

# Preliminary Stormwater Management Report

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*58 Kingaroy Street, Kingaroy, 4610*

*Lot 1 RP48338*

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Version	Authored By	Checked By	Approved By	Date
1.0	Jordan Picton	Philip De Guzman	Allen Christensen	09 January 2026
This version replaces all previous versions of this report.				

## 1. Introduction

This preliminary stormwater management plan forms part of the development requirements for a unit development application at 58 Kingaroy Street, Kingaroy, Queensland, 4610 (Lot 1 RP48338). The proposed development consists of 5 residential units (2-to-3-bedroom units), consisting of 2 x duplexes along the southern boundary and an additional unit at the rear (east) of the site. The development will have a communal access driveway along the northern boundary of the lot.

ATC Consulting Engineers and Project Managers have been engaged on behalf of the applicant to prepare a stormwater management plan for the proposed development. This report will address the pre- and post-development stormwater flows, and any detention requirements, to demonstrate that the post-development flows can be adequately managed without any additional impacts on other properties or infrastructure.

## 2. Site Characteristics

### 2.1. Pre-development site description

The site is located at 58 Kingaroy Street, Kingaroy, as shown in Figure 1.

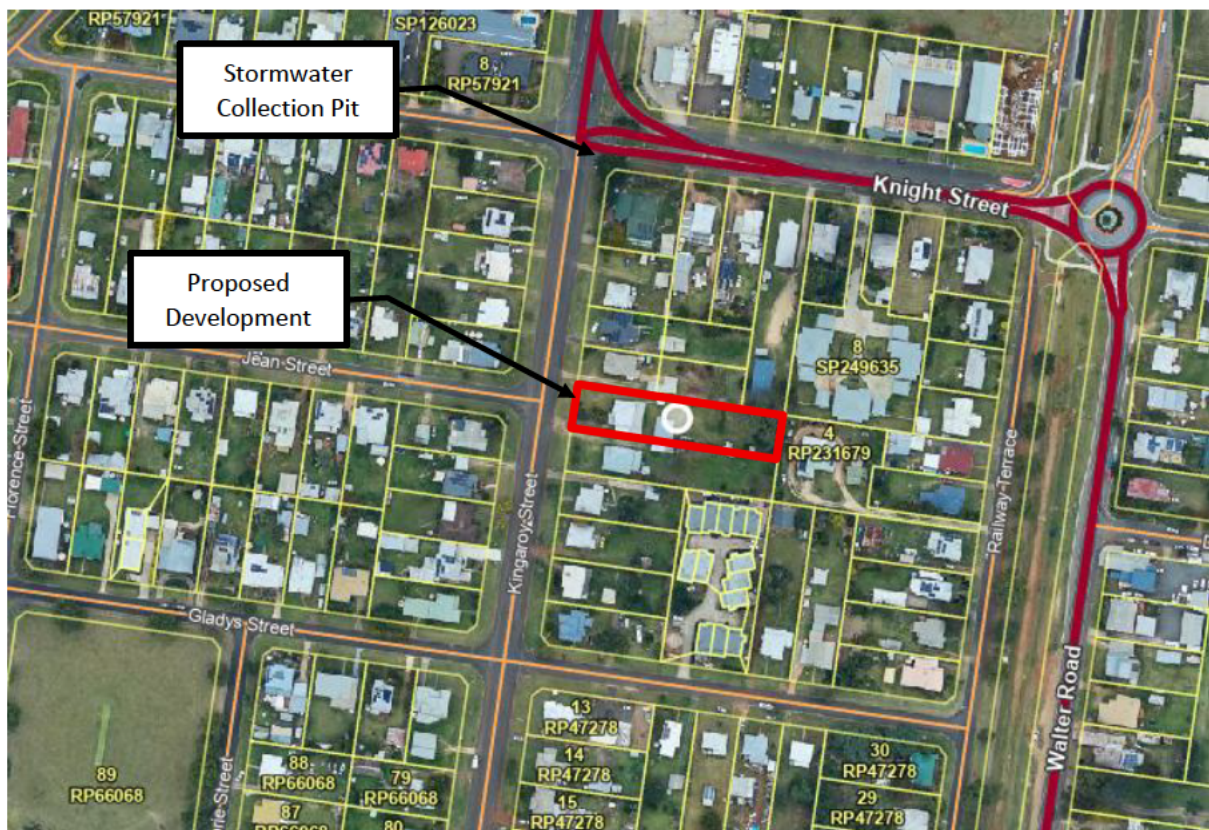


Figure 1 - Proposed Development Site 58 Kingaroy Street, Kingaroy (Lot 1 RP48338)

(Source: Queensland Globe)

- The site consists of an existing house, shed and two water collection tanks on a concrete slab, with the remainder of the property grassed.
- There is an approximate 1 to 2% (1m fall over 60 metre distance) fall towards the west and northwest towards the kerb and channel, and towards the neighbouring property on the northern side.
- The existing roof catchment feeds into a water tank, which overflows through a 90mm PVC underground pipe, discharging to kerb and channel on Kingaroy Street.
- There are no existing underground stormwater mains along the site frontage.
- The planned access to the development is from Kingaroy Street, at the western boundary of the lot.



Figure 2 – Aerial Image of Site (Source: Queensland Globe).

The existing lot is situated within a low-density, residential subdivision, as per the SBRC Planning Scheme zoning map as shown in Figure 3 below. The area consists primarily of low-density residential lots, with the majority of lots featuring individual houses.

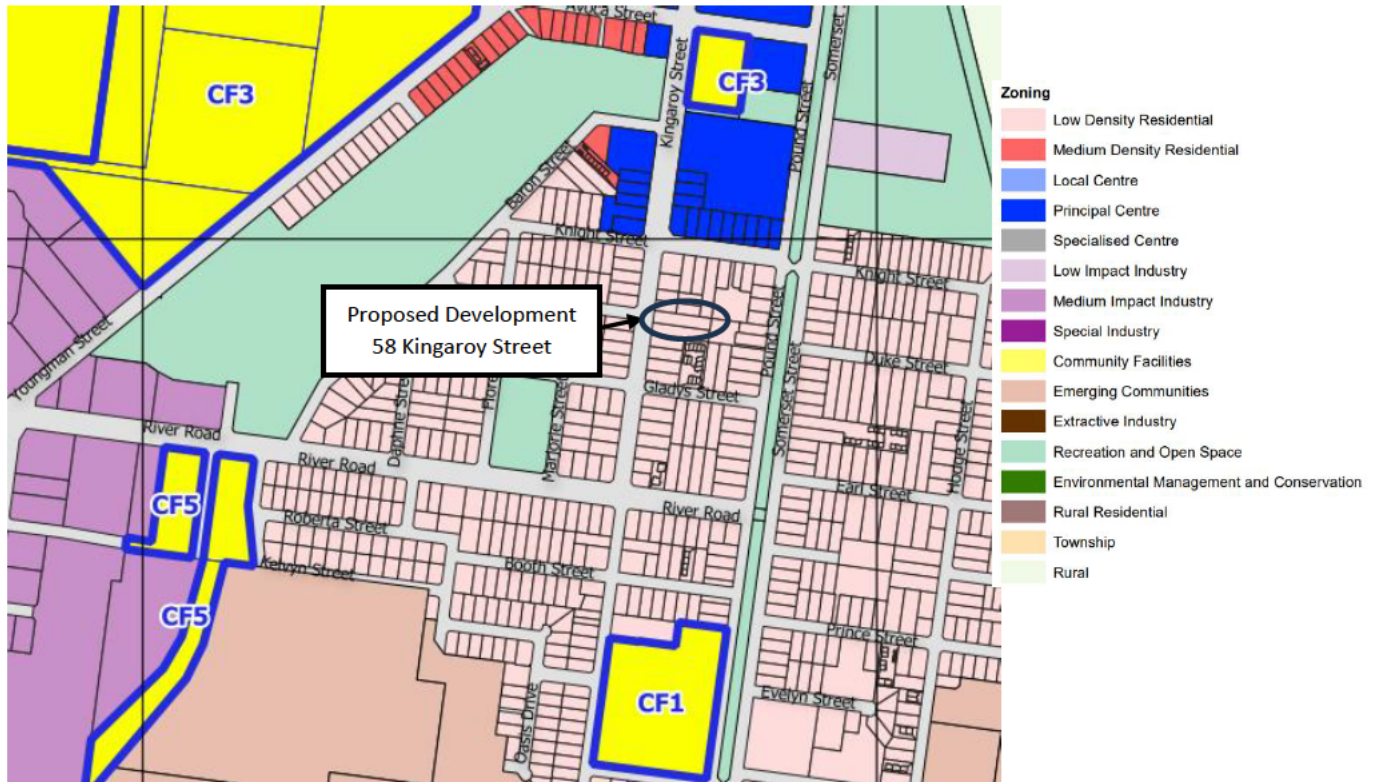


Figure 3 – Zoning Map of Site and Surrounds.

(Source: South Burnett Regional Council Planning Scheme: Zone Map – 02 Kingaroy).

## 2.2. Existing Stormwater Conditions

Stormwater discharges from the site to the barrier kerb and channel at the front of the site, where it is directed north along Kingaroy Street to an existing 600x900mm stormwater pit at the corner of Kingaroy and Knight Streets. The inlet grate to this pit was observed to have a buildup of debris causing considerable blockage at the time of the inspection.



Figure 4 – Site Photo of Kingaroy Street Kerb and Channel.



*Figure 5 – Site Photo of Stormwater Inlet Pit at Corner of Kingaroy and Knight Streets.*

There was no evidence of scouring or other erosion related issues during the site inspection undertaken on the 17<sup>th</sup> of December 2025. Some material deposits were seen at the rear of the site; however, these were predominantly organic in nature, consisting of leaf litter, grass clippings and other vegetation debris originating from on-site trees and grasses, and also potentially from the upstream property. As such, these deposits are not considered indicative of soil erosion or scouring. The site is characterised by gentle grades and the absence of defined overland flow paths. Sample site photographs are provided in Figures 6 to 8.



*Figure 6 – Site Photo – From Northwest Corner of Lot*



*Figure 7 – Site Photo - From Rear of Lot.*



*Figure 8 – Site Photo – From Southeast Corner of Lot – Showing Material Deposits.*

### 2.3. Pre-development site description

The proposed development site plan features a common driveway access to units along the northern boundary as shown in Figure 9, grassed private open space for each unit along the southern boundary and scattered landscaped areas (green areas) throughout the lot.



### 3. Stormwater Analysis

#### 3.1 Point of Discharge

##### Pre-development

The existing stormwater flow paths are illustrated in Figure 10, where the blue arrows indicate the general flow of stormwater runoff for the development site and the surrounding areas. Stormwater runoff has a general flow towards the kerb and channel on Kingaroy Street. Stormwater discharges from the kerb and channel to an on-grade 900 × 600 mm kerb-inlet pit located at the corner of Kingaroy Street and Knight Street, approximately 105 m north of the site boundary.

Roof runoff from the house flows to a rainwater tank which overflows via a 90mm uPVC pipe to the Kingaroy Street kerb and channel. Roof runoff from the larger shed flows to a smaller rainwater tank which overflows directly to the ground from the tank to follow the natural falls of the land. All other smaller sheds are not connected to any rainwater tanks and discharge directly to the ground.



Figure 10: Pre-Development Catchment Plan.



*Figure 11: Pre-Development Kerb and Channel Discharge Point.*

### Post-development

The point of discharge will remain the same in the post-development condition, with the ground areas to be piped or follow the ground slope towards the kerb and channel on Kingaroy Street. The kerb and channel falls towards the north, conveying stormwater within the channel to the existing stormwater pit at the corner of Knight Street, as illustrated in Figure 12.



### 3.2. Flood Hazard Overlay

The site is not situated within a flood hazard area, as defined in the SBRC Flood Hazard Overlay Mapping (Figure 13). Therefore, specific flood mitigation measures are not required for this development.



Figure 13: Flood Hazard Overlay of Site Area (Source: SBRC Flood Hazard Overlay – Overlay Map 3.2).

### 3.3. Hydrologic Design

#### Peak Flow Volume

A hydrologic assessment to determine stormwater impacts of pre- and post-development conditions was undertaken using the DRAINS software package (Version 2025.01.9147.24925). An analysis was conducted to determine the peak runoff flows for the pre- and post-development conditions, and any potential detention requirements. 39.35% AEP minor and 1% AEP major storm events, with storm durations between 5 minutes to 4.5 hours, were used as part of the assessment. This does not consider any external impacts or overland flow conditions external to the site.

#### DRAINS Input

The inputs shown in Table 1 & 2 were used for the stormwater modelling process.

Table 1 - DRAINS Model Inputs.

Hydrological Model	ILSAX
Paved (impervious) area depression storage (mm)	1
Supplementary area depression storage (mm)	1
Grassed (pervious) area depression storage (mm)	5
Soil Type	3 (Slow Infiltration Rate)
Antecedent Moisture Condition	3 – Rather Wet

#### Catchment Information

The below areas and assumptions were used in the stormwater modelling process. The existing condition of the site will be used as the pre-development condition, being a conservative assumption compared to the 0.40 recommended fraction impervious as per Table 4.5.1 of QUDM. This value from QUDM is typically used in greenfield sites or areas serviced by trunk stormwater infrastructure.

As there are no stormwater mains within the subject section of Kingaroy Street, the fraction impervious as per the current site conditions / development will be used. Due to the blockage (potential) within the inlet main downstream, reducing the post-development stormwater flows to equal to or less than the existing condition is considered ideal for this site.

Table 2 – DRAINS Model Assumptions.

Catchment	Area	Impervious (Paved)	Supplementary	Grassed
Pre-development	1,948m <sup>2</sup>	18.3% (356m <sup>2</sup> )	1.2% (24m <sup>2</sup> )	80.5% (1568m <sup>2</sup> )
Post-development	1,948m <sup>2</sup>	78.9% (1566m <sup>2</sup> )	3.1% (62m <sup>2</sup> )	18.0% (425m <sup>2</sup> )

Note that supplementary areas refer to impervious areas which are not directly connected to the stormwater drainage system, being the smaller sheds which do not have guttering in the pre-development conditions, and concreted ground areas at the rear of units in the post-development condition.

### Peak Flows

The peak flow rates for pre-development and post-development (with and without attenuation) are shown in Tables 3 & 4. Peak flow rates shown in the following tables may not be representative of the critical stormwater event under ARR guidelines.

Table 3 – Pre- and Post-Development (Unattenuated) Peak Flows.

Storm Duration	Peak Flow Discharges			
	Pre-development		Post-development	
	Minor 39.35% AEP (m3/s)	Major 1% AEP (m3/s)	Minor 39.35% AEP (m3/s)	Major 1% AEP (m3/s)
5 minutes	0.019	0.070	0.052	0.128
10	0.033	0.106	0.063	0.148
15	0.040	0.116	0.064	0.149
20	0.045	0.110	0.063	0.140
25	0.046	0.111	0.057	0.139
30	0.047	0.108	0.057	0.144
45	0.039	0.101	0.052	0.124
1 hour	0.037	0.092	0.050	0.112
1.5	0.036	0.069	0.042	0.077
2	0.026	0.061	0.053	0.072
3	0.027	0.053	0.031	0.055
4.5	0.019	0.034	0.023	0.044

The peak flow discharges in Table 3 demonstrate an increase in post-development (unattenuated) flow rates in critical storm events. With an increase greater than 5% for both minor and major storms, the development requires attenuation of peak flows leaving the site, with the following solution being proposed:

- Detention storage via 5 x 3,000L slimline attenuation tanks (one per unit), with a total detention volume of 12m<sup>3</sup> within the planned rainwater tanks as shown in Appendix A.

The required height and orifice size of the low flow outlet pipe will be determined based on this tank size. The detention volume required within the proposed tanks requires the pipe invert to be 0.4m above the base of each tank.

The results from modelling this proposed solution in DRAINS can be seen in Table 4, with comparison to the total pre-development peak flows leaving the site.

Table 4 – Pre- and Post-development (Attenuated) Peak Flows.

Storm Duration	Peak Flow Discharges			
	Pre-development		Post-development (attenuated)	
	Minor 39.35% AEP (m3/s)	Major 1% AEP (m3/s)	Minor 39.35% AEP (m3/s)	Major 1% AEP (m3/s)
5 minutes	0.019	0.070	0.020	0.064
10	0.033	0.106	0.035	0.087
15	0.040	0.116	0.040	0.103
20	0.045	0.110	0.043	0.103
25	0.046	0.111	0.044	0.101
30	0.047	0.108	0.045	0.100
45	0.039	0.101	0.037	0.092
1 hour	0.037	0.092	0.038	0.082
1.5	0.036	0.069	0.033	0.064
2	0.026	0.061	0.033	0.064
3	0.027	0.053	0.030	0.051
4.5	0.019	0.034	0.021	0.036

Comparing total peak flow discharges from the site in Table 4, the model of the post-development site conditions with attenuation has a lesser volume of stormwater leaving the site in both minor and major storm events.

A summary of the pre-development and post-development peak flows are shown in Table 5.

Table 5 - Peak Flow Discharges Summary.

Discharge Reference	Kingaroy Street Kerb & Channel	
	Minor 39.35% AEP	Major 1% AEP
Pre-Development (m <sup>3</sup> /s)	0.047	0.116
Post-Development (m <sup>3</sup> /s)	0.064 (+36.2%)	0.149 (+28.5%)
Post-Development (with detention) (m <sup>3</sup> /s)	0.045 (-4.3%)	0.103 (-11.2%)

Note: Percentages shown in Table 5 represent the difference in post-development peak discharges compared to the pre-development site condition.

#### 4. Stormwater Management Strategy

The results for the total stormwater runoff from the site demonstrate that the post-development flows lead to increases in stormwater discharges for both major and minor storm events, requiring attenuation of stormwater on-site to produce a non-worsening effect.

Therefore, the overall stormwater strategy is to:

- Adequately size all roof gutters for an AEP 5% storm event.
- Connect the downpipes from roofed areas to the proposed five (5) 3,000L slimline rainwater tanks (1 tank per unit), as per the “Proposed Drainage Layout” in Appendix B.
- Each tank is to have a 70mm orifice plate connected to a 100mm diameter low flow outlet pipe, with the invert located 0.4m maximum above the base of each tank (approximate 12m<sup>3</sup> total detention storage volume). Larger tanks may be used to allow for greater retention storage for reuse by residents, ensuring the detention storage volume is equal to or greater than 12m<sup>3</sup>. See Appendix C for proposed detention tank diagram.
- Include five (5) new grated stormwater sag pits (one per unit) along southern boundary to capture stormwater from grassed areas. All pits are to be 450 x 450mm. See Appendix A for proposed locations. Nearby grassed areas of backyards should slope towards the new pit locations.
- Pipes between pits are to be sized as per the “Proposed Drainage Layout” in Appendix A. The outlet pipes between the final pit and the street should be 2 / 100x75 RHS pipes due to uPVC pipes having inadequate cover near the kerb outlet location.
- Direct discharge from the tanks to the new pit and pipe system towards Kingaroy Street kerb and channel.
- A low point (invert) should be provided in the centre of the driveway along its length to direct stormwater to Kingaroy Street via overland flow and prevent stormwater from being discharged to the western site boundary.

- Monitor for erosion and adequately maintain pits, pipe inlets/outlets, and discharge points.
- Minimum finished floor levels for all lots shall be 100mm minimum above the surrounding ground level (free-draining) or 50mm above surrounding impermeable (paved or concreted) areas that slope away from the building (50mm or 25mm in the first 1m, respectively, as per the National Construction Code).
- The concrete crossover is to be constructed in accordance with IPWEA Standard Drawing RSD-101 to achieve a high point of 250mm above the invert of kerb to ensure stormwater is contained within the road reserve as per QUDM requirements.
- Do not pond or direct water to adjacent properties.

A copy of the DRAINS Model is attached in Appendix B.

## 5. Design Assumptions

The assumptions made in calculating the on-site flows are:

1. All water up to the 1% AEP event can be safely discharged to the kerb and channel on Kingaroy Street without adverse impacts.
2. Stormwater will act generally in accordance with the assumptions made in the DRAINS model.
3. Dimensions of water tanks were based upon standard sizing; actual tank dimensions may vary. Differing tank dimensions will not greatly affect the findings of this report (e.g. height of outlet pipe above base of tanks).
4. All stormwater from roofed areas will be conveyed via downpipes to the proposed detention tanks.
5. Appropriate clearance can be achieved between the sewer manhole and the stormwater pipes.

## 6. Conclusions

In summary:

- The development will lead to increases in stormwater flow discharging from the site for the specified design storm events.
- The effects of the increased discharge may be adequately managed by use of the proposed stormwater drainage system, comprising of:
  - five 3,000L rainwater tanks, each connected to a 100mm diameter outlet pipe with a 75mm orifice plate at 0.4m above the base of each tank (12m<sup>3</sup> minimum total detention volume), and,
  - five 450 x 450mm stormwater pits located in the grassed areas behind the units, with pipes sized as per the “Proposed Drainage Layout” in Appendix A.
- The existing kerb and channel on Kingaroy Street will be used as the legal point of discharge.
- Direct water falling on the driveway towards the Kingaroy Street kerb and channel via overland flow along the central invert of the driveway.

I believe that the above response satisfies the requirements of QUDM and South Burnett Regional Council requirements with respect to stormwater management – subject to the application of reasonable and relevant conditions.

Should you require further assistance or information, please feel free to contact ATC on

☎ 07 4162 2378 or email ✉ [office@atcengineers.com.au](mailto:office@atcengineers.com.au).

Regards,



Philip De Guzman

Technical Services | Design Manager

BSCE *cum laude* MEng Phd RPEQ (Civil / Structural)

## APPENDIX A

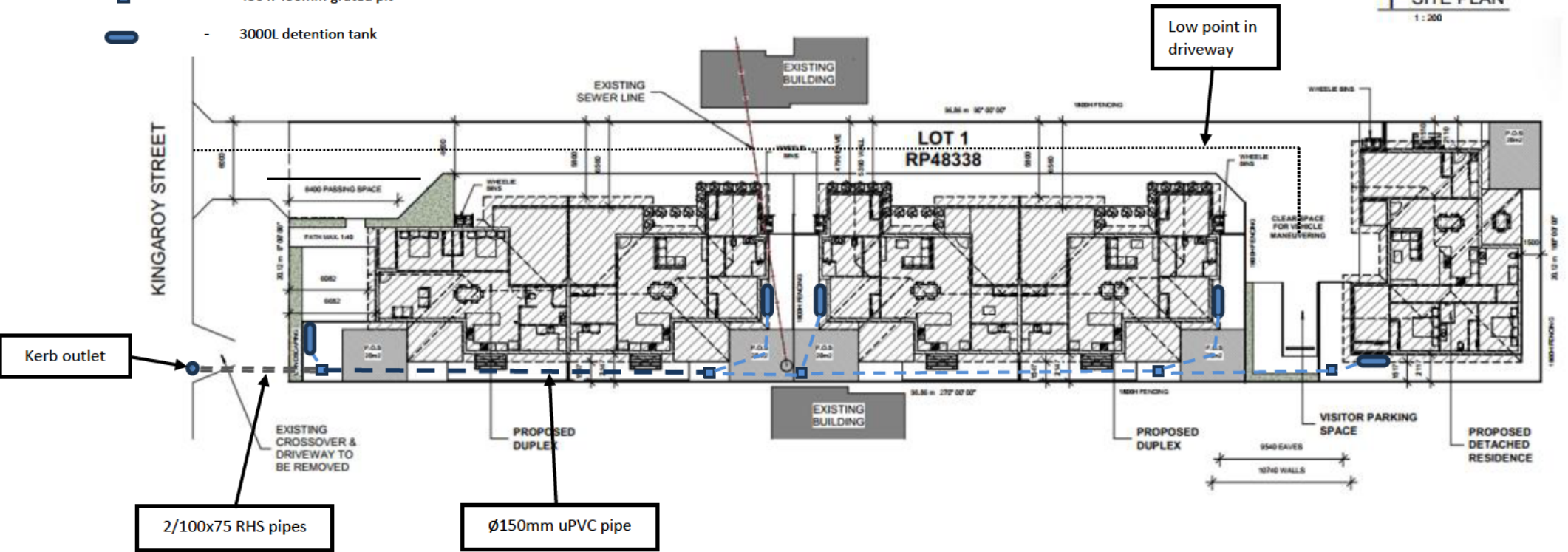
### Proposed Drainage Layout – Schematic Only

Notes: Downpipe locations subject to roofwater drainage design.

**Legend:**

- - Ø100mm uPVC pipe
- - 450 x 450mm grated pit
- ▭ - 3000L detention tank

**1 SITE PLAN**  
1:200



- Notes:**
- Downpipe locations subject to roofwater drainage design.
  - All downpipes to connect into detention tanks before being directed towards pits.
  - Tank locations shown are diagrammatical only and can be changed.



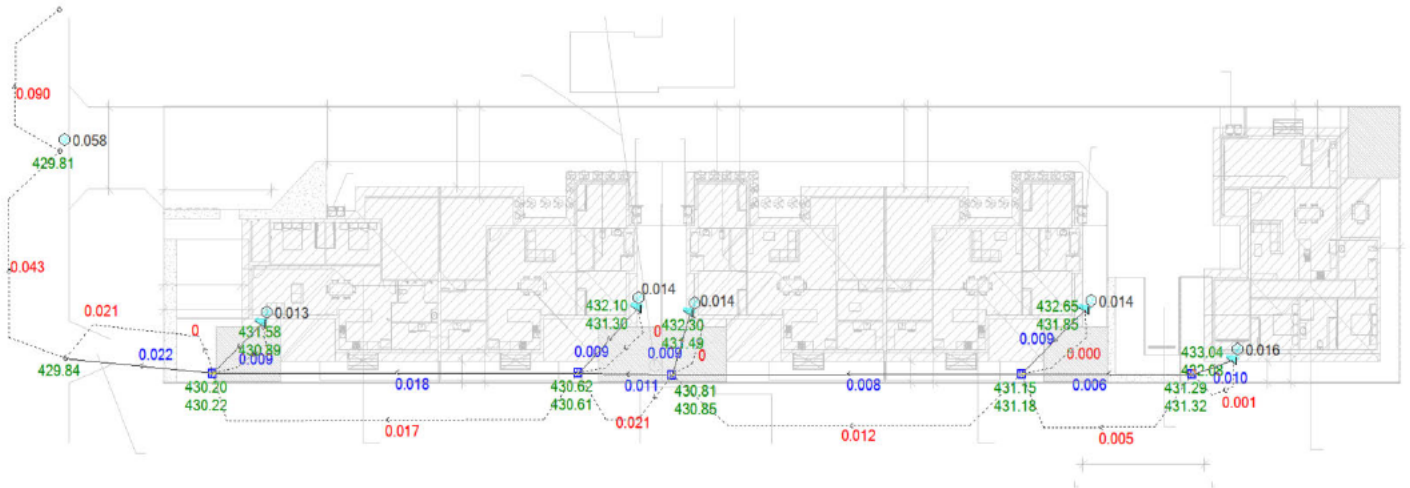
# Major (1% AEP)

## Pre- & Post- Development

0.100

0.128

### Post- Development with Detention



# APPENDIX C

## Proposed Detention Tank Diagram

