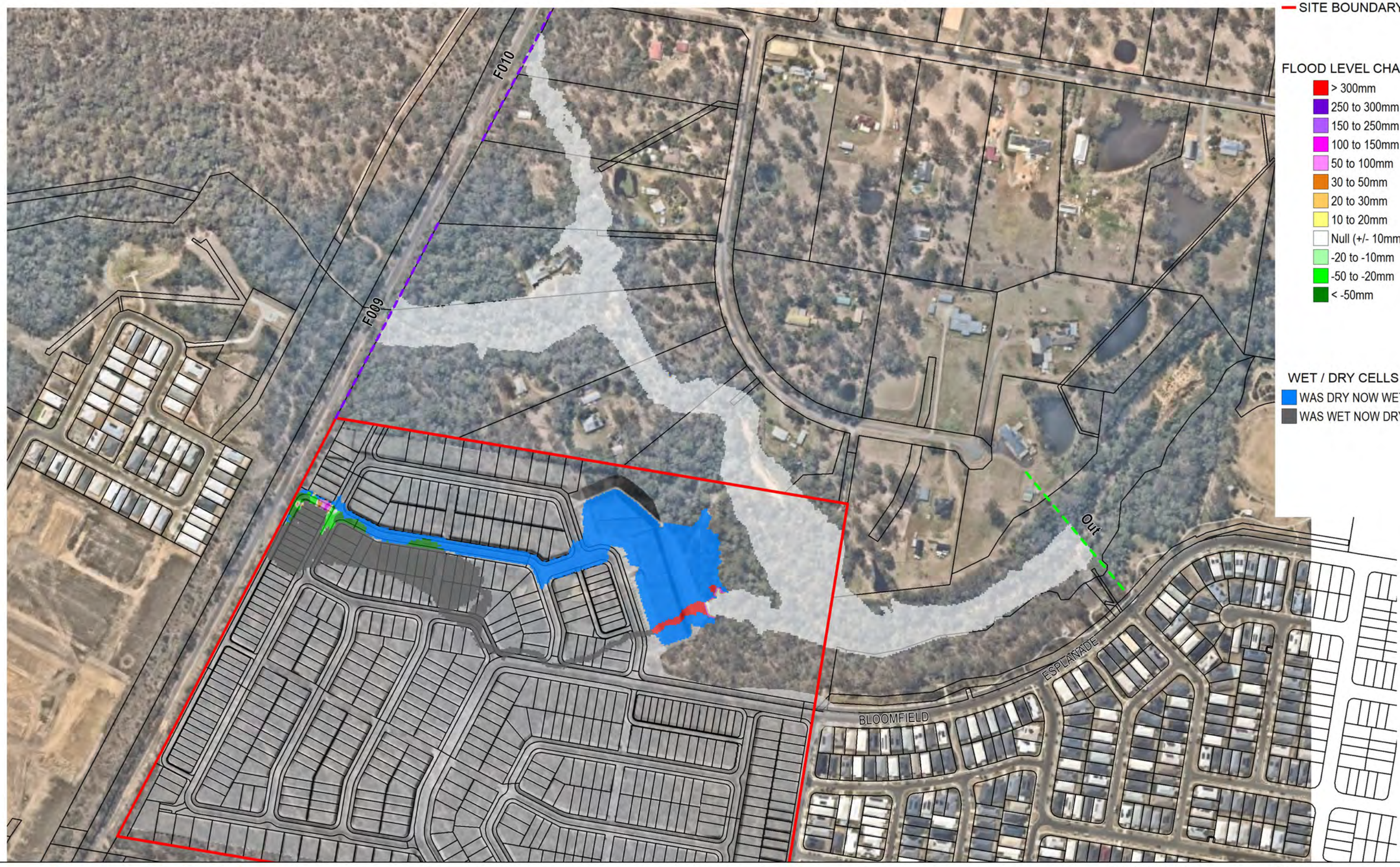
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SCALE: 1:4000 @ A3

DATE: 29/6/2026

APPENDIX O

POST-DEVELOPMENT 1% AEP FLOOD IMPACT PLANS



LEGEND

SITE BOUNDARY

FLOOD LEVEL CHANGES

- > 300mm
- 250 to 300mm
- 150 to 250mm
- 100 to 150mm
- 50 to 100mm
- 30 to 50mm
- 20 to 30mm
- 10 to 20mm
- Null (+/- 10mm)
- -20 to -10mm
- -50 to -20mm
- < -50mm

WET / DRY CELLS

- WAS DRY NOW WET
- WAS WET NOW DRY

JFOP URBAN CONSULTANTS

POST-DEVELOPMENT SCENARIO 1% AEP FLOOD LEVEL CHANGES

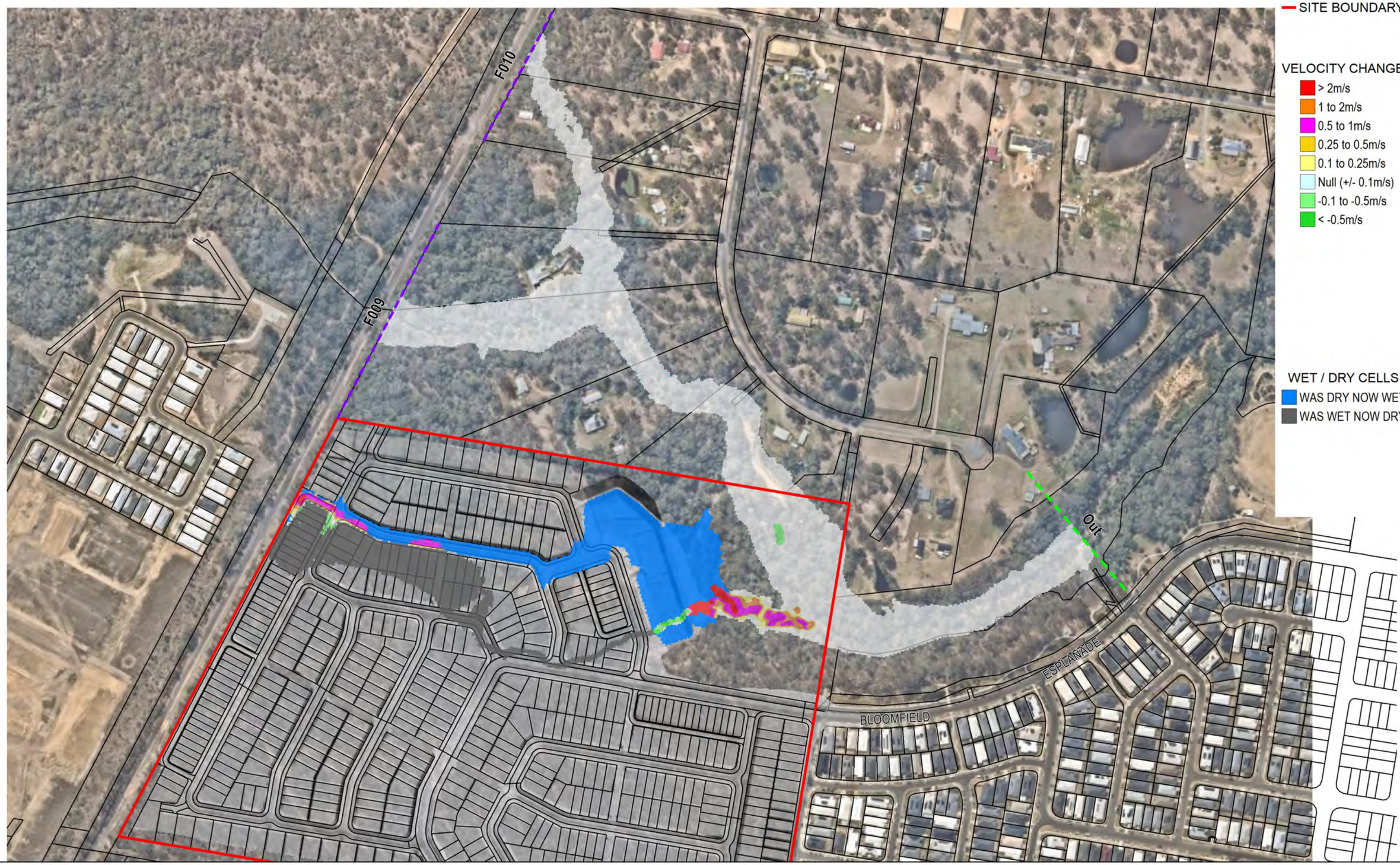
673 SILVERWOOD DRIVE, FLAGSTONE

THE TRUSTEE FOR CHANG FAMILY TRUST T/A ORIS ACCESSORIES PTY LTD

DRAWING N0.	ISSUE
B4942EA1_DA1_GIS301	A

SCALE: 1:4000 @ A3

DATE: 29/6/2026



LEGEND

SITE BOUNDARY

VELOCITY CHANGES

- > 2m/s
- 1 to 2m/s
- 0.5 to 1m/s
- 0.25 to 0.5m/s
- 0.1 to 0.25m/s
- Null (+/- 0.1m/s)
- -0.1 to -0.5m/s
- < -0.5m/s

WET / DRY CELLS

- WAS DRY NOW WET
- WAS WET NOW DRY

URBAN CONSULTANTS

POST-DEVELOPMENT SCENARIO 1% AEP FLOOD VELOCITY CHANGES

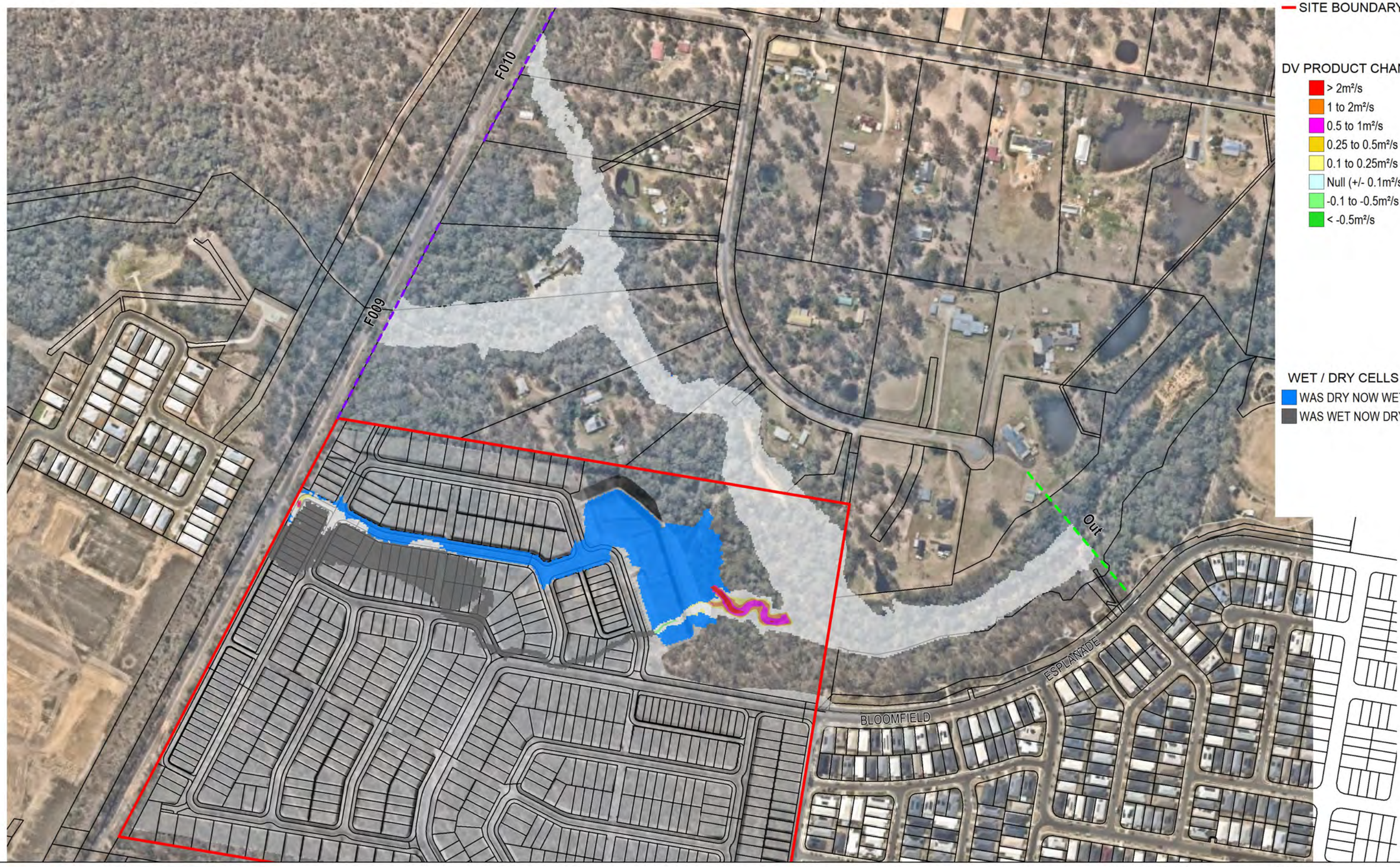
673 SILVERWOOD DRIVE, FLAGSTONE

THE TRUSTEE FOR CHANG FAMILY TRUST T/A ORIS ACCESSORIES PTY LTD

DRAWING N0.	ISSUE
B4942EA1_DA1_GIS302	A

SCALE: 1:4000 @ A3

DATE: 29/6/2026



LEGEND

SITE BOUNDARY

DV PRODUCT CHANGES

- > 2m²/s
- 1 to 2m²/s
- 0.5 to 1m²/s
- 0.25 to 0.5m²/s
- 0.1 to 0.25m²/s
- Null (+/- 0.1m²/s)
- -0.1 to -0.5m²/s
- < -0.5m²/s

WET / DRY CELLS

- WAS DRY NOW WET
- WAS WET NOW DRY

URBAN CONSULTANTS

POST-DEVELOPMENT SCENARIO 1% AEP FLOOD DV PRODUCT CHANGES

673 SILVERWOOD DRIVE, FLAGSTONE

THE TRUSTEE FOR CHANG FAMILY TRUST T/A ORIS ACCESSORIES PTY LTD

DRAWING N0.	ISSUE
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DATE: 29/6/2026