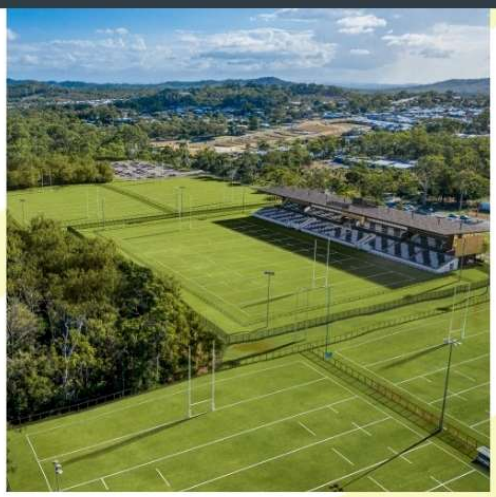
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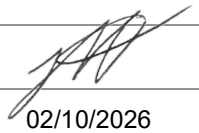


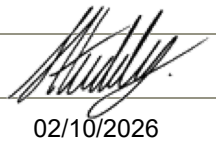
114 & 122-136 Binnies Road / 1-63 Bryants Road & 101 Jackson Court / 128-146 Bryants Road, Ripley

Stormwater Infrastructure Master Plan

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Executive Summary

KDL Property Group Pty Ltd engaged Burchills Engineering Solutions to prepare a Stormwater Infrastructure Master Plan (SW IMP) in response to Ipswich City Council's Request for Information for application 11092/2026/PDA. The application seeks approval for a residential subdivision at Binnies Road, Ripley. The SW IMP extends to neighbouring KDL land holdings at Jackson Court and Bryants Road and establishes stormwater quantity, stormwater quality, waterway and flood management strategies for the three subject Sites within the Ripley Valley Priority Development Area.

The subject Sites are located within the broader Deebing Creek and Bundamba Creek catchments. A review of surrounding development applications and Council's Local Government Infrastructure Plan identified no planned trunk stormwater infrastructure or existing regional treatment devices requiring integration with the proposed developments. The proposed strategy therefore provides for site-based management, with opportunities to consolidate infrastructure considered where appropriate.

Stormwater Quantity
Stormwater quantity management will comprise detention infrastructure designed to ensure post-development peak discharge does not exceed pre-development peak discharge at the identified Lawful Points of Discharge. Detention may be provided through offline basins or online waterway culvert crossings, subject to site-specific assessment. Device selection will consider hydraulic performance, environmental impacts, capital and maintenance costs, lot yield and opportunities to service broader contributing catchments.

Stormwater Quality
Stormwater quality treatment is proposed through bioretention basins for freehold lots and roads, with underground proprietary treatment systems also considered for Community Title Scheme developments. Treatment infrastructure will target pollutant load reductions of 80% for total suspended solids, 60% for total phosphorus, 45% for total nitrogen and 90% for gross pollutants. Infrastructure servicing freehold development is proposed to be dedicated to Council, whilst devices servicing Community Title Scheme developments will remain privately owned and maintained by the Body Corporate.

Waterways
Waterway management will prioritise retention of stable reaches and vegetation, rehabilitation of degraded areas and maintenance of drainage function. Reconstruction or stabilisation will be considered where required to address active or anticipated erosion risks, heavily modified channels, existing dams and impoundments, future maintainability or safe and stable development interfaces. Site-specific investigations will inform the final treatments, including fish-passage provisions where applicable, riparian corridor function and management of potentially dispersive subsoils.

Flooding
Hydraulic Impact Assessments are proposed for the subject Sites using sub-models of the relevant Council flood studies. The flood management objectives include no loss of floodplain storage and no material worsening of external flood risk or hazard. External flood level increases will be targeted at no greater than 10 mm, with justification required for any exceedance. Cross-drainage blockage sensitivity will also be assessed. Proposed dwellings are to achieve a minimum 0.5 m freeboard above the 1% AEP design flood level and remain above the assessed 1% AEP climate change flood level.

This SW IMP establishes the objectives and performance targets to guide subsequent development applications and detailed design. Development extents and infrastructure layouts remain preliminary, with final device selection, sizing and waterway treatments subject to further investigation, modelling and demonstration that the nominated performance targets are achieved.

Table of Contents

1. Introduction 1
   1.1 Background 1
      1.1.1 Policy and Legislative Context 1
      1.1.2 Purpose and Scope 1
2. Site Detail 2
   2.1 Location 2
   2.2 Existing Land Uses and Topography 3
      2.2.1 Binnies Road 3
      2.2.2 Jackson Court 4
      2.2.3 Bryants Road 5
3. Regional Context 6
   3.1 Application Review 6
      3.1.1 123-131 Binnies Road, Ripley 6
      3.1.2 144 Binnies Road, Ripley 7
      3.1.3 16B Jackson Court 7
      3.1.4 Ripley Valley Masterplan 8
   3.2 Local Government Infrastructure Plan 10
   3.3 Integration with Regional Development 10
   3.4 Ripley Valley PDA Scheme 10
4. Stormwater Management Strategy 12
   4.1 Stormwater Management Objectives 12
   4.2 Stormwater Quantity Management 13
      4.2.1 Lawful Point of Discharge 13
      4.2.2 Proposed Mitigation Strategy 15
   4.3 Stormwater Quality Management 17
      4.3.1 Proposed Treatment Strategy 17
   4.4 Waterway Management 18
      4.4.1 Proposed Strategy 18
   4.5 Flood Management 20
      4.5.1 Proposed Mitigation Strategy 20

Tables

Table 4.1 Stormwater Management Objectives and Performance Targets 12

Figures

Figure 2.1 Site Locality Map 2
Figure 2.2 Binnies Road Site Topography 3
Figure 2.3 Jackson Court Site Topography 4
Figure 2.4 Bryants Road Site Topography 5

Figure 3.1 123-131 Binnies Road Stormwater Management 6
Figure 3.2 16B Jackson Court Flood Management 7
Figure 3.3 Ripley Valey Stage 16A 8
Figure 3.3 Ripley Valley Masterplan Layout (extract from Water Technology report dated November 2022) 8
Figure 3.4 Ripley Valley Stages 2-5 Flood Model Layout (extract from Water Tech report dated November 2022) 9
Figure 3.5 Ripley Valley Masterplan 1% AEP Climate Change Flood Level Results (extract from Water Technology report dated November 2022) 9
Figure 3.7 Ripley Valley PDA Scheme – Structure Plan 10
Figure 3.8 Ripley Valley PDA Scheme – Values map 11
Figure 4.1 Binnies Road Lawful Points of Discharge 13
Figure 4.2 Jackson Court Lawful Points of Discharge 14
Figure 4.3 Bryants Road Lawful Points of Discharge 14
Figure 4.4 Conceptual Comparison of Offline Detention Basin Tool vs Online Culvert Crossing 15
Figure 4.5 Indicative Binnies Road Stormwater Management Strategy Layout 16
Figure 4.6 Indicative Binnies Road Stormwater Management Strategy Layout 16
Figure 4.7 Indicative Jackson Court Stormwater Management Strategy Layout 17
Figure 4.8 Conceptual Stormwater Quality Device Comparison 18
Figure 4.9 Conceptual Waterway Sections 20
Figure 4.10 Bundamba and Deebing Creeks Catchment Ridgeline 21
Figure 4.11 Ipswich City Council Flood Risk and Overland Flow Mapping (Ipswich City Plan 2025) 21

1. Introduction

KDL Property Group Pty Ltd engaged Burchills Engineering Solutions to prepare a Stormwater Infrastructure Master Plan (SW IMP) in support of a Development Application (DA) Request for Information (RFI) response. The SW IMP was requested by Ipswich City Council (the EDQ Delegate for the Ripley PDA) in Item 1 of the RFI (app ref. 11092/2026/PDA) dated 12 August 2026 over the application associated with 114 & 122-136 Binnies Road, Ripley. The subject application seeks a Development Permit for Reconfiguring a Lot to facilitate a residential subdivision comprising residential lots, associated roads, open space, drainage reserves, utility infrastructure and land identified for future medium density residential development. This SW IMP was extended to consider neighbouring KDL land holdings and as such covers the following addresses:

- 114 & 122-136 Binnies Road, Ripley
- 1-63 Bryants Road & 101 Jackson Court, Ripley
- 128-146 Bryants Road, Ripley

1.1 Background

1.1.1 Policy and Legislative Context

The strategies proposed in this SW IMP were developed to address the applicable local, state and national standards and guidelines outlined below.

- National Standards and Guidelines
  - Australian Rainfall & Runoff: A Guide to Flood Estimation Version 4.2 (Ball J, 2016);
- State Standards and Guidelines
  - State Planning Policy (DILGP, 2017);
  - Environmental Protection Act (Water and Wetland Biodiversity) Policy (2019);
  - Queensland Urban Drainage Manual (QUDM) Fourth Edition (IPWEAQ, 2017);
- PDA/Other Standards and Guidelines
  - Ripley Valley Development Scheme (1 July 2025)
  - PDA Guideline No. 13 Engineering Standards (EDQ, 2015);
  - PDA Guideline No. 15 Protection Flood and Storm Tide Inundation (EDQ, 2015);
  - MUSIC Modelling Guidelines (Water by Design, 2018);
  - Bioretention Technical Design Guidelines (Water by Design, 2014)
  - Guidelines for the Construction and Establishment of Bioretention Systems and Wetlands (Water by Design, 2023);
  - Best Practice Erosion and Sediment Control (IECA, 2016).
- Local Standards and Guidelines
  - Ipswich City Plan 2025
- MUSIC Modelling Guidelines (Water by Design, 2019), and

1.1.2 Purpose and Scope

The purpose and scope of this report is summarised below:

- Review industry-standard literature including local, state and national guidelines and standards.
- Define stormwater management objectives for the subject Sites that meet the requirements of the relevant guidelines.
- Define measurable metrics and performance targets that demonstrate that the management objectives are achieved.
- Outline key Site management strategies, pathways and opportunities to meet the management objectives whilst retaining flexibility in delivery flexibility.

2. Site Detail

2.1 Location

The investigation areas under this report are comprised of three separate sites:

- **Site 1:** 114 & 122-136 Binnies Road, Ripley (Lot 356 on S3173 & Lot 2 on SP114885).
- **Site 2:** 1-63 Bryants Road & 101 Jackson Court, Ripley (Lot 359 & Lot 360 on S3173).
- **Site 3:** 128-146 Bryants Road, Ripley (Lot 361 on S3173)

The proposed development Sites are located within the Ripley Valley Priority Development Area (PDA). Site 1 will hereby be referred to as the Binnies Road project site, Site 2 will be hereby referred to as the Jackson Court project site, and Site 3 will be referred to as the Bryants Road project site.

The Binnies Road Site occupies a total area of approximately 17.07 ha and is bounded by Binnies Road to the north, Bryants Road to the south, and freehold land to the east and west.

The Jackson Court Site occupies a total combined lot area of approximately 37.39 ha and is bounded by Jackson Court to the north, Wensley Road to the east, Bryants Road to the south and freehold land to the west.

The Bryants Road Site occupies a total area of approximately 12.14 ha and is bounded by Bryants Road to the north, Centenary Highway to the south, and freehold land to the east and west.

Figure 2.1 below identifies the locations of the subject Sites.

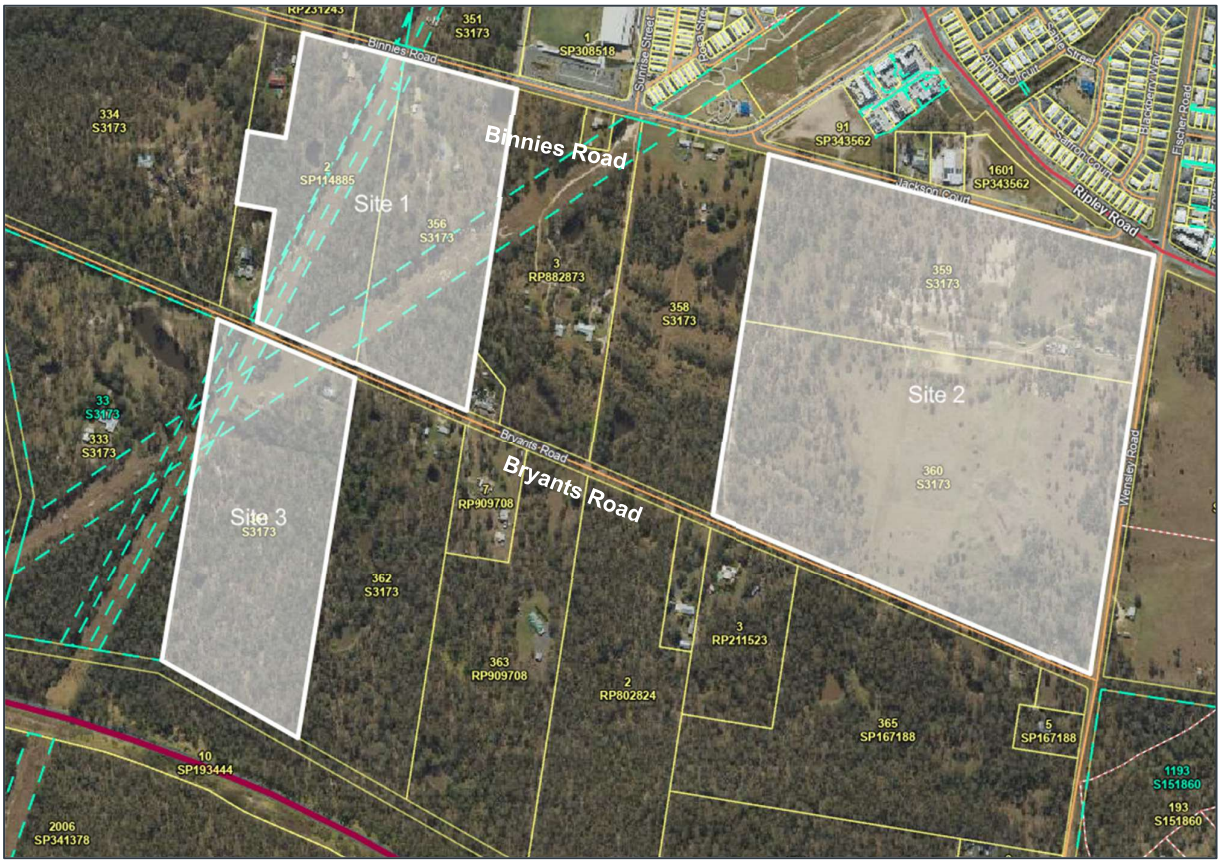


Figure 2.1 Site Locality Map

2.2 Existing Land Uses and Topography

2.2.1 Binnies Road

Existing surface levels vary between approximately 54 mAHD and 72 mAHD. The Site generally falls from east to west, with a small portion of the Site falling eastward due to a natural ridgeline bisecting the parcels. The western catchment forms part of the Deebing Creek catchment, whilst the eastern catchment forms part of the Bundamba Creek catchment.

The existing Site contours are shown below in Figure 2.2.

The Site is comprised of a combination of cleared corridors (electricity transmission easements) and medium density vegetation cover. Existing dwellings and access tracks are observed across the Site and are anticipated to be removed as part of future development works.

Upstream catchments are discharged to and conveyed through the Site via informal overland flow paths.

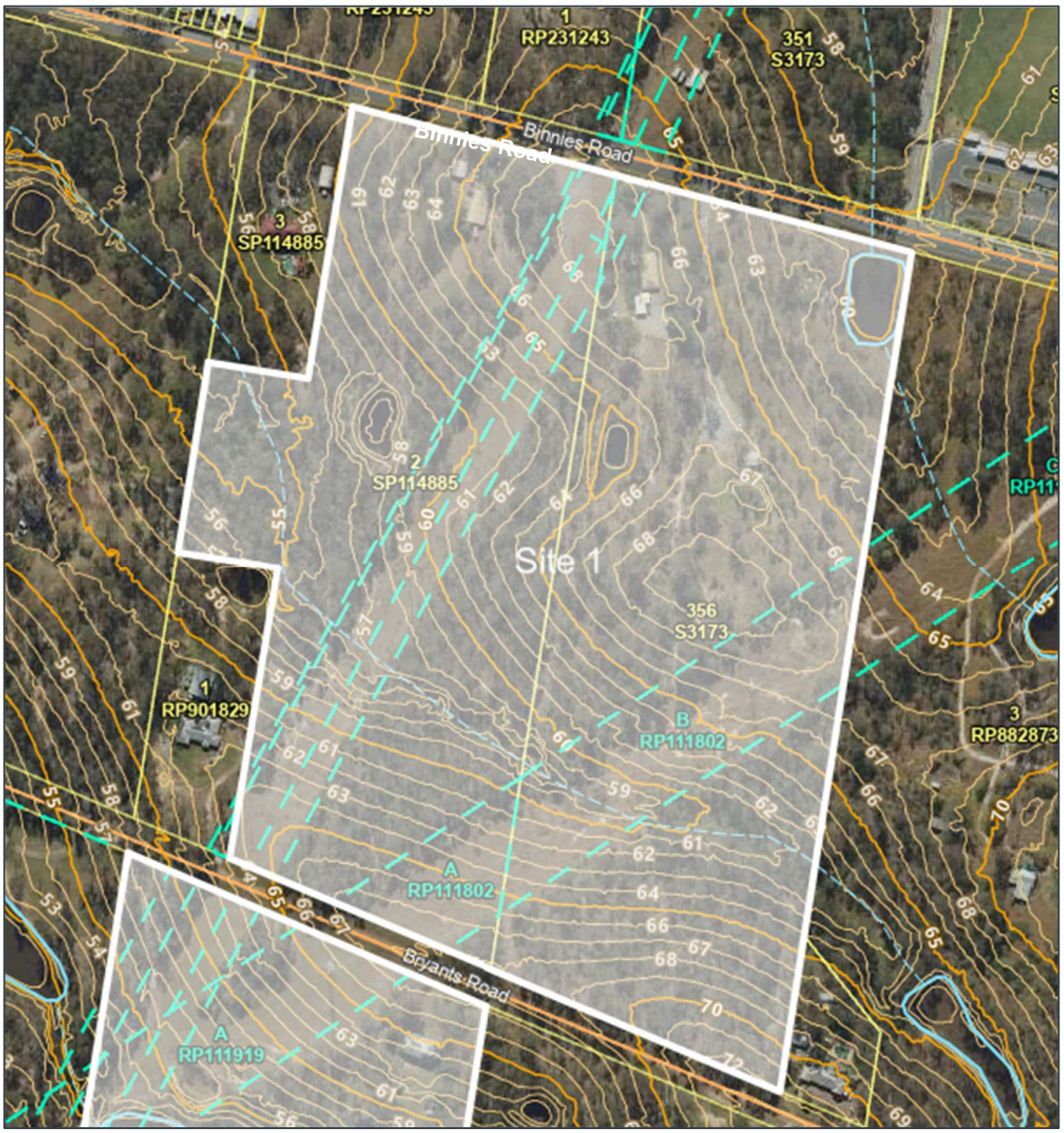


Figure 2.2 Binnies Road Site Topography

2.2.2 Jackson Court

Existing surface levels vary between approximately 61 mAHD and 96 mAHD. The land is characterised by undulating to steep terrain, with several ridgelines, drainage gullies and established vegetation covering the Site. There are several existing dwellings and access tracks within the land parcels that will be removed as part of future development works.

The existing Site contours are shown below in Figure 2.3.

The Site is situated at the top of the catchment and is encumbered only by a minor external catchment along the western boundary which discharges as sheet flow.

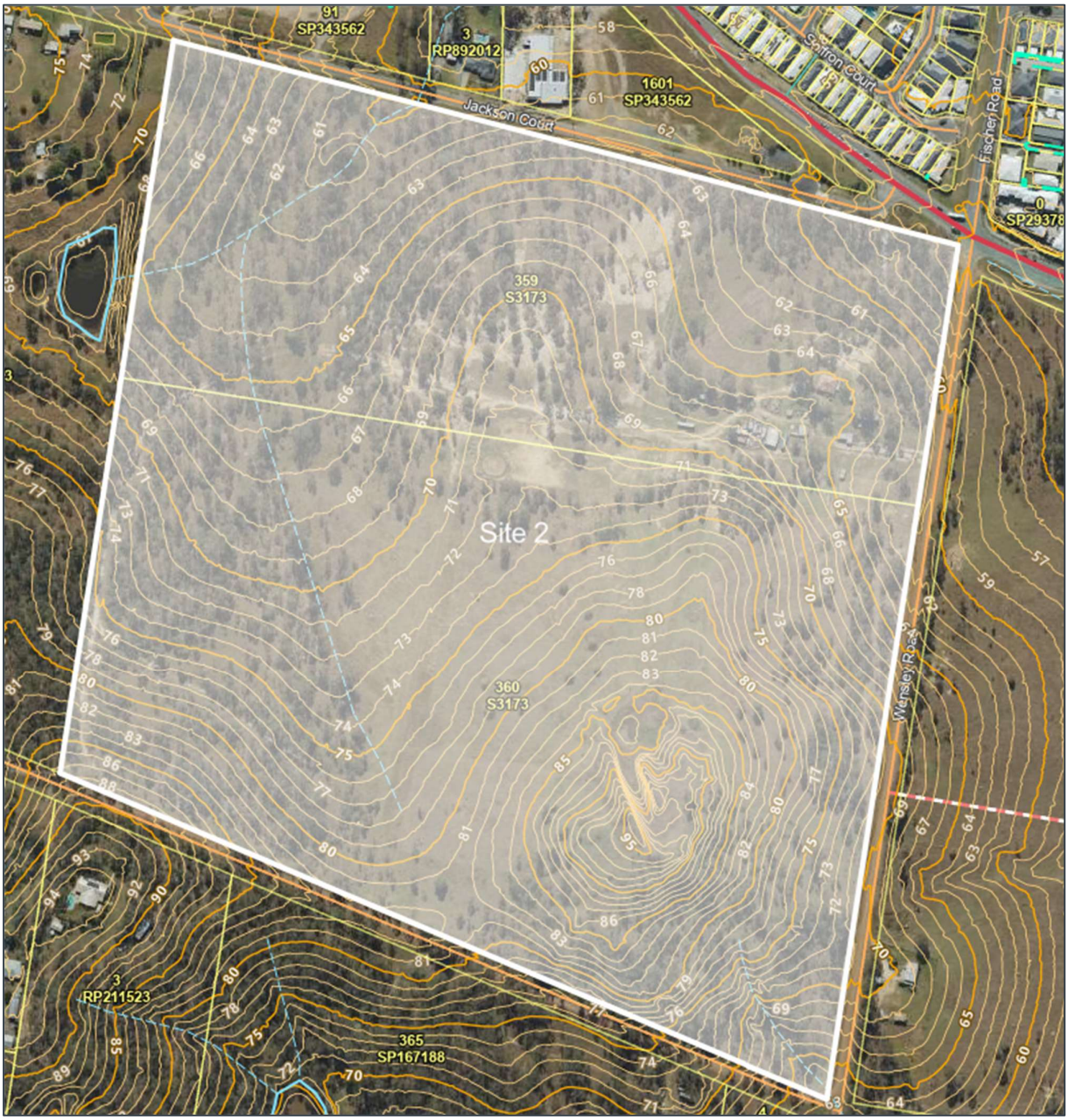


Figure 2.3 Jackson Court Site Topography

2.2.3 Bryants Road

The existing surface levels vary between approximately 51 mAHD to 74 mAHD. Local terrain generally falls towards the north with a small portion of the Site at the Bryants Road frontage falling back towards the South.

The existing Site contours are shown below in Figure 2.4.

The eastern neighbouring land parcel discharges runoff to the Site which is conveyed via an informal overland flow path. There are several manmade waterbodies and other manipulations along this flow path, with discharge from the Site occurring at the western Site boundary which forms part of the Deebing Creek catchment.

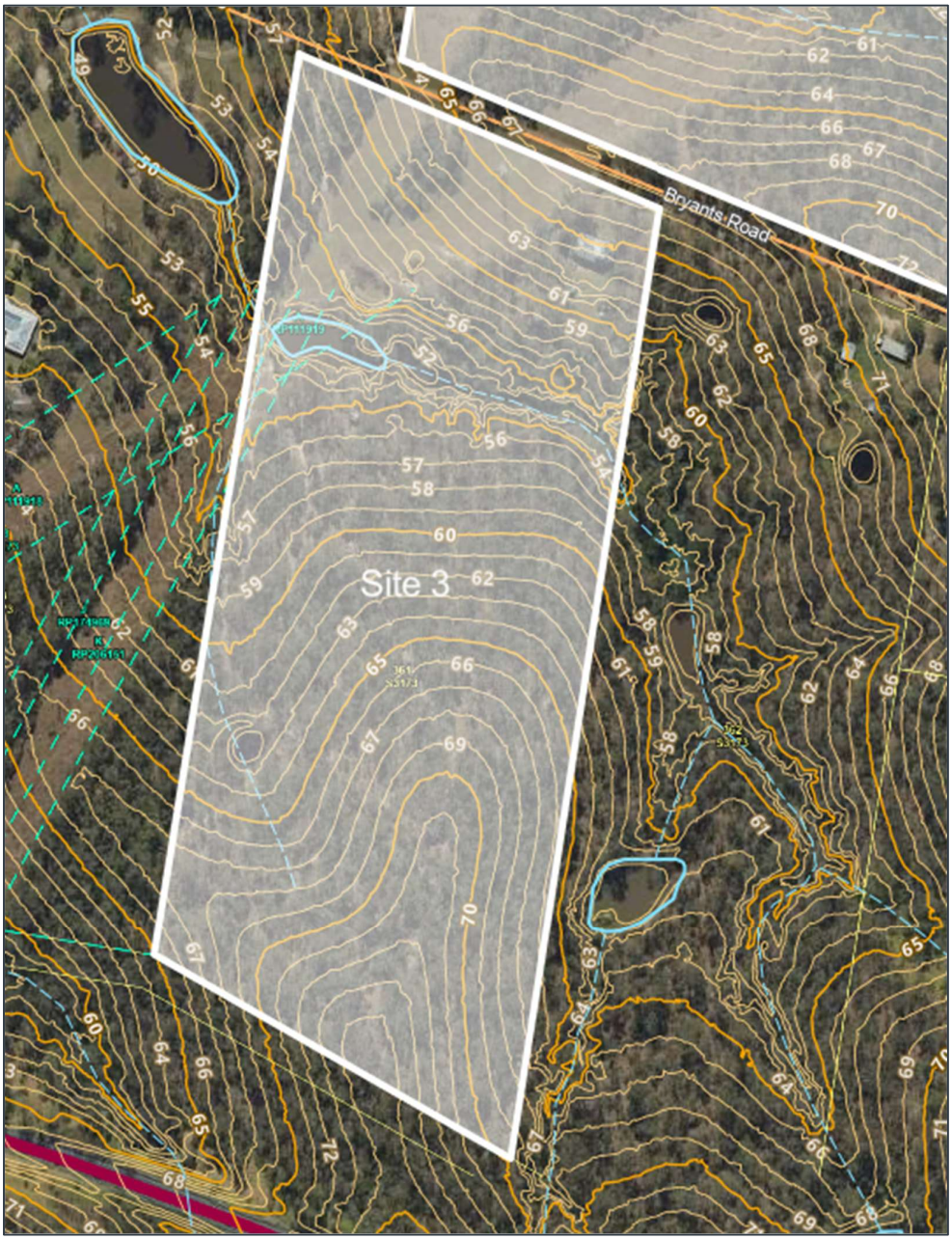


Figure 2.4 Bryants Road Site Topography

3. Regional Context

Several surrounding land parcels have been submitted to the MEDQ Delegate for development assessment. A brief summary of the applications relevant to stormwater and flooding are provided below. Discussion of how the proposed Binnies, Jackson and Bryants developments integrate with these applications is discussed later in this section.

A review of the Council LGIP was also undertaken to verify whether future trunk drainage or stormwater infrastructure is planned for.

3.1 Application Review

3.1.1 123-131 Binnies Road, Ripley

A PDA application was made over 123 Binnies Road, Ripley (Application Ref. 5399/2023/PDA) for urban residential development. A Site-Based Stormwater Management Plan was prepared for SEG Land Holdings Pty Ltd by Bornhorst + Ward on July 2023 and submitted to ICC for assessment.

The proposed urbanisation of the Site was proposed to be managed for stormwater quantity and stormwater quality by discharging to the bioretention and detention basin located in the north-eastern corner of the adjacent 131 Binnies Road, Ripley, development. The 131 Binnies Road development is approved and undergoing construction.

There is no contributing upstream catchment discharge relevant to 123 Binnies Road, however there is a constructed drain along the eastern boundary of the 131 Binnies Road development which conveys upstream catchment discharge. It is noted that the discharge from the KDL Binnies Road development ultimately reports to this drain.

An extract of the Bornhorst + Ward civil drawings are provided below in Figure 3.1 which provided context to the stormwater management strategy for the Site.

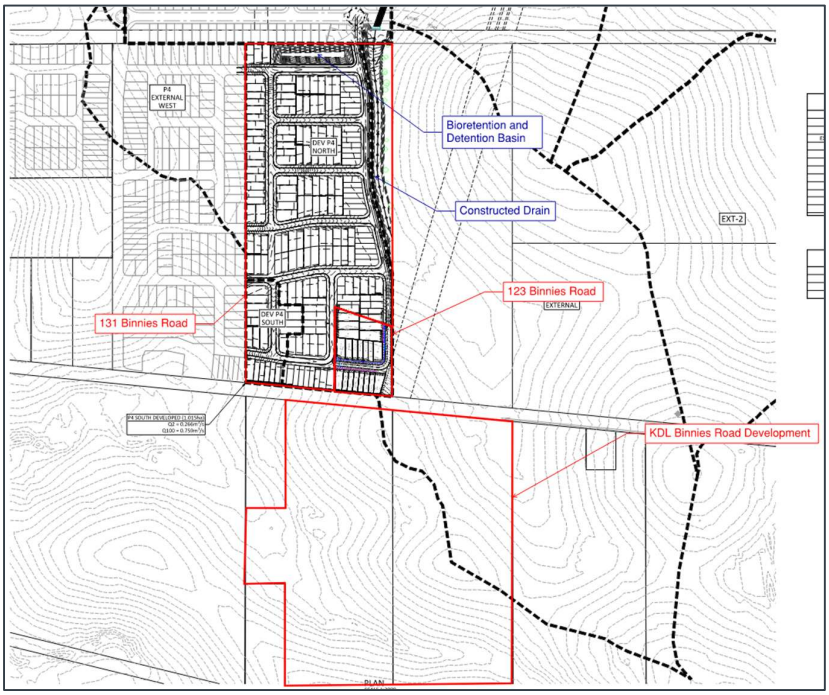


Figure 3.1 123-131 Binnies Road Stormwater Management

3.1.2 144 Binnies Road, Ripley

A PDA application (Application Ref. 12193/2023/PDA) had been submitted over the parcel of land located at 144 Binnies Road, Ripley, in 2023, however this application was ultimately withdrawn following a Council RFI. The development had sought to completely fill the existing watercourse through the land parcel.

3.1.3 16B Jackson Court

A PDA application (Application Ref. 13883/2024/PDA) was submitted over the parcel of land located at 16B Jackson Court, Ripley. This development is located immediately north of the Jackson Court Site on the opposite side of the road reserve, and consists of several new multiple dwelling allotments.

A Stormwater Management Plan was prepared by HCE Engineers for AR Developments Pty Ltd on 14 May 2025. Stormwater quantity and quality management is addressed through an underground tank and cart system in the north-west corner of the Site, controlling flow and treating runoff before entering the receiving waterway.

A flood assessment was undertaken by DCF Engineering and documented in the Flood Modelling Assessment report dated 8 September 2026. A cross-drainage upgrade is proposed at Ripley Road north of 16B Jackson Court, this upgrade was considered in the flood assessment of the Site which demonstrated no increases to flood levels within 10 mm in the 1% AEP. An extract from the flood assessment report is provided below in Figure 3.2.

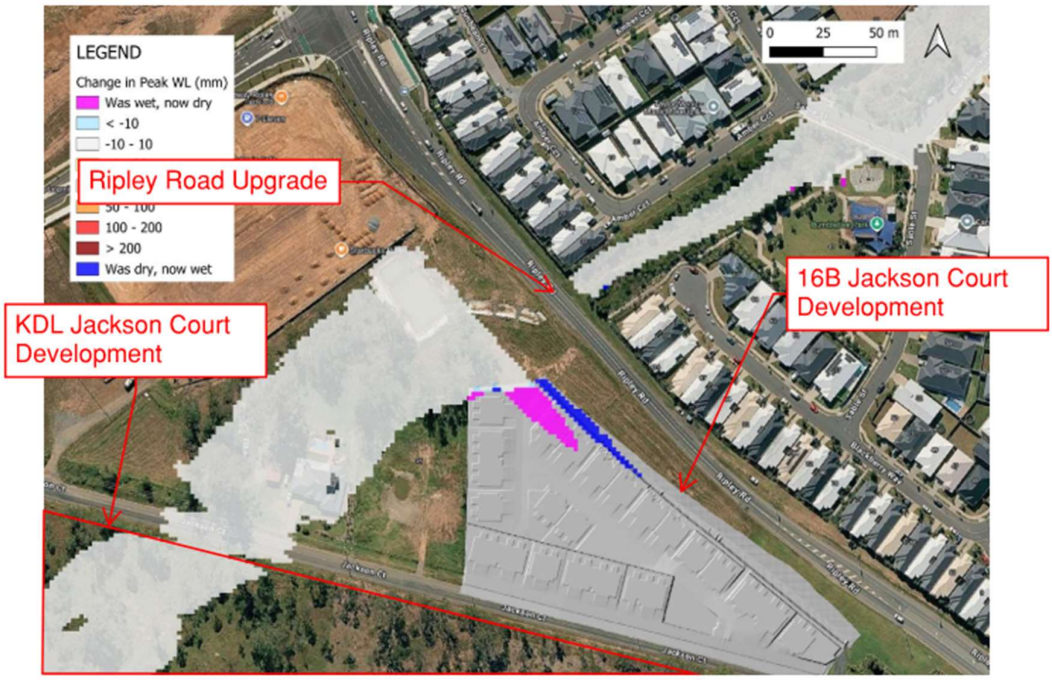


Figure 3.2 16B Jackson Court Flood Management

7136/2023/PDA was approved December 2024 referred to in application documentation as Ripley Valley Stage 16A as shown in Figure 3.3. The development seeks to rehabilitate and discharge into the flow path downstream of Jackson court.



Figure 3.3 Ripley Valey Stage 16A

3.1.4 Ripley Valley Masterplan

A series of PDA applications have been made over several lots downstream of Ripley Road north-east of the 16A and 16B Jackson Court developments. This area forms Stages 2-5 of the Ripley Valley Masterplan as shown in the extract from the report named *Ripley Road, Ripley – Stormwater Management and Flood Investigations (Water Technology, November 2022)* as shown in Figure 3.4 below. This report was prepared and submitted with the application referenced as 14284/2021/PDA.

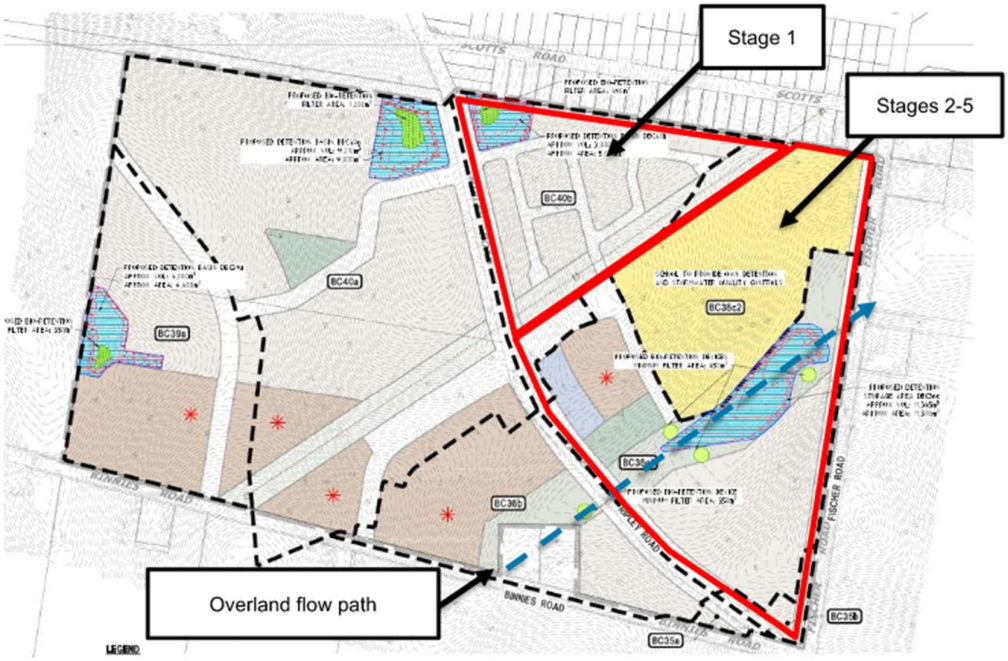


Figure 3.4 Ripley Valley Masterplan Layout (extract from Water Technology report dated November 2022)

A stormwater and flood investigation report was prepared by Water Technology (as referenced above) which outlines how flooding and stormwater runoff is proposed to be managed. A drainage channel and several key culvert crossings are proposed to form the flood management solution for the Site. The TUFLOW model layout is provided below in Figure 3.5. The report specifies that the upstream catchment south of Jackson Court (the proposed KDL development Site as part of this SW IMP) was adopted as fully urbanised in accordance with the Ipswich City Council Planning Scheme. Additionally, the 1% AEP climate change sensitivity mapping

results indicate that the drainage channel constructed with Stages 2-5 can safely convey this event without inundating private dwellings adjacent the channel, or existing dwellings downstream.

It is noted that whilst the Ripley Valley development can manage 1% AEP climate change discharge, there are several existing dwellings fronting Jackson Court located within the flood extent associated with this event as shown in Figure 3.6.

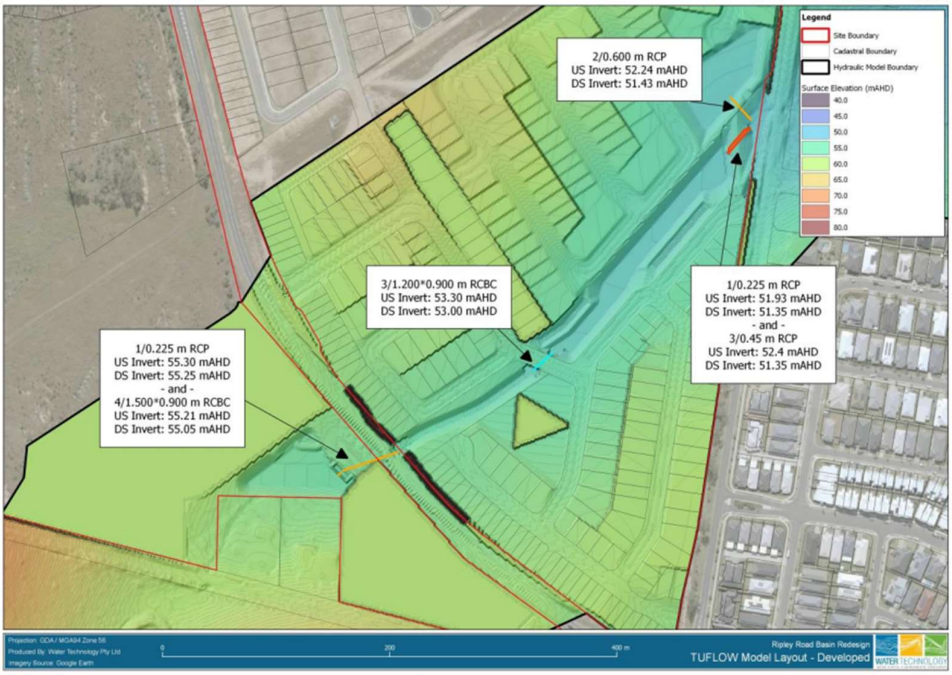


Figure 3.5 Ripley Valley Stages 2-5 Flood Model Layout (extract from Water Tech report dated November 2022)

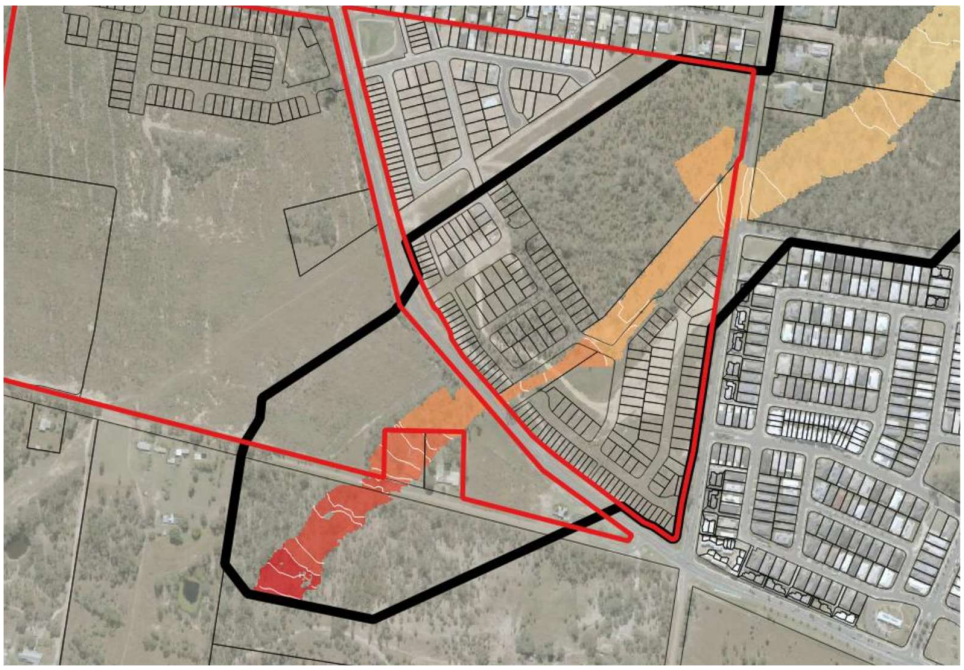


Figure 3.6 Ripley Valley Masterplan 1% AEP Climate Change Flood Level Results (extract from Water Technology report dated November 2022)

3.2 Local Government Infrastructure Plan

A review of the Ipswich City Council Local Government Infrastructure Plan indicates there is no planned trunk infrastructure relevant to stormwater, waterways or flooding management.

3.3 Integration with Regional Development

Review of the surrounding applications and regional intent of Ripley indicates there are no specific requirements or considerations for interfacing from a stormwater, waterways or flooding management perspective.

The downstream environments within Bundamba are typically reconstructed channels with site-based detention, there are no regional devices that need to be considered. Asset design is generally consistent with providing safe conveyance of the 1% AEP climate change event.

The downstream environments within Deebing Creek are mostly undeveloped and retained vegetation, with some urbanisation much further down in the catchment. There are no regional devices or constructed waterways that need to be considered as part of this report.

3.4 Ripley Valley PDA Scheme

Review of the of the Ripley Valley PDA Development scheme shows two second order streams, and no major watercourses or significant riparian corridors identified across the subject sites as shown in Figure 3.7 and Figure 3.8.

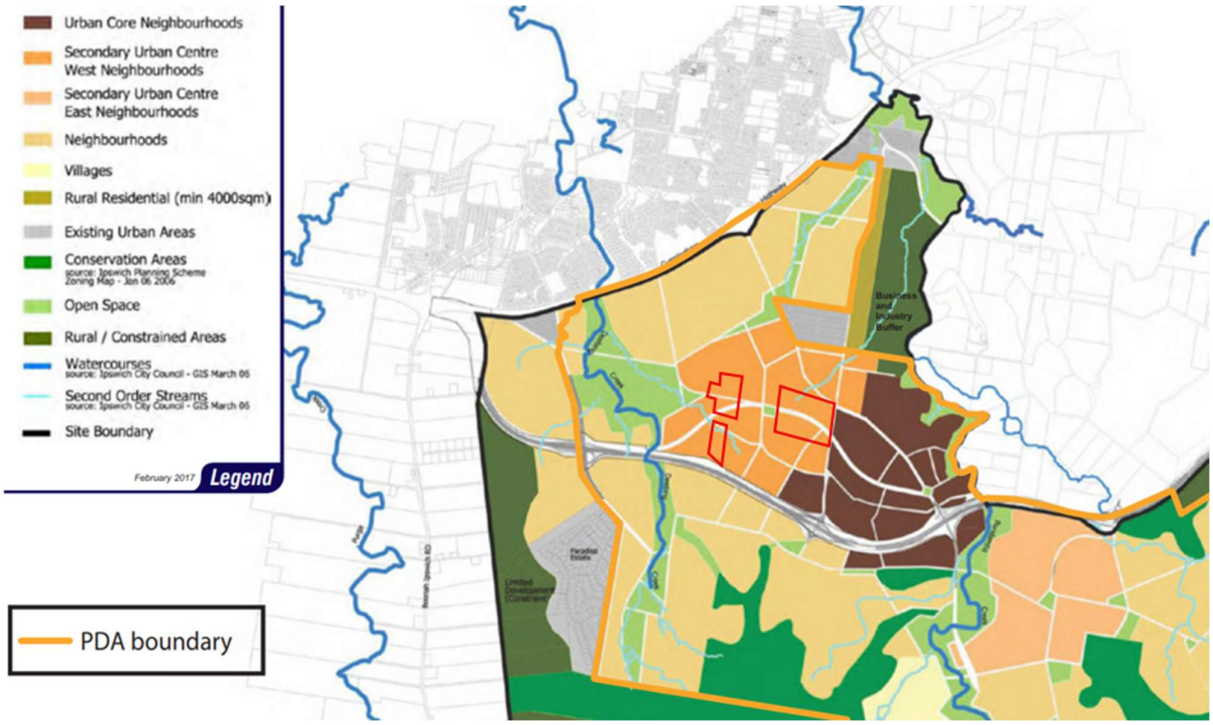


Figure 3.7 Ripley Valley PDA Scheme – Structure Plan

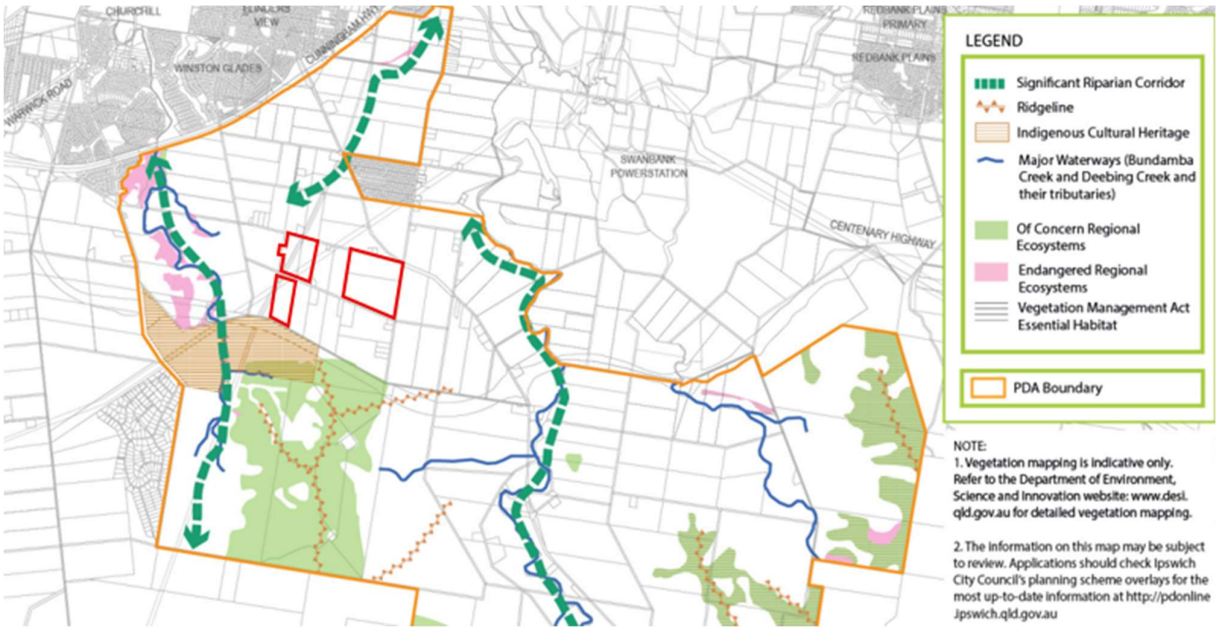


Figure 3.8 Ripley Valley PDA Scheme – Values map

4. Stormwater Management Strategy

4.1 Stormwater Management Objectives

The proposed stormwater management strategy for the subject Sites consists of objectives and performance targets prepared in accordance with the relevant standards and guidelines. The proposed objectives and performance targets are outlined in Table 4.1.

Table 4.1 Stormwater Management Objectives and Performance Targets

Element	Objective	Performance Target
Stormwater Quantity	> Mitigation of stormwater runoff of new urban areas.	> Mitigation of peak flows at the lawful point of discharge such that post-development discharge does not exceed pre-development discharge.
Stormwater Quality	> Stormwater quality treatment of new urban areas.	> Achieve the following pollutant load-based reduction targets prior to discharge to the receiving waterway. o Total suspended solids: 80% o Total phosphorus: 60% o Total nitrogen: 45% o Gross pollutants: 90% > Removal of 80% of sediment from runoff prior to discharge to the receiving waterway.
Waterways	> Conservation and management of overland flow paths and waterways, riparian corridors, hydraulic, geomorphic, environmental and ecological values, as well as fish-passage where applicable. > Minimise risk of scour and erosion within waterways.	> Identification of selected waterways and their existing stream order, value and condition, in consultation with key stakeholders. > Retention and rehabilitation of higher order existing waterways (where existing condition is considered good/stable) and minimisation of disturbance including optimisation of pipe outlets or overbank flow points within riparian corridors. > Reconstruction of existing waterways (where existing condition is considered poor and the extent of rehabilitation works are not practicable).
Flooding	> No loss of floodplain storage. > No increase to flood risk or hazard for people and the environment external to the Site. > Management of flood risk within the Site.	> No increase to flood hazard or flood risk in areas external so the Site, unless it can be demonstrated that it does not pose any material worsening of flood conditions. > Flood risk managed in accordance with QUDM and ARR guidelines. > All proposed dwellings to be located a minimum of 0.5 m above the 1% AEP design flood event, and located above the 1% AEP climate change at 2100 sensitivity flood event.

4.2 Stormwater Quantity Management

4.2.1 Lawful Point of Discharge

The Lawful Points of Discharge (LPD) are defined at the following locations and shown in Figure 4.1.

- **Binnies Road**
  - Waterway along the western boundary of the Site.
  - Binnies Road culverts along the northern boundary of the Site.
- **Jackson Court**
  - Jackson Court culverts at a central point along the northern frontage.
  - Jackson Court culverts at the intersection of Jackson Court and Wensley Road.
  - Wensley Road culverts at the southern third of the Wensley Road frontage.
  - Wensley Road culverts at the northern third of the Wensley Road frontage.
  - Overland flow path at the intersection of Wensley Road and Bryants Road.
- **Bryants Road**
  - Within the waterway along the western boundary of the Site.

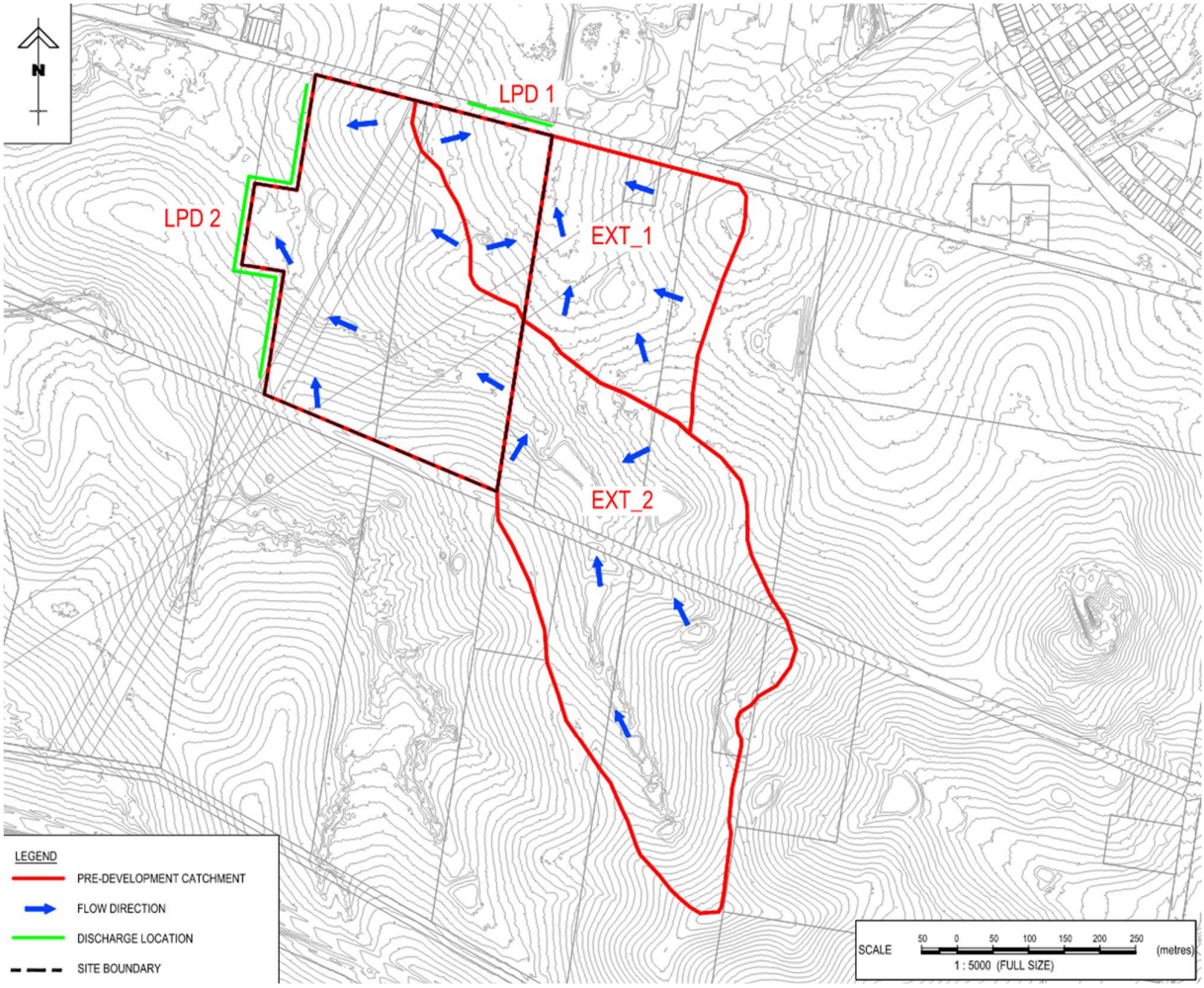


Figure 4.1 Binnies Road Lawful Points of Discharge

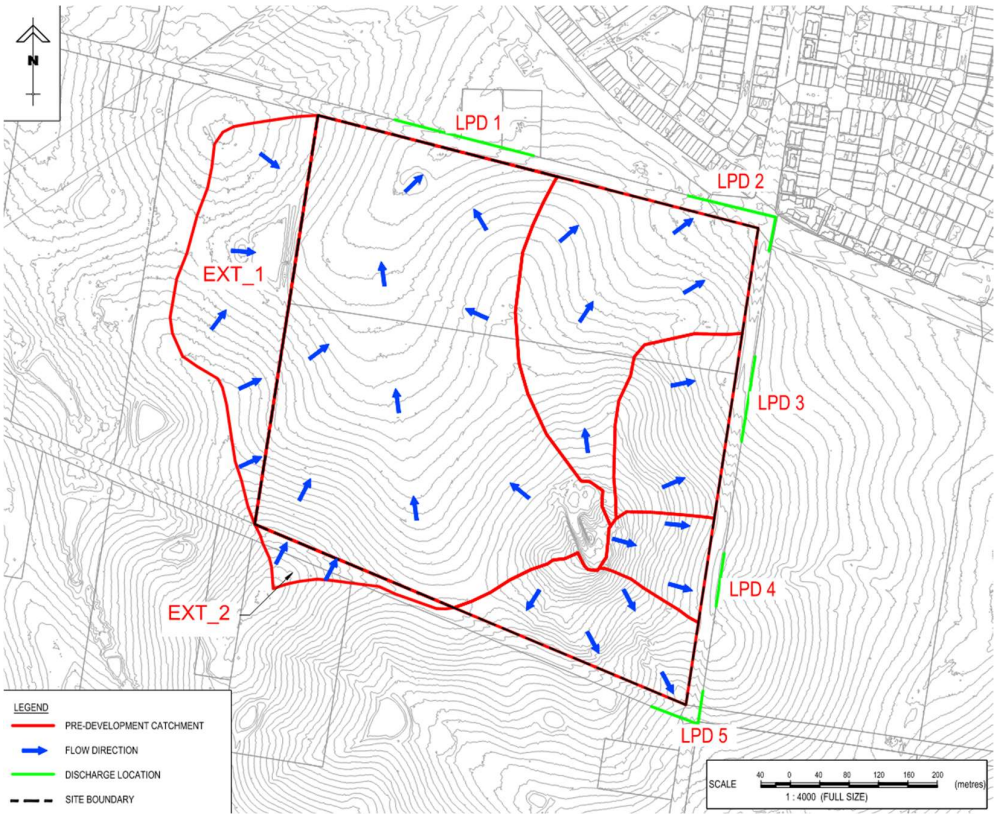


Figure 4.2 Jackson Court Lawful Points of Discharge

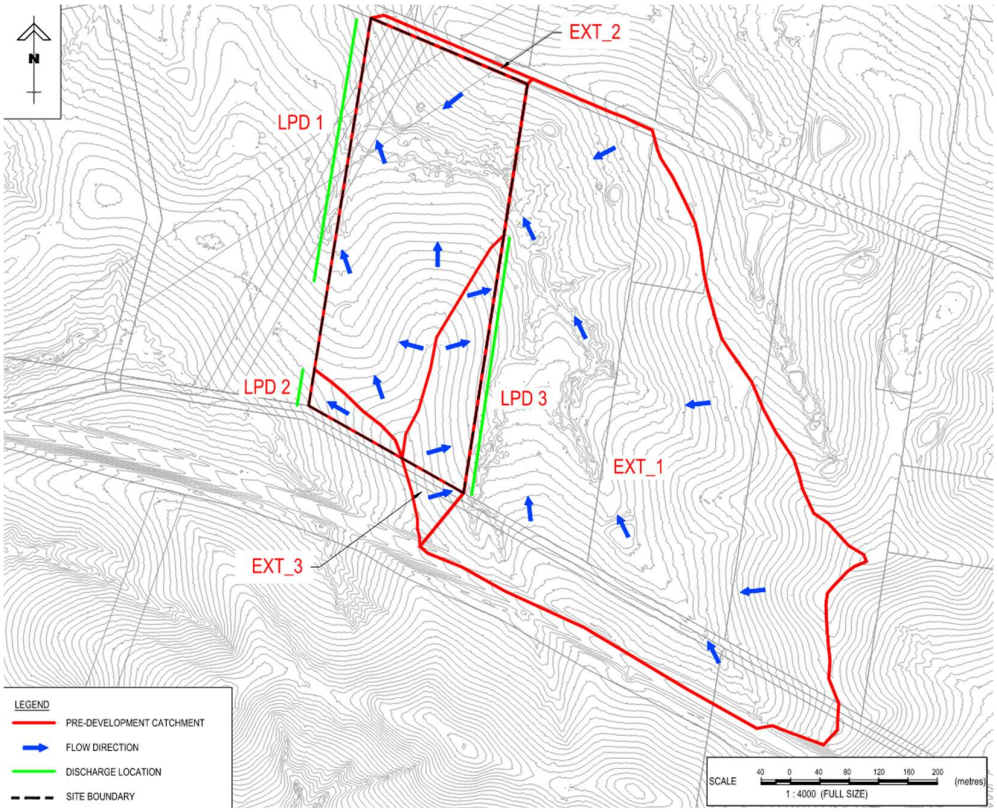


Figure 4.3 Bryants Road Lawful Points of Discharge

4.2.2 Proposed Mitigation Strategy

The works proposed at each of the subject Site's will result in an increase in hardstand areas within the catchment, leading to an intensification of runoff which discharge to various receiving waterways downstream of the works. It is proposed that detention infrastructure will be provided for the developments to ensure the peak flow mitigation targets at the LPD's are met.

Detention infrastructure may be provided as either offline (detention basins) or online (waterway culvert crossings) devices, selected based on the most appropriate solution for each subject Site. Device type selection will consider the below:

- Suitability of the proposed mitigation device to achieving the required management objectives and performance targets.
- Environmental impacts such as loss of vegetation and/or habitat.
- Economic impacts such as capital costs, lot yield outcomes and Councils maintenance burden.
- Whether assets can be consolidated to provide a regional solution to expedite upstream catchment urbanisation.

A conceptual sketch and side-by-side comparison of an offline detention basin vs an online culvert crossing is provided for context below in Figure 4.4.

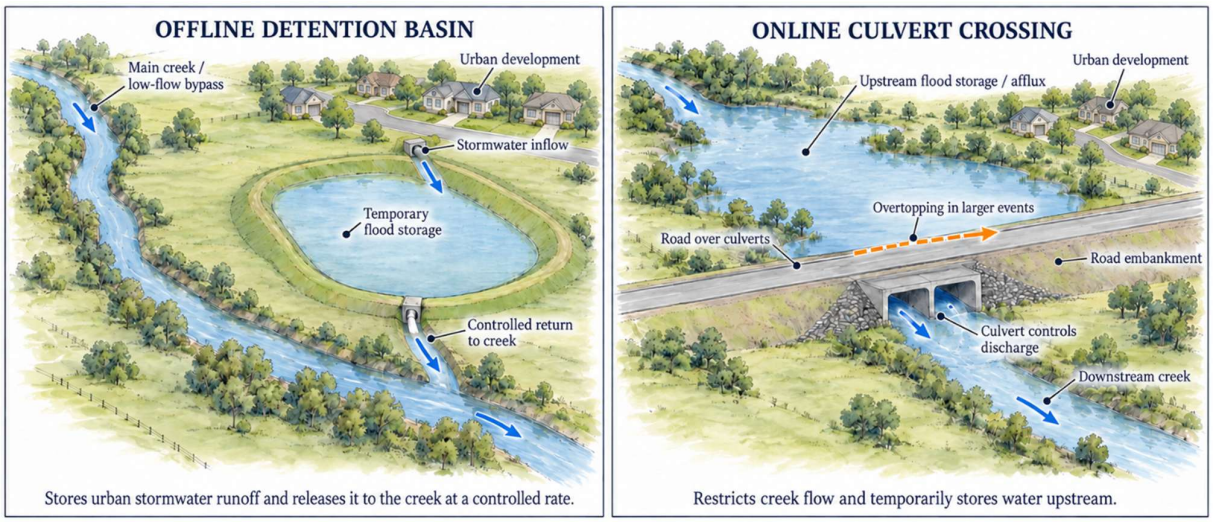


Figure 4.4 Conceptual Comparison of Offline Detention Basin Tool vs Online Culvert Crossing

Any proposed stormwater quantity mitigation measures delivered with standard freehold lots will be located within a suitable drainage reserve and dedicated to Council following the maintenance period. Any proposed mitigation measures for a Community Title Scheme (CTS) development will be retained within private land and maintained by Body Corporate.

A preliminary and indicative markup of the potential development extents and the associated stormwater management devices are provided in Figure 4.5, Figure 4.6 and Figure 4.7. The development extents and proposed devices should be considered preliminary only and are subject to change to suit the constraints and development intent of the Site. The below plans are prepared only to provide context to this SW IMP.

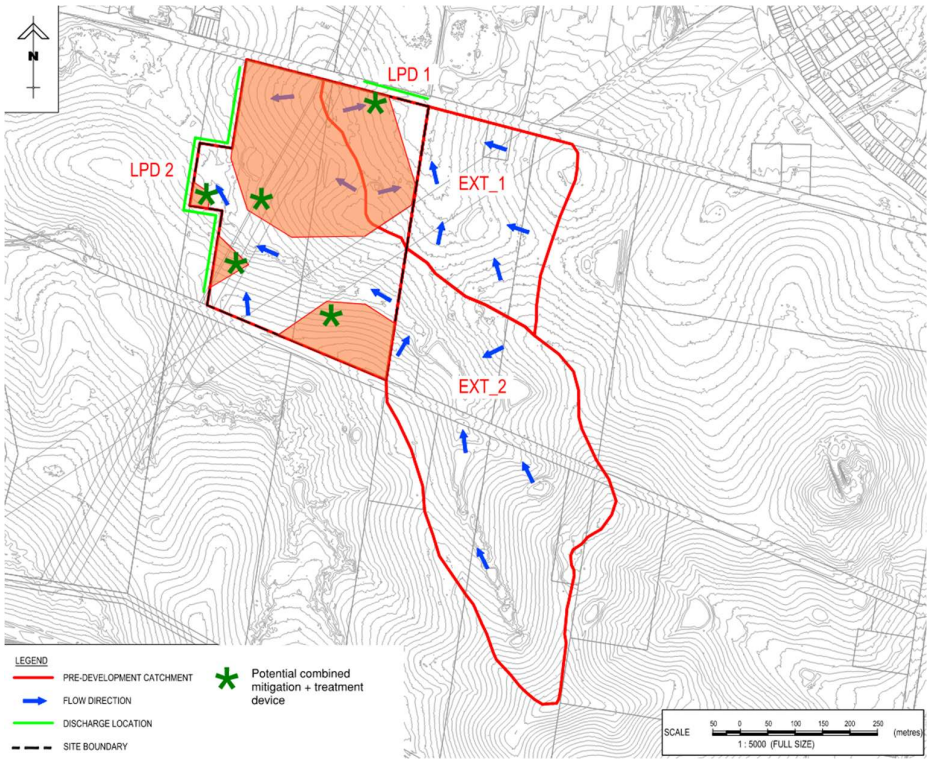


Figure 4.5 Indicative Binnies Road Stormwater Management Strategy Layout

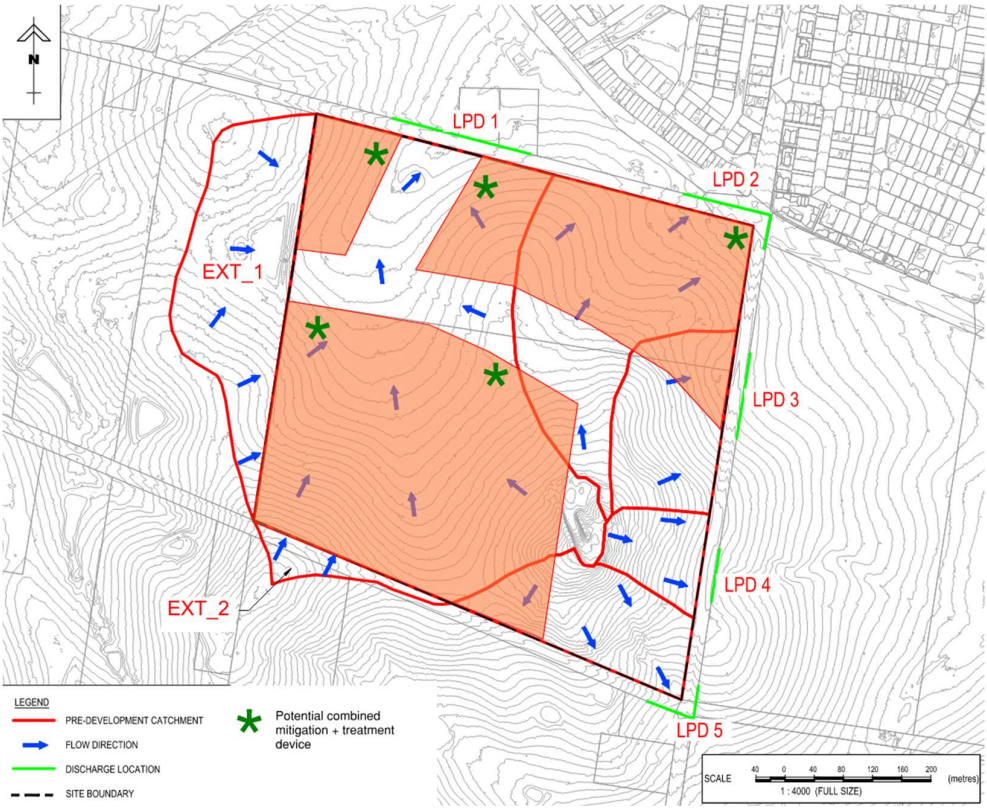


Figure 4.6 Indicative Binnies Road Stormwater Management Strategy Layout

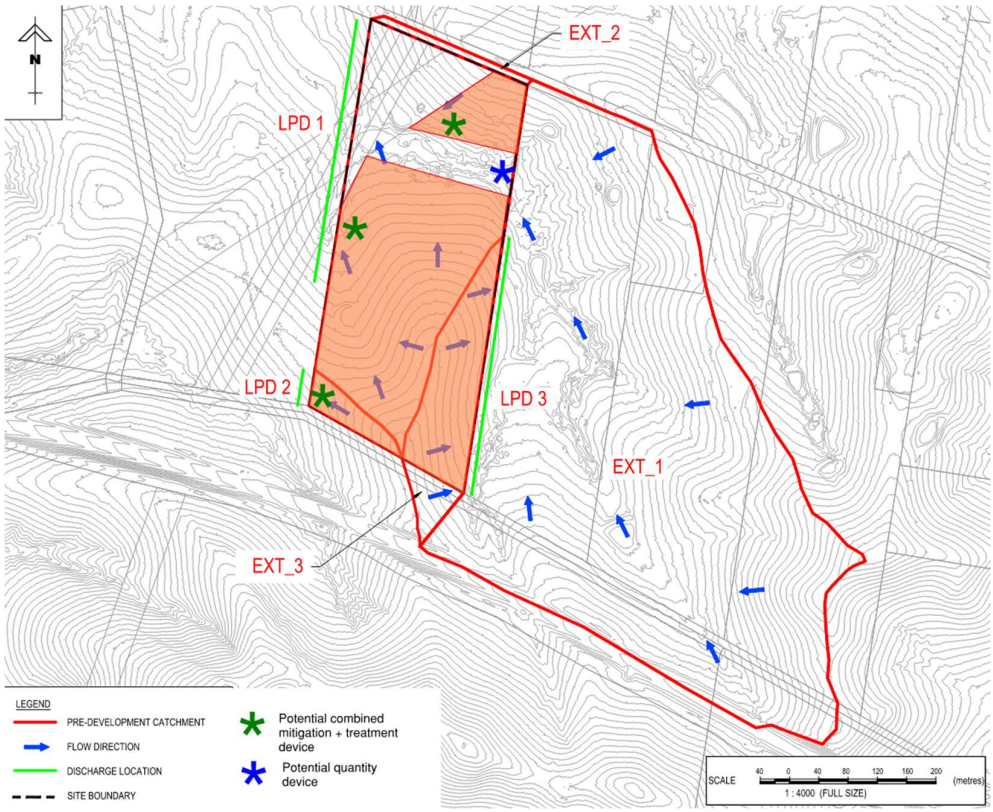


Figure 4.7 Indicative Jackson Court Stormwater Management Strategy Layout

4.3 Stormwater Quality Management

4.3.1 Proposed Treatment Strategy

The stormwater quality performance targets are proposed to be met through local bioretention basins and/or underground proprietary devices provided at development outlets upstream of the receiving waterway. Whilst there are several treatment methods available, a review of the subject Site constraints and opportunities indicated that a treatment train is likely to consist of a bioretention basin or proprietary cart system at the development outlet. There are minimal opportunities to provide alternative treatment methods such as wetlands, swales and reuse opportunities due to existing site constraints.

Bioretention basins are an industry-standard, cost-effective and low-maintenance solution to stormwater quality treatment and is therefore considered suitable to be adopted across the development. It is proposed that bioretention basins will be adopted for treatment of freehold lots and roads which will ultimately be dedicated to Council.

Proprietary devices such as an underground cart system similar to the products offered by Ocean Protect and Atlan may be considered for stormwater quality treatment of a CTS development. Underground proprietary systems offer the benefit of maximising the developable area, however, comes at the expense of a maintenance contract with the product manufacturer which is borne by the Body Corporate entity.

A conceptual comparison of the two proposed stormwater quality treatment device pathways are provided below in Figure 4.8.

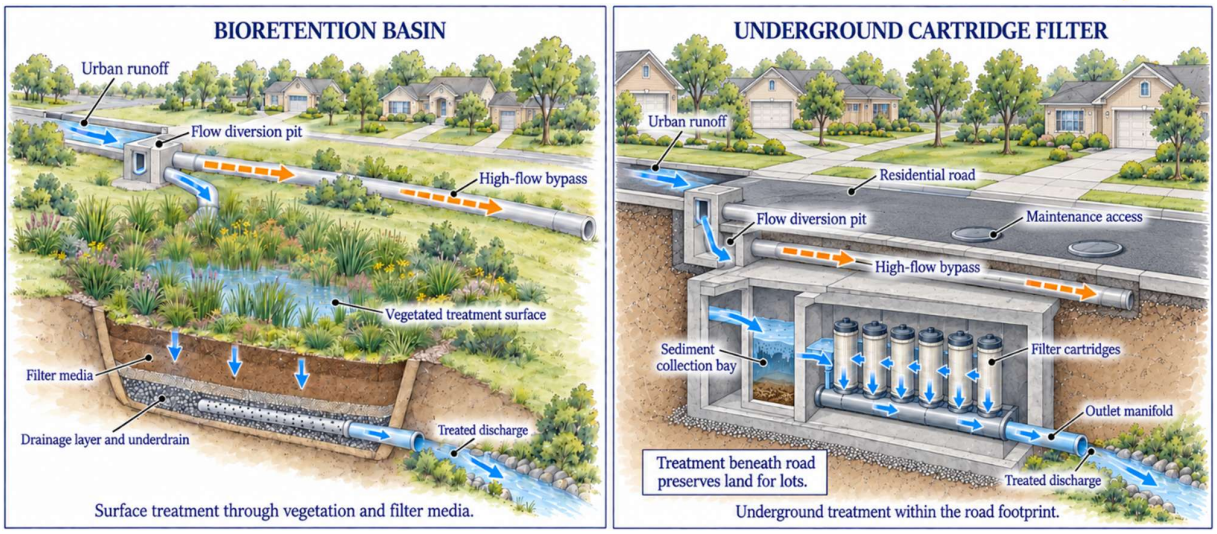


Figure 4.8 Conceptual Stormwater Quality Device Comparison

The benefits and risks associated with adopting a proprietary device for a CTS development will be assessed and documented in the associated Stormwater Management Plan.

The proposed stormwater quality management strategy is in accordance with current best-practise industry-standard measures. A preliminary and indicative layout of potential stormwater quality devices are provided above in Figure 4.5, Figure 4.6 and Figure 4.7. The development extents and proposed devices should be considered preliminary only and are subject to change to suit the constraints and development intent of the Site. The plans are prepared only to provide context for this SW IMP.

4.4 Waterway Management

4.4.1 Proposed Strategy

The proposed sites encompass four separate overland flow/waterway locations within the broader Deebing Creek and Bundamba Creek catchments. Each location has different existing attributes, significance, hydraulic functions and regulatory requirements; therefore a Waterway Strategy will be developed on a site-specific basis. A summary of existing features is as follows.

- **Binnies Road**: Two mapped stream-order 1 watercourses occur within or adjacent to the site, one draining west towards Reedy Creek and Deebing Creek and one draining north towards Bundamba Creek. Reach 1 is a broad, low-confinement waterway that becomes more defined downstream, with localised lateral and gully erosion, scour, head-cutting and historical modification. The reach is a green, low-risk waterway. Reach 2 is a broad valley modified by an existing farm dam and culvert inlet beneath Binnies Road, which interrupt channel continuity and fish passage. SARA has confirmed that Reach 2 is not considered a waterway for fish-passage purposes; however, it should be managed as part of the site's overland-flow and drainage system.
- **Jackson Court**: A broad, shallow and vegetated drainage depression crosses the north-western part of the site. The observed thalweg is east of the State mapped alignment, and no continuous defined bed, banks, persistent pools or low-flow channel were identified. SARA has confirmed that the feature is not a waterway for fish-passage purposes; however, it should be managed as part of the site's overland-flow and drainage system.
- **Bryants Road**: An unmapped overland-flow path joins a mapped green, low-risk waterway affected by an existing farm dam, earth embankment and brick weir or causeway. The mapped waterway is an intermittently flowing, locally incised drainage depression, with the original channel

through the ponded area obscured by sediment and impoundment. SARA has confirmed that fish-passage requirements apply.

The overall management objective is to maintain or improve flow path stability and riparian function while avoiding unnecessary disturbance to stable reaches and providing the required flood immunity to the proposed development. The strategy will retain and rehabilitate selected existing channels and riparian areas of significant where practicable, with reconstruction or stabilisation undertaken only where required to address erosion, development interfaces, drainage constraints or dam-related impacts.

At a high level, the proposed Waterway strategy for each site at the DA phase will consider:

- Ground truthing and assessment of the attributes of higher stream order mapped features to validate significance and value as a waterway or as an overland flow path;
- retention of stable waterway reaches and existing vegetation where practicable or otherwise reconstruction;
- rehabilitation of degraded or disturbed areas using appropriate channel, bank and riparian treatments;
- provision of stable transitions between existing waterways, proposed drainage infrastructure and development areas;
- management of erosion, scour, sediment movement and concentrated overland flow;
- maintenance or improvement of hydraulic conveyance and floodplain connectivity, subject to detailed assessment;
- consideration of fish passage requirements where applicable;
- integration of waterway treatments with stormwater, earthworks, access and landscape design; and
- use of natural or nature-based stabilisation measures where appropriate, supplemented by engineered treatments where site conditions require.

Detailed design will be informed by further survey, hydraulic, geomorphic, geotechnical and soil assessments. At 114 & 122-136 Binnies Road and 128-146 Bryants Road, this will include confirming channel alignment, bed levels, low-flow paths, grade controls and stable transitions through modified reaches or former impoundments. At 101 Jackson Court, design will focus on maintaining drainage function, minimising erosion and limiting disturbance to potentially dispersive subsoils.

The final extent, form and construction methodology of the stabilisation works will be confirmed during detailed design, having regard to design flows, bank stability, scour potential, vegetation establishment, maintenance access, construction staging and relevant regulatory requirements.

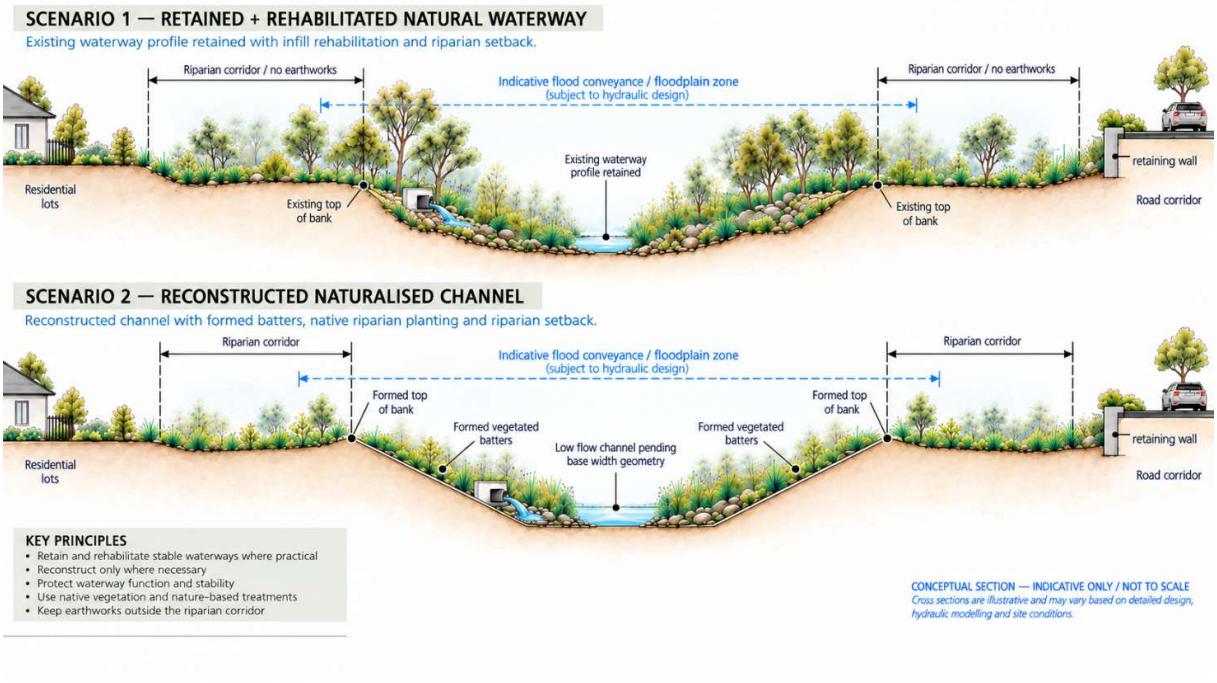


Figure 4.9 Conceptual Waterway Sections

4.5 Flood Management

4.5.1 Proposed Mitigation Strategy

A Hydraulic Impact Assessment will be undertaken for the Sites to quantify the change to flood risk as a result of the proposed developments (where applicable, this excludes Jackson Court). The flood modelling undertaken will be used to demonstrate achievement of the performance targets outlined in Table 4.1 and comply with ARR 2019 v4.2 and QUDM guidelines.

Hydraulic modelling will be undertaken using sub-models of the Bundamba Creek Flood Study (Water Technology, March 2024) and Deebing Creek Flood Study (WMA, May 2024). The ridgeline between these two creek catchments relative to the subject Sites are shown below in Figure 4.10, and Councils flood risk and overland flow mapping is provided in Figure 4.11.

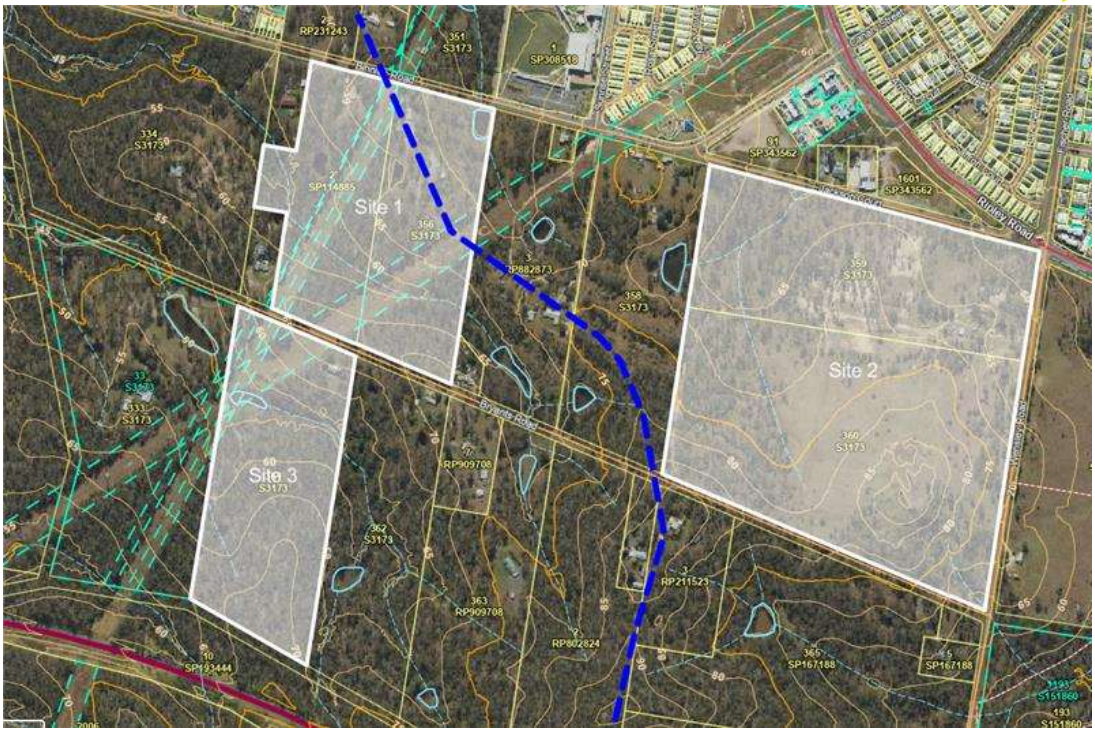


Figure 4.10 Bundamba and Deebing Creeks Catchment Ridgeline

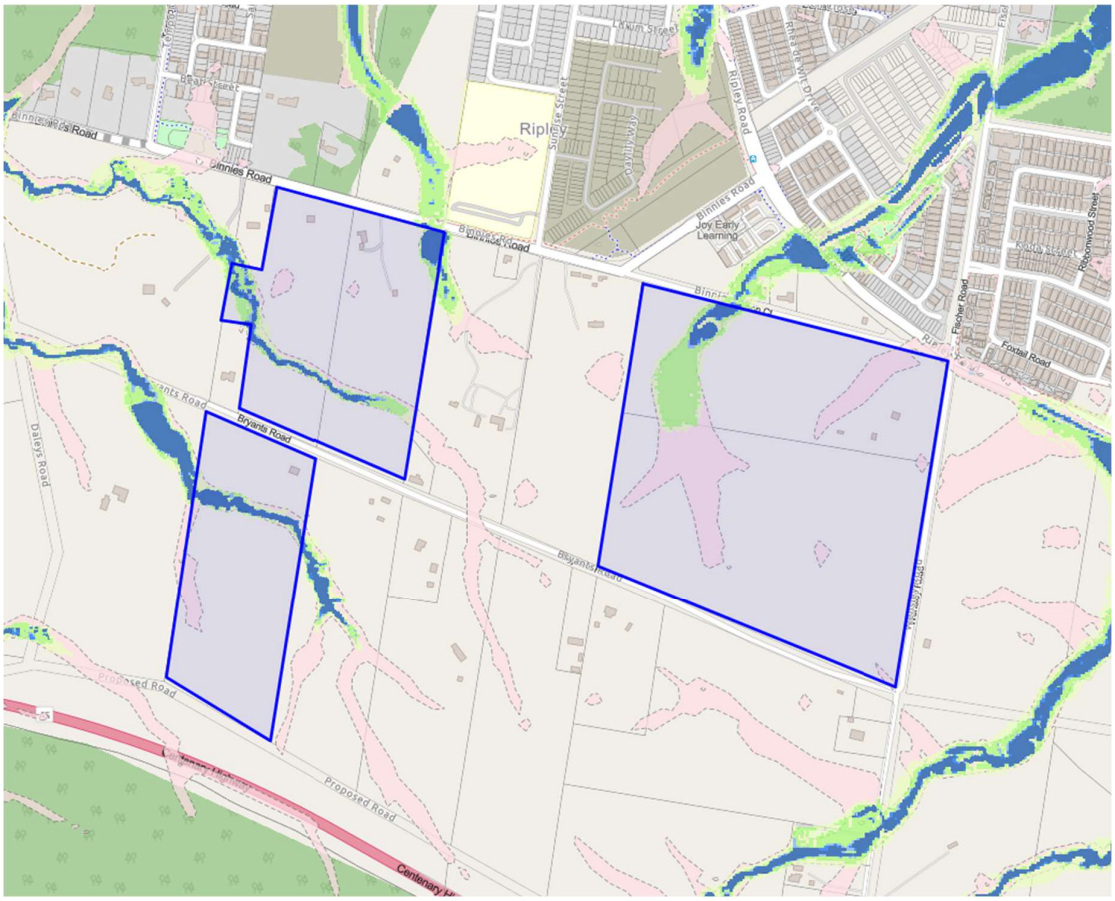


Figure 4.11 Ipswich City Council Flood Risk and Overland Flow Mapping (Ipswich City Plan 2025)

It is intended that all external flood level increases do not exceed 10 mm, as this is the general acceptable tolerance within the limitations of modern hydraulic solvers. However, where this can't be achieved, suitable justification of the predicted flood level increases will be provided, which demonstrates that the increases do not provide any material worsening of flood conditions.

A blockage sensitivity assessment will be undertaken for any existing or proposed cross-drainage structures to quantify the change to hydraulic risk. The results of the sensitivity assessment will be analysed to determine whether any change to hydraulic risk poses a threat to life or emergency egress, and subsequently whether the changed risk is considered tolerable.

All proposed dwellings are to be located above the 1% AEP climate change at 2100 flood level. This provides the development with crucial resilience against a changing climate and is in accordance with industry standard guidelines. It is not considered necessary to provide any dwelling freeboard to this sensitivity event.