MILFORD PLANNING

MP ref: M2347-RAL-1
QA: hw.ms.mc

10 March 2025

Assessment Manager
Hinchinbrook Shire Council
PO Box 366
INGHAM QLD 4850
Via: *council@hinchinbrook.qld.gov.au*

Attention: Planning and Development

Dear Sir/ Madam,

Re: Development Application seeking a Development Permit for Reconfiguring a Lot – Subdivision (One Lot into 27 Lots, Pump Station Lot, and Drainage Reserves) on land described as Lot 2 on RP730390 and located at Bruce Highway, Toobanna

On behalf of the Applicant, Milford Planning hereby make the enclosed development application seeking the abovementioned development approval on the abovementioned land in accordance with Section 51 of the *Planning Act 2016*.

Assessment Fee

The relevant assessment fee for the proposed development has been calculated below in accordance with Hinchinbrook Shire Council's (Council) Schedule of Fees and Charge 2024/25.

Component	Calculation	Fee
Reconfiguring a Lot – Application Fee	$844 per Application	**$844.00**
Reconfiguring a Lot – Per Lot Fee	$255 per Lot x 28 lots	**$7,140.00**
	TOTAL ASSESSMENT FEE:	**$7,984.00**

We kindly ask that Council provide payment details to Milford Planning for the Applicant's action immediately upon receipt of this development application.

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info@milfordplanning.com.au
283 Flinders Street
Townsville City Q 4810
PO Box 5463
Townsville City Q 4810
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Proceeding

We look forward to working with Council to progress the proposed development, and request the opportunity to discuss any queries or further information that may be required prior to the issue of any formal correspondence.

In the instance that Council requires no further information, we look forward to receipt of Council's Confirmation Notice to facilitate referral of the development application to the State.

If you have any questions regarding this correspondence, please contact the undersigned or George Milford on TEL: (07) 4724 0095.

Yours sincerely,

MILFORD PLANNING

Matteo Sandona
SENIOR TOWN PLANNER

Encl: Development application package

MILFORD PLANNING

Applicant	**Keita Services**
Reference	**M2347-RAL-1**
Date	**March 2025**

Development Application

Proposed Development	**Reconfiguring a Lot – Subdivision (One Lot into 27 Lots, Pump Station Lot, and Drainage Reserves)**
Property Details	**Lot 2 on RP730390** **Bruce Highway, Toobanna**

DOCUMENT CONTROL

Applicant	Keita Services
Proposed Development	Reconfiguring a Lot – Subdivision (One Lot into 27 Lots, Pump Station Lot, and Drainage Reserves)
Contact	Matteo Sandona

Quality Assurance		
Date 9.3.25 **Version** 1 **Issue** Final **Template** DA-STN-1	 Matteo Sandona SENIOR TOWN PLANNER	 George Milford DIRECTOR
	Author	**Reviewer**

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APPENDICES

Appendix 1	DA Form 1; and land owners consent
Appendix 2	SmartMap; and site aerial plan of the subject site
Appendix 3	State Assessment Referral Agency mapping
Appendix 4	Proposed subdivision layout plan
Appendix 5	Engineering Services Report prepared by Langtree Consulting
Appendix 6	Traffic Impact Assessment prepared by Langtree Consulting

1.0 INTRODUCTION

1.1 Purpose

The purpose of this development application is to seek approval for Reconfiguring a Lot – Subdivision (One Lot into 27 Lots, Pump Station Lot, and Drainage Reserves) (the proposed development) under the provisions of the *Planning Act 2016* (the Act).

The purpose of this report is to provide information about the site on which the subject development is proposed, detail of the proposed development, and an assessment against the relevant assessment benchmarks. The assessment detailed in this report has been undertaken in accordance with the provisions and subordinate planning controls under the Act.

1.2 Structure

This report provides the following information with respect to the assessment of the proposed development:

- overview of the site and surrounding area;
- description of the proposed development;
- overview of the relevant assessment framework;
- assessment of the proposed development against the relevant assessment benchmarks; and
- conclusion and recommendation.

This development application is made in accordance with Section 51 of the Act and contains the mandatory supporting information specified in the applicable DA Form. **Appendix 1** comprises DA Form 1 and the accompanying land owners consent.

2.0 SUBJECT SITE

2.1 Site Parameters

The following parameters are applicable to the site of the proposed development (the subject site).

Property Owner	Brescianini Investments Pty Ltd (refer **Appendix 1**)
Street Address	Bruce Highway, Toobanna
Formal Description	Lot 2 on RP730390
Site Area	80,940 m^2 (refer **Appendix 2**)
Easements	The land is not burdened by any easements.
Street Frontage	The Bruce Highway and Scovazzis Road.
Topography	The site has generally even topography and runs from west to east.
Existing Use	Cropping use (sugarcane).
Existing Infrastructure	The site is serviced by the following infrastructure: ▪ reticulated water (Council); ▪ electricity (Ergon); and ▪ telecommunications (NBN).
Local Heritage Register	The site is not listed on the Local Heritage Register.
Contaminated Land	The land is not known to be included on the State Environmental Management Register or Contaminated Land Register.
Relevant State Interests	The following State interests are relevant to the proposed development as detailed in the State Assessment Referral Agency (SARA) mapping (refer **Appendix 3**): ▪ State transport infrastructure – site located within 25 m of a State-controlled Road; and ▪ State transport infrastructure – site located within 25 m of a railway corridor

2.2 Surrounding Area

North	Directly north of the site are rural residential properties and large rural allotments used for cropping (sugarcane).
East	Directly east of the site is a railway corridor associated with cropping (cane train use). Further east are large rural allotments used for cropping (sugarcane).
South	Directly south of the site is Scovazzis Road and residential properties.
West	Directly west of the site is the Bruce Highway. Further west are residential properties and larger scale rural allotments.

3.0 PROPOSED DEVELOPMENT

3.1 Description of Proposed Development

The proposed development involves the subdivision of Lot 2 on RP730390 which will result in the creation of 27 residential lots and a pump station lot. Specific detail of the proposed development is provided below.

Purpose of Development

The proposed subdivision will facilitate the creation of 27 new lots, facilitating further residential development in the Hinchinbrook Shire in a location where natural hazard risk is minimal. The proposed development aligns with Hinchinbrook Shire Council's (Council) strategic intent residential development along the Bruce Highway, and within the General Residential Zone.

Design Overview

The proposed development seeks to subdivide Lot 2 on RP730390. The proposed subdivision will result in the creation of 27 new lots each with areas ranging from 2,000 m^2 to 2,900 m^2. There will be an additional parcel created for a pump station that will have an area 644 m^2 and transferred to Council. The proposed development will also result in the construction of a new residential street with entry on Scovazzis Road to facilitate access into the newly formed lots. The proposed plan is illustrated in the layout plan (refer **Appendix 4**).

Scale and Intensity

The proposed development will facilitate residential development within the Hinchinbrook Shire in the anticipated location, as prescribed by Council's strategic planning direction. The scale of the proposed allotments is compatible with development within the locality, and the density intended by the planning scheme. In accordance with the General Residential Zone, the proposed development will contribute to achieving residential growth in the area over the next 20 years by developing land and bringing fully serviced residential allotments to the market. The development also enables connection from the new residential street to future residential development on land to the immediate north which is also anticipated by Council for residential purposes.

Access and Parking

Langtree Consulting Engineers have prepared a Traffic Impact Assessment that has assessed and designed the site access arrangements (refer **Appendix 5**). As detailed in this report, key roads in the proximity of the proposed development are the Bruce Highway and Scovazzis Road. The existing road network has been determined suitable to service the development, with no significant adverse impact on the operational performance or safety of the surrounding road network identified. It is understood that recent works on the Bruce Highway anticipate residential development on the subject land, aligning with Council's longstanding strategic intent.

Water, Sewer, and Stormwater

An Engineering Services Report prepared by Langtree Consulting Engineers (refer **Appendix 6**) informs how the development appropriately manages water, sewage, and stormwater.

In terms of water, the subdivision will connect to the existing water main running along Scovazzis Road, with a new DN100 water main which will run along the new residential street. This will efficiently service all 27 new lots whilst integrating with the existing infrastructure. The existing water network will not be detrimentally affected by the proposed development, with water pressure testing completed to confirm pressure within the network will continue to exceed minimum pressure standards required to service allotments, including for firefighting purposes. The new DN100 proposed within the residential street will include a cap at the northern end to facilitate service connection for future residential development to the north.

The proposed allotments will be fully serviced, meaning a new connection to Council's reticulated sewer network will be provided to the land. Connection to the existing sewer network will require an extension to the existing network along the Bruce Highway corridor. The proposed residential lots will be gravity fed to a new pump station, which is to be located within its own allotment adjacent to the Bruce Highway frontage, at the rear of Lot 23, which will connect to an extension to Council's sewer within the Bruce Highway corridor. The sewer pump station will achieve access via a 4 m wide handle to the new residential street.

In terms of stormwater, the existing stormwater regime which allows water to run from west to east, will be retained and facilitated by the proposed development. To retain the existing stormwater regime, a total of five drainage reserves will be dedicated throughout the site, which will work in combination with two stormwater easements running along the rear of all proposed lots at the site's western and eastern boundaries. The stormwater regime will continue to direct water toward culverts transecting the railway line as per the existing arrangement. It is noted that the site is free from flood hazard and will thus not require earthworks to enable future residential dwellings to achieve flood immunity.

3.2 Development Plans

The proposed development is detailed in the plans provided at **Appendix 4** and listed below. In addition, the proposed development is further detailed in the associated reports listed below and appended as referenced.

Title	Number	Issue	Date
Layout Plan	1271-C-001	A	20-2-25
Associated Reports			
Traffic Impact Assessment Revision C dated 5 March 2025 prepared by Langtree Consulting Engineers (refer **Appendix 5**)			
Engineering Services Report Revision C dated 25 February 2025 prepared by Langtree Consulting Engineers (refer **Appendix 6**)			

3.3 Prelodgement Meeting

The proposed development was the subject of a prelodgement meeting between State Assessment and Referral Agency (SARA), the Department of Transport and Main Roads (DTMR), and the Applicant's representatives on 13 September 2024. The purpose of the prelodgement meeting was to determine DTMR's position on the ability for the development to be serviced by the existing road network. Discussions determined that SARA and DTMR were generally supportive of the proposal, particularly given the existing turning lane and service road arrangement, and recommended the development application be supported by a traffic impact assessment and stormwater management reporting.

The proposed development was also the subject of a prelodgement meeting between Hinchinbrook Shire (Council) and the Applicant's representatives on 10 October 2024. Council were noted as being generally supportive of the proposed development given the land proposed for subdivision is located within the General Residential Zone, aligns with their strategic vision for the urban footprint, and that the land is at one of the highest points in the area, ensuring future residents would not be subject to unacceptable risk of flooding.

4.0 ASSESSMENT FRAMEWORK

4.1 Planning Act 2016

The *Planning Act 2016* (the Act) provides the framework for Queensland's planning system and coordinates local, regional, and State planning. The Act allows for the establishment and is supported by subordinate planning legislation and instruments such as planning schemes. The provisions of the Act are therefore applicable to the proposed development.

4.2 Planning Regulation 2017

The *Planning Regulation 2017* (the Regulation) is established under the Act and provides support to the Act by detailing how it functions at a practical level. The Regulation determines the Assessment Manager and Referral Agencies relevant to assessable development, and relevant State interests through the State Planning Policy (SPP) and State Development Assessment Provisions (SDAP). The provisions of the Regulation are therefore applicable to the proposed development.

4.3 Approval Sought

Approval Type	Development Permit
Development Type	Reconfiguring a Lot
Definition or General Description	Subdivision
Specific Description	(One Lot into 27 Lots, Pump Station Lot, and Drainage Reserves)

4.4 Assessment Manager Assessment Parameters

Assessment Manager	Hinchinbrook Shire Council
Planning Instrument	Hinchinbrook Shire Council *2017* (the planning scheme)
Zone and Precinct	General residential Zone
Triggered Overlays	No Overlay
Category of Assessment	Code Assessment
Table of Assessment Reference	Table 5.5.1 – Reconfiguring a lot (General Residential Zone)

Assessment Manager Assessment Benchmarks	▪ Reconfiguring a Lot Code; ▪ General Residential Zone Code; ▪ Infrastructure, Services and Works Code ; ▪ Landscaping Code; and ▪ Parking and Access Code.

4.5 Referral Agency Assessment Parameters

Referral Agencies	State Assessment Referral Agency
Planning Instrument	*Planning Regulation 2017* (the Regulation)
Referral Triggers	The proposed development triggers the following referrals: ▪ Schedule 10, Part 9, Division 4, Subdivision 2, Table 1 – Reconfiguring a lot near a State transport corridor where all or part of the premises are within 25m of a State transport corridor and the total number of lots is increased
Referral Agency Assessment Benchmarks	▪ State Code 1 – Development in a State-controlled road environment; and ▪ State Code 2 – Development in a railway environment.

5.0 ASSESSMENT MANAGER CONSIDERATIONS

5.1 State Planning Policy

The *State Planning Policy* (the SPP) is a State planning instrument established under the Act and is designed to ensure the State's interests in planning are protected and delivered as part of local government planning across Queensland. Local government use the SPP when making or amending its planning scheme. Local government will also assess aspects of development applications using the SPP if their local planning scheme has not integrated certain State interests.

In accordance with Section 2.1 – State Planning Policy (SPP) of the planning scheme, the Minister has identified that all relevant State interests as outlined in the SPP dated July 2017 have been integrated into the planning scheme.

For the purpose of the proposed development, we consider that assessment against the provisions of the SPP is not required, and all relevant matters will be dealt with under the provisions of the planning scheme.

5.2 Regional Plan

Regional plans are State planning instruments established under the Act, and set the long term strategic direction for how regions grow and respond to change. Regional plans are designed to facilitate economic growth, development, liveable communities, and the protection of natural resources. Regional plans seek to balance the State interests identified by the SPP in the context of the particular region they apply to.

The *North Queensland Regional Plan* (the Regional Plan) applies to the local government areas of Townsville City, Hinchinbrook Shire, Burdekin Shire, Charters Towers Regional, and Palm Island Aboriginal Shire. The Regional Plan was implemented in March 2020, and seeks to capitalise on the growth, prosperity, and diversity of the region by supporting a vibrant economy, generating jobs, improving business investment, protecting our natural environment, and encouraging tourism and lifestyle opportunities over the next 25 years.

The proposed development is considered to align with the goals outlined in the Regional Plan to the extent relevant.

5.3 Planning Scheme Purpose and Overall Outcomes

The proposed development is considered to further the purpose and overall outcomes sought by the relevant planning scheme codes by demonstrating compliance with the relevant performance and accepted outcomes.

5.4 Planning Scheme Assessment Matrix

The assessment matrix below summarises the outcome of an assessment of the proposed development against the relevant performance and accepted outcomes of the applicable Assessment Manager assessment benchmarks. The assessment matrix identifies the level of compliance of the proposed development in accordance with the legend below.

Legend	
	Criteria is clearly met and no further assessment is required.
	Criteria is met and further explanation is provided for clarity.
	Criteria is not met and further performance assessment is required.
	Not applicable or no criteria prescribed.

Outcome PO or AO	General Residential Zone Code		Reconfiguring a Lot Code		Landscaping Code		Parking and Access Code		Infrastructure, Services and Work Code											
	PO	AO	PO	AO	PO	AO	PO	AO	PO	AO	PO	AO	PO	AO	PO	AO	PO	AO	PO	AO
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Criteria identified in the assessment matrix as requiring further explanation or further assessment is addressed in the following subsection.

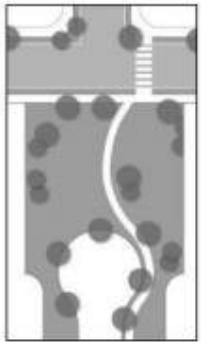
5.5 Planning Scheme Detailed Assessment

Reconfiguring a Lot Code	
PO1 Lots have areas and dimensions that: (a) are consistent with the purpose and overall outcomes of the applicable zone; and (b) can be safely and efficiently serviced with infrastructure and stormwater drainage; and (c) are generally rectangular in shape; and (d) support energy efficient development.	**AO1.1** Lots comply with the lot reconfiguration outcomes in **Table 9.4.4.4b**. **AO1.2** Drainage management and infrastructure services are integrated across sites through easements, reserves or other legal means. **AO1.3** New lots are generally rectangular in shape.

Complies with PO1

The proposed subdivision will feature new lots substantially larger than the 400 m^2 minimum lot size, with new lots between 2,000 m^2 and 2,900 m^2, and rectangular in shape (refer **Appendix 4**). This is consistent with surrounding residential allotments and aligns with the intent of the zone. The layout and design of both new lots and the new road, ensures the development integrates efficiently to existing and planned infrastructure, including the surrounding water network. The development will be serviced by an onsite sewerage pump station, and will connect to the surrounding stormwater network, including culverts. It is noted that lot depth allows for a drainage easement to run along the rear.

Given the above, the proposed development complies with Performance Outcome 1 of the Reconfiguring a Lot Code.

PO4 Road, drainage and pedestrian networks provide connectivity that is integrated with adjoining existing or planned development.	**AO4.1** The lot layout provides a grid road network that achieves connectivity across adjoining lots that are capable of subdivision. **AO4.2** The ability to further reconfigure the site is demonstrated by submitting a concept plan that meets requirements for the applicable zone. **AO4.3** For connectivity, drainage, amenity, efficiency of infrastructure of provision, cul-de-sac streets are minimised or avoided and where necessary the cul-de-sac provides connections: (a) to open space or other streets; and (b) with a minimum width of 12 metres from the top of the cul-de-sac. 

Complies with AO4

The proposed subdivision features a clear road network, connecting as a 'T' intersection to Scovazzis Road to support a grid network. The design of the new road will support future development north of the site. It is noted that the road will collect and direct stormwater from new lots toward drainage reserves on site, and culverts off site.

Given the above the proposed development complies with Acceptable Outcome 4 of the Reconfiguring a Lot Code.

PO5 Neighbourhood design supports walkable catchments, diverse housing choices through block sizes and lot design.	**PO5.1** Changes in lot size and frontage widths are established to facilitate a mix of housing choice. **AO5.2** Development provides opportunities for neighbourhood focal points such as

	community facilities, parks, corner stores, public / school transport stops, generally every 500m. **AO5.3** Lots surrounding neighbourhood focal points are of a size that enables higher residential densities to support the facilities.

Complies with AO5

The proposed development will create 27 new residential lots, each between 2,000 m^2 to 2,900 m^2. This provides desirable and generously sized lots in proximity to the Ingham town centre, and consistent with the pattern of development intended for the zone.

Given the above the proposed development complies with Acceptable Outcome 5 of the Reconfiguring a Lot Code.

Landscaping Code

PO3 Landscaping contributes to a sense of place, is functional to the surroundings and enhances the streetscape and visual appearance of the development.	**AO3.1** Existing vegetation on site is retained and incorporated into the site design, wherever possible. **AO3.2** Where there is an existing landscape character in a street or locality which results from existing vegetation, similar species are incorporated into new development. **AO3.3** Plant species are selected with consideration to the scale and form of development, screening, buffering, streetscape, shading and the tropical locality.

Complies with PO3

It is noted that the site is currently used exclusively for cropping (sugarcane) and does not feature any other vegetation, mature or otherwise. The proposed subdivision will facilitate private landscaping to occur, as seen by surrounding properties. The new road will have turfed verges, consistent with surrounding roads, that is maintainable and well presented.

Given the above the proposed development complies with Performance Outcome 3 of the Landscaping Code.

Infrastructure, services and work Code

PO1 A potable water supply is provided that is adequate for the needs of the intended use.	**AO1.1** Where within an area designated for urban development, the development is connected to Council's reticulated water supply system. **OR** **AO1.2** Otherwise, the development is provided with an onsite water supply that is sufficient to meet the demand generated by the development. **AND** **AO1.3** Water supply systems and connections are designed and constructed in accordance with Council's standards.

Complies with PO1

The proposed subdivision, which is located within the General Residential Zone, will connect to the existing DN100 water main which runs along Scovazzis Road. The new connection will run along the length of the new road as a DN100 main, servicing all 27 residential lots.

Given the above the proposed development complies with Performance Outcome 1 of the Infrastructure, Services and Works Code.

PO2 Development is connected to reticulated sewer, or includes infrastructure to treat and dispose of effluent, appropriate for the level of demand, to ensure: (a) no adverse impacts on water quality; and (b) no adverse ecological impacts as a result of the system or as a result of increasing the cumulative effect of systems in the locality.	**AO2.1** Where within Council's sewered area, the development is connected to Council's reticulated sewerage system. **AO2.2** Reticulated sewerage infrastructure is designed and constructed in accordance with Council's standards. **OR** **AO2.3** Otherwise, the development is serviced with an effluent disposal system that is provided in accordance with ASNZ 1547 On-Site Domestic Wastewater Management (as amended). **OR** **AO2.4** Where for a rural use within the Rural zone, on-site effluent is appropriately managed to deal with demand generated by the use.

Complies with PO2

The proposed subdivision will feature one non-resident lot at the rear of proposed Lot 23. This lot is intended for use as a sewer pump station, which will service residential allotments. It is noted that the pump station has been designed in accordance with Council's standards, and as part of Council's future works. Council is proposing to extend the 50 mm rising main south, to catch the Toobanna area sewerage. The proposed development will connect to this main.

Given the above the proposed development complies with Performance Outcome 2 of the Infrastructure, Services and Works Code.

PO5	AO5
Development does not adversely impact on other premises as a result of storm water drainage flows or flooding.	Storm water drainage flows must be taken to a lawful point of discharge.

Complies with PO5

The existing subject site currently falls west to east, toward the railway line, and is outside of any mapped flood hazard overlay. In relation to stormwater flow, the proposed subdivision will direct overland flow toward the proposed road, which will drain toward culverts along the railway line. This will ensure stormwater regimes are managed and not adversely affecting drainage flow or flooding.

Given the above, the proposed development complies with Performance Outcome 5 of the Infrastructure, Services and Works Code.

6.0 REFERRAL AGENCY CONSIDERATIONS

6.1 State Code Purpose and Overall Outcomes

The proposed development is considered to further the purpose and overall outcomes sought by the relevant State Codes by demonstrating compliance with the relevant performance and accepted outcomes.

6.2 State Code Assessment Matrix

The assessment matrix below summarises the outcome of an assessment of the proposed development against the relevant performance and accepted outcomes of the applicable Referral Agency assessment benchmarks. The assessment matrix identifies the level of compliance of the proposed development in accordance with the legend below.

Legend	Criteria is clearly met and no further assessment is required. Criteria is met and further explanation is provided for clarity. Criteria is not met and further performance assessment is required. Not applicable or no criteria prescribed.

Outcome PO or AO	State code 1: Development in a State-Controlled Road		State Code 2: Development in a Railway Environment															
	PO	AO	PO	AO	PO	AO	PO	AO	PO	AO	PO	AO	PO	AO	PO	AO	PO	AO
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Outcome PO or AO	State code 1: Development in a State-Controlled Road		State Code 2: Development in a Railway Environment																	
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Outcome PO or AO	State code 1: Development in a State-Controlled Road		State Code 2: Development in a Railway Environment																	
	PO	AO	PO	AO	PO	AO	PO	AO	PO	AO	PO	AO	PO	AO	PO	AO	PO	AO	PO	AO
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Criteria identified in the assessment matrix as requiring further explanation or further assessment is addressed in the following subsection.

6.3 State Code Detailed Assessment

State Code 1: Development in a State-Controlled Road	
PO1 The location of the development does not create a safety hazard for users of the **state-controlled road.**	**AO1.1** Development is not located in a **state-controlled road**. AND **AO1.2** Development can be maintained without requiring access to a **state-controlled road**.

Complies with PO1

A Traffic Impact Assessment prepared by Langtree Consulting Engineers (refer **Appendix 6**) concludes that the proposed subdivision will have accesses which do not adversely impact the operation or safety of the surrounding road network, including the Bruce Highway, which is a State-controlled Road. It is noted that the subdivision will not feature any direct access onto the State-controlled Road, but will rather connect to Scovazzis Road, ensuring the development does not require access to the State-controlled Road for maintenance or other purposes.

Given the above the proposed development complies with Performance Outcome 1 of State Code 1.

PO38 Reconfiguring a lot minimises free field noise intrusion from a **state-controlled road.**	**AO38.1** Development provides noise barrier or earth mound which is designed, sited and constructed: 1. to achieve the maximum free field acoustic levels in reference table 2 (item 2.1); 2. in accordance with: a. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR **AO38.2** Development achieves the maximum free field acoustic levels in reference table 2 (item 2.1) by **alternative noise attenuation measures** where it is not practical to provide a noise barrier or earth mound.

Complies with PO38

The proposed development achieves appropriate noise attenuation through an existing vegetation buffer which runs parallel to both the State-controlled road and the development site. The vegetation buffer is approximately 30 m in width, and provides a substantial sound buffer for proposed residential lots. Additionally, the proposed lots comprise a depth of approximately 100 m, providing ample space for appropriately set back building footprints separated from the road reserve. The proposed allotments also feature a drainage easement along the rear boundary shared with the State-controlled road reserve, providing an additional

10 m separation buffer from any future development that could be affected by State-controlled road acoustics.

Given the above the proposed development complies with Performance Outcome 38 of State Code 1.

7.0 CONCLUSION

7.1 Assessment Summary

The assessment of the proposed development against the relevant assessment benchmarks detailed in this development application supports a recommendation for approval based on the following reasons:

- the proposed development complies with the relevant assessment benchmarks; and
- compliance with the relevant assessment benchmarks can be managed through reasonable and relevant conditions.

7.2 Recommended Conditions of Approval

Given the above facts and circumstances presented in this development application, we recommend that Council **approve** the proposed development subject to the following reasonable and relevant conditions that are considered specifically relevant to the proposed development.

Condition 1 – Approved Plans and Supporting Documentation

(a) The development must generally comply with the plan(s) and supporting documentation referenced in the table below and attached as stamped "Approved Subject to Conditions" which forms part of this approval, unless otherwise specified by any condition of this approval.

Title	Number	Issue	Date
Layout Plan	1271-C-001	A	20-2-25
Associated Reports			
Traffic Impact Assessment Revision C dated 5 March 2025 prepared by Langtree Consulting Engineers			
Engineering Services Report Revision C dated 25 February 2025 prepared by Langtree Consulting Engineers			

(b) The recommendations outlined in the above reports/s must be implemented prior to the commencement of the use.

MILFORD PLANNING

Appendix 1

DA Form 1 – Development application details

Approved form (version 1.6 effective 2 August 2024) made under section 282 of the Planning Act 2016.

This form **must** be used to make a development application **involving code assessment or impact assessment**, except when applying for development involving only building work.

For a development application involving **building work only**, use *DA Form 2 – Building work details*.

For a development application involving **building work associated with any other type of assessable development (i.e. material change of use, operational work or reconfiguring a lot)**, use this form (*DA Form 1*) **and** parts 4 to 6 of *DA Form 2 – Building work details.*

Unless stated otherwise, all parts of this form **must** be completed in full and all required supporting information **must** accompany the development application.

One or more additional pages may be attached as a schedule to this development application if there is insufficient space on the form to include all the necessary information.

This form and any other form relevant to the development application must be used to make a development application relating to strategic port land and Brisbane core port land under the *Transport Infrastructure Act 1994*, and airport land under the *Airport Assets (Restructuring and Disposal) Act 2008.* For the purpose of assessing a development application relating to strategic port land and Brisbane core port land, any reference to a planning scheme is taken to mean a land use plan for the strategic port land, Brisbane port land use plan for Brisbane core port land, or a land use plan for airport land.

Note: *All terms used in this form have the meaning given under the Planning Act 2016, the Planning Regulation 2017, or the Development Assessment Rules (DA Rules).*

PART 1 – APPLICANT DETAILS

1) Applicant details	
Applicant name(s) (*individual or company full name*)	Keita Services c/- Milford Planning
Contact name *(only applicable for companies)*	Matteo Sandona
Postal address *(P.O. Box or street address)*	PO Box 5463
Suburb	Townsville City
State	Queensland
Postcode	4810
Country	Australia
Contact number	4724 0095
Email address *(non-mandatory)*	info@milfordplanning.com.au
Mobile number *(non-mandatory)*	
Fax number *(non-mandatory)*	
Applicant's reference number(s) *(if applicable)*	M2347-RAL-1

1.1) Home-based business
☐ Personal details to remain private in accordance with section 264(6) of *Planning Act 2016*

2) Owner's consent
2.1) Is written consent of the owner required for this development application?
☒ Yes – the written consent of the owner(s) is attached to this development application ☐ No – proceed to 3)

PART 2 – LOCATION DETAILS

3) Location of the premises *(complete 3.1) or 3.2), and 3.3) as applicable)*

***Note**: Provide details below and attach a site plan for any or all premises part of the development application. For further information, see DA Forms Guide: Relevant plans.*

3.1) Street address and lot on plan

☒ Street address **AND** lot on plan (*all lots must be listed*), ***or***

☐ Street address **AND** lot on plan for an adjoining or adjacent property of the premises *(appropriate for development in water but adjoining or adjacent to land e.g. jetty, pontoon. All lots must be listed).*

a)	Unit No.	Street No.	Street Name and Type	Suburb
			Bruce Highway	Toobanna
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
	4850	2	RP730390	Hinchinbrook Shire Council
b)	Unit No.	Street No.	Street Name and Type	Suburb
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)

3.2) Coordinates of premises *(appropriate for development in remote areas, over part of a lot or in water not adjoining or adjacent to land e.g. channel dredging in Moreton Bay)*

***Note**: Place each set of coordinates in a separate row.*

☐ Coordinates of premises by longitude and latitude

Longitude(s)	Latitude(s)	Datum	Local Government Area(s) *(if applicable)*
		☐ WGS84 ☐ GDA94 ☐ Other:	

☐ Coordinates of premises by easting and northing

Easting(s)	Northing(s)	Zone Ref.	Datum	Local Government Area(s) *(if applicable)*
		☐ 54 ☐ 55 ☐ 56	☐ WGS84 ☐ GDA94 ☐ Other:	

3.3) Additional premises

☐ Additional premises are relevant to this development application and the details of these premises have been attached in a schedule to this development application

☒ Not required

4) Identify any of the following that apply to the premises and provide any relevant details

☐ In or adjacent to a water body or watercourse or in or above an aquifer

Name of water body, watercourse or aquifer:

☐ On strategic port land under the *Transport Infrastructure Act 1994*

Lot on plan description of strategic port land:

Name of port authority for the lot:

☐ In a tidal area

Name of local government for the tidal area *(if applicable)*:

Name of port authority for tidal area *(if applicable)*

☐ On airport land under the *Airport Assets (Restructuring and Disposal) Act 2008*	
Name of airport:	
☐ Listed on the Environmental Management Register (EMR) under the *Environmental Protection Act 1994*	
EMR site identification:	
☐ Listed on the Contaminated Land Register (CLR) under the *Environmental Protection Act 1994*	
CLR site identification:	

5) Are there any existing easements over the premises?

Note: Easement uses vary throughout Queensland and are to be identified correctly and accurately. For further information on easements and how they may affect the proposed development, see DA Forms Guide.

☐ Yes – All easement locations, types and dimensions are included in plans submitted with this development application

☒ No

PART 3 – DEVELOPMENT DETAILS

Section 1 – Aspects of development

6.1) Provide details about the first development aspect

a) What is the type of development? *(tick only one box)*

☐ Material change of use ☒ Reconfiguring a lot ☐ Operational work ☐ Building work

b) What is the approval type? *(tick only one box)*

☒ Development permit ☐ Preliminary approval ☐ Preliminary approval that includes a variation approval

c) What is the level of assessment?

☒ Code assessment ☐ Impact assessment *(requires public notification)*

d) Provide a brief description of the proposal *(e.g. 6 unit apartment building defined as multi-unit dwelling, reconfiguration of 1 lot into 3 lots)*:

Subdivision (One Lot into 27 Lots, Pump Station Lot, and Drainage Reserves)

e) Relevant plans

***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms guide: Relevant plans.*

☒ Relevant plans of the proposed development are attached to the development application

6.2) Provide details about the second development aspect

a) What is the type of development? *(tick only one box)*

☐ Material change of use ☐ Reconfiguring a lot ☐ Operational work ☐ Building work

b) What is the approval type? *(tick only one box)*

☐ Development permit ☐ Preliminary approval ☐ Preliminary approval that includes a variation approval

c) What is the level of assessment?

☐ Code assessment ☐ Impact assessment *(requires public notification)*

d) Provide a brief description of the proposal *(e.g. 6 unit apartment building defined as multi-unit dwelling, reconfiguration of 1 lot into 3 lots)*:

e) Relevant plans

***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms Guide: Relevant plans.*

☐ Relevant plans of the proposed development are attached to the development application

6.3) Additional aspects of development
☐ Additional aspects of development are relevant to this development application and the details for these aspects that would be required under Part 3 Section 1 of this form have been attached to this development application
☒ Not required
6.4) Is the application for State facilitated development?
☐ Yes - Has a notice of declaration been given by the Minister?
☒ No

Section 2 – Further development details

7) Does the proposed development application involve any of the following?	
Material change of use	☐ Yes – complete division 1 if assessable against a local planning instrument
Reconfiguring a lot	☒ Yes – complete division 2
Operational work	☐ Yes – complete division 3
Building work	☐ Yes – complete *DA Form 2 – Building work details*

Division 1 – Material change of use

***Note**: This division is only required to be completed if any part of the development application involves a material change of use assessable against a local planning instrument.*

8.1) Describe the proposed material change of use			
Provide a general description of the proposed use	Provide the planning scheme definition *(include each definition in a new row)*	Number of dwelling units *(if applicable)*	Gross floor area (m^2) *(if applicable)*

8.2) Does the proposed use involve the use of existing buildings on the premises?
☐ Yes
☐ No

8.3) Does the proposed development relate to temporary accepted development under the Planning Regulation?	
☐ Yes – provide details below or include details in a schedule to this development application	
☐ No	
Provide a general description of the temporary accepted development	Specify the stated period dates under the Planning Regulation

Division 2 – Reconfiguring a lot

***Note**: This division is only required to be completed if any part of the development application involves reconfiguring a lot.*

9.1) What is the total number of existing lots making up the premises?
1

9.2) What is the nature of the lot reconfiguration? *(tick all applicable boxes)*	
☒ Subdivision *(complete 10)*	☐ Dividing land into parts by agreement *(complete 11)*
☐ Boundary realignment *(complete 12)*	☐ Creating or changing an easement giving access to a lot from a constructed road *(complete 13)*

10) Subdivision				
10.1) For this development, how many lots are being created and what is the intended use of those lots:				
Intended use of lots created	Residential	Commercial	Industrial	Other, please specify:
				Pump Station
Number of lots created	27			1

10.2) Will the subdivision be staged?	
☐ Yes – provide additional details below ☒ No	
How many stages will the works include?	
What stage(s) will this development application apply to?	

11) Dividing land into parts by agreement – how many parts are being created and what is the intended use of the parts?				
Intended use of parts created	Residential	Commercial	Industrial	Other, please specify:
Number of parts created				

12) Boundary realignment			
12.1) What are the current and proposed areas for each lot comprising the premises?			
Current lot		Proposed lot	
Lot on plan description	Area (m^2)	Lot on plan description	Area (m^2)
12.2) What is the reason for the boundary realignment?			

13) What are the dimensions and nature of any existing easements being changed and/or any proposed easement? *(attach schedule if there are more than two easements)*				
Existing or proposed?	Width (m)	Length (m)	Purpose of the easement? *(e.g. pedestrian access)*	Identify the land/lot(s) benefitted by the easement

Division 3 – Operational work

***Note**: This division is only required to be completed if any part of the development application involves operational work.*

14.1) What is the nature of the operational work?		
☐ Road work	☐ Stormwater	☐ Water infrastructure
☐ Drainage work	☐ Earthworks	☐ Sewage infrastructure
☐ Landscaping	☐ Signage	☐ Clearing vegetation
☐ Other – please specify:		

14.2) Is the operational work necessary to facilitate the creation of new lots? *(e.g. subdivision)*	
☐ Yes – specify number of new lots:	
☐ No	

14.3) What is the monetary value of the proposed operational work? *(include GST, materials and labour)*

$

PART 4 – ASSESSMENT MANAGER DETAILS

15) Identify the assessment manager(s) who will be assessing this development application

Hinchinbrook Shire Council

16) Has the local government agreed to apply a superseded planning scheme for this development application?

☐ Yes – a copy of the decision notice is attached to this development application
☐ The local government is taken to have agreed to the superseded planning scheme request – relevant documents attached
☒ No

PART 5 – REFERRAL DETAILS

17) Does this development application include any aspects that have any referral requirements?
***Note**: A development application will require referral if prescribed by the* Planning Regulation 2017.

☐ No, there are no referral requirements relevant to any development aspects identified in this development application – proceed to Part 6

Matters requiring referral to the **Chief Executive of the *Planning Act 2016***:

☐ Clearing native vegetation
☐ Contaminated land *(unexploded ordnance)*
☐ Environmentally relevant activities (ERA) *(only if the ERA has not been devolved to a local government)*
☐ Fisheries – aquaculture
☐ Fisheries – declared fish habitat area
☐ Fisheries – marine plants
☐ Fisheries – waterway barrier works
☐ Hazardous chemical facilities
☐ Heritage places – Queensland heritage place *(on or near a Queensland heritage place)*
☐ Infrastructure-related referrals – designated premises
☐ Infrastructure-related referrals – state transport infrastructure
☒ Infrastructure-related referrals – State transport corridor and future State transport corridor
☐ Infrastructure-related referrals – State-controlled transport tunnels and future state-controlled transport tunnels
☐ Infrastructure-related referrals – near a state-controlled road intersection
☐ Koala habitat in SEQ region – interfering with koala habitat in koala habitat areas outside koala priority areas
☐ Koala habitat in SEQ region – key resource areas
☐ Ports – Brisbane core port land – near a State transport corridor or future State transport corridor
☐ Ports – Brisbane core port land – environmentally relevant activity (ERA)
☐ Ports – Brisbane core port land – tidal works or work in a coastal management district
☐ Ports – Brisbane core port land – hazardous chemical facility
☐ Ports – Brisbane core port land – taking or interfering with water
☐ Ports – Brisbane core port land – referable dams
☐ Ports – Brisbane core port land – fisheries
☐ Ports – Land within Port of Brisbane's port limits *(below high-water mark)*
☐ SEQ development area
☐ SEQ regional landscape and rural production area or SEQ rural living area – tourist activity or sport and recreation activity
☐ SEQ regional landscape and rural production area or SEQ rural living area – community activity
☐ SEQ regional landscape and rural production area or SEQ rural living area – indoor recreation
☐ SEQ regional landscape and rural production area or SEQ rural living area – urban activity
☐ SEQ regional landscape and rural production area or SEQ rural living area – combined use
☐ SEQ northern inter-urban break – tourist activity or sport and recreation activity

☐ SEQ northern inter-urban break – community activity
☐ SEQ northern inter-urban break – indoor recreation
☐ SEQ northern inter-urban break – urban activity
☐ SEQ northern inter-urban break – combined use
☐ Tidal works or works in a coastal management district
☐ Reconfiguring a lot in a coastal management district or for a canal
☐ Erosion prone area in a coastal management district
☐ Urban design
☐ Water-related development – taking or interfering with water
☐ Water-related development – removing quarry material *(from a watercourse or lake)*
☐ Water-related development – referable dams
☐ Water-related development –levees *(category 3 levees only)*
☐ Wetland protection area

Matters requiring referral to the **local government:**
☐ Airport land
☐ Environmentally relevant activities (ERA) (*only if the ERA has been devolved to local government)*
☐ Heritage places – Local heritage places

Matters requiring referral to the **Chief Executive of the distribution entity or transmission entity:**
☐ Infrastructure-related referrals – Electricity infrastructure

Matters requiring referral to:
- The **Chief Executive of the holder of the licence**, if not an individual
- The **holder of the licence**, if the holder of the licence is an individual

☐ Infrastructure-related referrals – Oil and gas infrastructure

Matters requiring referral to the **Brisbane City Council:**
☐ Ports – Brisbane core port land

Matters requiring referral to the **Minister responsible for administering the *Transport Infrastructure Act 1994*:**
☐ Ports – Brisbane core port land *(where inconsistent with the Brisbane port LUP for transport reasons)*
☐ Ports – Strategic port land

Matters requiring referral to the **relevant port operator**, if applicant is not port operator**:**
☐ Ports – Land within Port of Brisbane's port limits *(below high-water mark)*

Matters requiring referral to the **Chief Executive of the relevant port authority:**
☐ Ports – Land within limits of another port *(below high-water mark)*

Matters requiring referral to the **Gold Coast Waterways Authority:**
☐ Tidal works or work in a coastal management district *(in Gold Coast waters)*

Matters requiring referral to the **Queensland Fire and Emergency Service:**
☐ Tidal works or work in a coastal management district *(involving a marina (more than six vessel berths))*

18) Has any referral agency provided a referral response for this development application?

☐ Yes – referral response(s) received and listed below are attached to this development application
☒ No

Referral requirement	Referral agency	Date of referral response

Identify and describe any changes made to the proposed development application that was the subject of the referral response and this development application, or include details in a schedule to this development application *(if applicable).*

PART 6 – INFORMATION REQUEST

19) Information request under the DA Rules

☒ I agree to receive an information request if determined necessary for this development application

☐ I do not agree to accept an information request for this development application

***Note**: By not agreeing to accept an information request I, the applicant, acknowledge:*

- *that this development application will be assessed and decided based on the information provided when making this development application and the assessment manager and any referral agencies relevant to the development application are not obligated under the DA Rules to accept any additional information provided by the applicant for the development application unless agreed to by the relevant parties*
- *Part 3 under Chapter 1 of the DA Rules will still apply if the application is an application listed under section 11.3 of the DA Rules or*
- *Part 2under Chapter 2 of the DA Rules will still apply if the application is for state facilitated development*

Further advice about information requests is contained in the DA Forms Guide.

PART 7 – FURTHER DETAILS

20) Are there any associated development applications or current approvals? *(e.g. a preliminary approval)*

☐ Yes – provide details below or include details in a schedule to this development application

☒ No

List of approval/development application references	Reference number	Date	Assessment manager
☐ Approval ☐ Development application			
☐ Approval ☐ Development application			

21) Has the portable long service leave levy been paid? *(only applicable to development applications involving building work or operational work)*

☐ Yes – a copy of the receipted QLeave form is attached to this development application

☐ No – I, the applicant will provide evidence that the portable long service leave levy has been paid before the assessment manager decides the development application. I acknowledge that the assessment manager may give a development approval only if I provide evidence that the portable long service leave levy has been paid

☒ Not applicable *(e.g. building and construction work is less than $150,000 excluding GST)*

Amount paid	Date paid (dd/mm/yy)	QLeave levy number (A, B or E)
$		

22) Is this development application in response to a show cause notice or required as a result of an enforcement notice?

☐ Yes – show cause or enforcement notice is attached

☒ No

23) Further legislative requirements

Environmentally relevant activities

23.1) Is this development application also taken to be an application for an environmental authority for an **Environmentally Relevant Activity (ERA)** under section 115 of the *Environmental Protection Act 1994*?

☐ Yes – the required attachment (form ESR/2015/1791) for an application for an environmental authority accompanies this development application, and details are provided in the table below

☒ No

***Note**: Application for an environmental authority can be found by searching "ESR/2015/1791" as a search term at www.qld.gov.au. An ERA requires an environmental authority to operate. See www.business.qld.gov.au for further information.*

Proposed ERA number:		Proposed ERA threshold:	
Proposed ERA name:			

☐ Multiple ERAs are applicable to this development application and the details have been attached in a schedule to this development application.

Hazardous chemical facilities

23.2) Is this development application for a **hazardous chemical facility**?

☐ Yes – *Form 536: Notification of a facility exceeding 10% of schedule 15 threshold* is attached to this development application

☒ No

***Note**: See www.business.qld.gov.au for further information about hazardous chemical notifications.*

Clearing native vegetation

23.3) Does this development application involve **clearing native vegetation** that requires written confirmation that the chief executive of the *Vegetation Management Act 1999* is satisfied the clearing is for a relevant purpose under section 22A of the *Vegetation Management Act 1999*?

☐ Yes – this development application includes written confirmation from the chief executive of the *Vegetation Management Act 1999* (s22A determination)

☒ No

***Note**: 1. Where a development application for operational work or material change of use requires a s22A determination and this is not included, the development application is prohibited development.*

2. See https://www.qld.gov.au/environment/land/vegetation/applying for further information on how to obtain a s22A determination.

Environmental offsets

23.4) Is this development application taken to be a prescribed activity that may have a significant residual impact on a **prescribed environmental matter** under the *Environmental Offsets Act 2014*?

☐ Yes – I acknowledge that an environmental offset must be provided for any prescribed activity assessed as having a significant residual impact on a prescribed environmental matter

☒ No

***Note**: The environmental offset section of the Queensland Government's website can be accessed at www.qld.gov.au for further information on environmental offsets.*

Koala habitat in SEQ Region

23.5) Does this development application involve a material change of use, reconfiguring a lot or operational work which is assessable development under Schedule 10, Part 10 of the Planning Regulation 2017?

☐ Yes – the development application involves premises in the koala habitat area in the koala priority area

☐ Yes – the development application involves premises in the koala habitat area outside the koala priority area

☒ No

***Note**: If a koala habitat area determination has been obtained for this premises and is current over the land, it should be provided as part of this development application. See koala habitat area guidance materials at www.desi.qld.gov.au for further information.*

Water resources

23.6) Does this development application involve **taking or interfering with underground water through an artesian or subartesian bore, taking or interfering with water in a watercourse, lake or spring, or taking overland flow water under the *Water Act 2000***?

☐ Yes – the relevant template is completed and attached to this development application and I acknowledge that a relevant authorisation or licence under the *Water Act 2000* may be required prior to commencing development

☒ No

***Note**: Contact the Department of Resources at www.resources.qld.gov.au for further information.*

DA templates are available from planning.statedevelopment.qld.gov.au. If the development application involves:

- *Taking or interfering with underground water through an artesian or subartesian bore: complete DA Form 1 Template 1*
- *Taking or interfering with water in a watercourse, lake or spring: complete DA Form1 Template 2*
- *Taking overland flow water: complete DA Form 1 Template 3.*

Waterway barrier works

23.7) Does this application involve **waterway barrier works?**

☐ Yes – the relevant template is completed and attached to this development application

☒ No

DA templates are available from planning.statedevelopment.qld.gov.au. For a development application involving waterway barrier works, complete DA Form 1 Template 4.

Marine activities

23.8) Does this development application involve **aquaculture, works within a declared fish habitat area or removal, disturbance or destruction of marine plants?**

☐ Yes – an associated *resource* allocation authority is attached to this development application, if required under the *Fisheries Act 1994*

☒ No

***Note**: See guidance materials at www.daf.qld.gov.au for further information.*

Quarry materials from a watercourse or lake

23.9) Does this development application involve the **removal of quarry materials from a watercourse or lake** under the *Water Act 2000?*

☐ Yes – I acknowledge that a quarry material allocation notice must be obtained prior to commencing development

☒ No

***Note**: Contact the Department of Resources at www.resources.qld.gov.au and www.business.qld.gov.au for further information.*

Quarry materials from land under tidal waters

23.10) Does this development application involve the **removal of quarry materials from land under tidal water** under the *Coastal Protection and Management Act 1995?*

☐ Yes – I acknowledge that a quarry material allocation notice must be obtained prior to commencing development

☒ No

***Note**: Contact the Department of Environment, Science and Innovation at www.desi.qld.gov.au for further information.*

Referable dams

23.11) Does this development application involve a **referable dam** required to be failure impact assessed under section 343 of the *Water Supply (Safety and Reliability) Act 2008* (the Water Supply Act)?

☐ Yes – the 'Notice Accepting a Failure Impact Assessment' from the chief executive administering the Water Supply Act is attached to this development application

☒ No

***Note**: See guidance materials at www.resources.qld.gov.au for further information.*

Tidal work or development within a coastal management district

23.12) Does this development application involve **tidal work or development in a coastal management district**?

☐ Yes – the following is included with this development application:
- ☐ Evidence the proposal meets the code for assessable development that is prescribed tidal work *(only required if application involves prescribed tidal work)*
- ☐ A certificate of title

☒ No

***Note**: See guidance materials at www.desi.qld.gov.au for further information.*

Queensland and local heritage places

23.13) Does this development application propose development on or adjoining a place entered in the **Queensland heritage register** or on a place entered in a local government's **Local Heritage Register**?

☐ Yes – details of the heritage place are provided in the table below

☒ No

***Note**: See guidance materials at www.desi.qld.gov.au for information requirements regarding development of Queensland heritage places.*

For a heritage place that has cultural heritage significance as a local heritage place and a Queensland heritage place, provisions are in place under the Planning Act 2016 that limit a local categorising instrument from including an assessment benchmark about the effect or impact of, development on the stated cultural heritage significance of that place. See guidance materials at www.planning.statedevelopment.qldgov.au for information regarding assessment of Queensland heritage places.

Name of the heritage place:		Place ID:	

Decision under section 62 of the *Transport Infrastructure Act 1994*

23.14) Does this development application involve new or changed access to a state-controlled road?

☐ Yes – this application will be taken to be an application for a decision under section 62 of the *Transport Infrastructure Act 1994* (subject to the conditions in section 75 of the *Transport Infrastructure Act 1994* being satisfied)

☒ No

Walkable neighbourhoods assessment benchmarks under Schedule 12A of the Planning Regulation

23.15) Does this development application involve reconfiguring a lot into 2 or more lots in certain residential zones (except rural residential zones), where at least one road is created or extended?

☐ Yes – Schedule 12A is applicable to the development application and the assessment benchmarks contained in schedule 12A have been considered

☒ No

***Note**: See guidance materials at www.planning.statedevelopment.qld.gov.au for further information.*

PART 8 – CHECKLIST AND APPLICANT DECLARATION

24) Development application checklist	
I have identified the assessment manager in question 15 and all relevant referral requirement(s) in question 17 ***Note**: See the Planning Regulation 2017 for referral requirements*	☒ Yes
If building work is associated with the proposed development, Parts 4 to 6 of *DA Form 2 – Building work details* have been completed and attached to this development application	☐ Yes ☒ Not applicable
Supporting information addressing any applicable assessment benchmarks is with the development application ***Note**: This is a mandatory requirement and includes any relevant templates under question 23, a planning report and any technical reports required by the relevant categorising instruments (e.g. local government planning schemes, State Planning Policy, State Development Assessment Provisions). For further information, see DA Forms Guide: Planning Report Template.*	☒ Yes
Relevant plans of the development are attached to this development application ***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms Guide: Relevant plans.*	☒ Yes
The portable long service leave levy for QLeave has been paid, or will be paid before a development permit is issued *(see 21)*	☐ Yes ☒ Not applicable

25) Applicant declaration
☒ By making this development application, I declare that all information in this development application is true and correct ☒ Where an email address is provided in Part 1 of this form, I consent to receive future electronic communications from the assessment manager and any referral agency for the development application where written information is required or permitted pursuant to sections 11 and 12 of the *Electronic Transactions Act 2001* ***Note**: It is unlawful to intentionally provide false or misleading information.*
Privacy – Personal information collected in this form will be used by the assessment manager and/or chosen assessment manager, any relevant referral agency and/or building certifier (including any professional advisers which may be engaged by those entities) while processing, assessing and deciding the development application. All information relating to this development application may be available for inspection and purchase, and/or published on the assessment manager's and/or referral agency's website. Personal information will not be disclosed for a purpose unrelated to the *Planning Act 2016*, Planning Regulation 2017 and the DA Rules except where: • such disclosure is in accordance with the provisions about public access to documents contained in the *Planning Act 2016* and the Planning Regulation 2017, and the access rules made under the *Planning Act 2016* and Planning Regulation 2017; or • required by other legislation (including the *Right to Information Act 2009*); or • otherwise required by law. This information may be stored in relevant databases. The information collected will be retained as required by the *Public Records Act 2002.*

PART 9 – FOR COMPLETION OF THE ASSESSMENT MANAGER – FOR OFFICE USE ONLY

Date received: | Reference number(s):

Notification of engagement of alternative assessment manager	
Prescribed assessment manager	
Name of chosen assessment manager	
Date chosen assessment manager engaged	
Contact number of chosen assessment manager	
Relevant licence number(s) of chosen assessment manager	

QLeave notification and payment *Note: For completion by assessment manager if applicable*			
Description of the work			
QLeave project number			
Amount paid ($)		Date paid (dd/mm/yy)	
Date receipted form sighted by assessment manager			
Name of officer who sighted the form			

MP ref: M2347
QA: ms

5 March 2025

Assessment Manager
Hinchinbrook Shire Council
PO Box 366
INGHAM QLD 4850
Via: *council@hinchinbrook.qld.gov.au*

Attention: Planning and Development

Re: Land Owner Consent

Under the provisions of the *Planning Act 2016*, we **BRESCIANINI INVESTMENTS PTY LTD (ACN 009 697 492)**, being the registered owner of land described as **LOT 2 ON RP730390** and located at **BRUCE HIGHWAY, TOOBANNA**, do hereby authorise and confirm the engagement and appointment of Milford Planning to act on our behalf with respect to the procurement of all development approvals for the aforementioned land.

Date	7	3	2025
	Day	Month	Year
Signature			
Name	EZIO BRESCIANINI		
Position	DIRECTOR		

Note

Where registered owner is a company the ACN must be included and accompanied by:
(a) the signature of either:
- two directors of the company;
- a director and a company secretary of the company; or
- if a proprietary company that has a sole director who is also the sole company secretary, that director; **or**

(b) the company seal (if the company has a common seal) witnessed by:
- two directors of the company;
- a director and a company secretary of the company; or
- for a propriety company that has a sole director who is also the sole company secretary, that director.

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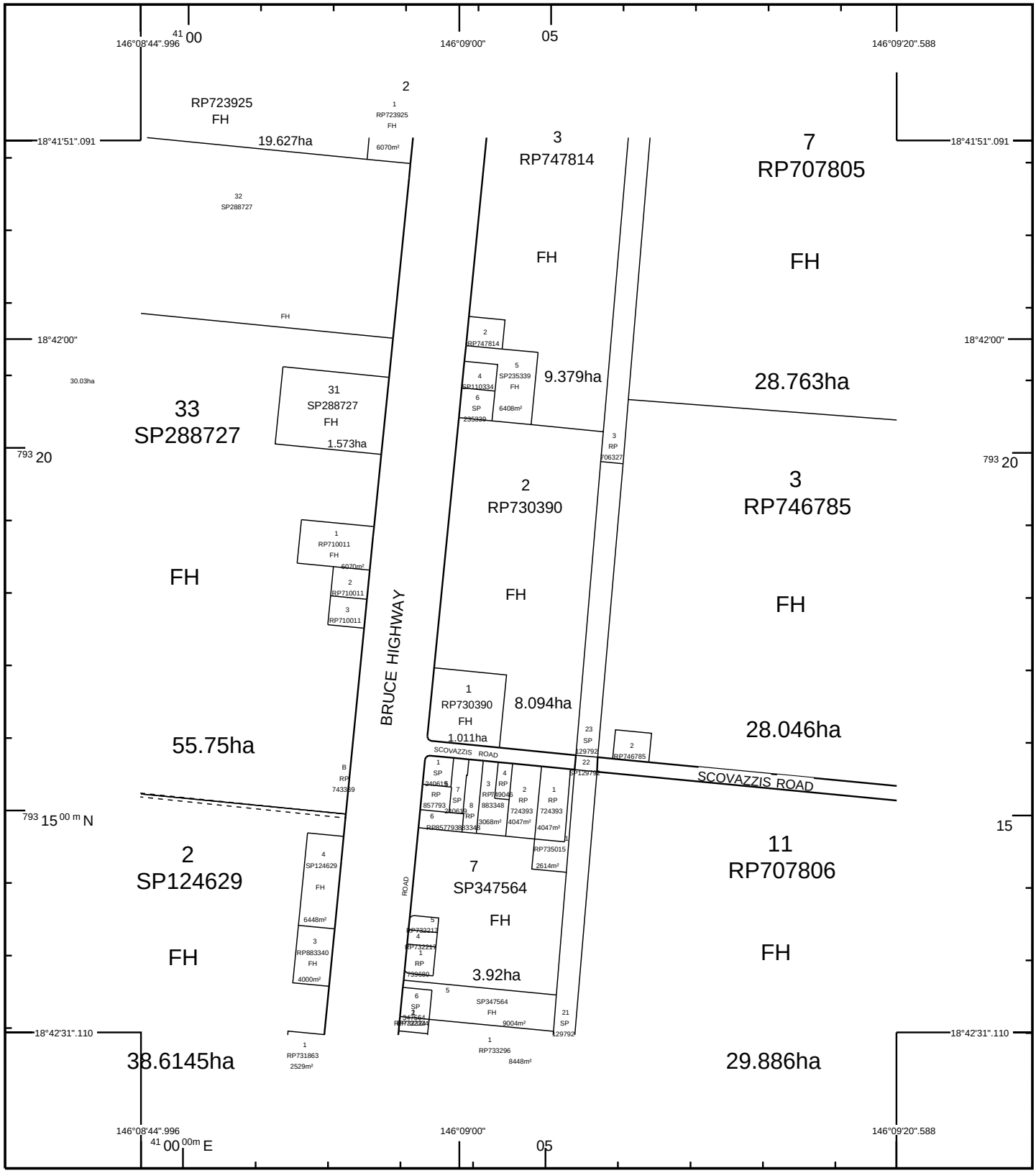
Appendix 2



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HORIZONTAL DATUM:GDA94 ZONE:55 SCALE 1 : 7500

SmartMap

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Based upon an extraction from the
Digital Cadastral Data Base

MAP WINDOW POSITION &
NEAREST LOCATION

146°09'02".792
18°42'11".101
TOOBANNA
1.50 KM

SUBJECT PARCEL DESCRIPTION

DCDB

Lot/Plan	2/RP730390
Area/Volume	8.094ha
Tenure	FREEHOLD
Local Government	HINCHINBROOK SHIRE
Locality	TOOBANNA
Segment/Parcel	39617/64

CLIENT SERVICE STANDARDS

PRINTED 06/03/2025

DCDB 05/03/2025

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Drawing
Site Aerial

Property
Bruce Highway, Toobana
Lot 2 on RP730390

Drawing Number	Issue	Sheet
M2347-SK-01	A	1
Date	**Author**	**Reviewer**
6.3.25	HW	MS

Legend
- Cadastre
- Subject Site

LOT 32 SP288727
LOT 33 SP288727
LOT 31 SP288727
LOT 33 SP288727
LOT 1 RP710011
LOT 2 RP710011
LOT 3 RP710011
LOT 33 SP288727
LOT 2 RP747814
LOT 3 RP747814
LOT 4 SP110334
LOT 5 SP235339
LOT 6 SP235339
LOT 3 RP706327
TOWNSVILLE ROAD
LOT 2 RP730390
LOT 23 SP129792
LOT 1 RP730390
LOT 1 SP240619
LOT 7 SP240619
LOT 5 RP857793
LOT 8 RP883348
LOT 4 RP749046
LOT 3 RP883348
LOT 2 RP724393
LOT 1 RP724393
LOT 6 RP857793
LOT 2 RP735015
LOT 1 RP735015
SCOVAZZIS ROAD
LOT 22 SP129792
LOT 21 SP129792
LOT 2 RP746785
LOT 3 RP746785
LOT 11 RP707806

Scale (A3 Original)
1:2,000
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Sources
Milford Planning GIS (2025)
DCDB extract – State of Queensland (2025)
Aerial imagery – Bing (2025)

Disclaimer
Areas and dimensions are approximate only and are subject to site survey.

MILFORD PLANNING

Appendix 3

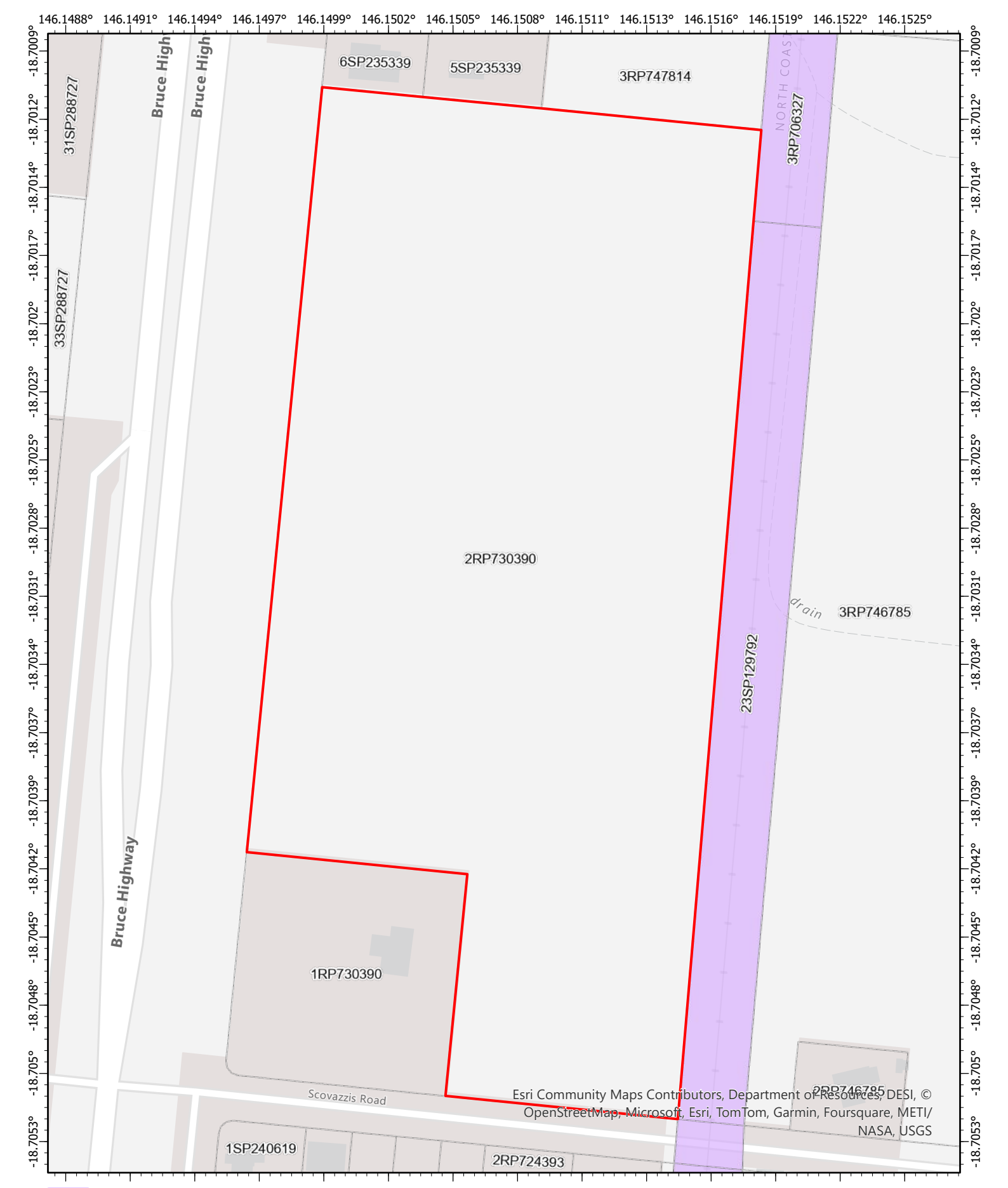
Matters of Interest for all selected Lot Plans

Railway corridor
Area within 25m of a State-controlled road
Area within 25m of a railway corridor

Matters of Interest by Lot Plan

Lot Plan: 2RP730390 (Area: 80940 m²)

Railway corridor
Area within 25m of a State-controlled road
Area within 25m of a railway corridor



Railway corridor

Date: 06/03/2025

N

Scale: 1:2,300

0 20 40 60 80

Metres

Queensland Government

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Area within 25m of a State-controlled road

Date: 06/03/2025

N

Scale: 1:2,300

0 20 40 60 80

Metres

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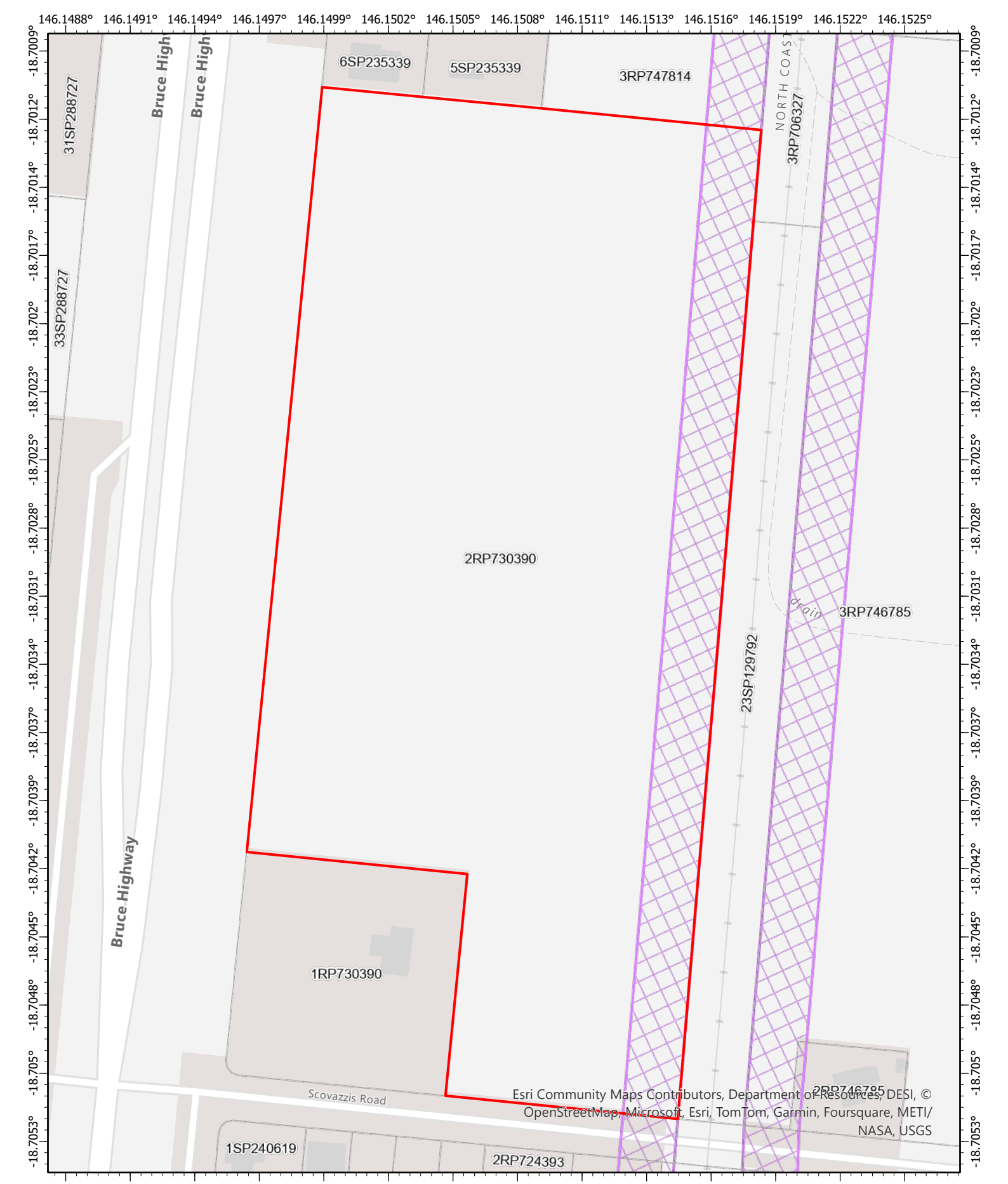

Area within 25m of a railway corridor

Date: 06/03/2025

N

Scale: 1:2,300

0 20 40 60 80

Metres

Queensland Government

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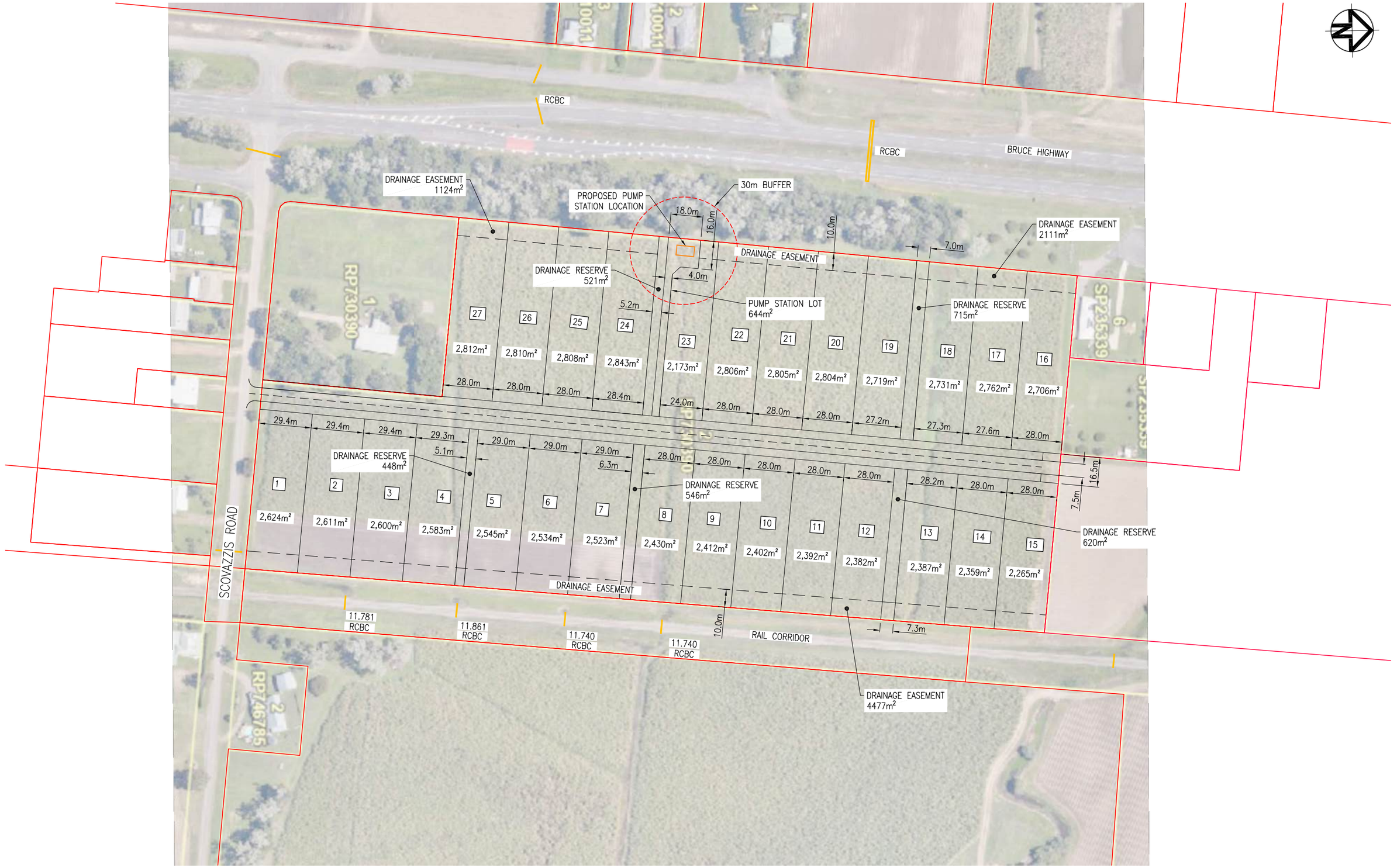
Appendix 4



LAYOUT PLAN
1:1000

REVISIONS				
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HORIZ. DATUM	MGA	
VERT. DATUM	AHD	
DRG. FILE		DATE
DESIGN		10.12.24
DRAWN	M.AMIN	10.12.24

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MILFORD PLANNING

SCOVAZZIS ROAD SUBDIVISION
BRUCE HIGHWAY, TOOBANNA, 4850
LAYOUT PLAN

SCALE	AS SHOWN
SHEET	1 OF 1
REVISION	0
DRG No.	1271–C–001

MILFORD PLANNING

Appendix 5

LANGTREE CONSULTING ENGINEERS

SCOVAZZIS ROAD SUBDIVISION

ENGINEERING SERVICES REPORT

KEITA SERVICES PTY LTD

LANGTREE CONSULTING

Project No.: 1271

Reference No.: R-AR0267

Date: 25/02/2025

Controlled Copy No.: 1

Revisions: C

Revision Record:

Rev	Review Date	Description	Prepared	Checked	Approved
A	31/01/2025	Issued for Client Comment	Aidan Reinaudo	Brett Langtree	Brett Langtree
B	20/02/2025	Issued for Approval	Aidan Reinaudo	Brett Langtree	Brett Langtree
C	25/02/2025	Issued for Approval	Brett Langtree	Brett Langtree	Brett Langtree

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APPENDIX B – PRE DEVELOPMENT CALCULATIONS

APPENDIX C – POST DEVELOPMENT CALCULATIONS

APPENDIX D – DRAIN SIZING CALCULATIONS

1.0 INTRODUCTION

Langtree Consulting has been engaged by Keita Services to prepare this Engineering Services Report in support of a development application for a 27 lot subdivision along Scovazzis Road, Toobanna on land described as Lot 2 on RP730390.

This report describes the outcomes of the following processes undertaken to identify suitable engineering solutions for the proposed development:

- Assessment of the water and sewer infrastructure services and proposed connection points for the development;
- Identification of the existing stormwater regime and any flooding issues at the proposed site;
- Determine the civil engineering requirements for internal water, sewer and stormwater drainage infrastructure and prepare concept design plans for these services; and
- Investigation of the potential impacts that can be directly attributed to the proposed development and determination of any mitigation measures required.

2.0 EXISTING CONDITIONS

The subject site for this development is located on Scovazzis Road, Toobanna and is described as Lot 2 on RP730390. The subject site is shown in Figure 1 below.

Figure 1: *Site Locality*

The site has an area of approximately 8.9ha and currently consists of cane farmland. The site is bound by rural residential lots and cane farm to the north, railway line to the east, Scovazzis Road and a residential lot to the south and the Bruce Highway to the west. The site falls from west to east.

2.1 SITE ZONING AND FLOOD HAZARD OVERLAY

In accordance with the Hinchinbrook Shire Council (HSC) Mapping, the site is zoned as general residential (refer to **Figure 2**). The site is also clear of any flood hazard as shown in **Figure 3**.

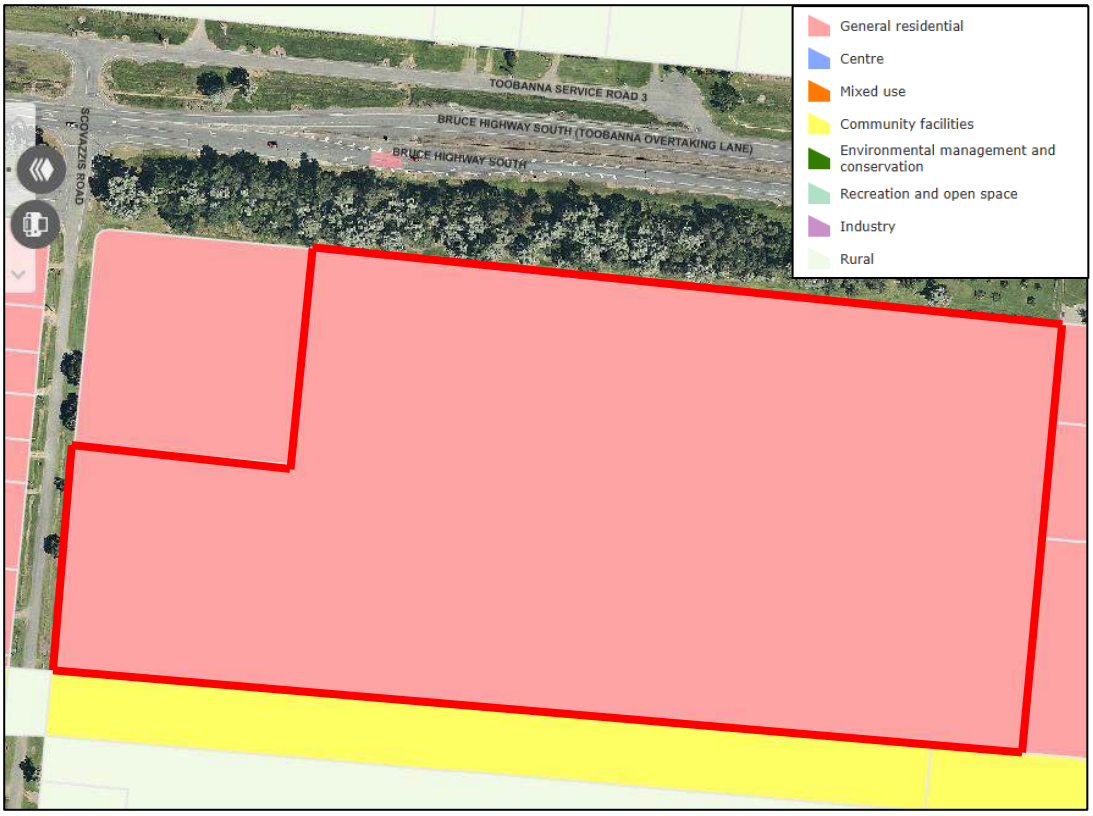


Figure 2: *Site Zoning (Source: HSC Development App)*

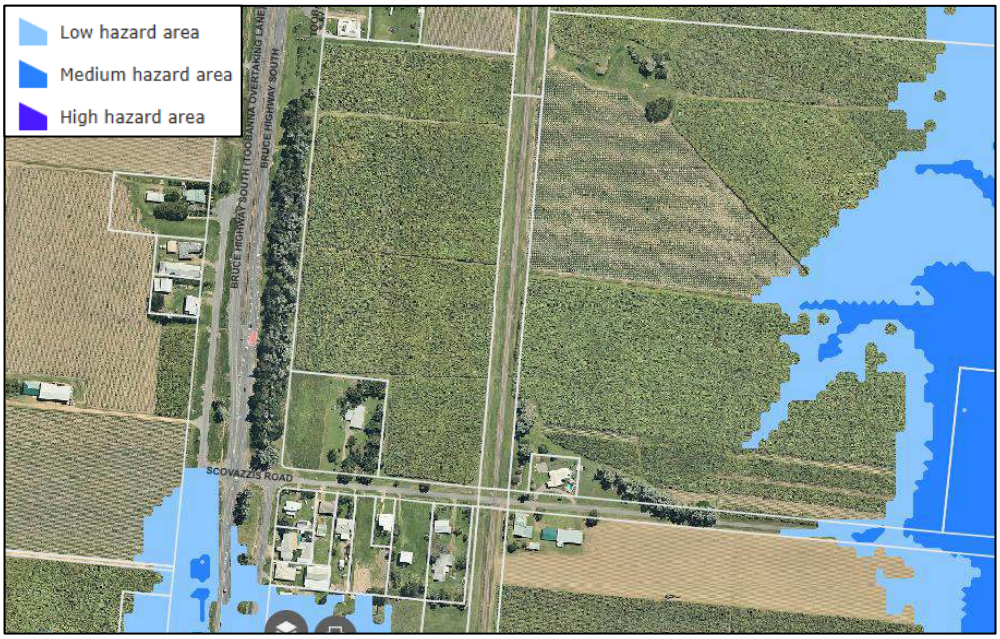


Figure 3: *Flood Hazard Mapping (Source: HSC Development App)*

2.2 EXISTING INFRASTRUCTURE

The existing infrastructure surrounding the site was gathered from Dial Before You Dig (DBYD).

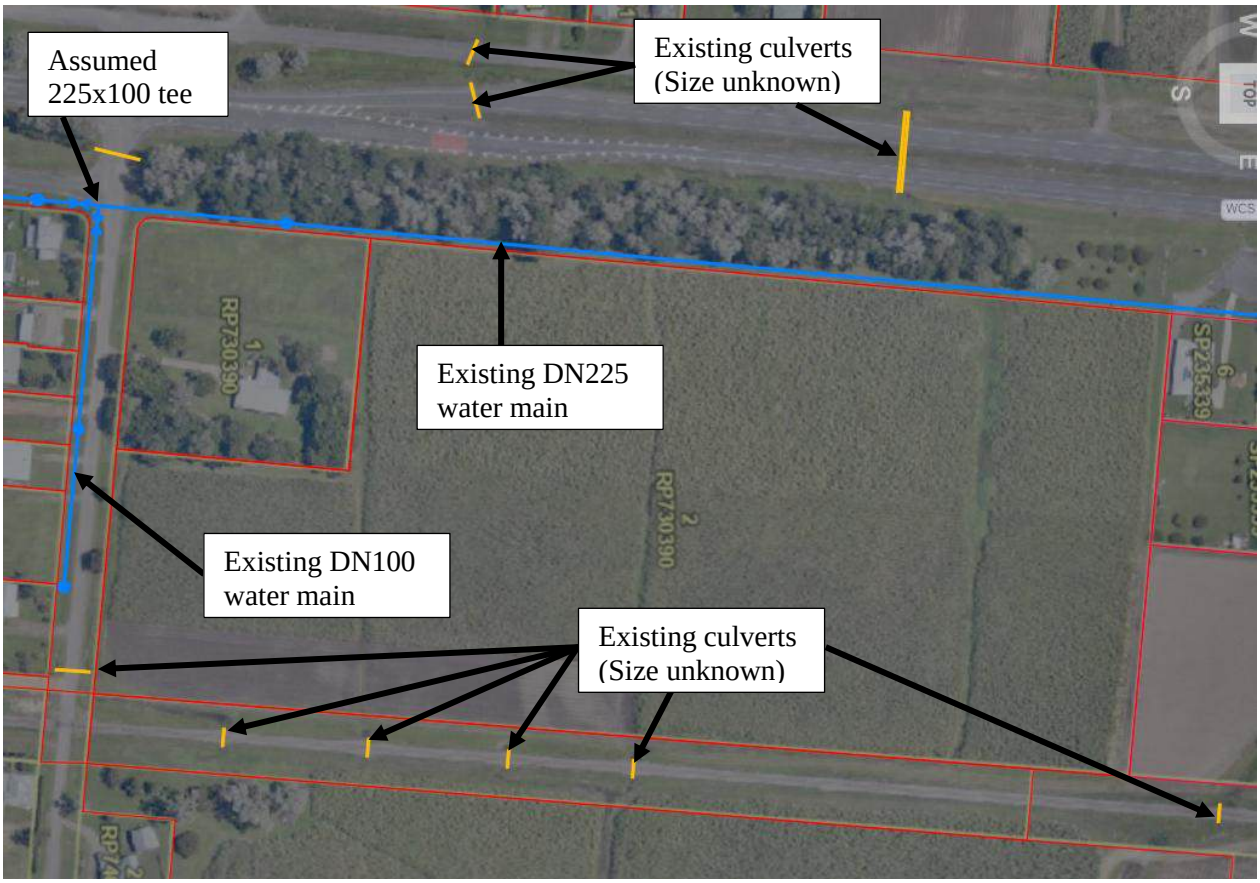


Figure 4: *Existing Infrastructure*

2.2.1 Existing Water

An existing DN225 AC water main runs parallel to the Bruce Highway that services the entire Toobanna area. A DN100 AC water main is connected off the DN225 and runs along Scovazzis Road for approximately 165m for being capped.

2.2.2 Existing Sewer

The site is currently not serviced by any sewerage.

The sewerage treatment plant located at the HSC Depot which is located approximately 4km north of the proposed development site. A 50mm rising main runs approximately 1.3km south before it ends

2.2.3 *Existing Stormwater*

There is currently no stormwater infrastructure on the site however there is multiple stormwater pipes surrounding the site. The site flows from the Bruce Highway towards the rail corridor and through the culverts and into the neighbouring farmland.

3.0 PROPOSED DEVELOPMENT

The development consists of 27 residential lots that are accessed off a new road that comes off Scovazzis Road. The lot areas vary from 2,173m^2 at the smallest and 2,812m^2 at the largest. The development requires drainage easements/reserves to allow the natural flow through the site. Refer to Figure 5 and Appendix A for the proposed layout plan.

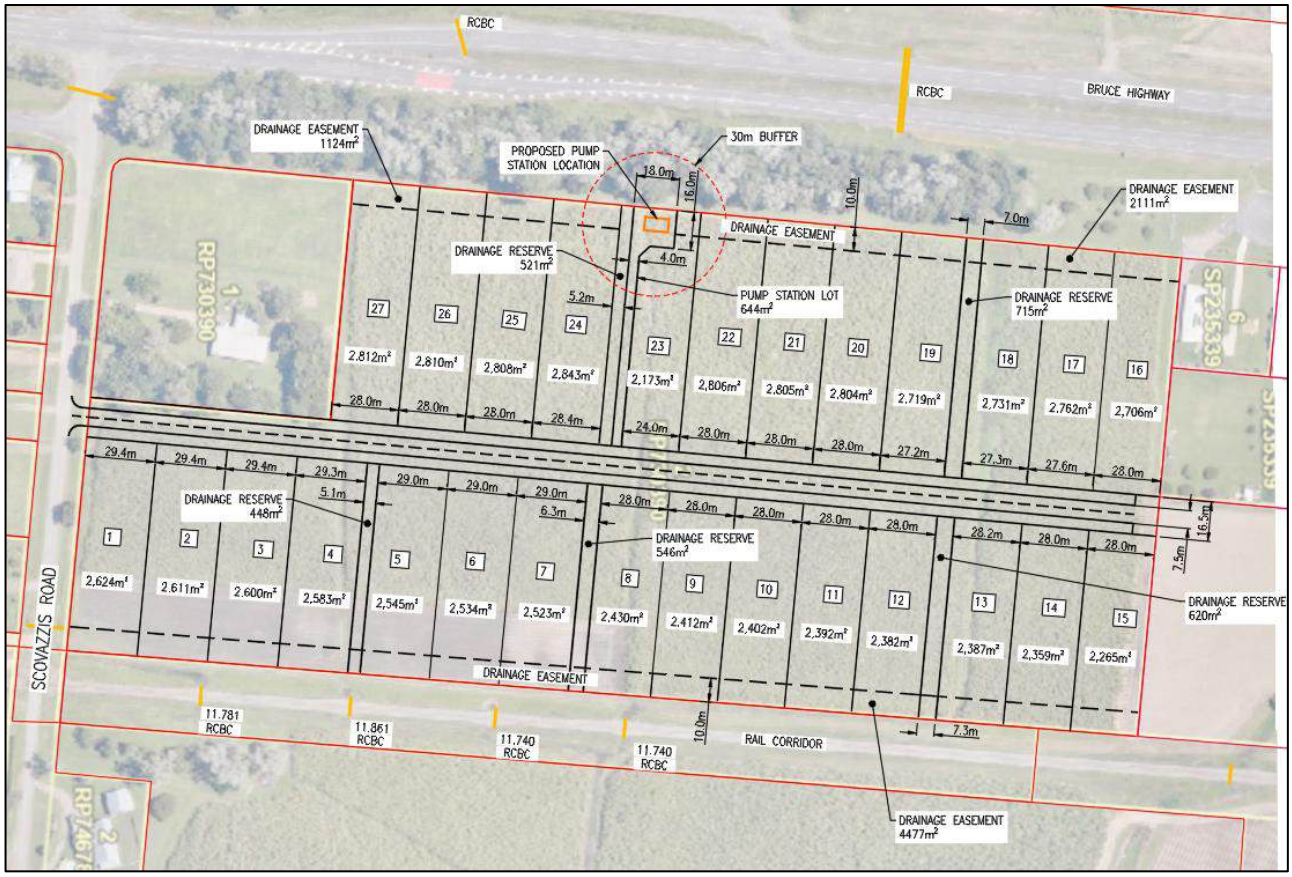


Figure 5: *Proposed Layout Plan*

3.1 PROPOSED WATER

The site will be connected to the existing DN100 AC watermain that runs along Scovazzis Road. In accordance with FNQROC Development Manual D6 Water Reticulation Table 6.1 the demand EP per lot is 3.7 for single dwelling lots greater than 1500m^2. The site has 27 lots which will generate a total of 99.9EP.

In accordance with the HSC Planning Scheme, the average day demand is 450L/EP/Day with a peaking factor of 2.25. Therefore, this development generates 44,955L/day (0.52L/s) with a peak demand of 1.17L/s. The development is connected to the DN100 AC watermain not far from the DN225 AC trunk watermain (approximately 100m) with only five (5) house connections being between this.

A water pressure tests was conducted on Friday 21st February 2025, the results are as follows:

- The flow rate in the DN225 AC water main is 14.4L/Sec at a pressure of 350Kpa (approximately 35m head); and
- The flow rate in DN100 AC water main is 13.66L/Sec at 325Kpa (approximately 33m head).

From our discussions with Council the firefighting minimum requirement is 7.5L/s at a pressure of 25m head (approximately 246Kpa). Please note that the existing water supply exceeds Council's minimum requirements for firefighting.

The new water main is proposed to be a DN100 AC watermain with hydrants at every 80m. This watermain will be capped at the end allowing for a potential extension on the future. The DN100 watermain will be connected to the existing DN100 AC watermain that runs along Scovazzis Road.

Refer to **Figure 6** for the proposed water main layout.

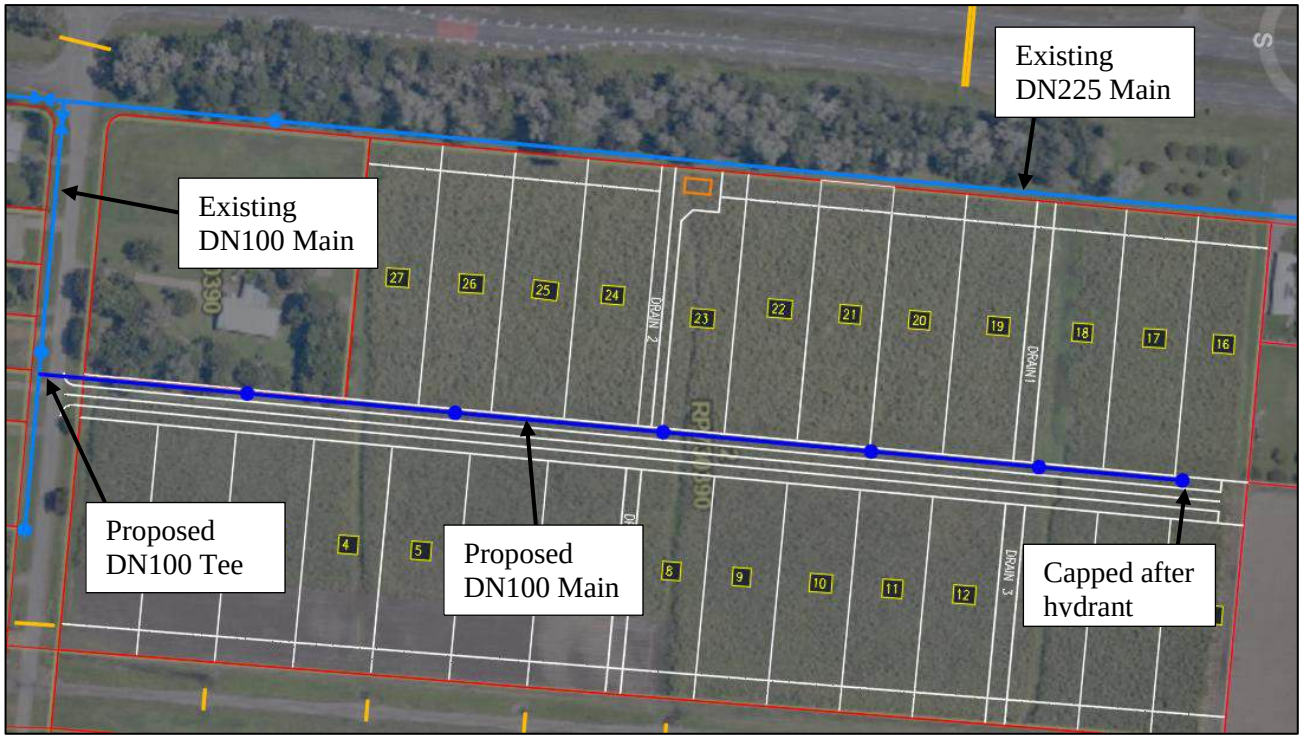


Figure 6: *Proposed Water Main Layout*

3.2 PROPOSED SEWER

In accordance with FNQROC Development Manual D7 Sewerage System Table 7.1 the demand EP per lot is 3.7 for single dwelling lots greater than 1500m^2. The site has 27 lots which will generate a total of 99.9EP. In accordance with the HSC Planning Scheme, the average dry weather flow (ADWF) demand is 230L/EP/day and a peak wet weather flow (PWWF) of 5xADWF. Therefore, the development has a ADWF of 22,977L/day (0.27L/s) and PWWF of 1.35L/s.

HSC have agreed in principle to extending the existing 50mm rising main south to catch the Toobanna area sewerage. Therefore, this development is proposed to be connected to the extended 50mm rising main. A pump station is required and will be located in the back corner of Lot 25. This pump station is to be designed as part of the HSC future works.

It is proposed to run a DN32 PE main from each end of the development to a DN40 PE main that runs to the pump station. Refer to **Figure 7** for the proposed sewer layout.

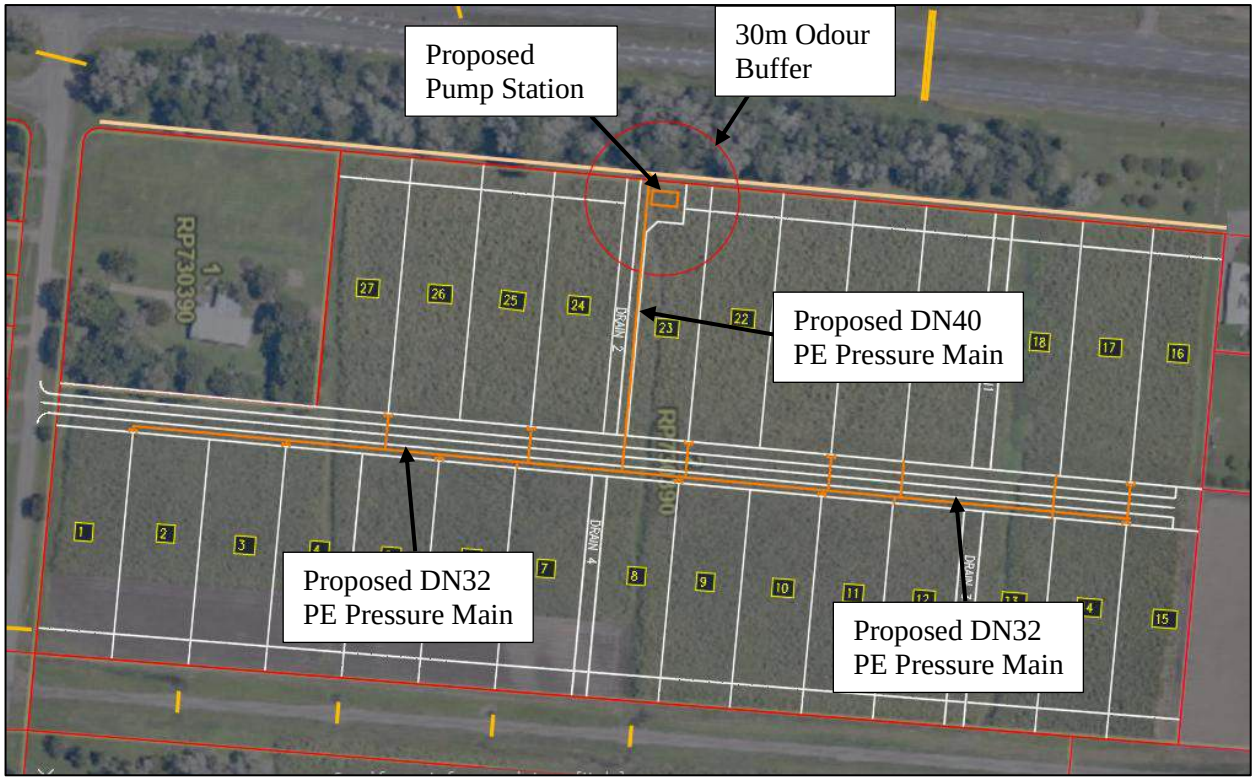


Figure 7: *Proposed Sewerage Layout*

4.0 STORMWATER ASSESSMENT

LIDAR contours of the subject site indicate that the major portion of the existing site falls west east towards rail corridor. Four (4) existing culverts are located under the rail corridor which discharge the stormwater from the site into neighbouring farmland. The site has four (4) catchment areas which are for culvert 1, culvert 2, culvert 3 and culvert 4 All of the four (4) culverts consist of 2 cells of 1200 x 450 RCBCs.

Refer to Figure 8 for the existing site contours.

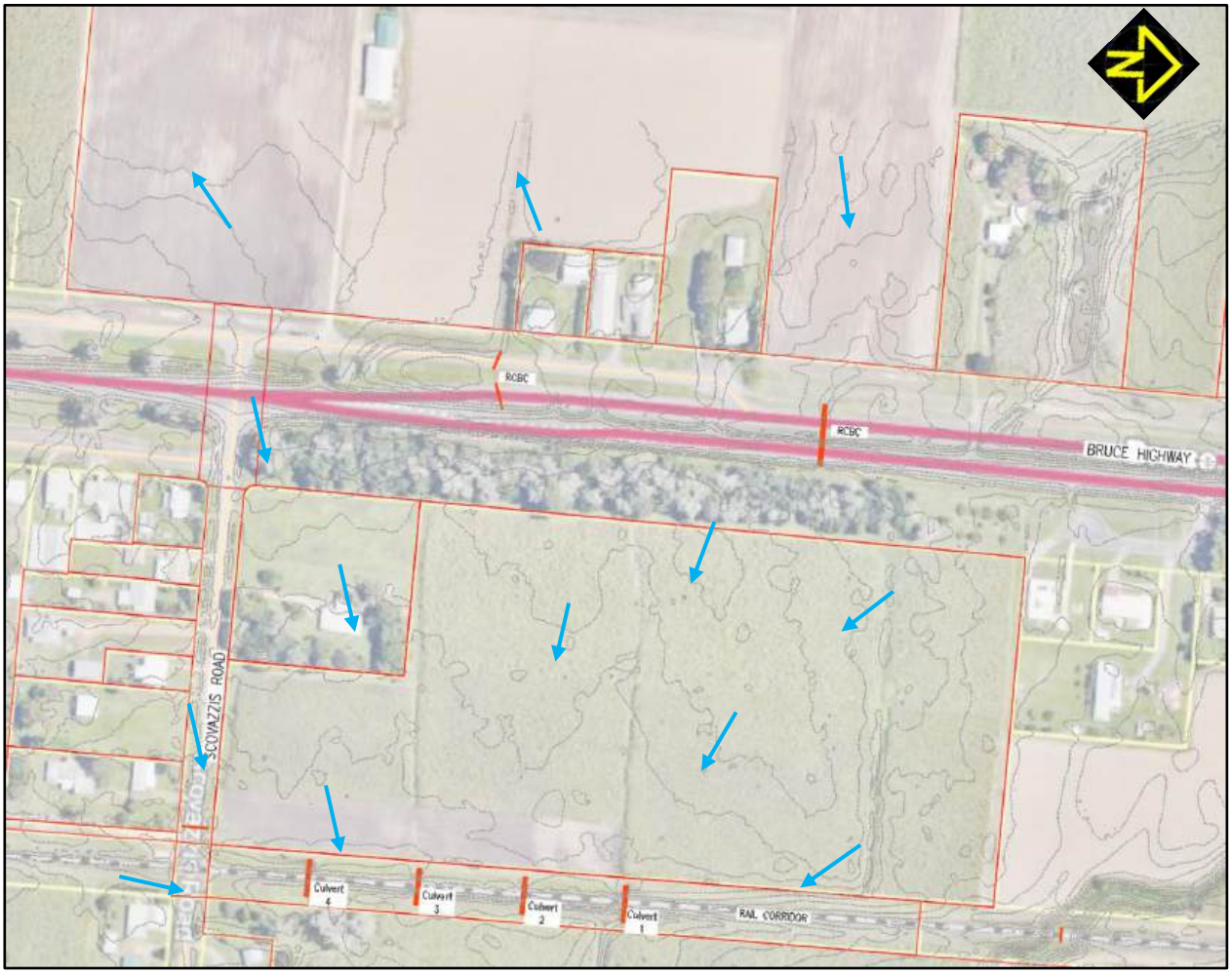


Figure 8: *Existing Site Contours*

4.1 HYDRAULIC ASSESMENT

Hydraulic assessment of the site has been undertaken in accordance with the Queensland Urban Drainage Manual (QUDM) 2017. The rational method equations have been adopted:

$$Q_y = (C_y . {}^{t}I_y . A) / 360$$

Where: Q_y = peak flow rate (m3/s) for average recurrence interval (ARI) of 'y' years

Cy = coefficient of discharge (dimensionless) for ARI of 'y' years

A = area of catchment (Hectares)

${}^{t}I_y$ = average rainfall intensity (mm/h) for a design duration of 't' hours and an ARI of 'y' years

t = the nominal design storm duration as defined by the time of concentration

4.1.1 Pre- Development Stormwater

The catchment areas (blue) and longest flow path (dashed blue line) are shown in **Figure 9Error! Reference source not found.** below. Culvert 1 has catchment area of 12.54ha, Culvert 2 has catchment area of 0.15ha, Culvert 3 has catchment area of 3.33ha and Culvert 4 has catchment area of 4.06ha.

The pre-development catchments have the following Q100 flow rates.

- Culvert 1 Catchment = 3.683 m3/s
- Culvert 2 Catchment = 0.095 m3/s
- Culvert 3 Catchment = 1.297 m3/s
- Culvert 4 Catchment = 1.389 m3/s

Refer to **Appendix B** for the calculations.

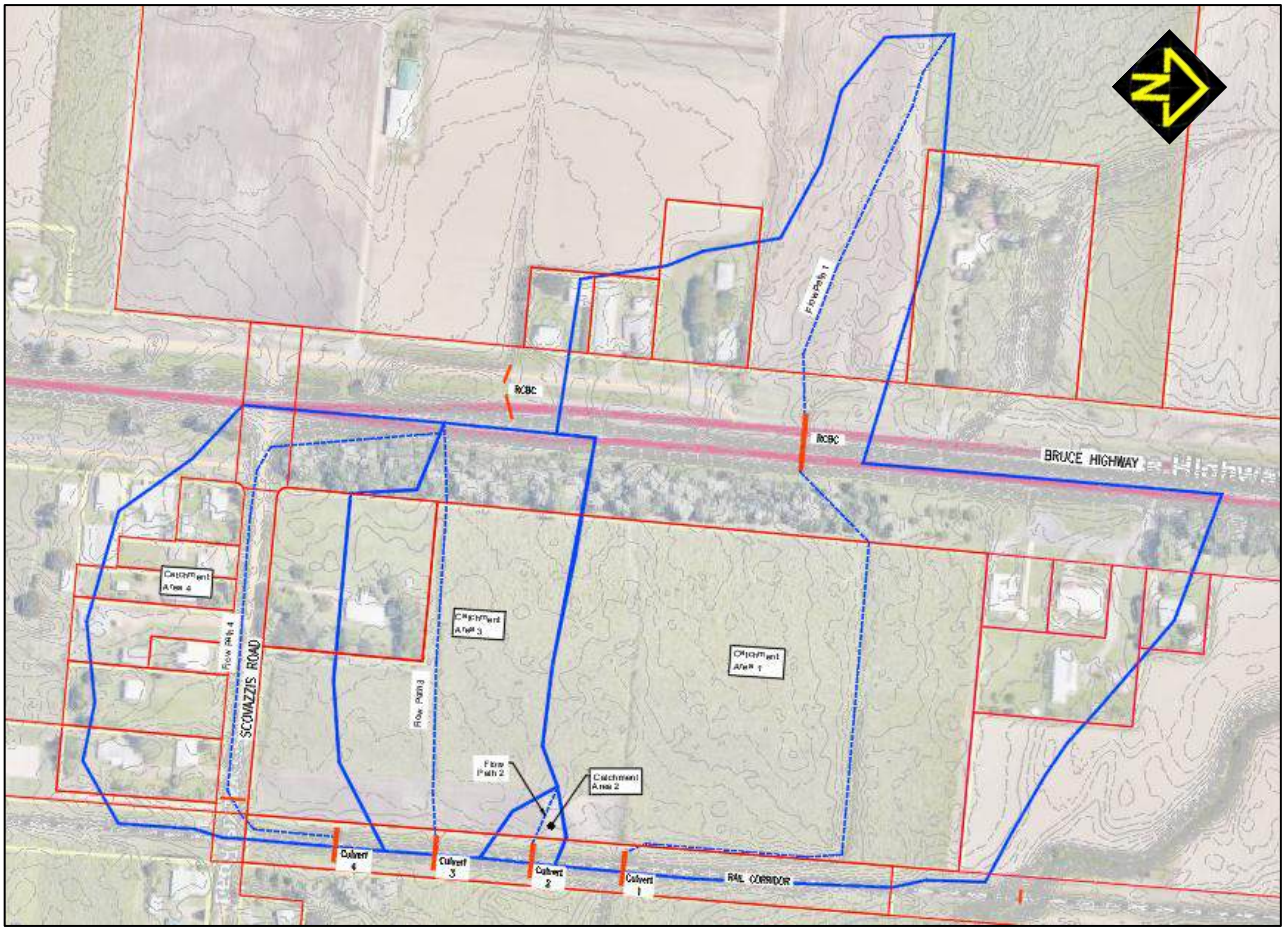


Figure 9: *Pre-Development Catchment Area*

4.1.2 Post - Development Stormwater

The catchment areas (blue) and longest flow path (dashed blue line) are shown in **Figure 10** below. Culvert 1 has catchment area of 12.65ha, Culvert 2 has catchment area of 0.41ha, Culvert 3 has catchment area of 3.16ha and Culvert 4 has catchment area of 4.06ha.

The pre-development catchments have the following Q100 flow rates.

- Culvert 1 Catchment = 3.872 m3/s
- Culvert 2 Catchment = 0.095 m3/s
- Culvert 3 Catchment = 1.333 m3/s
- Culvert 4 Catchment = 1.410 m3/s

It will be assumed that lots 1-15 grade to the culverts near rail corridor and then into neighbouring farmland. The development site has total 27 lots. The post development stormwater heading to drains and then to the culverts is calculated as per QUDM.

For the proposed development, 20% area of each lot is taken as impervious area.

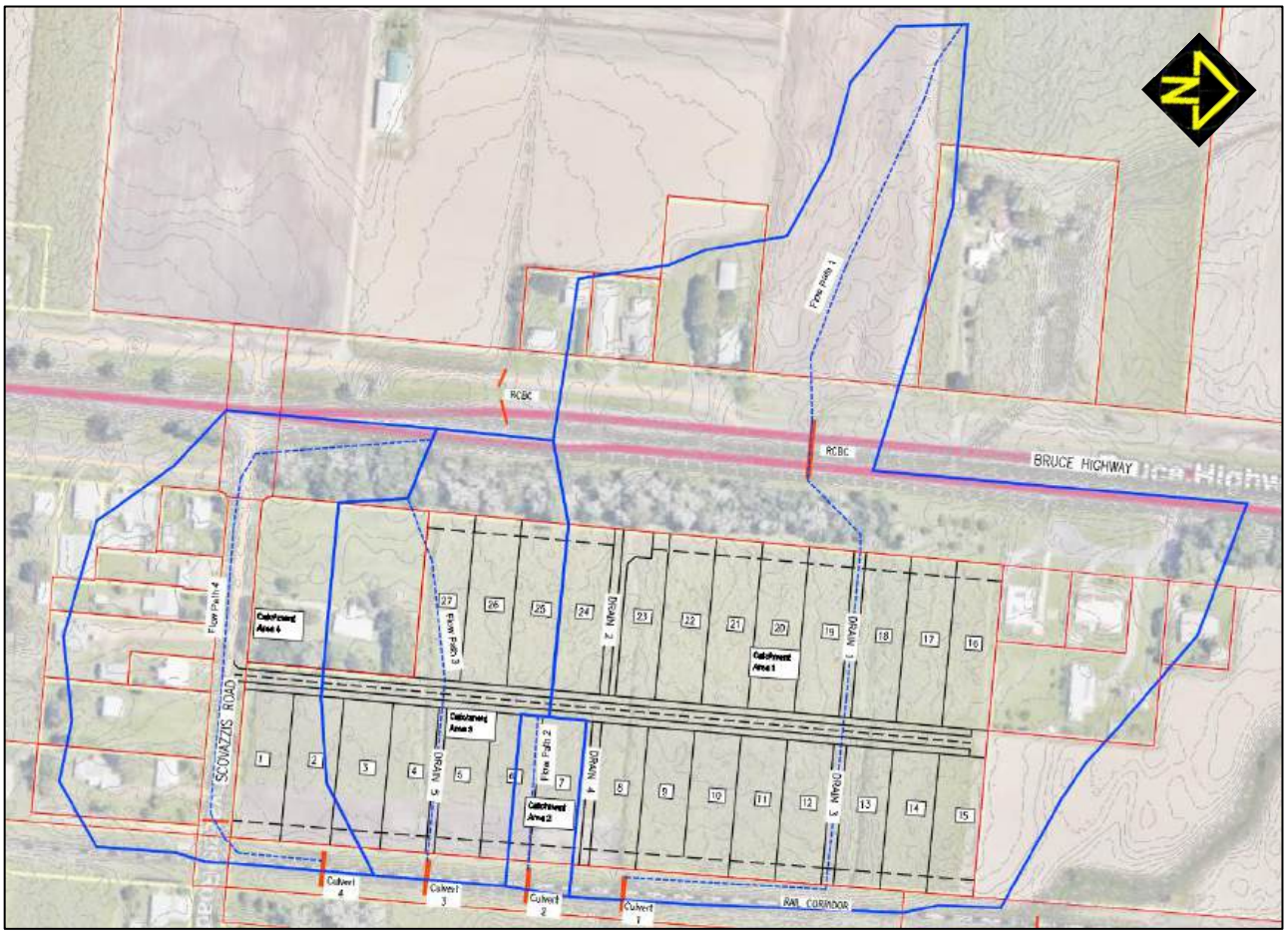


Figure 10: *Post -Development Catchment Area*

Refer to Appendix C for the calculations.

4.1.3 *Pre and Post Stormwater Summary*

A comparison of pre and post development Q100 flows is summarised in **Table 1.**

Table 1: *Comparison of Q100 Flows*

Catchment Area	Pre-Development Q_{100} (m^3/s)	Post Development Q_{100} (m^3/s)	Difference (m^3/s)
Culvert 1	3.683	3.872	0.189[1]
Culvert 2	0.095	0.200	0.105
Culvert 3	1.297	1.333	0.036
Culvert 4	1.389	1.410	0.021
Total	**6.464**	**6.812**	**0.162[2]**

[1]Difference will be stored in the drain with bund

[2]Does not include Culvert 1

Culvert 1 has had a flow increase of 0.189m^3/s. In order to match the pre and post development flows for Culvert 1, storage of 670m^3 is required. This storage is to be located within the table drain along the rail corridor. The table drain north of Culvert 1 will be required to be regraded to ensure suitable storage is available. A rough volume calculation was completed based on the regrading and reprofiled and a 400mm high bund just north of the Culvert 1 inlet which was found to have storage of 795m^3. Note that there is still approximately 430mm from the top of bund to the top of the railway. The bund will also likely require a low flow pipe to ensure discharge is still possible when the bund doesn't overtop. Culvert 2 increases by 0.105m^3/s. Due to the small post development flow of 0.2m^3/s this increase wont impact the downstream end. Culvert 3 and 4 have a minor increase of 0.036m^3/s and 0.021m^3/s respectively.

As the Culvert 1 difference is to be caught within the drains it won't be discharged into the neighbouring property. Therefore, the neighbouring property has an increase in flow of 0.162m^3/s which is approximately a 2.5% increase. It is noted that no residential lots are located downstream of the development, only farmland. Therefore, the increase in flow from the development will not impact any downstream properties.

4.2 DRAIN SIZING

4.2.1 Catchment Area for Grassed Drain

The stormwater catchments for the proposed four drain are shown in **Figure 11** below. The Drain 1 will carry runoff from catchment area 1 and catchment area 2. The Drain 2 will carry runoff from catchment area 4. The Drain 3 will carry runoff from catchment area 3 and drain 1. The Drain 4 will carry runoff from drain 2 and catchment area 5 and Drain 5 will carry runoff from catchment 6.

4.2.2 Flow Calculation

The stormwater assessment has been completed using the rational method in accordance with the QUDM. The flow rate has been calculated based on 1% AEP events are shown **Table 2** below and size of drains are shown in ***Table 3***

Table 3 below.

***Table 2**: Post Development Flow for Drain Catchments*

Catchment Area	Catchment Area	Total Flow for Drain (m3/s)
Drain 1	Catchment Area 1, 2	2.499
Drain 2	Catchment Area 4	0.802
Drain 3	Catchment Area 1, 2 and 3	2.769
Drain 4	Catchment Area 4 and 5	0.992
Drain 5	Catchment 6	0.517

***Table 3:** Size of Drain*

Drain	Total Width (m)	Base Width (m)	Depth (m)	Batter
Drain 1	7.0	1.0	0.5	1:6
Drain 2	5.2	0.4	0.4	1:6
Drain 3	7.3	1.3	0.5	1:6
Drain 4	6.3	0.3	0.5	1:6
Drain 5	5.1	0.3	0.4	1:6

Lots 1-15 are falling east to rail corridor. Therefore, stormwater from these lots will not enter into Drain 3, Drain 4 and Drain 5.

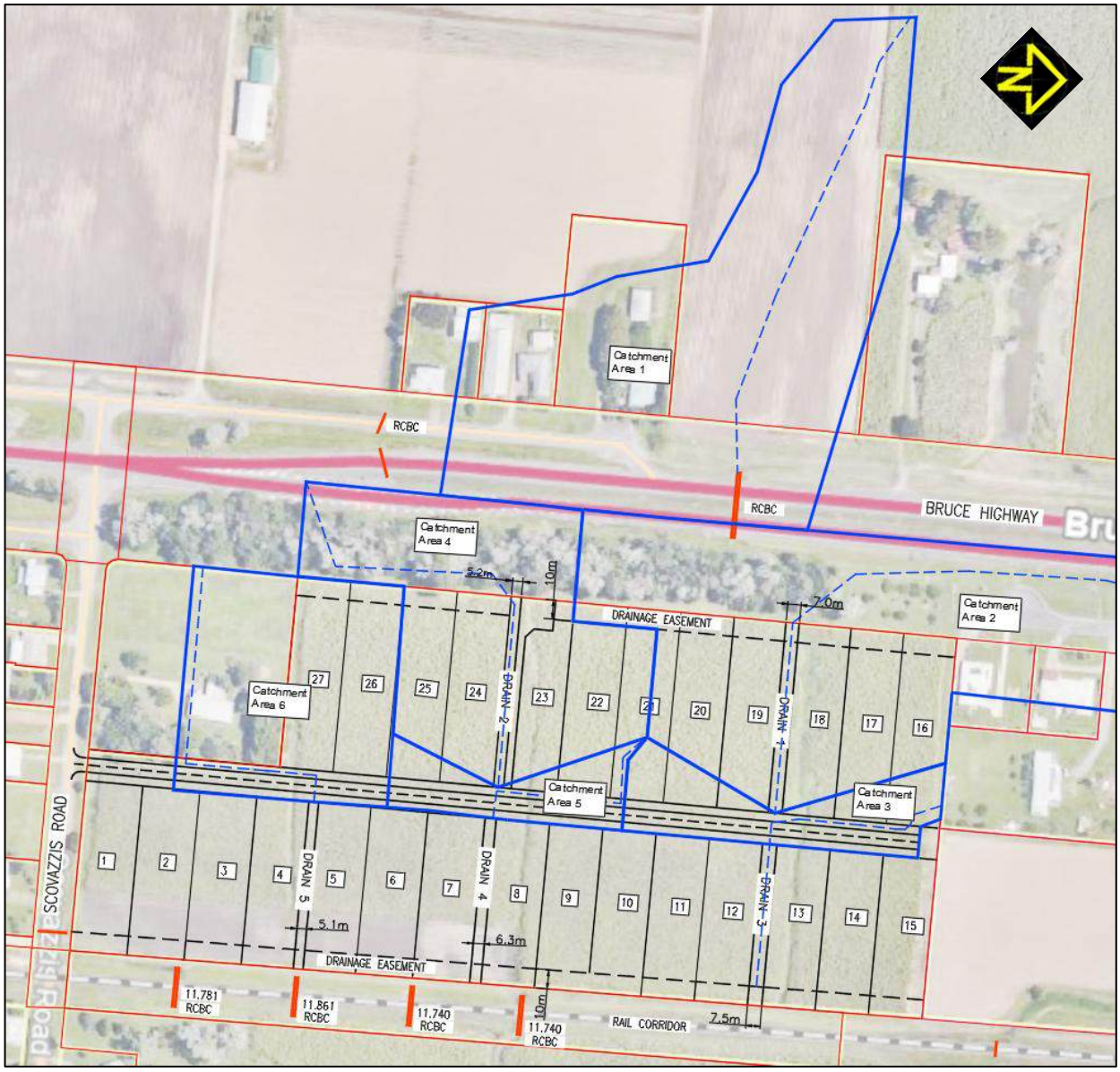


Figure 11: *Catchment Area for Drain*

Refer to Appendix C for the calculations.

5.0 SUMMARY

The proposed 27 lot subdivision has been assessed and the with the following outcomes:

Water

- The development will connect to the existing DN100 main on Scovazzis Road.
- A DN100 main will run along the proposed road and pe capped at the end to allow for a potential extension in the future.

A water pressure tests was conducted on Friday 21st February 2025, the results are as follows:

- The flow rate in the DN225 water main is 14.4L/Sec at a pressure of 350Kpa (approximately 35m head); and
- The flow rate in DN100 water main is 13.66L/Sec at 325Kpa (approximately 33m head).

From our discussions with Council the firefighting minimum requirement is 7.5L/s at a pressure of 25m head (approximately 246Kpa). Please note that the existing water supply exceeds Council's minimum requirements for firefighting.

Sewerage

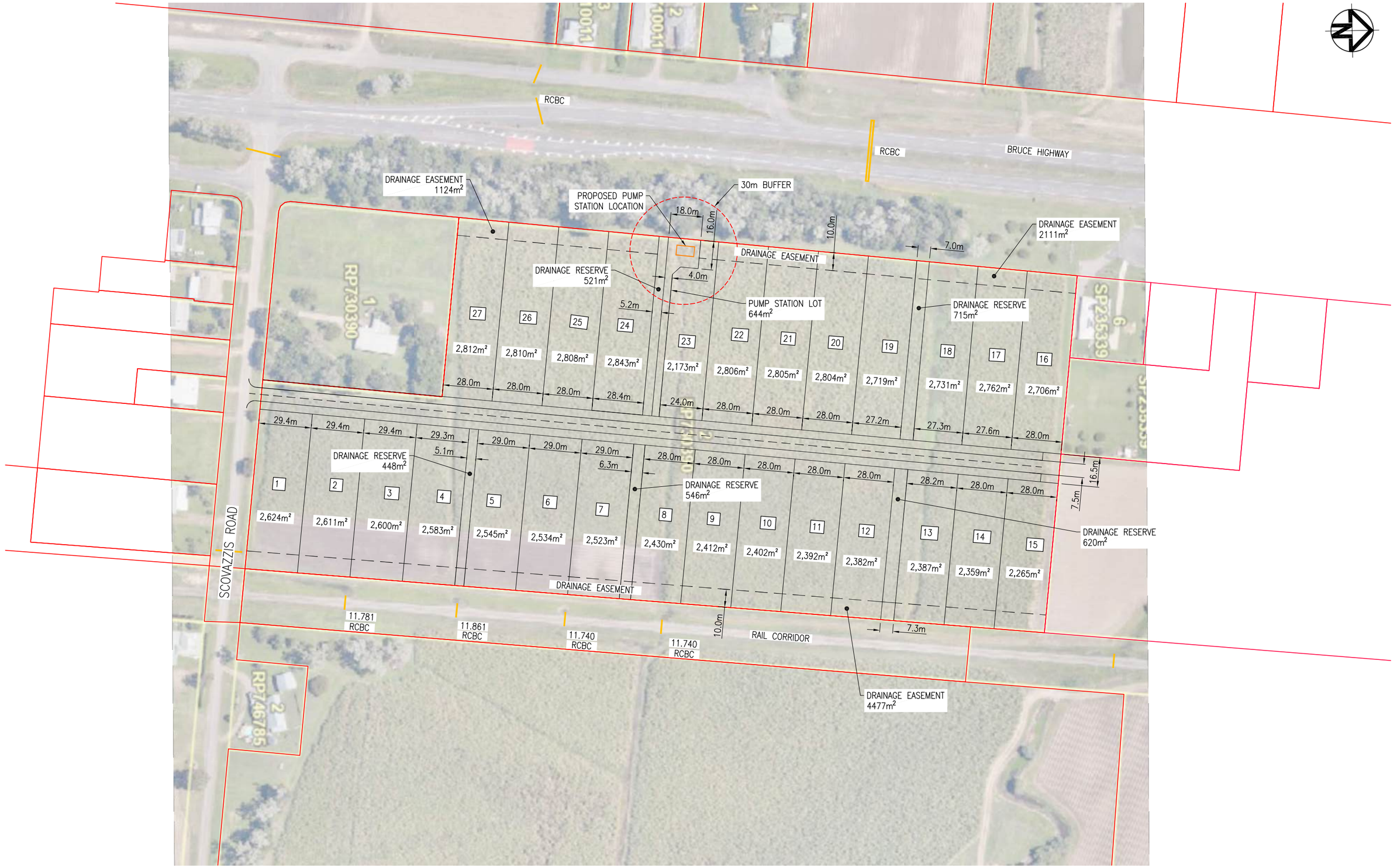
- The sewerage for the development will rely on the proposed extension of the HSC network with a pressure sewer being proposed.
- The development will likely require a pump station.

Stormwater

- A pre and post development stormwater assessment was completed which found that all the stormwater still can adequately discharge to the culverts in the rail corridor with minimal impact on the neighbouring properties.
- Stormwater storage is required to store the difference between the pre and post for Culvert 1. Sufficient storage is available in the drain along the railway with some reprofiling required.
- Internal drains have been sized based on a Q100 flood event.

APPENDIX A

PROPOSED DEVELOPMENT LAYOUT



LAYOUT PLAN
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A	B.L	20.02.25	FOR INFORMATION	
No.	BY	DATE	DESCRIPTION	

HORIZ. DATUM	MGA	
VERT. DATUM	AHD	
DRG. FILE		DATE
DESIGN		10.12.24
DRAWN	M.AMIN	10.12.24

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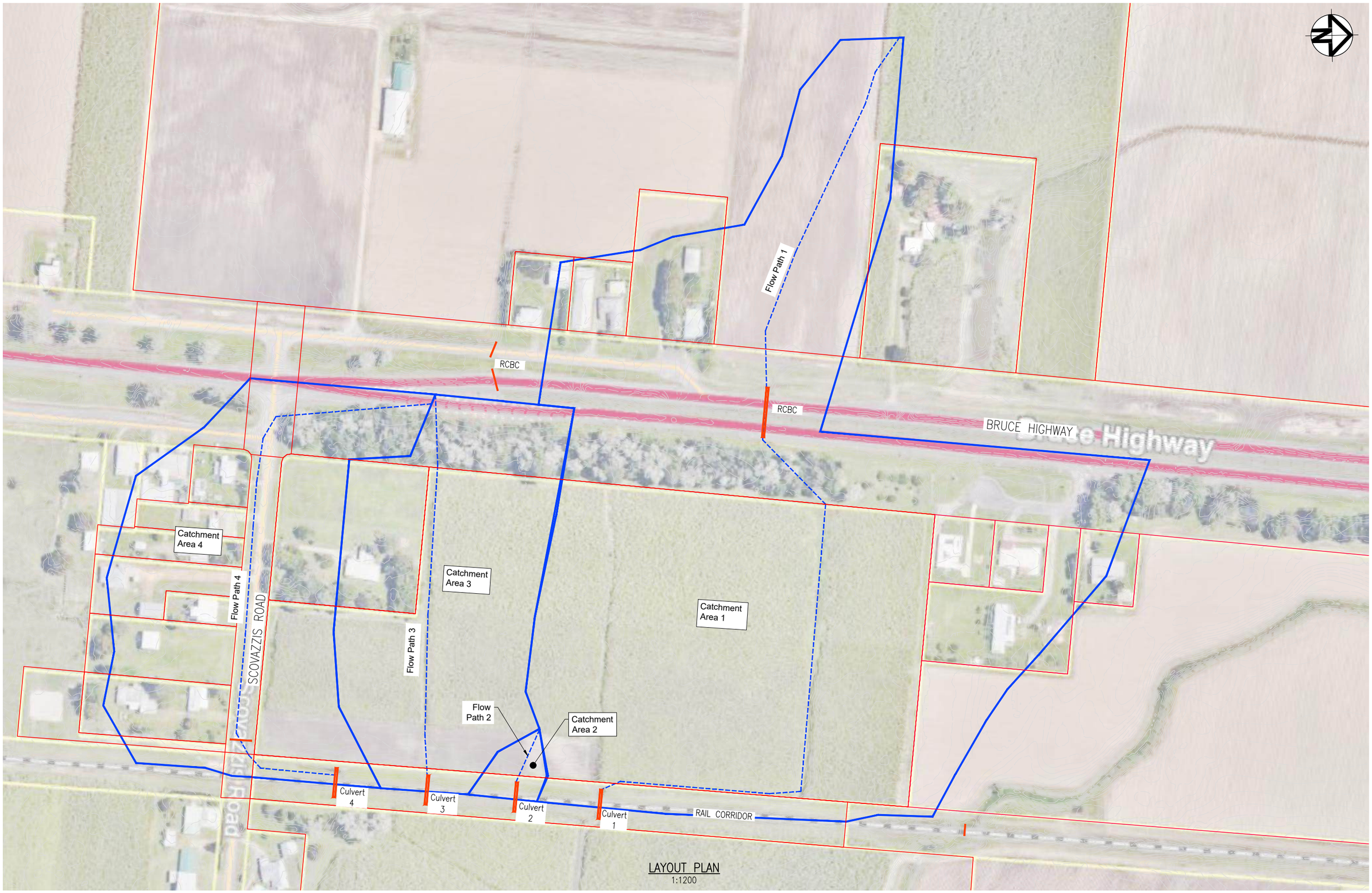
MILFORD PLANNING

SCOVAZZIS ROAD SUBDIVISION
BRUCE HIGHWAY, TOOBANNA, 4850
LAYOUT PLAN

SCALE	AS SHOWN
SHEET	1 OF 1
REVISION	0
DRG No.	1271–C–001

APPENDIX B

PRE DEVELOPMENT CALCULATIONS



LAYOUT PLAN
1:1200

REVISIONS

No.	BY	DATE	DESCRIPTION
0	B.L	10.12.24	FOR INFORMATION

HORIZ. DATUM	MGA	
VERT. DATUM	AHD	
DRG. FILE		DATE
DESIGN	M.AMIN	10.12.24
DRAWN	M.AMIN	10.12.24

CERTIFICATION
B. LANGTREE RPEQ 11932

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MILFORD PLANNING

SCOVAZZIS ROAD SUBDIVISION
BRUCE HIGHWAY, TOOBANNA, 4850
PRE DEVELOPMENT CATCHMENT AREA PLAN

SCALE	AS SHOWN
SHEET	1 OF 1
REVISION	0
DRG No.	1271–C–001

CATCHMENT HYDROLOGY
(RATIONAL METHOD)
PRE - DEVELOPMENT

PROJECT No.	1271			
CALCULATION BY	MA	DATE	30/01/25	
CHECKED BY	AR	DATE	30/01/25	
SHEET	1	OF	4	

Project Name: *Scovazzis Road Subdivision*

Project Location: *Scovazzis Road, Toobanna*

Input
Output

(1) Guidelines

- Queensland Urban Drainage Manual (QUDM) 2017
- Bureau of Meteorology (BOM)

Pre -Catchment Area 1

(2) Time of Concentration (t_c)

a) Overland Flow (Friend's equation) - *refer QUDM 2017, Section 4.6.8*

$t = (107 \, n \, L^{0.333}) / S^{0.2}$

where:

t = overland sheet flow travel time (min)
L = overland sheet flow path length (m)
n = Horton's surface roughness factor
S = slope of surface (%)

L (m) =	294.4
U/S RL (m) =	13.57
D/S RL (m) =	12.40
S (%) =	0.40
n =	0.0450

- refer QUDM 2017, Figure 4.4, assumed average grassed

t (mins) = 38.4

b) Using Chart for flow travel times in pipes and channels - *refer QUDM 2017, Figure 4.5*

where:

Δ Multiplier = 2 - *refer QUDM 2017, Section 4.6.7, assumed earth table drains*

L (m) =	397.00
U/S RL (m) =	12.4
D/S RL (m) =	11.85
Fall of channel (m) =	0.55

t_c (mins) = 28.0

c) Total tc

t_c (mins) = 66.4

(3) Design Flow (Q)

$Q_y = 0.00278 \times C_y \times {}^{t}I_y \times A$ - *refer QUDM 2017, Section 4.3*

where:

Q_y = peak flow rate (m^3/s) for annual exceedence probability (AEP) of 1 in 'y' years
C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years
A = area of catchment (ha)
${}^{t}I_y$ = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years
t = the nominal design storm duration as defined by the time of concentration (t_c)

Design ARI, y = 100

A (ha) =	12.5391	=	125391	m2	
t_c (mins) =	66.4			Catchment Area (m2) =	125391
Rainfall intensity, I (mm/hr) =	122.2			Impervious Area (m2) =	12950.81
${}^{1}I_{10}$ (mm/hr) =	85.6			Fraction Impervious =	0.10

Fraction impervious, f_i =	0.10	*- refer QUDM 2017, Table 4.5.1*
Frequency Factor, F =	1.20	*- refer QUDM 2017, Table 4.5.2*
C_{10} =	0.72	*- refer QUDM 2017, Table 4.5.3 & 4.5.4*
C_y =	0.86	

Q (m^3/s) = 3.683

CATCHMENT HYDROLOGY
(RATIONAL METHOD)
PRE - DEVELOPMENT

PROJECT No.	1271			
CALCULATION BY	MA	DATE	30/01/25	
CHECKED BY	AR	DATE	30/01/25	
SHEET	2	OF	4	

Project Name: *Scovazzis Road Subdivision*

Project Location: *Scovazzis Road, Toobanna*

Input
Output

(1) Guidelines

- Queensland Urban Drainage Manual (QUDM) 2017
- Bureau of Meteorology (BOM)

Pre - Catchment Area 2

(2) Time of Concentration (t_c)

a) Overland Flow (Friend's equation) - *refer QUDM 2017, Section 4.6.8*

$t = (107\ n\ L^{0.333}) / S^{0.2}$

where:

t = overland sheet flow travel time (min)
L = overland sheet flow path length (m)
n = Horton's surface roughness factor
S = slope of surface (%)

L (m) =	39.6
U/S RL (m) =	12.46
D/S RL (m) =	11.90
S (%) =	1.41
n =	0.0350

- refer QUDM 2017, Figure 4.4, assumed average grassed

t (mins) =	**11.9**

b) Using Chart for flow travel times in pipes and channels

where:

Δ Multiplier =	
L (m) =	
U/S RL (m) =	
D/S RL (m) =	
Fall of channel (m) =	
t_c (mins) =	

c) Total tc

t_c (mins) =	**11.9**

(3) Design Flow (Q)

$Q_y = 0.00278 \times C_y \times {}^{t}I_y \times A$ - *refer QUDM 2017, Section 4.3*

where:

Q_y = peak flow rate (m^3/s) for annual exceedence probability (AEP) of 1 in 'y' years
C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years
A = area of catchment (ha)
${}^{t}I_y$ = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years
t = the nominal design storm duration as defined by the time of concentration (t_c)

Design ARI, y =	100				
A (ha) =	0.1578	=	1578	m2	
t_c (mins) =	11.9			Catchment Area (m2) =	1578
Rainfall intensity, I (mm/hr) =	258.7			Impervious Area (m2) =	0
${}^{1}I_{10}$ (mm/hr) =	85.6			Fraction Impervious =	0.00
Fraction impervious, f_i =	0.00	*- refer QUDM 2017, Table 4.5.1*			
Frequency Factor, F =	1.20	*- refer QUDM 2017, Table 4.5.2*			
C_{10} =	0.70	*- refer QUDM 2017, Table 4.5.3 & 4.5.4*			
C_y =	0.84				
Q (m^3/s) =	**0.095**				

CATCHMENT HYDROLOGY
(RATIONAL METHOD)
PRE - DEVELOPMENT

PROJECT No.	1271		
CALCULATION BY	MA	DATE	30/01/25
CHECKED BY	AR	DATE	30/01/25
SHEET	3	OF	4

Project Name: *Scovazzis Road Subdivision*

Project Location: *Scovazzis Road, Toobanna*

Input
Output

(1) Guidelines

- Queensland Urban Drainage Manual (QUDM) 2017
- Bureau of Meteorology (BOM)

Pre - Catchment Area 3

(2) Time of Concentration (t_c)

a) Overland Flow (Friend's equation) - *refer QUDM 2017, Section 4.6.8*

$t = (107 \, n \, L^{0.333}) / S^{0.2}$

where:

t = overland sheet flow travel time (min)
L = overland sheet flow path length (m)
n = Horton's surface roughness factor
S = slope of surface (%)

L (m) =	
U/S RL (m) =	
D/S RL (m) =	
S (%) =	
n =	
t (mins) =	

b) Using Chart for flow travel times in pipes and channels - *refer QUDM 2017, Figure 4.5*

where:

Multiplier = 2 - *refer QUDM 2017, Section 4.6.7, assumed earth table drains*

L (m) =	241.49
U/S RL (m) =	12.6
D/S RL (m) =	12
Fall of channel (m) =	0.60
t_c (mins) =	**16.0**

c) Total tc

t_c (mins) =	**16.0**

(3) Design Flow (Q)

$Q_y = 0.00278 \times C_y \times {}^{t}I_y \times A$ - *refer QUDM 2017, Section 4.3*

where:

Q_y = peak flow rate (m^3/s) for annual exceedence probability (AEP) of 1 in 'y' years
C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years
A = area of catchment (ha)
${}^{t}I_y$ = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years
t = the nominal design storm duration as defined by the time of concentration (t_c)

Design ARI, y =	100				
A (ha) =	3.3288	=	33288	m2	
t_c (mins) =	16.0			Catchment Area (m2) =	33288
Rainfall intensity, I (mm/hr) =	231.3			Impervious Area (m2) =	1032.47
${}^{1}I_{10}$ (mm/hr) =	85.6			Fraction Impervious =	0.03
Fraction impervious, f_i =	0.03	- *refer QUDM 2017, Table 4.5.1*			
Frequency Factor, F =	1.20	- *refer QUDM 2017, Table 4.5.2*			
C_{10} =	0.71	- *refer QUDM 2017, Table 4.5.3 & 4.5.4*			
C_y =	0.85				
Q (m^3/s) =	**1.819**				

CATCHMENT HYDROLOGY
(RATIONAL METHOD)
PRE - DEVELOPMENT

PROJECT No.	1271		
CALCULATION BY	MA	DATE	30/01/25
CHECKED BY	AR	DATE	30/01/25
SHEET	4	OF	4

Project Name: *Scovazzis Road Subdivision*

Project Location: *Scovazzis Road, Toobanna*

Input
Output

(1) Guidelines

- Queensland Urban Drainage Manual (QUDM) 2017
- Bureau of Meteorology (BOM)

Pre - Catchment Area 4

(2) Time of Concentration (t_c)

a) Overland Flow (Friend's equation) - *refer QUDM 2017, Section 4.6.8*

$t = (107 \, n \, L^{0.333}) / S^{0.2}$

where:

t = overland sheet flow travel time (min)
L = overland sheet flow path length (m)
n = Horton's surface roughness factor
S = slope of surface (%)

L (m) =	104.3
U/S RL (m) =	13.00
D/S RL (m) =	12.60
S (%) =	0.38
n =	0.0450

- refer QUDM 2017, Figure 4.4, assumed average grassed surface

t (mins) = 27.4

b) Using Chart for flow travel times in pipes and channels - *refer QUDM 2017, Figure 4.5*

where:

△ Multiplier = 2 - *refer QUDM 2017, Section 4.6.7, assumed earth table drains*

L (m) =	299.21
U/S RL (m) =	12.6
D/S RL (m) =	12.2
Fall of channel (m) =	0.40

t_c (mins) = 23.0

b) Total tc

t_c (mins) = 50.4

(3) Design Flow (Q)

$Q_y = 0.00278 \times C_y \times {}^{t}I_y \times A$ - *refer QUDM 2017, Section 4.3*

where:

Q_y = peak flow rate (m^3/s) for annual exceedence probability (AEP) of 1 in 'y' years
C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years
A = area of catchment (ha)
${}^{t}I_y$ = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years
t = the nominal design storm duration as defined by the time of concentration (t_c)

Design ARI, y = 100

A (ha) =	4.058158	=	40581.58 m2
t_c (mins) =	50.4		
Rainfall intensity, I (mm/hr) =	139.8		
${}^{1}I_{10}$ (mm/hr) =	85.6		

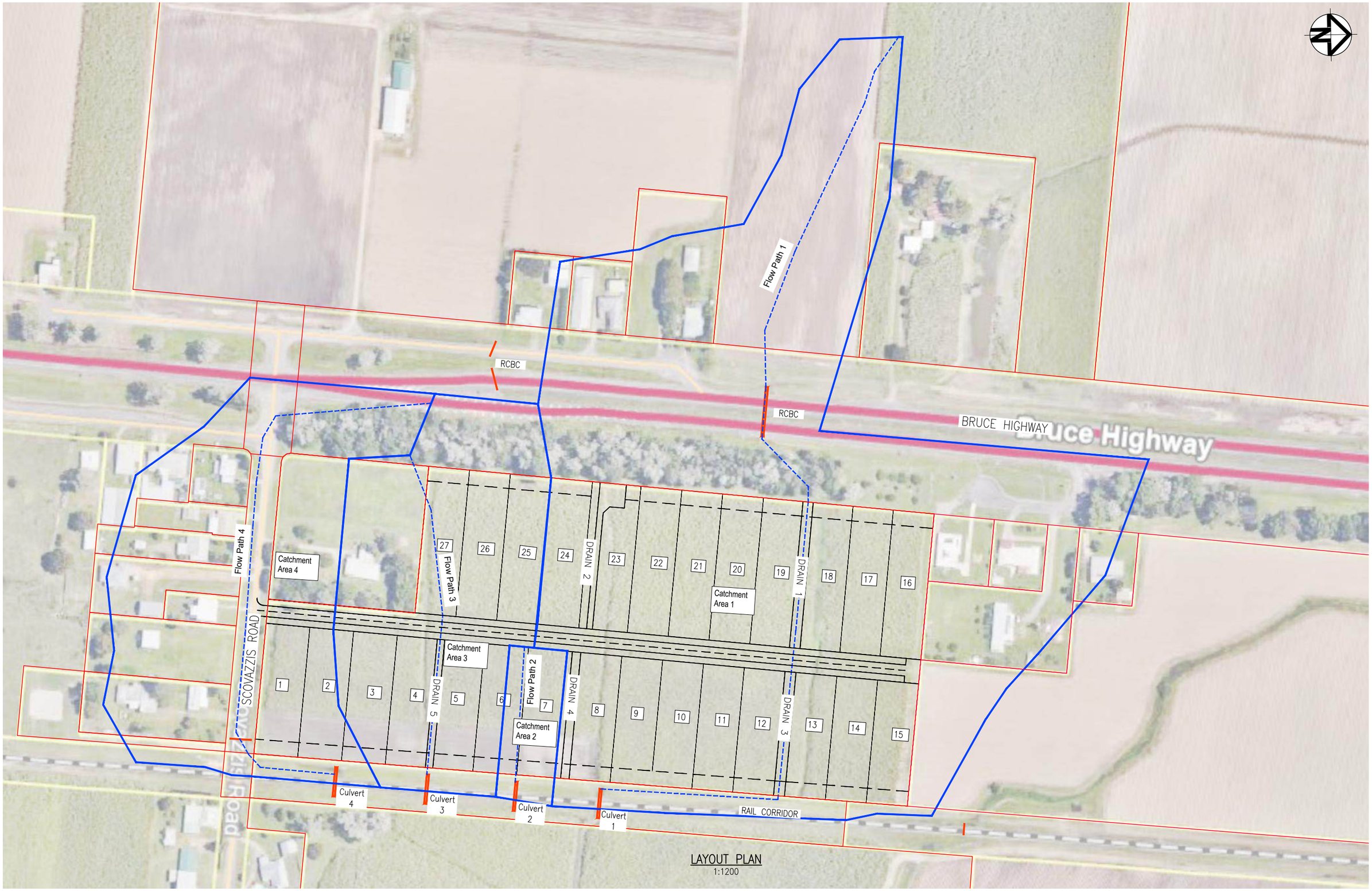
Catchment Area (m2) =	40581.88
Impervious Area (m2) =	6787.6
Fraction Impervious =	0.17

Fraction impervious, f_i =	0.17	*- refer QUDM 2017, Table 4.5.1*
Frequency Factor, F =	1.20	*- refer QUDM 2017, Table 4.5.2*
C_{10} =	0.73	*- refer QUDM 2017, Table 4.5.3 & 4.5.4*
C_y =	0.88	

Q (m^3/s) = 1.389

APPENDIX C

POST DEVELOPMENT CALCULATIONS



LAYOUT PLAN
1:1200

REVISIONS				
0	B.L	10.12.24	FOR INFORMATION	
No.	BY	DATE	DESCRIPTION	

HORIZ. DATUM	MGA		
VERT. DATUM	AHD		
DRG. FILE		DATE	
DESIGN		10.12.24	
DRAWN	M.AMIN	10.12.24	

CERTIFICATION
B. LANGTREE RPEQ 11932

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MILFORD PLANNING

SCOVAZZIS ROAD SUBDIVISION
BRUCE HIGHWAY, TOOBANNA, 4850
POST DEVELOPMENT CATCHMENT AREA PLAN

SCALE	AS SHOWN
SHEET	1 OF 1
REVISION	0
DRG No.	1271–C–002

CATCHMENT HYDROLOGY
(RATIONAL METHOD)
POST - DEVELOPMENT

PROJECT No.	1271		
CALCULATION BY	MA	DATE	30/01/25
CHECKED BY	AR	DATE	30/01/25
SHEET	1	OF	4

Project Name: *Scovazzis Road Subdivision*

Project Location: *Scovazzis Road, Toobanna*

Input
Output

(1) Guidelines

- Queensland Urban Drainage Manual (QUDM) 2017
- Bureau of Meteorology (BOM)

Post -Catchment Area 1

(2) Time of Concentration (t_c)

a) Overland Flow (Friend's equation) - *refer QUDM 2017, Section 4.6.8*

$$t = (107\ n\ L^{0.333}) / S^{0.2}$$

where:

t = overland sheet flow travel time (min)
L = overland sheet flow path length (m)
n = Horton's surface roughness factor
S = slope of surface (%)

L (m) =	294.4
U/S RL (m) =	13.57
D/S RL (m) =	12.40
S (%) =	0.40
n =	0.0450

- refer QUDM 2017, Figure 4.4, assumed average grassed

t (mins) = 38.5

b) Using Chart for flow travel times in pipes and channels - *refer QUDM 2017, Figure 4.5*

where:

Δ Multiplier = 2 - *refer QUDM 2017, Section 4.6.7, assumed earth table drains*

L (m) =	381.08
U/S RL (m) =	12.4
D/S RL (m) =	11.85
Fall of channel (m) =	0.55

t_c (mins) = 26.0

c) Total tc

t_c (mins) = 64.5

(3) Design Flow (Q)

$$Q_y = 0.00278 \times C_y \times {}^{t}I_y \times A$$ - *refer QUDM 2017, Section 4.3*

where:

Q_y = peak flow rate (m^3/s) for annual exceedence probability (AEP) of 1 in 'y' years
C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years
A = area of catchment (ha)
${}^{t}I_y$ = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years
t = the nominal design storm duration as defined by the time of concentration (t_c)

Design ARI, y = 100

A (ha) =	12.6473	= 126473	m2
t_c (mins) =	64.5		
Rainfall intensity, I (mm/hr) =	124.0		
${}^{1}I_{10}$ (mm/hr) =	85.6		

Catchment Area (m2) =	126473
Impervious Area (m2) =	25294.6
Fraction Impervious =	0.20

Fraction impervious, f_i =	0.20	*- refer QUDM 2017, Table 4.5.1*
Frequency Factor, F =	1.20	*- refer QUDM 2017, Table 4.5.2*
C_{10} =	0.74	*- refer QUDM 2017, Table 4.5.3 & 4.5.4*
C_y =	0.89	

Q (m^3/s) = 3.872

CATCHMENT HYDROLOGY
(RATIONAL METHOD)
POST - DEVELOPMENT

PROJECT No.	1271			
CALCULATION BY	MA	DATE	30/01/25	
CHECKED BY	AR	DATE	30/01/25	
SHEET	2	OF	4	

Project Name: *Scovazzis Road Subdivision*

Project Location: *Scovazzis Road, Toobanna*

(1) Guidelines

- Queensland Urban Drainage Manual (QUDM) 2017
- Bureau of Meteorology (BOM)

Post - Catchment Area 2

Input
Output

(2) Time of Concentration (t_c)

a) Overland Flow (Friend's equation) - *refer QUDM 2017, Section 4.6.8*

$t = (107\ n\ L^{0.333}) / S^{0.2}$

where:

t = overland sheet flow travel time (min)
L = overland sheet flow path length (m)
n = Horton's surface roughness factor
S = slope of surface (%)

L (m) =	92.9
U/S RL (m) =	12.49
D/S RL (m) =	11.90
S (%) =	0.63
n =	0.0450

- refer QUDM 2017, Figure 4.4, assumed grassed surface

t (mins) =	**23.9**

c) Total tc

t_c (mins) =	**23.9**

(3) Design Flow (Q)

$Q_y = 0.00278 \times C_y \times {}^{t}I_y \times A$ - *refer QUDM 2017, Section 4.3*

where:

Q_y = peak flow rate (m^3/s) for annual exceedence probability (AEP) of 1 in 'y' years
C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years
A = area of catchment (ha)
${}^{t}I_y$ = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years
t = the nominal design storm duration as defined by the time of concentration (t_c)

Design ARI, y =	100				
A (ha) =	0.4115	=	4115	m2	
t_c (mins) =	23.9			Catchment Area (m2) =	4115
Rainfall intensity, I (mm/hr) =	196.5			Impervious Area (m2) =	823
${}^{1}I_{10}$ (mm/hr) =	85.6			Fraction Impervious =	0.20
Fraction impervious, f_i =	0.20	*- refer QUDM 2017, Table 4.5.1*			
Frequency Factor, F =	1.20	*- refer QUDM 2017, Table 4.5.2*			
C_{10} =	0.74	*- refer QUDM 2017, Table 4.5.3 & 4.5.4*			
C_y =	0.89				
Q (m^3/s) =	**0.200**				

CATCHMENT HYDROLOGY
(RATIONAL METHOD)
POST - DEVELOPMENT

PROJECT No.	1271			
CALCULATION BY	MA	DATE	30/01/25	
CHECKED BY	AR	DATE	30/01/25	
SHEET	3	OF	4	

Project Name: *Scovazzis Road Subdivision*

Project Location: *Scovazzis Road, Toobanna*

(1) Guidelines

- Queensland Urban Drainage Manual (QUDM) 2017
- Bureau of Meteorology (BOM)

Post - Catchment Area 3

Input
Output

(2) Time of Concentration (t_c)

a) Overland Flow (Friend's equation) - *refer QUDM 2017, Section 4.6.8*

$t = (107 \, n \, L^{0.333}) / S^{0.2}$

where:

t = overland sheet flow travel time (min)
L = overland sheet flow path length (m)
n = Horton's surface roughness factor
S = slope of surface (%)

L (m) =	116.0
U/S RL (m) =	12.87
D/S RL (m) =	12.37
S (%) =	0.44
n =	0.0450

- refer QUDM 2017, Figure 4.4, assumed average grass surface

t (mins) =	**27.7**

b) Using Chart for flow travel times in pipes and channels

where:

Multiplier = 2

L (m) =	104.00
U/S RL (m) =	12.365
D/S RL (m) =	11.787
Fall of channel (m) =	0.58

t_c (mins) =	**5.0**

c) Total tc

t_c (mins) =	**32.7**

(3) Design Flow (Q)

$Q_y = 0.00278 \times C_y \times {}^{t}I_y \times A$ - *refer QUDM 2017, Section 4.3*

where:

Q_y = peak flow rate (m^3/s) for annual exceedence probability (AEP) of 1 in 'y' years
C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years
A = area of catchment (ha)
${}^{t}I_y$ = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years
t = the nominal design storm duration as defined by the time of concentration (t_c)

Design ARI, y =	100
A (ha) =	3.155
=	31550 m2
t_c (mins) =	32.7
Rainfall intensity, I (mm/hr) =	171.1
${}^{1}I_{10}$ (mm/hr) =	85.6

Catchment Area (m2) =	31550
Impervious Area (m2) =	6310
Fraction Impervious =	0.20

Fraction impervious, f_i =	0.20	*- refer QUDM 2017, Table 4.5.1*
Frequency Factor, F =	1.20	*- refer QUDM 2017, Table 4.5.2*
C_{10} =	0.74	*- refer QUDM 2017, Table 4.5.3 & 4.5.4*
C_y =	0.89	
Q (m^3/s) =	**1.333**	

CATCHMENT HYDROLOGY
(RATIONAL METHOD)
POST - DEVELOPMENT

PROJECT No.	1271			
CALCULATION BY	MA	DATE	30/01/25	
CHECKED BY	AR	DATE	30/01/25	
SHEET	4	OF	4	

Project Name: *Scovazzis Road Subdivision*

Project Location: *Scovazzis Road, Toobanna*

(1) Guidelines

- Queensland Urban Drainage Manual (QUDM) 2017
- Bureau of Meteorology (BOM)

Post - Catchment Area 4

Input
Output

(2) Time of Concentration (t_c)

a) Overland Flow (Friend's equation) - *refer QUDM 2017, Section 4.6.8*

$t = (107 \, n \, L^{0.333}) / S^{0.2}$

where:

t = overland sheet flow travel time (min)
L = overland sheet flow path length (m)
n = Horton's surface roughness factor
S = slope of surface (%)

L (m) =	106.3
U/S RL (m) =	13.00
D/S RL (m) =	12.60
S (%) =	0.38
n =	0.0450

- refer QUDM 2017, Figure 4.4, assumed average grassed

t (mins) =	**27.7**

b) Using Chart for flow travel times in pipes and channels - *refer QUDM 2017, Figure 4.5*

where:

Δ Multiplier =	2

- refer QUDM 2017, Section 4.6.7, assumed earth table drains

L (m) =	299.21
U/S RL (m) =	12.6
D/S RL (m) =	12.2
Fall of channel (m) =	0.40
t_c (mins) =	**22.0**

b) Total tc

t_c (mins) =	**49.7**

(3) Design Flow (Q)

$Q_y = 0.00278 \times C_y \times {}^{t}I_y \times A$ - *refer QUDM 2017, Section 4.3*

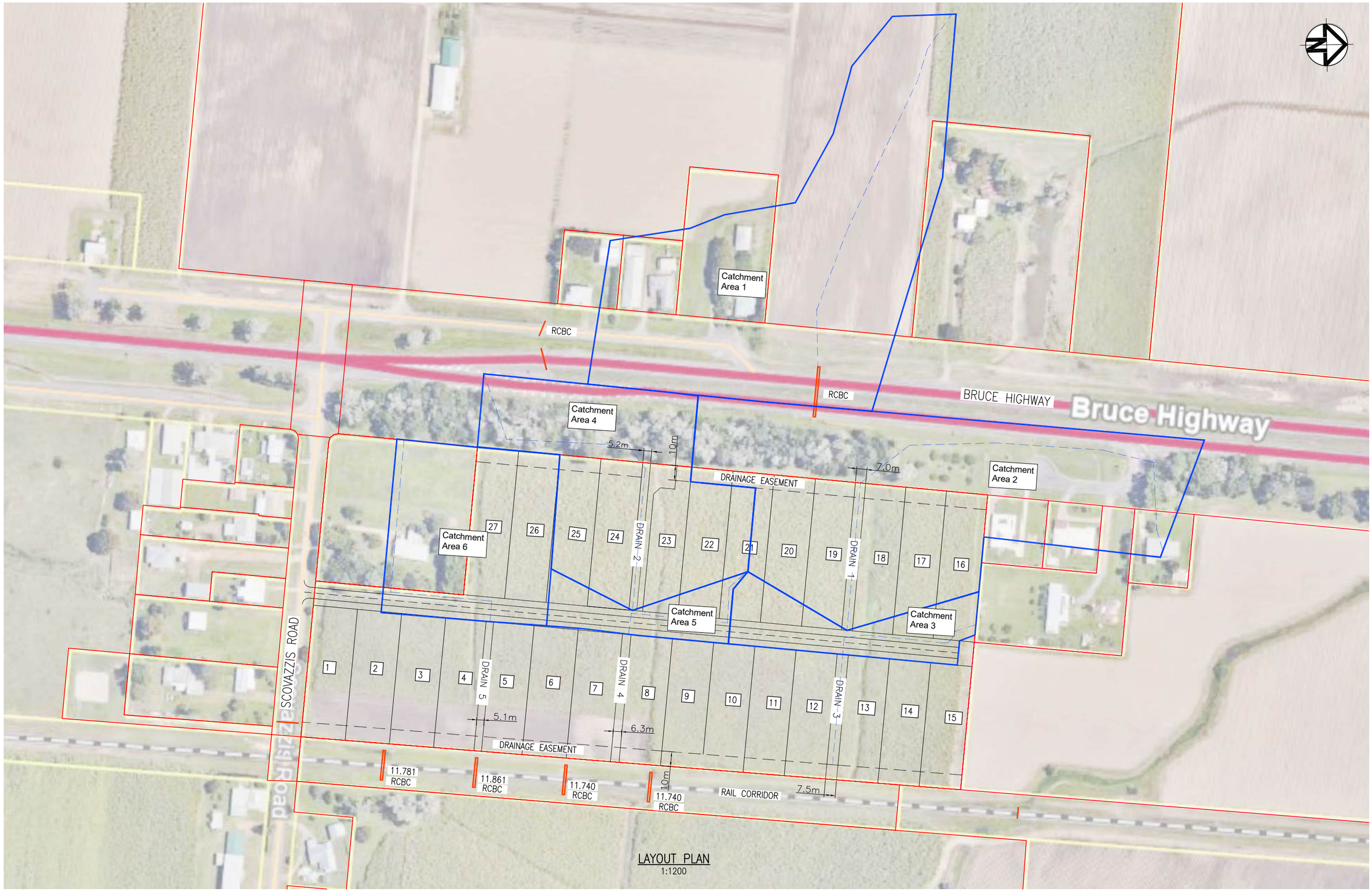
where:

Q_y = peak flow rate (m^3/s) for annual exceedence probability (AEP) of 1 in 'y' years
C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years
A = area of catchment (ha)
${}^{t}I_y$ = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years
t = the nominal design storm duration as defined by the time of concentration (t_c)

Design ARI, y =	100				
A (ha) =	4.058158	=	40581.58	m2	
t_c (mins) =	49.7			Catchment Area (m2) =	40581.88
Rainfall intensity, I (mm/hr) =	140.8			Impervious Area (m2) =	8116.376
${}^{1}I_{10}$ (mm/hr) =	85.6			Fraction Impervious =	0.20
Fraction impervious, f_i =	0.20	*- refer QUDM 2017, Table 4.5.1*			
Frequency Factor, F =	1.20	*- refer QUDM 2017, Table 4.5.2*			
C_{10} =	0.74	*- refer QUDM 2017, Table 4.5.3 & 4.5.4*			
C_y =	0.89				
Q (m^3/s) =	**1.410**				

APPENDIX D

DRAIN SIZING CALCULATIONS



LAYOUT PLAN
1:1200

REVISIONS				
0	B.L	10.12.24	FOR INFORMATION	
No.	BY	DATE	DESCRIPTION	

HORIZ. DATUM	MGA		
VERT. DATUM	AHD		
DRG. FILE			DATE
DESIGN			10.12.24
DRAWN	M.AMIN		10.12.24

CERTIFICATION
B. LANGTREE RPEQ 11932

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MILFORD PLANNING

SCOVAZZIS ROAD SUBDIVISION
BRUCE HIGHWAY, TOOBANNA, 4850
CATCHMENT AREA PLAN FOR DRAIN

SCALE	AS SHOWN
SHEET	1 OF 1
REVISION	0
DRG No.	1271–C–003

CATCHMENT HYDROLOGY
(RATIONAL METHOD)
PRE - DEVELOPMENT

PROJECT No.	1271		
CALCULATION BY	MA	DATE	30/01/25
CHECKED BY	AR	DATE	30/01/25
SHEET	1	OF	9

Project Name: *Scovazzis Road Subdivision*

Project Location: *Scovazzis Road, Toobanna*

(1) Guidelines

- Queensland Urban Drainage Manual (QUDM) 2017
- Bureau of Meteorology (BOM)

Catchment Area 1

Input
Output

(2) Time of Concentration (t_c)

a) Overland Flow (Friend's equation) - *refer QUDM 2017, Section 4.6.8*

$$t = (107\ n\ L^{0.333}) / S^{0.2}$$

where:

t = overland sheet flow travel time (min)
L = overland sheet flow path length (m)
n = Horton's surface roughness factor
S = slope of surface (%)

L (m) =	259.2
U/S RL (m) =	13.60
D/S RL (m) =	12.28
S (%) =	0.51
n =	0.0450

- refer QUDM 2017, Figure 4.4, assumed average grassed

t (mins) =	35.1

b) Total tc

t_c (mins) =	35.1

(3) Design Flow (Q)

$Q_y = 0.00278 \times C_y \times {}^{t}I_y \times A$ - *refer QUDM 2017, Section 4.3*

where:

Q_y = peak flow rate (m^3/s) for annual exceedence probability (AEP) of 1 in 'y' years
C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years
A = area of catchment (ha)
${}^{t}I_y$ = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years
t = the nominal design storm duration as defined by the time of concentration (t_c)

Design ARI, y =	100				
A (ha) =	3.48793	=	34879.3	m2	
t_c (mins) =	35.1			Catchment Area (m2) =	34879.3
Rainfall intensity, I (mm/hr) =	165.7			Impervious Area (m2) =	8383.5
${}^{1}I_{10}$ (mm/hr) =	85.6			Fraction Impervious =	0.24
Fraction impervious, f_i =	0.24	*- refer QUDM 2017, Table 4.5.1*			
Frequency Factor, F =	1.20	*- refer QUDM 2017, Table 4.5.2*			
C_{10} =	0.75	*- refer QUDM 2017, Table 4.5.3 & 4.5.4*			
C_y =	0.90				
Q (m^3/s) =	**1.442**				

CATCHMENT HYDROLOGY
(RATIONAL METHOD)
PRE - DEVELOPMENT

PROJECT No.	1271			
CALCULATION BY	MA	DATE	30/01/25	
CHECKED BY	AR	DATE	30/01/25	
SHEET	2	OF	9	

Project Name: *Scovazzis Road Subdivision*

Project Location: *Scovazzis Road, Toobanna*

(1) Guidelines

- Queensland Urban Drainage Manual (QUDM) 2017
- Bureau of Meteorology (BOM)

Catchment Area 2

Input
Output

(2) Time of Concentration (t_c)

a) Overland Flow (Friend's equation) - *refer QUDM 2017, Section 4.6.8*

$t = (107 \, n \, L^{0.333}) / S^{0.2}$

where:

t = overland sheet flow travel time (min)
L = overland sheet flow path length (m)
n = Horton's surface roughness factor
S = slope of surface (%)

L (m) =	59.4
U/S RL (m) =	13.20
D/S RL (m) =	12.70
S (%) =	0.84
n =	0.0450

- refer QUDM 2017, Figure 4.4, assumed average grassed

t (mins) = 19.4

c) Using Chart for flow travel times in pipes and channels - *refer QUDM 2017, Figure 4.5*

where:

Multiplier = 4 - *refer QUDM 2017, Section 4.6.7, assumed earth table drains*

L (m) =	296.09
U/S RL (m) =	12.7
D/S RL (m) =	12.44
Fall of channel (m) =	0.26

t_c (mins) = 48.0

b) Total tc

t_c (mins) = 67.4

(3) Design Flow (Q)

$Q_y = 0.00278 \times C_y \times {}^{t}I_y \times A$ - *refer QUDM 2017, Section 4.3*

where:

Q_y = peak flow rate (m^3/s) for annual exceedence probability (AEP) of 1 in 'y' years
C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years
A = area of catchment (ha)
${}^{t}I_y$ = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years
t = the nominal design storm duration as defined by the time of concentration (t_c)

Design ARI, y =	100				
A (ha) =	3.3847	=	33847	m2	
t_c (mins) =	67.4			Catchment Area (m2) =	33847
Rainfall intensity, I (mm/hr) =	121.3			Impervious Area (m2) =	12127.14
${}^{1}I_{10}$ (mm/hr) =	85.6			Fraction Impervious =	0.36
Fraction impervious, f_i =	0.36		*- refer QUDM 2017, Table 4.5.1*		
Frequency Factor, F =	1.20		*- refer QUDM 2017, Table 4.5.2*		
C_{10} =	0.77		*- refer QUDM 2017, Table 4.5.3 & 4.5.4*		
C_y =	0.93				

Q (m^3/s) = 1.057

CATCHMENT HYDROLOGY
(RATIONAL METHOD)
PRE - DEVELOPMENT

PROJECT No.	1271			
CALCULATION BY	MA	DATE	30/01/25	
CHECKED BY	AR	DATE	30/01/25	
SHEET	3	OF	9	

Project Name: ***Scovazzis Road Subdivision***

Project Location: ***Scovazzis Road, Toobanna***

Input
Output

(1) Guidelines

- Queensland Urban Drainage Manual (QUDM) 2017
- Bureau of Meteorology (BOM)

Catchment Area 3

(2) Time of Concentration (t_c)

a) Overland Flow (Friend's equation) *- refer QUDM 2017, Section 4.6.8*

$t = (107 \, n \, L^{0.333}) / S^{0.2}$

where:

t = overland sheet flow travel time (min)
L = overland sheet flow path length (m)
n = Horton's surface roughness factor
S = slope of surface (%)

L (m) =	14.8
U/S RL (m) =	12.76
D/S RL (m) =	12.71
S (%) =	0.34
n =	0.0150

- refer QUDM 2017, Section 4.6.7, assumed earth table drains

t (mins) =	**4.9**

c) Using Chart for flow travel times in pipes and channels *- refer QUDM 2017, Figure 4.5*

where:

Multiplier = 2

L (m) =	166.14
U/S RL (m) =	12.71
D/S RL (m) =	12.42
Fall of channel (m) =	0.29
t_c (mins) =	**14.0**

b) Total tc

t_c (mins) =	**18.9**

(3) Design Flow (Q)

$Q_y = 0.00278 \times C_y \times {}^{t}I_y \times A$ *- refer QUDM 2017, Section 4.3*

where:

Q_y = peak flow rate (m^3/s) for annual exceedence probability (AEP) of 1 in 'y' years
C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years
A = area of catchment (ha)
${}^{t}I_y$ = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years
t = the nominal design storm duration as defined by the time of concentration (t_c)

Design ARI, y =	100				
A (ha) =	0.448357	=	4483.57	m2	
t_c (mins) =	18.9			Catchment Area (m2) =	4483.57
Rainfall intensity, I (mm/hr) =	216.5			Impervious Area (m2) =	3517.63
${}^{1}I_{10}$ (mm/hr) =	85.6			Fraction Impervious =	0.78
Fraction impervious, f_i =	0.78	*- refer QUDM 2017, Table 4.5.1*			
Frequency Factor, F =	1.20	*- refer QUDM 2017, Table 4.5.2*			
C_{10} =	0.86	*- refer QUDM 2017, Table 4.5.3 & 4.5.4*			
C_y =	1.00				
Q (m^3/s) =	**0.270**				

CATCHMENT HYDROLOGY
(RATIONAL METHOD)
PRE - DEVELOPMENT

PROJECT No.	1271		
CALCULATION BY	MA	DATE	30/01/25
CHECKED BY	AR	DATE	30/01/25
SHEET	4	OF	9

Project Name: *Scovazzis Road Subdivision*

Project Location: *Scovazzis Road, Toobanna*

Input
Output

(1) Guidelines

- Queensland Urban Drainage Manual (QUDM) 2017
- Bureau of Meteorology (BOM)

Catchment Area 4

(2) Time of Concentration (t_c)

a) Overland Flow (Friend's equation) *- refer QUI - refer QUDM 2017, Section 4.6.8*

$t = (107 \, n \, L^{0.333}) / S^{0.2}$

where:

t = overland sheet flow travel time (min)
L = overland sheet flow path length (m)
n = Horton's surface roughness factor
S = slope of surface (%)

L (m) =	56.7
U/S RL (m) =	13.36
D/S RL (m) =	12.60
S (%) =	1.34
n =	0.0450
t (mins) =	**17.4**

c) Using Chart for flow travel times in pipes and channels *- refer QUDM 2017, Figure 4.5*

where:

Δ Multiplier = 2 *- refer QUDM 2017, Section 4.6.7, assumed earth table drains*

L (m) =	186.81
U/S RL (m) =	12.6
D/S RL (m) =	12.38
Fall of channel (m) =	0.22
t_c (mins) =	**14.0**

b) Total tc

t_c (mins) =	**31.4**

(3) Design Flow (Q)

$Q_y = 0.00278 \times C_y \times {}^{t}I_y \times A$ *- refer QUDM 2017, Section 4.3*

where:

Q_y = peak flow rate (m^3/s) for annual exceedence probability (AEP) of 1 in 'y' years
C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years
A = area of catchment (ha)
${}^{t}I_y$ = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years
t = the nominal design storm duration as defined by the time of concentration (t_c)

Design ARI, y =	100		
A (ha) =	1.8168	= 18168	m2
t_c (mins) =	31.4	Catchment Area (m2) =	18168
Rainfall intensity, I (mm/hr) =	174.1	Impervious Area (m2) =	5450.4
${}^{1}I_{10}$ (mm/hr) =	85.6	Fraction Impervious =	0.30
Fraction impervious, f_i =	0.30	*- refer QUDM 2017, Table 4.5.1*	
Frequency Factor, F =	1.20	*- refer QUDM 2017, Table 4.5.2*	
C_{10} =	0.76	*- refer QUDM 2017, Table 4.5.3 & 4.5.4*	
C_y =	0.91		
Q (m^3/s) =	**0.802**		

CATCHMENT HYDROLOGY
(RATIONAL METHOD)
PRE - DEVELOPMENT

PROJECT No.	1271			
CALCULATION BY	MA	DATE	30/01/25	
CHECKED BY	AR	DATE	30/01/25	
SHEET	5	OF	9	

Project Name: ***Scovazzis Road Subdivision***

Project Location: ***Scovazzis Road, Toobanna***

(1) Guidelines

- Queensland Urban Drainage Manual (QUDM) 2017
- Bureau of Meteorology (BOM)

Catchment Area 5

Input
Output

(2) Time of Concentration (t_c)

a) Overland Flow (Friend's equation) *- refer QUI - refer QUDM 2017, Section 4.6.8*

$t = (107 \, n \, L^{0.333}) / S^{0.2}$

where:

t = overland sheet flow travel time (min)
L = overland sheet flow path length (m)
n = Horton's surface roughness factor
S = slope of surface (%)

L (m) =	37.0
U/S RL (m) =	12.75
D/S RL (m) =	12.64
S (%) =	0.29
n =	0.0450
t (mins) =	**20.5**

c) Using Chart for flow travel times in pipes and channels *- refer QUDM 2017, Figure 4.5*

where:

Δ Multiplier = 2 *- refer QUDM 2017, Section 4.6.7, assumed earth table drains*

L (m) =	79.60
U/S RL (m) =	12.639
D/S RL (m) =	12.262
Fall of channel (m) =	0.38
t_c (mins) =	**4.0**

b) Total tc

t_c (mins) =	**24.5**

(3) Design Flow (Q)

$Q_y = 0.00278 \times C_y \times {}^{t}I_y \times A$ *- refer QUDM 2017, Section 4.3*

where:

Q_y = peak flow rate (m^3/s) for annual exceedence probability (AEP) of 1 in 'y' years
C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years
A = area of catchment (ha)
${}^{t}I_y$ = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years
t = the nominal design storm duration as defined by the time of concentration (t_c)

Design ARI, y =	100		
A (ha) =	0.3667	= 3667	m2
t_c (mins) =	24.5	Catchment Area (m2) =	3667
Rainfall intensity, I (mm/hr) =	194.4	Impervious Area (m2) =	1833.5
${}^{1}I_{10}$ (mm/hr) =	85.6	Fraction Impervious =	0.50
Fraction impervious, f_i =	0.50	*- refer QUDM 2017, Table 4.5.1*	
Frequency Factor, F =	1.20	*- refer QUDM 2017, Table 4.5.2*	
C_{10} =	0.80	*- refer QUDM 2017, Table 4.5.3 & 4.5.4*	
C_y =	0.96		
Q (m^3/s) =	**0.190**		

CATCHMENT HYDROLOGY
(RATIONAL METHOD)
PRE - DEVELOPMENT

PROJECT No. 1271
CALCULATION BY MA DATE
CHECKED BY AR DATE
SHEET 7 OF

Project Name: *Scovazzis Road Subdivision*
Project Location: *Scovazzis Road, Toobanna*

Input
Output

(1) Guidelines

- Queensland Urban Drainage Manual (QUDM) 2017
- Bureau of Meteorology (BOM)

Catchment Area 6

(2) Time of Concentration (t_c)

a) Overland Flow (Friend's equation) - *refer QUDM 2017, Section 4.6.8*

$t = (107\ n\ L^{0.333}) / S^{0.2}$

where:

t = overland sheet flow travel time (min)
L = overland sheet flow path length (m)
n = Horton's surface roughness factor
S = slope of surface (%)

L (m) =	103.0
U/S RL (m) =	12.56
D/S RL (m) =	12.40
S (%) =	0.16
n =	0.0450

- *refer QUDM 2017, Section 4.6.7, assumed average grassed*

t (mins) =	32.6

c) Using Chart for flow travel times in pipes and channels - *refer QUDM 2017, Figure 4.5*

where:

Δ Multiplier =	2	- *refer QUDM 2017, Section 4.6.7, assumed earth table drains*

L (m) =	82.60
U/S RL (m) =	12.4
D/S RL (m) =	12.322
Fall of channel (m) =	0.08
t_c (mins) =	**5.0**

d) Total tc

t_c (mins) =	37.6

(3) Design Flow (Q)

$Q_y = 0.00278 \times C_y \times {}^{t}I_y \times A$ - *refer QUDM 2017, Section 4.3*

where:

Q_y = peak flow rate (m^3/s) for annual exceedence probability (AEP) of 1 in 'y' years
C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years
A = area of catchment (ha)
${}^{t}I_y$ = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years
t = the nominal design storm duration as defined by the time of concentration (t_c)

Design ARI, y =	100		
A (ha) =	1.3051	= 13051	m2
t_c (mins) =	37.6	Catchment Area (m2) =	13051
Rainfall intensity, I (mm/hr) =	160.5	Impervious Area (m2) =	2610.2
${}^{1}I_{10}$ (mm/hr) =	85.6	Fraction Impervious =	0.20
Fraction impervious, f_i =	0.20	- *refer QUDM 2017, Table 4.5.1*	
Frequency Factor, F =	1.20	- *refer QUDM 2017, Table 4.5.2*	
C_{10} =	0.74	- *refer QUDM 2017, Table 4.5.3 & 4.5.4*	
C_y =	0.89		
Q (m^3/s) =	**0.517**		

HYDRAULICS ASSESSMENT

(OPEN DRAIN CAPACITY - TRAPIZOIDAL)

Manning's Equation

PROJECT No.	1271		
CALCULATION BY	MA	DATE	30/01/25
CHECKED BY	AR	DATE	30/01/25
SHEET	6	OF	9

Project Name: *Scovazzis Road Subdivision*

Project Location: *Scovazzis Road, Toobanna*

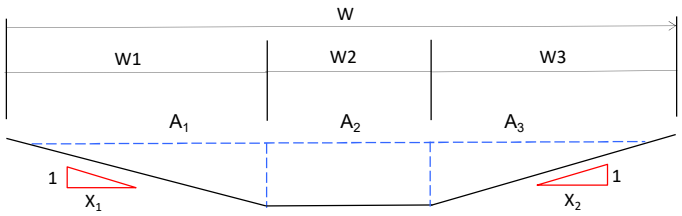
Input
Output

(1) Design Flow

Drain 1 sizing

Q_{Des} = 2.499 m^3/s

(2) Open Drain - Trapizoidal



Channel Properties

X_1 =	6.0	
X_2 =	6.0	
Material =	grass	
Manning's, n =	0.030	
Channel length =		m
USIL =		m
DSIL =		m
Slope =	0.009	m/m
Base width =	1.000	m
Flow depth =	0.500	m
Freeboard =	0.000	m

0.90%

Manning's Calculation:

Flow Areas

A_1 =	0.750	m^2
A_2 =	0.500	m^2
A_3 =	0.750	m^3

Wetted Perimeters

P_1 =	3.041	m
P_2 =	1.000	m
P_3 =	3.041	m

Hydraulic Radius

R = 0.282 m

Capacity

Q = 2.722 m^3/s

Velocity:	**1.361**	**m/s**	**OK**
D_g x V_{ave}:	**0.681**	**m^2/s**	**WARNING!! - dg x Vave > 0.60**
Total Capacity:	**2.722**	**m^3/s**	**OK**

Grated-Drain Design:

Top width, W1	**3.00**	**m**
Top width, W2	**1.00**	**m**
Top width, W3	**3.00**	**m**
Total Width, W	**7.000**	**m**
Base width	**1.000**	**m**
Side Slope (LHS)	**1 on 6**	
Side Slope (RHS)	**1 on 6**	
Channel Depth	**0.500**	**m**
Channel Slope	**0.009**	**m/m**

HYDRAULICS ASSESSMENT

(OPEN DRAIN CAPACITY - TRAPIZOIDAL)

Manning's Equation

PROJECT No.	1271			
CALCULATION BY	MA	DATE	30/01/25	
CHECKED BY	AR	DATE	30/01/25	
SHEET	7	OF	9	

Project Name: *Scovazzis Road Subdivision*

Project Location: *Scovazzis Road, Toobanna*

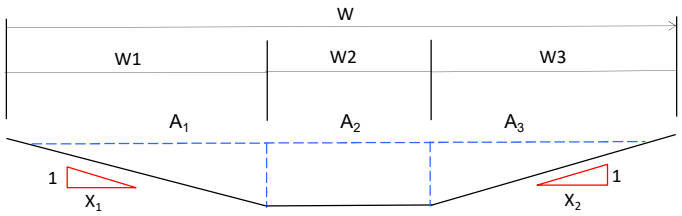
Input
Output

(1) Design Flow

Drain 2 sizing

Q_{Des} = 0.802 m^3/s

(2) Open Drain - Trapizoidal



Channel Properties

X_1 =	6.0	
X_2 =	6.0	
Material =	grass	
Manning's, n =	0.030	
Channel length =		m
USIL =		m
DSIL =		m
Slope =	0.005	m/m
Base width =	0.400	m
Flow depth =	0.400	m
Freeboard =	0.000	m

0.50%

Manning's Calculation:

Flow Areas

A_1 =	0.480	m^2
A_2 =	0.160	m^2
A_3 =	0.480	m^3

Wetted Perimeters

P_1 =	2.433	m
P_2 =	0.400	m
P_3 =	2.433	m

Hydraulic Radius

R = 0.213 m

Capacity

Q = 0.941 m^3/s

Velocity:	**0.840**	**m/s**	**OK**
D_g x V_{ave}:	**0.336**	**m^2/s**	**OK**
Total Capacity:	**0.941**	**m^3/s**	**OK**

Grated-Drain Design:

Top width, W1	**2.40**	**m**
Top width, W2	**0.40**	**m**
Top width, W3	**2.40**	**m**
Total Width, W	**5.200**	**m**
Base width	**0.400**	**m**
Side Slope (LHS)	**1 on 6**	
Side Slope (RHS)	**1 on 6**	
Channel Depth	**0.400**	**m**
Channel Slope	**0.005**	**m/m**

HYDRAULICS ASSESSMENT

(OPEN DRAIN CAPACITY - TRAPIZOIDAL)

Manning's Equation

PROJECT No.	1271		
CALCULATION BY	MA	DATE	30/01/25
CHECKED BY	AR	DATE	30/01/25
SHEET	8	OF	9

Project Name: *Scovazzis Road Subdivision*

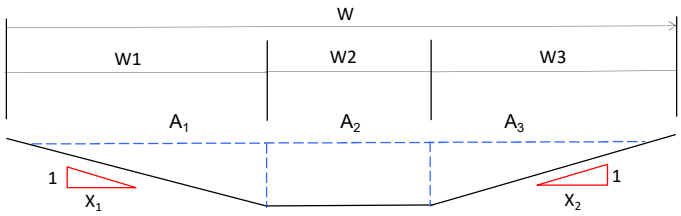
Project Location: *Scovazzis Road, Toobanna*

Input
Output

(1) Design Flow — **Drain 3 sizing**

Q_{Des} = 2.769 m^3/s

(2) Open Drain - Trapizoidal



Channel Properties

X_1 =	6.0	
X_2 =	6.0	
Material =	grass	
Manning's, n =	0.030	
Channel length =		m
USIL =		m
DSIL =		m
Slope =	0.009	m/m
Base width =	1.300	m
Flow depth =	0.500	m
Freeboard =	0.000	m

0.90%

Manning's Calculation:

Flow Areas

A_1 =	0.750	m^2
A_2 =	0.650	m^2
A_3 =	0.750	m^3

Wetted Perimeters

P_1 =	3.041	m
P_2 =	1.300	m
P_3 =	3.041	m

Hydraulic Radius

R = 0.291 m

Capacity

Q = 2.987 m^3/s

Velocity:	**1.389**	**m/s**	**OK**
D_g x V_{ave}:	**0.695**	**m^2/s**	**WARNING!! - dg x Vave > 0.60**
Total Capacity:	**2.987**	**m^3/s**	**OK**

Grated-Drain Design:

Top width, W1	**3.00**	**m**
Top width, W2	**1.30**	**m**
Top width, W3	**3.00**	**m**
Total Width, W	**7.300**	**m**
Base width	**1.300**	**m**
Side Slope (LHS)	**1 on 6**	
Side Slope (RHS)	**1 on 6**	
Channel Depth	**0.500**	**m**
Channel Slope	**0.009**	**m/m**

HYDRAULICS ASSESSMENT

(OPEN DRAIN CAPACITY - TRAPIZOIDAL)

Manning's Equation

PROJECT No.	1271			
CALCULATION BY	MA	DATE	30/01/25	
CHECKED BY	AR	DATE	30/01/25	
SHEET	9	OF	9	

Project Name: ***Scovazzis Road Subdivision***

Project Location: ***Scovazzis Road, Toobanna***

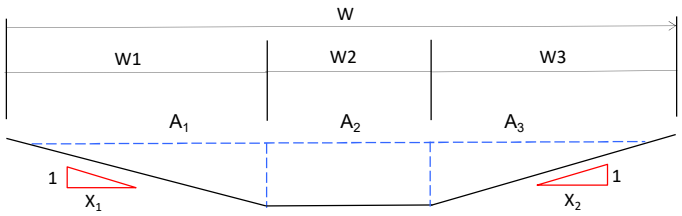
Input
Output

(1) Design Flow

Drain 4 sizing

Q_{Des} = 0.992 m^3/s

(2) Open Drain - Trapizoidal



Channel Properties

X_1 =	6.0	
X_2 =	6.0	
Material =	grass	
Manning's, n =	0.030	
Channel length =		m
USIL =		m
DSIL =		m
Slope =	0.005	m/m
Base width =	0.300	m
Flow depth =	0.500	m
Freeboard =	0.000	m

0.50%

Manning's Calculation:

Flow Areas

A_1 =	0.750	m^2
A_2 =	0.150	m^2
A_3 =	0.750	m^3

Wetted Perimeters

P_1 =	3.041	m
P_2 =	0.300	m
P_3 =	3.041	m

Hydraulic Radius

R = 0.259 m

Capacity

Q = 1.578 m^3/s

Velocity:	**0.956**	**m/s**	**OK**
D_g x V_{ave}:	**0.478**	**m^2/s**	**OK**
Total Capacity:	**1.578**	**m^3/s**	**OK**

Grated-Drain Design:

Top width, W1	**3.00**	**m**
Top width, W2	**0.30**	**m**
Top width, W3	**3.00**	**m**
Total Width, W	**6.300**	**m**
Base width	**0.300**	**m**
Side Slope (LHS)	**1 on 6**	
Side Slope (RHS)	**1 on 6**	
Channel Depth	**0.500**	**m**
Channel Slope	**0.005**	**m/m**

HYDRAULICS ASSESSMENT

(OPEN DRAIN CAPACITY - TRAPIZOIDAL)

Manning's Equation

PROJECT No.	1271			
CALCULATION BY	MA	DATE	30/01/25	
CHECKED BY	AR	DATE	30/01/25	
SHEET	9	OF	9	

Project Name: ***Scovazzis Road Subdivision***

Project Location: ***Scovazzis Road, Toobanna***

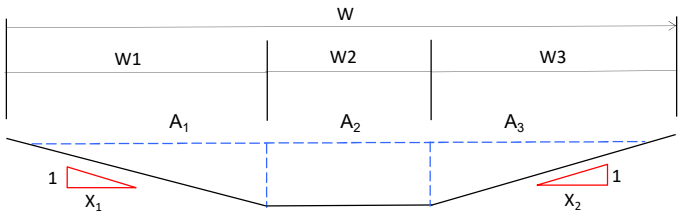
Input
Output

(1) Design Flow

Drain 5 sizing

Q_{Des} = 0.517 m^3/s

(2) Open Drain - Trapizoidal



Channel Properties

X_1 =	6.0	
X_2 =	6.0	
Material =	grass	
Manning's, n =	0.030	
Channel length =		m
USIL =		m
DSIL =		m
Slope =	0.005	m/m
Base width =	0.300	m
Flow depth =	0.400	m
Freeboard =	0.000	m

0.50%

Manning's Calculation:

Flow Areas

A_1 =	0.480	m^2
A_2 =	0.120	m^2
A_3 =	0.480	m^3

Wetted Perimeters

P_1 =	2.433	m
P_2 =	0.300	m
P_3 =	2.433	m

Hydraulic Radius

R = 0.209 m

Capacity

Q = 0.897 m^3/s

Velocity:	**0.830**	**m/s**	**OK**
D_g x V_{ave}:	**0.332**	**m^2/s**	**OK**
Total Capacity:	**0.897**	**m^3/s**	**OK**

Grated-Drain Design:

Top width, W1	**2.40**	**m**
Top width, W2	**0.30**	**m**
Top width, W3	**2.40**	**m**
Total Width, W	**5.100**	**m**
Base width	**0.300**	**m**
Side Slope (LHS)	**1 on 6**	
Side Slope (RHS)	**1 on 6**	
Channel Depth	**0.400**	**m**
Channel Slope	**0.005**	**m/m**

MILFORD PLANNING

Appendix 6

LANGTREE CONSULTING ENGINEERS

SCOVAZZIS ROAD SUBDIVISION

TRAFFIC IMPACT ASSESSMENT

KEITA SERVICES PTY LTD

LANGTREE CONSULTING

Project No.: 1271

Reference No.: R-RM0012

Date: 05/03/2025

Controlled Copy No.: 1

Revisions: C

Revision Record:

Rev	Review Date	Description	Prepared	Checked	Approved
A	31/01/2025	Issued for Client Comment	Rea Maglaya	Aidan Reinaudo	Brett Langtree
B	20/02/2025	Amendments in Response to the Client's Comments	Rea Maglaya	Aidan Reinaudo	Brett Langtree
C	05/03/2025	Updated Layout Plan	Rea Maglaya	Aidan Reinaudo	Brett Langtree

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APPENDICES

APPENDIX A - Proposed Development Layout

APPENDIX B - Site 90024 2020 AADT Segment Analysis Report

APPENDIX C - SIDRA Summary Result

1.0 INTRODUCTION

Langtree Consulting has been engaged by Keita Services to prepare this Engineering Services Report in support of a development application for a 27-lot subdivision along Scovazzis Road, Toobanna on land described as Lot 2 on RP730390.

This report outlines the following:

- Background information for the subject site and proposed development of the site;
- Determination of existing traffic conditions and post-development traffic conditions; including traffic generation and distribution;
- Assessment of the impact post-development traffic
- Investigation of safety issues associated with or arising from the proposed development; and
- Recommendations and mitigation measures.

2.0 BACKGROUND

2.1 SITE LOCATION

The subject site is located on Lot 2 on RP730390. The subject site is approximately 6km south of Ingham CBD. The subject site is approximately 80,940 m^2 and is bounded by Bruce Highway to the west, the North Coast Queensland Rail line to the east, Scovazzis Road to the south and rural residential and agricultural to the north. Refer to **Figure 1** for the site locality.

***Figure 1**. Site Locality (Source: Queensland Globe)*

3.0 EXISTING ENVIRONMENTS

3.1 LAND USE AND ZONING

According to the Hinchinbrook Shire Council's Interactive Mapping, the subject site is currently zoned as General Residential and at present, the site is a cane farmland. Refer to Figure 2 below.

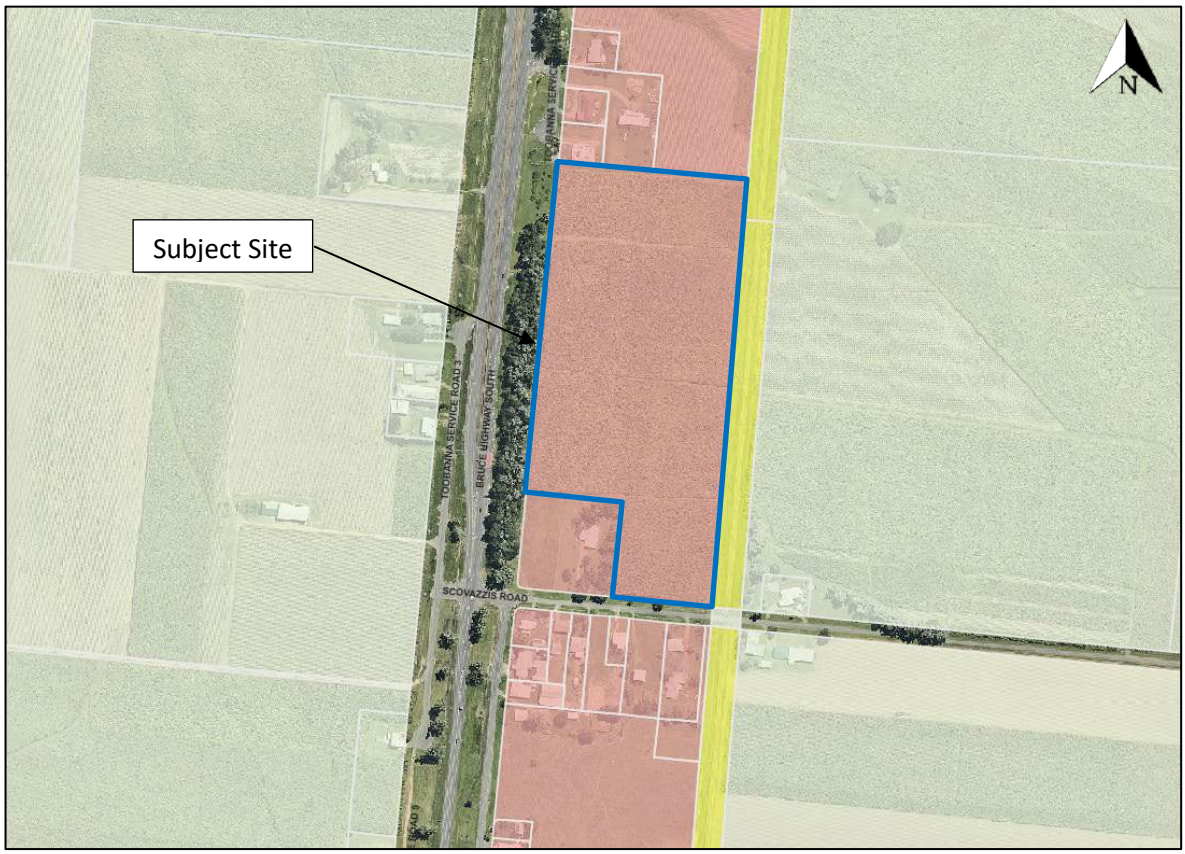


Figure 2. *Subject Site Zoning (Source: Hinchinbrook Sire Council Interactive Mapping)*

4.0 SURROUNDING ROAD NETWORKS

4.1 KEY ROADS

The key roads in the proximity of the subject site are summarised in Table 1 below.

Table 1. *Key Roads Summary*

Road Name	Count Site	Jurisdiction	Hierarchy	Speed Limit	AADT (Year)/ Gazettal AADT/ Against Gazettal AADT
Bruce Highway	90024	DTMR	Class 1- National Highway	100km/h	5,239 (2020) /2603/2636
Scovazzis Road	-	Hinchinbrook Shire Council	Class 7-Rural Road	50km/h	-

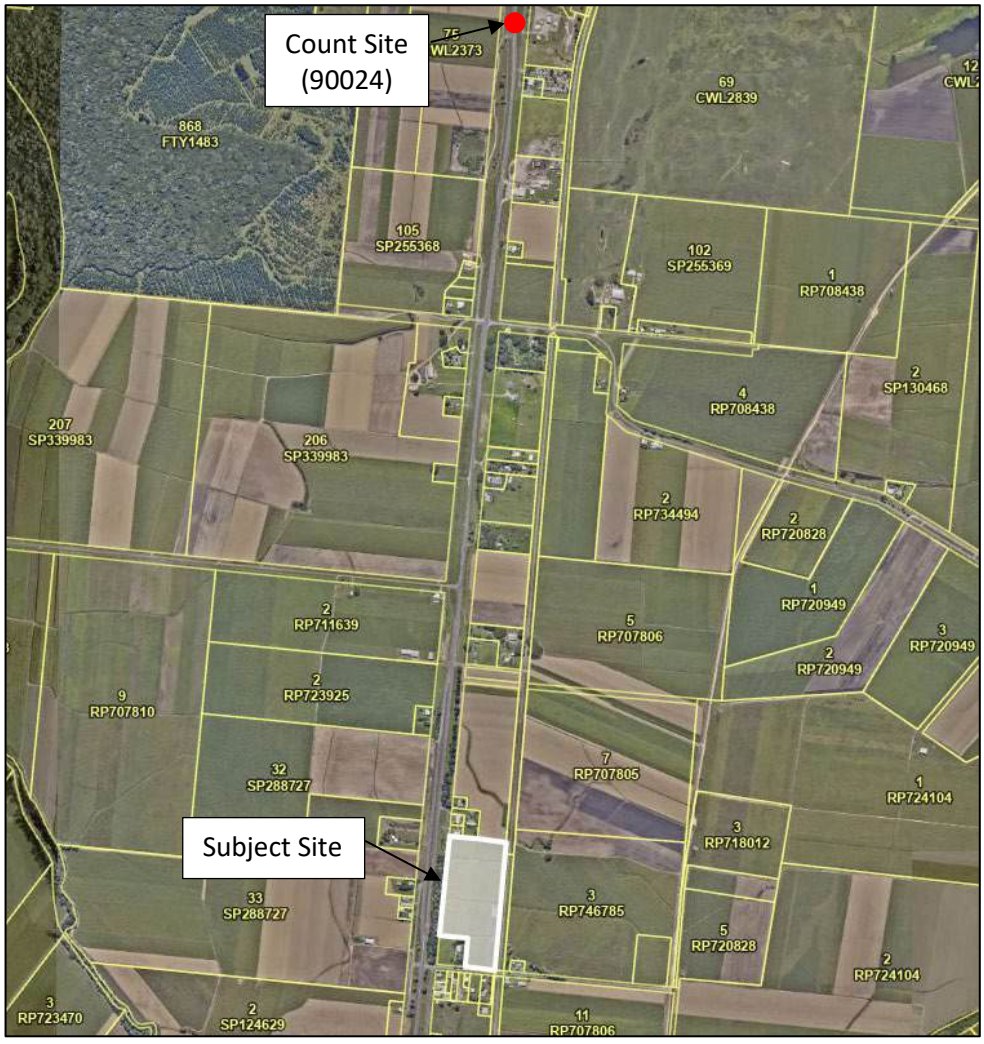


Figure 3. *Surrounding DTMR Traffic Count Site*

4.2 KEY INTERSECTIONS

The summary of the key intersections within the proximity of the subject site is provided in **Table 2** and **Figure 4**.

Table 2. *Key Intersection Summary*

ID	Roads	Control
Intersection 1	Bruce Highway/ Scovazzis Road	Giveway

Figure 4. *Surrounding Road Network (Source: Queensland Globe)*

4.3 CRASH HISTORY

Queensland Globe was used to investigate the crash history in the vicinity of the key roads and intersection. Ten (10) crashes have been occurred in close vicinity to the subject site with the most recent one being 2020. No safety deficiencies have been identified by the crash history data. Refer to **Figure 5** for the crash sites and to **Table 3** for the crash data summary.

Figure 5. *Crash Locations (Source: Queensland Globe)*

***Table 3**. Crash Data Summary*

Location	Year	Severity	Crash Type (DCA Code)	Crash Nature	Crash Description
1	2004	Property Damage	Other (609)	Hit Animal	Darkness, Clear, sealed dry, curved-view open, Pass and Misc: Hit Animal
2	2010	Property Damage	Multi-Vehicle (301)	Rear-end	Daylight, raining, sealed-wet, straight, Vehs Same Direction: Rear End
3	2006	Hospitalisation	Single Vehicle (502)	Overturned	Daylight, clear, sealed-dry, straight, Vehs Overtaking: Out of Control
4	2007	Minor Injury	Other (609)	Hit Animal	Darkness, Clear, sealed dry, straight, Pass and Misc: Hit Animal
5	2005	Medical Treatment	Multi-Vehicle (301)	Rear-end	Daylight, clear, sealed-dry, straight, Vehs Same Direction: Rear End
6	2020	Medical Treatment	Single Vehicle (700)	Hit Object	Darkness, Clear, unsealed dry, straight, Off Path-Straight: Other
7	2001	Property Damage	Single Vehicle (704)	Hit Object	Daylight, clear, sealed-dry, straight, Off Path-Straight: Right Off Cway Hit Obj.
8	2003	Medical Treatment	Multi-Vehicle (202)	Angle	Daylight, clear, sealed-dry, straight, Vehs Opposite Approach: Thru-Right
9	2010	Property damage	Multi-Vehicle (301)	Rear-end	Daylight, clear, sealed-dry, straight, Vehs Same Direction: Rear End
10	2014	Hospitalisation	Multi-Vehicle (202)	Rear-end	Darkness, Clear, sealed dry, straight, Vehs Same Direction: Right Rear

5.0 BACKGROUND TRAFFIC

5.1 BRUCE HIGHWAY

5.1.1 Traffic Growth Rate

The Bruce Highway that is one of the key road is located along the DTMR Segment Site 90024. In accordance with the 2020 AADT Segment analysis report, the historical annual segment growth rates for Bruce Highway adjacent to the subject site are shown in **Table 4**. As seen in Table 4, growth data is only available for both directions, and all are negative growth. For the purpose of this assessment, a **2%** growth rate has been adopted. Refer to **Appendix B** for the 2020 AADT Segment Analysis Report.

***Table 4**. Bruce Highway Segment Growth Rate Summary*

Road Name	Travel Direction	Annual Segment Growth Rate			Adopted Growth
		Based on 1 year Data	Based on 5 years Data	Based on 10 years Data	
Bruce Highway	Gazettal (Northbound)	No Data	No Data	No Data	2%
	Against Gazettal (Southbound)	No Data	No Data	No Data	2%
	Both Directions	-1.11%	-1.47%	-0.56%	2%

5.1.2 Heavy Vehicle Percentage

Similarly, the heavy vehicle percentage (HV%) for Bruce Highway was also extracted from DTMR's 2020 AADT Segment analysis report (Count Site 90024) and is summarised in **Table 5**.

***Table 5.** Bruce Highway Heavy Vehicle Percentage*

Site No.	Gazettal (Northbound)	Against Gazettal (Southbound)	Both Directions
90024	18.98%	12.59%	15.77%

5.1.3 Peak Hour Traffic Distribution

The peak hour traffic volumes on Bruce Highway were assessed using the DTMR's 2020 AADT Segment Analysis report (Count Site 90024). As the site can be used at any time and any day throughout the week, the largest peak hour during the week (including weekends) from the AADT segment report has been taken for AM and PM peak hour. The peak hour traffic distribution for Bruce Highway latest data, base year and horizon year is summarised in **Table 6**.

Table 6. *Bruce Highway (Site 90024) AM and PM Peak Hour Traffic*

Year	AM Peak (veh/hr)		PM Peak (veh/hr)	
	Gazettal (Northbound)	Against Gazettal (Southbound)	Gazettal (Northbound)	Against Gazettal (Southbound)
2020	224	227	237	240
2025	247	250	261	264
2035	322	325	340	344

5.2 SERVICE ROADS

In the western part of Bruce Highway, there is an existing service road to provide access to the existing dwelling along this side. It was assessed that approximately 2 dwelling is utilising this service road. For the purpose of this assessment, it is assumed that during the AM and PM peak hour, there is 2 vehicles exiting and entering the service road.

Moreover, a service road is also present along Scovazzis Road. All vehicles entering and exiting in this service road is utilising Scovazzis Road. As such, the vehicles utilising this service road has been considered in the generation of background traffic in Scovazzis Road in Section 5.3. Refer to **Figure 6** for the service roads locality.

Figure 6*. Service Road Locality*

5.3 SCOVAZZIS ROAD

As traffic data for Scovazzis Road is unavailable, the background traffic for this road has been estimated using the RTA Guide to Traffic Generating Developments. The assumed catchment area for traffic development is shown in **Figure 7**. Within the catchment area there are 26 lots that have existing dwellings and are using the Scovazzis Road (i.e exiting/entering from the existing service road along Scovazzis Road).

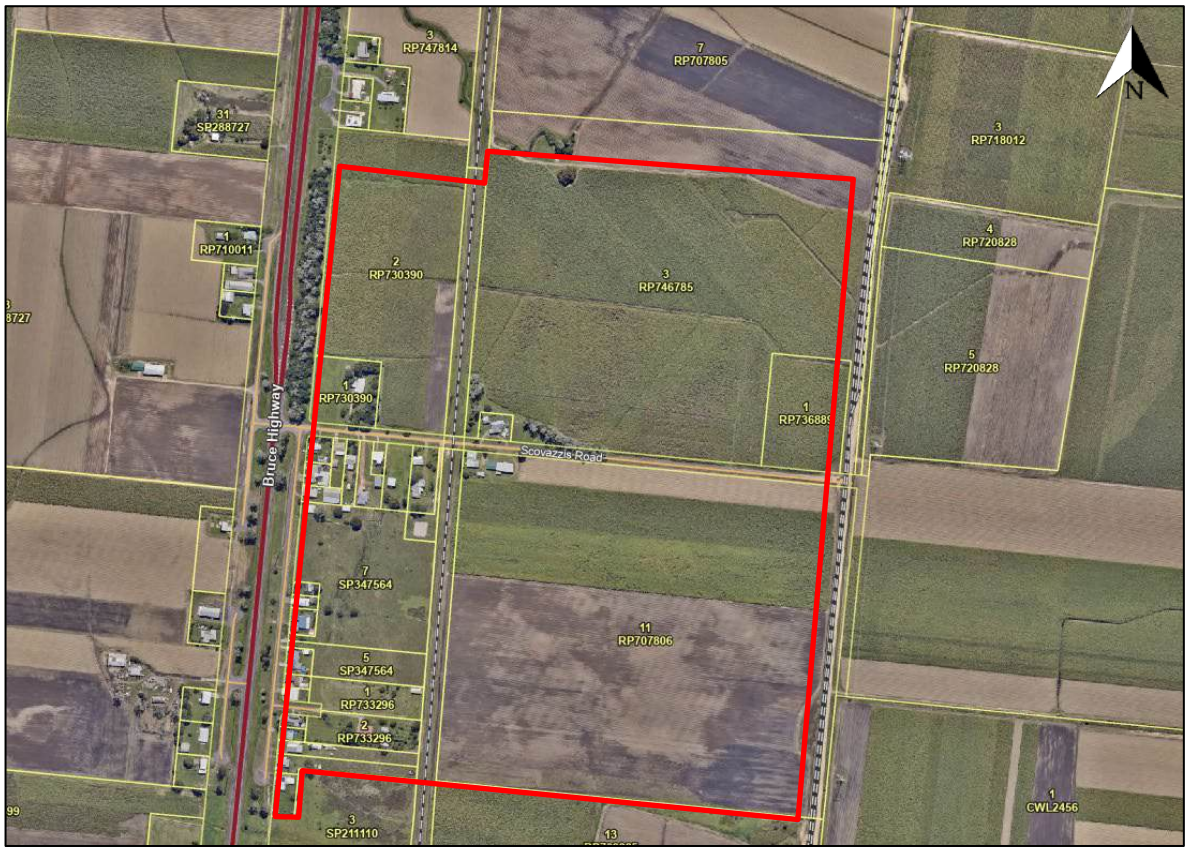


Figure 7. *Assumed catchment area currently utilising Scovazzis Road.*

The RTA provides peak hour trips for a dwelling of 0.85. Considering the assumed number of lots with dwellings utilising the Scovazzis Road, the total peak hour trips along Scovazzis Road is 22 trips. Furthermore, the peak hour total trip is assumed to have 50:50 split entering/ exiting Scovazzis Road during the peak hours. Refer to **Table 7** for the Scovazzis Road Background Traffic Generation.

Table 7. *Scovazzis Road Background Traffic Trip Generation*

No. of Dwellings	RTA Peak Hour Rate	Total Peak Hour Trips	Entering	Exiting
26	0.85	22	11	11

5.4 BACKGROUND TRIP DISTRIBUTION

The background traffic for 2025 and 2035 AM and PM peak hour is shown in Figure 8 and Figure 9.

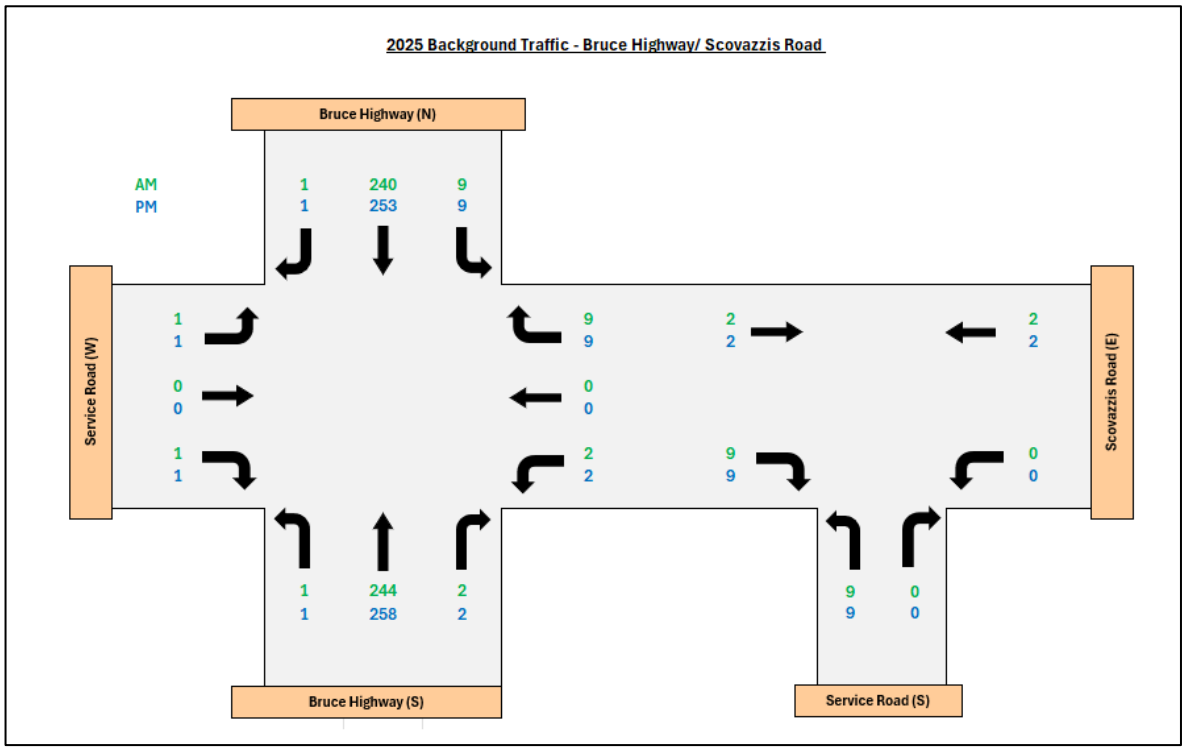


Figure 8. *2025 AM and PM Background Traffic Distribution- Bruce Highway/ Scovazzis Road Intersection*

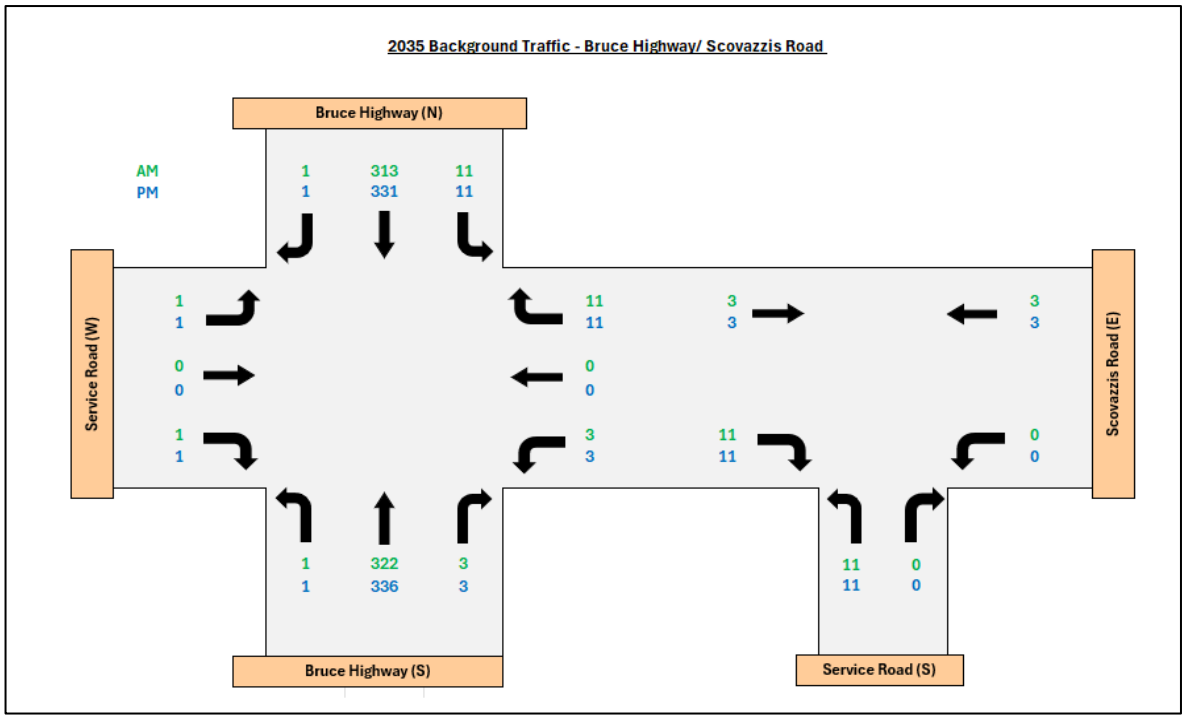


Figure 9. *2035 AM and PM Background Traffic Distribution- Bruce Highway/ Scovazzis Road Intersection*

6.0 PROPOSED DEVELOPMENT

The proposed development is a 27-lot subdivision, with each lot having an area of approximately 2,100m^2 to 2,800m^2.

The proposed development site access (ingress and egress) is along Scovazzis Road.

Refer to Figure 10 for the proposed development layout and is attached to Appendix A.

Figure 10. *Proposed Development*

7.0 DEVELOPMENT TRAFFIC

The RTA Guide to Traffic Generating Developments has been used to determine the trip generation for the site. The proposed development is a 27-lot subdivision. It is assumed that 1 (one) dwelling will be present in each lot on the proposed development.

The RTA provides peak hour trips for a dwelling of 0.85 and as such, the proposed development's total peak hour trips is 23 trips. A 50:50 split is assumed for vehicles entering and existing the proposed development during the peak hours.

Refer to Table 8 for the Proposed development Traffic Trip Generation Summary.

Table 8. *Proposed Development Traffic Trip Generation Summary*

Assumed No. of Dwellings	AM Peak Hour	AM Peak Hour (veh/hr)		PM Peak Hour	PM Peak Hour (veh/hr)	
		Entering	Exiting		Entering	Exiting
27	23	11	12	23	11	12

In addition to the above, the following development traffic distribution assumptions have been made as part of the assessment of the proposed development traffic:

- All vehicles exiting the subject site will right turn out to Scovazzis Road.
- All vehicle entering the subject site will left turn in from Scovazzis Road.
- 80% of the vehicles exiting Scovazzis Road from the subject site will right turn out to North Bruce Highway and 20% will left turn out to South Bruce Highway.
- 80% of the vehicles entering Scovazzis Road from North Bruce Highway will left turn in and 20% will right turn in from South Bruce Highway.

The proposed development traffic trip distribution is shown in Figure 11 and Figure 12.

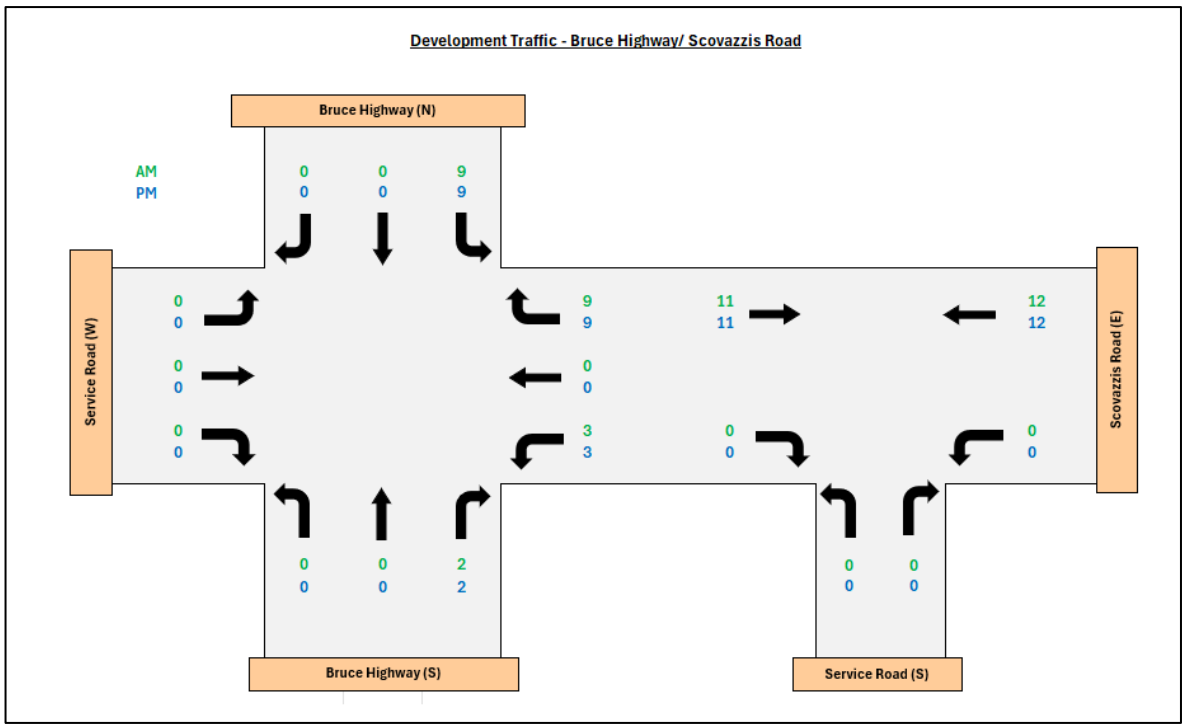


Figure 11. *Development Traffic-Bruce Highway/Scovazzis Road Intersection*

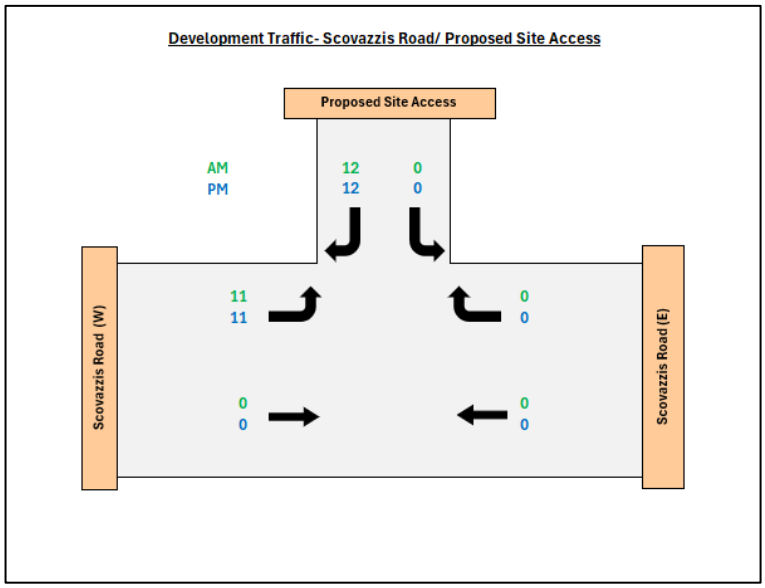


Figure 12. *Development Traffic- Scovazzis Road/ Proposed Site Access*

8.0 POST DEVELOPMENT TRAFFIC (BACKGRPUND + DEVELOPMENT)

The 2025 and 2035 AM and PM post development traffic is shown in Figure 13, Figure 14, Figure 15 and Figure 16.

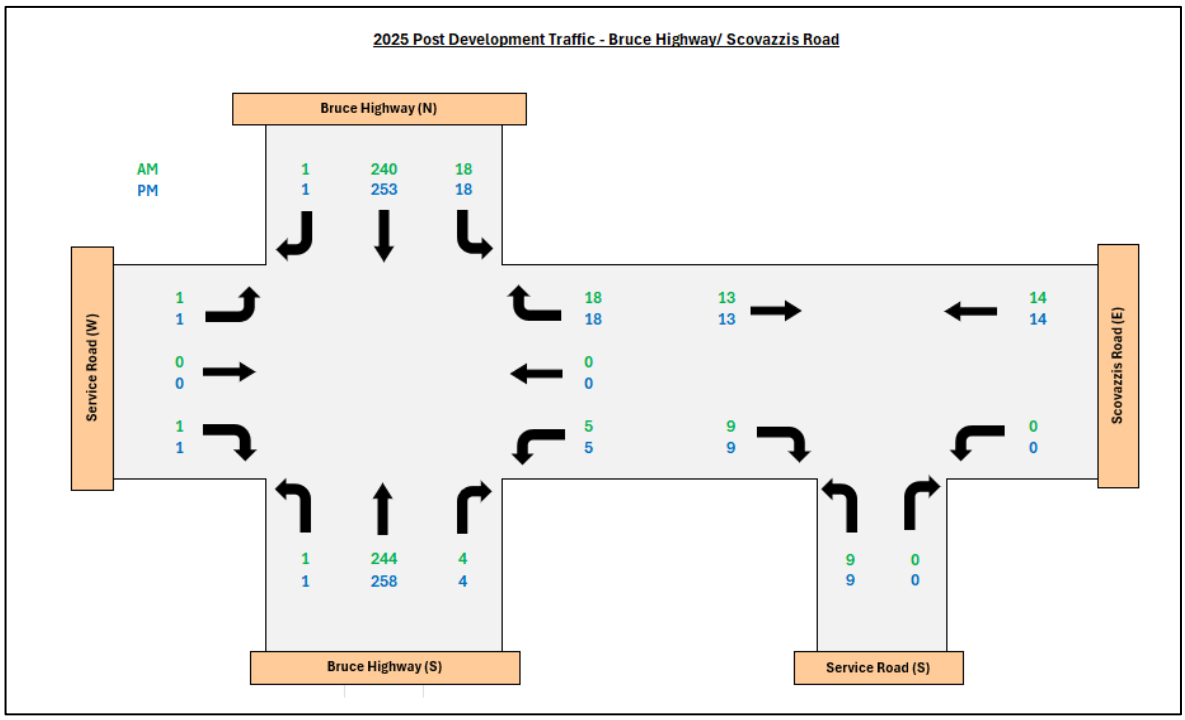


Figure 13. *2025 AM and PM Post Development Traffic- Bruce Highway/Scovazzis Road Intersection*

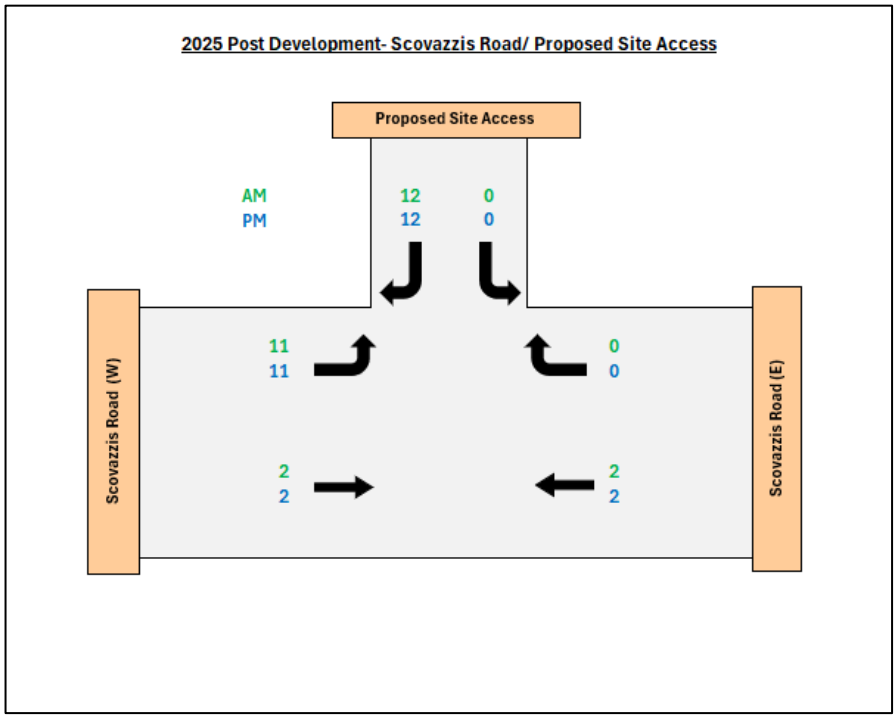


Figure 14. *2025 AM and PM Post Development Traffic-Scovazzis Road/Proposed Site Access Intersection*

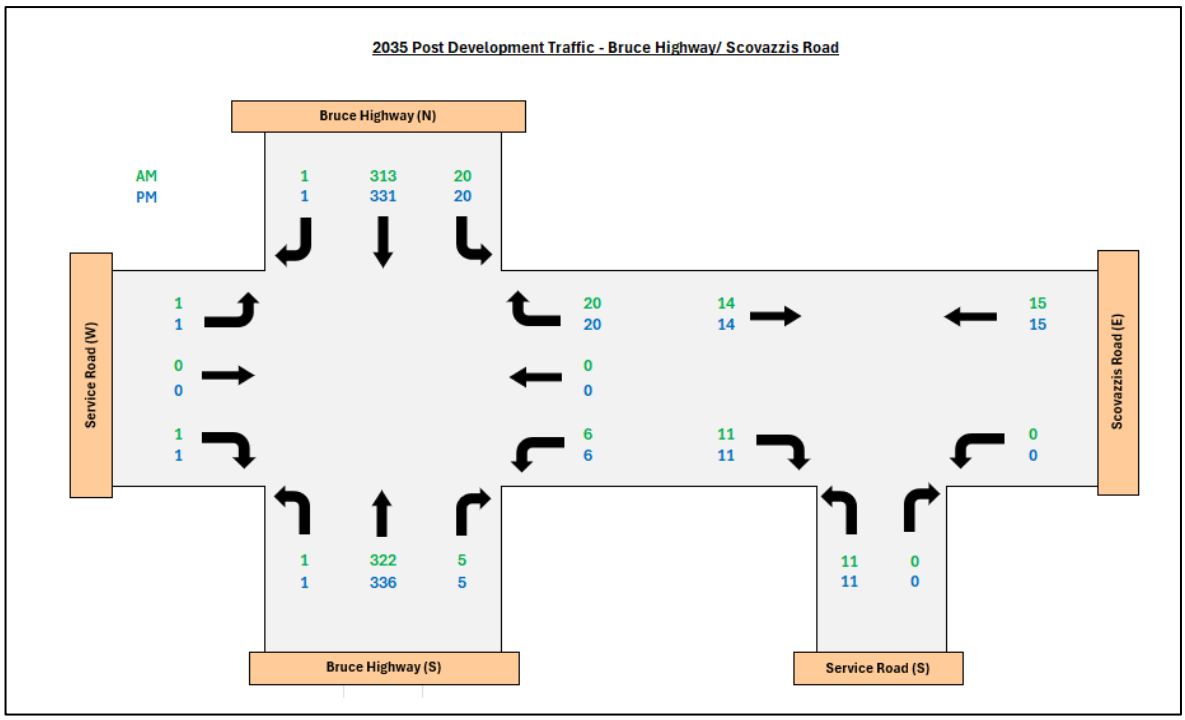


Figure 15. *2035 AM and PM Post Development Traffic- Bruce Highway/Scovazzis Road Intersection*

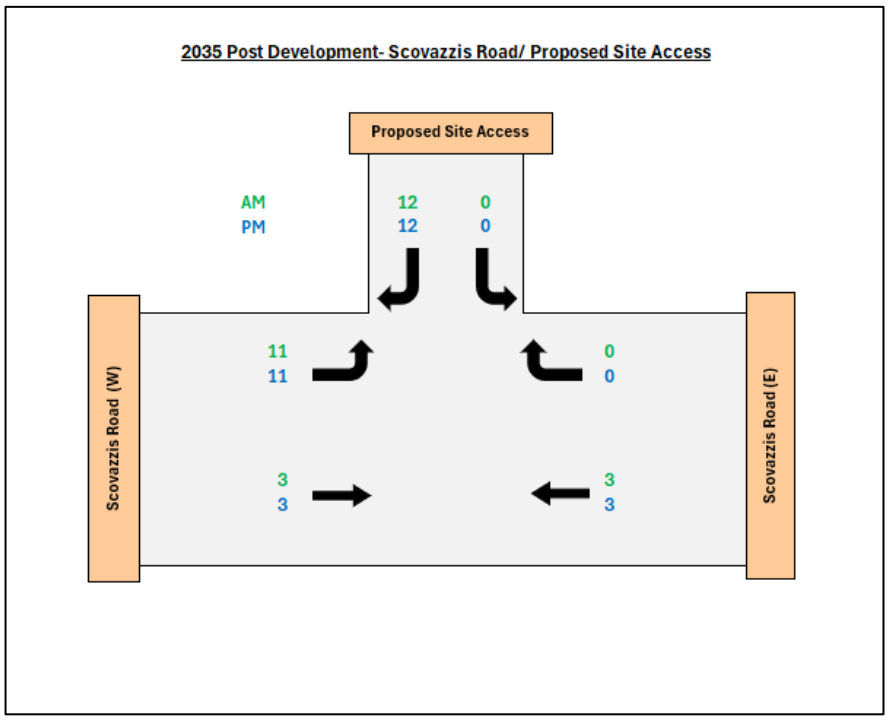


Figure 16. *2035 AM and PM Post Development Traffic-Scovazzis Road/Proposed Site Access Intersection*

9.0 TRAFFIC IMPACT ASSESSMENT

9.1 SIDRA INTERSECTION ANALYSIS

It is proposed to measure the operational performance of the access "intersections" using SIDRA 9.1 software package. SIDRA is a computer package used to describe the capability and operational performance of an intersection in terms of the parameters as defined below:

- Degree of Saturation (DoS) – is the ratio of demand flow (or number of vehicles) to the physical capacity of the intersection or approach and is usually represented by a value that lies between zero and one. A DoS in excess of 1.0 indicates that the intersection will operate above capacity and that long delays and congestion will occur;
- Average Delay – is usually defined as the difference in time between interrupted and uninterrupted travel times through an intersection;
- Queue Length – is the 95th percentile back of queue length. This is the length to the back of the queue for a particular approach which 95% of all observed queue lengths fall below; and
- Level of Service (LOS) – an index of the operational performance of traffic-on-traffic lane, approach, intersection, route or network, based on measures such as delay, degree of saturation, density, speed, congestion coefficient, speed efficiency or travel time index during a given flow period. This provides a quantitative stratification of a performance measure or measures that represent the quality of service, measured on an A to F scale, with LOS A representing the best operating conditions from the traveller's perspective and LOS F the worst.

9.1.1 Intersection Performances Assessment Criteria

The two key performance measurements adopted to assess the intersection operational conditions were Degree of Saturation (DoS) and Level of Service (LOS).

In general, the intersection capacity DoS, where it is considered that the operation of the intersection is constrained, are:

- 0.80 (80%) for un-signalised intersections;
- 0.85 (85%) for roundabouts; and
- 0.90 (90%) for signalised intersections.

The typical LOS, its characteristics and rating are defined in Table 9.

Table 9. *Summary of traffic movements*

LOS	Description	Rating
A	Free, unrestrictive flow	Very good
B	Mostly free flow, few disruptions	Very good
C	Stable flow	Good
D	Mostly stable flow, some delays	Acceptable
E	Congested	Bad
F	Forced flow	Bad

9.1.2 Intersection Layout

The SIDRA intersection layout for pre and post development is shown in Figure 17 and Figure 18.

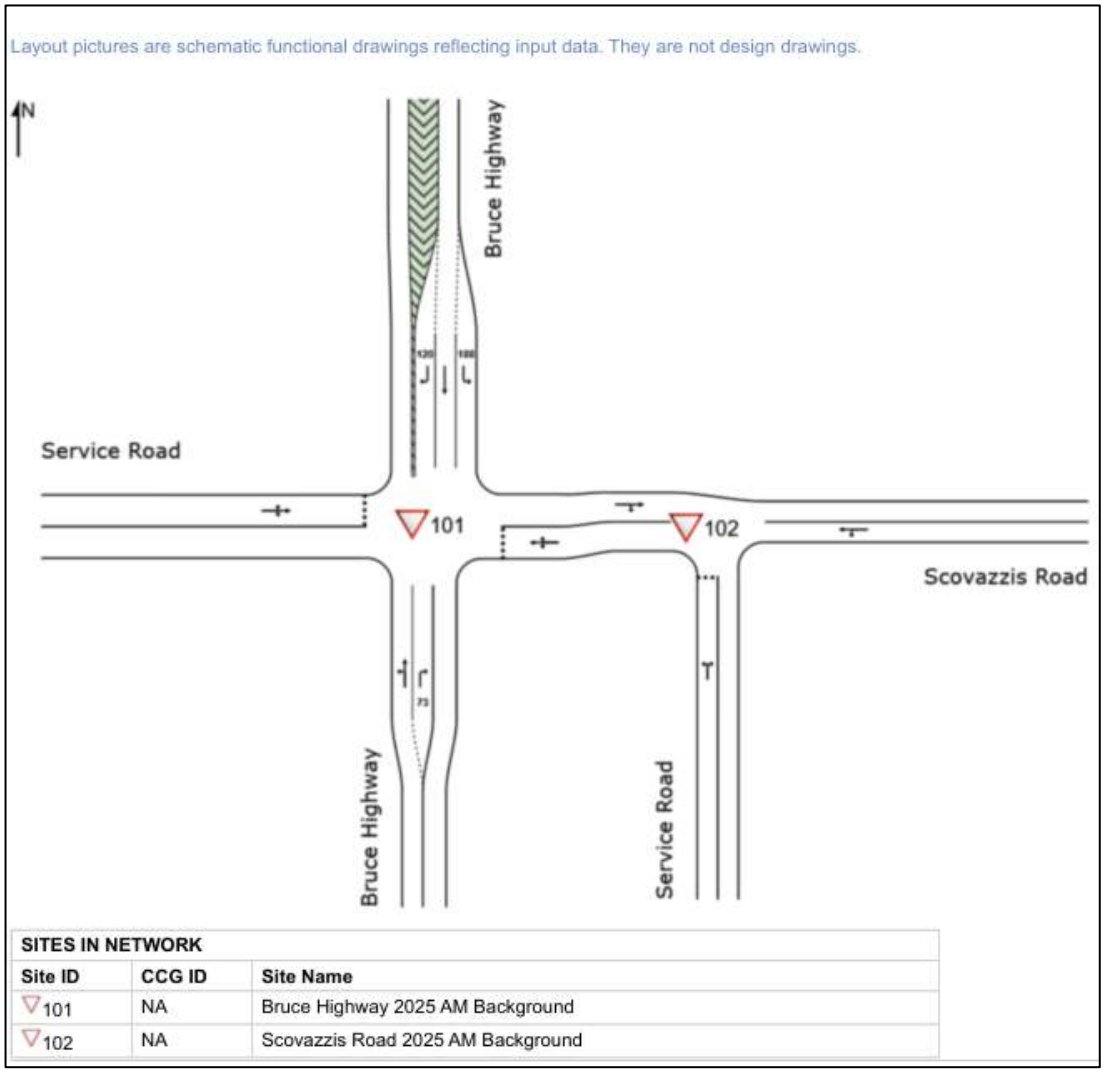
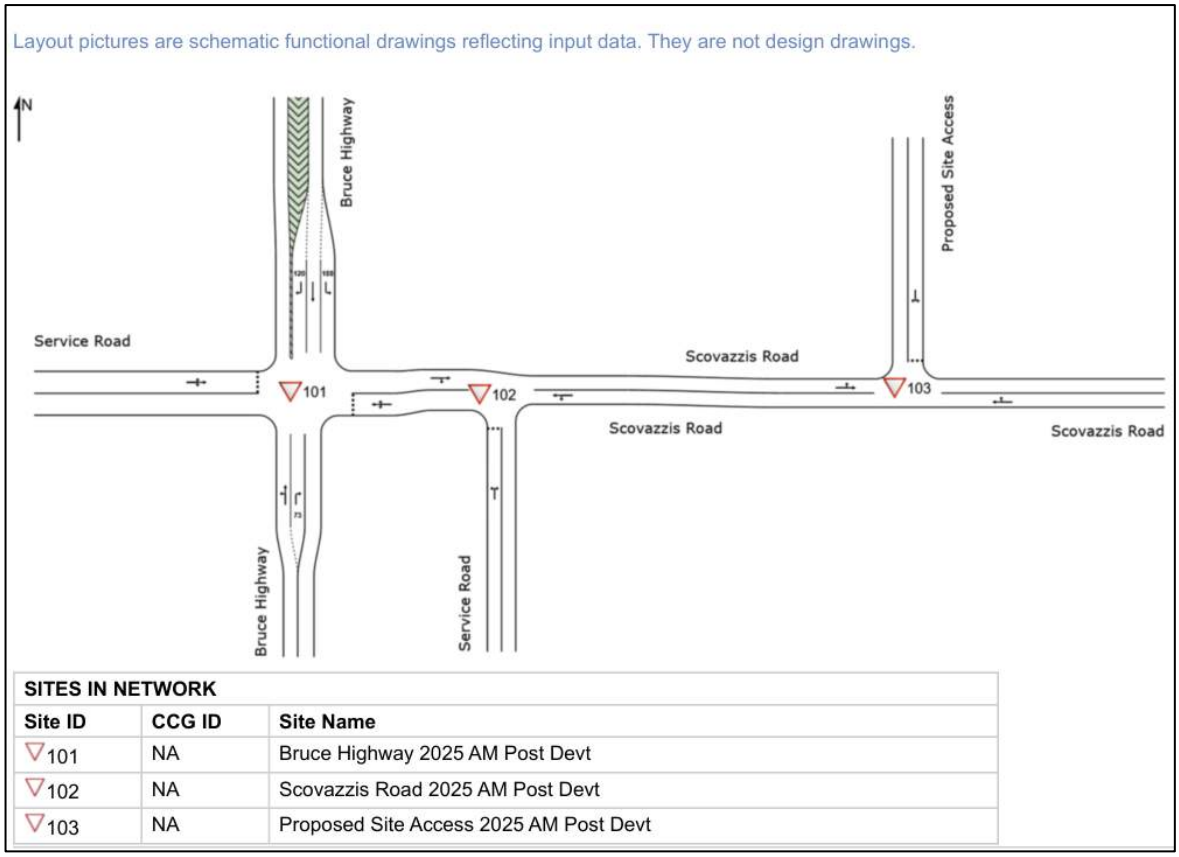


Figure 17. *Pre-Development (Background Traffic) SIDRA Intersection Layout*



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽101	NA	Bruce Highway 2025 AM Post Devt
▽102	NA	Scovazzis Road 2025 AM Post Devt
▽103	NA	Proposed Site Access 2025 AM Post Devt

Figure 18. *Post Development (Background + Development Traffic) SIDRA Intersection Layout*

9.1.3 *Intersection Performance*

The SIDRA movement results for 2025 and 2035 AM and PM background and post development scenario are summarised in Table 10,Table 11,Table 12 and Table 13 and is attached to Appendix C.

***Table 10**.SIDRA Movement Summary- 2025 AM Background and Post Development*

Site No.	Intersection	Approach	Movement	2025 AM Background			2025 AM Background + Dev		
				DoS	Delay (s)	LOS	DoS	Delay (s)	LOS
101	Bruce Highway/ Scovazzis Road	Bruce Highway (S)	Left Turn	0.147	5.60	A	0.147	5.60	A
			Through	0.147	0.00	A	0.147	0.00	A
			Right Turn	0.002	6.60	A	0.004	6.60	A
			Overall	0.147	0.10	NA	0.147	0.10	NA
		Scovazzis Road (E)	Left Turn	0.032	3.70	A	0.062	3.80	A
			Through	0.032	8.40	A	0.062	8.70	A
			Right Turn	0.032	10.30	B	0.062	10.70	B
			Overall	0.032	9.10	A	0.062	9.20	A
		Bruce Highway (N)	Left Turn	0.005	5.50	A	0.010	5.50	A
			Through	0.139	0.00	A	0.139	0.00	A
			Right Turn	0.001	6.30	A	0.001	6.30	A
			Overall	0.139	0.20	NA	0.139	0.40	NA
		Service Road (W)	Left Turn	0.007	3.70	A	0.007	3.70	A
			Through	0.007	8.10	A	0.007	8.30	A
			Right Turn	0.007	9.70	A	0.007	9.80	A
			Overall	0.007	7.20	A	0.007	7.30	A
102	Scovazzis Road / Service Road	Service Road (S)	Left Turn	0.007	5.50	A	0.007	5.60	A
			Right Turn	0.007	5.50	A	0.007	5.50	A
			Overall	0.007	5.50	A	0.007	5.60	A
		Scovazzis Road (E)	Left Turn	0.002	5.50	A	0.008	4.40	A
			Right Turn	0.002	0.00	A	0.008	0.00	A
			Overall	0.002	1.80	NA	0.008	0.30	NA
		Scovazzis Road (W)	Left Turn	0.006	0.00	A	0.012	0.00	A
			Through	0.006	2.60	A	0.012	2.60	A
			Overall	0.006	2.10	NA	0.012	1.10	NA
103	Proposed Site Access / Scovazzis Road	Scovazzis Road (E)	Through	-	-	-	0.002	0.00	A
			Right Turn	-	-	-	0.002	4.10	A
			Overall	-	-	-	0.002	1.40	NA
		Proposed Site Access (N)	Left Turn	-	-	-	0.011	5.50	A
			Right Turn	-	-	-	0.011	5.50	A
			Overall	-	-	-	0.011	5.50	A
		Scovazzis Road (W)	Left Turn	-	-	-	0.007	4.40	A
			Through	-	-	-	0.007	0.00	A
			Overall	-	-	-	0.007	3.70	NA

Table 11. *SIDRA Movement Summary- 2025 PM Background and Post Development*

Site No.	Intersection	Approach	Movement	2025 PM Background			2025 PM Background + Dev		
				DoS	Delay (s)	LOS	DoS	Delay (s)	LOS
101	Bruce Highway/ Scovazzis Road	Bruce Highway (S)	Left Turn	0.155	5.60	A	0.155	5.60	A
			Through	0.155	0.00	A	0.155	0.00	A
			Right Turn	0.002	6.60	A	0.004	6.70	A
			Overall	0.155	0.10	NA	0.155	0.10	NA
		Scovazzis Road (E)	Left Turn	0.033	3.80	A	0.066	3.90	A
			Through	0.033	9.00	A	0.066	9.30	A
			Right Turn	0.033	11.00	B	0.066	11.40	B
			Overall	0.033	9.60	A	0.066	9.80	A
		Bruce Highway (N)	Left Turn	0.005	5.50	A	0.010	5.50	A
			Through	0.146	0.00	A	0.146	0.00	A
			Right Turn	0.001	6.40	A	0.001	6.40	A
			Overall	0.146	0.20	NA	0.146	0.40	NA
		Service Road (W)	Left Turn	0.007	3.70	A	0.007	3.70	A
			Through	0.007	8.70	A	0.007	8.90	A
			Right Turn	0.007	10.40	B	0.007	10.50	B
			Overall	0.007	7.60	A	0.007	7.70	A
102	Scovazzis Road / Service Road	Service Road (S)	Left Turn	0.007	5.50	A	0.007	5.60	A
			Right Turn	0.007	5.50	A	0.007	5.50	A
			Overall	0.007	5.50	A	0.007	5.60	A
		Scovazzis Road (E)	Left Turn	0.002	5.50	A	0.008	4.40	A
			Right Turn	0.002	0.00	A	0.008	0.00	A
			Overall	0.002	1.80	NA	0.008	0.30	NA
		Scovazzis Road (W)	Left Turn	0.006	0.00	A	0.012	0.00	A
			Through	0.006	2.60	A	0.012	2.60	A
			Overall	0.006	2.10	NA	0.012	1.10	NA
103	Proposed Site Access / Scovazzis Road	Scovazzis Road (E)	Through	-	-	-	0.002	0.00	A
			Right Turn	-	-	-	0.002	4.10	A
			Overall	-	-	-	0.002	1.40	NA
		Proposed Site Access (N)	Left Turn	-	-	-	0.011	5.50	A
			Right Turn	-	-	-	0.011	5.50	A
			Overall	-	-	-	0.011	5.50	A
		Scovazzis Road (W)	Left Turn	-	-	-	0.007	4.40	A
			Through	-	-	-	0.007	0.00	A
			Overall	-	-	-	0.007	3.70	NA

Table 12. *SIDRA Movement Summary- 2035 AM Background and Post Development*

Site No.	Intersection	Approach	Movement	2035 AM Background			2035 AM Background + Dev		
				DoS	Delay (s)	LOS	DoS	Delay (s)	LOS
101	Bruce Highway/ Scovazzis Road	Bruce Highway (S)	Left Turn	0.194	5.60	A	0.194	5.60	A
			Through	0.194	0.00	A	0.194	0.00	A
			Right Turn	0.003	7.00	A	0.005	7.10	A
			Overall	0.194	0.10	NA	0.194	0.10	NA
		Scovazzis Road (E)	Left Turn	0.053	4.20	A	0.095	4.20	A
			Through	0.053	12.20	B	0.095	12.60	B
			Right Turn	0.053	15.00	C	0.095	15.60	C
			Overall	0.053	12.70	B	0.095	13.00	B
		Bruce Highway (N)	Left Turn	0.006	5.50	A	0.011	5.50	A
			Through	0.181	0.00	A	0.181	0.00	A
			Right Turn	0.001	6.70	A	0.001	6.70	A
			Overall	0.181	0.20	NA	0.181	0.40	NA
		Service Road (W)	Left Turn	0.009	4.10	A	0.009	4.10	A
			Through	0.009	11.70	B	0.009	12.00	B
			Right Turn	0.009	14.20	B	0.009	14.30	B
			Overall	0.009	10.00	A	0.009	10.10	B
102	Scovazzis Road / Service Road	Service Road (S)	Left Turn	0.008	5.50	A	0.008	5.60	A
			Right Turn	0.008	5.50	A	0.008	5.50	A
			Overall	0.008	5.50	A	0.008	5.60	A
		Scovazzis Road (E)	Left Turn	0.002	5.50	A	0.009	4.40	A
			Right Turn	0.002	0.00	A	0.009	0.00	A
			Overall	0.002	1.40	NA	0.009	0.30	NA
		Scovazzis Road (W)	Left Turn	0.007	0.00	A	0.014	0.00	A
			Through	0.007	2.60	A	0.014	2.60	A
			Overall	0.007	0.60	NA	0.014	1.20	NA
103	Proposed Site Access / Scovazzis Road	Scovazzis Road (E)	Through	-	-	-	0.002	0.00	A
			Right Turn	-	-	-	0.002	4.10	A
			Overall	-	-	-	0.002	1.40	NA
		Proposed Site Access (N)	Left Turn	-	-	-	0.011	5.50	A
			Right Turn	-	-	-	0.011	5.50	A
			Overall	-	-	-	0.011	5.50	A
		Scovazzis Road (W)	Left Turn	-	-	-	0.008	4.40	A
			Through	-	-	-	0.008	0.00	A
			Overall	-	-	-	0.008	3.70	N/A

***Table 13**. SIDRA Movement Summary- 2035 PM Background and Post Development*

Site No.	Intersection	Approach	Movement	2035 PM Background			2035 PM Background + Dev		
				DoS	Delay (s)	LOS	DoS	Delay (s)	LOS
101	Bruce Highway/ Scovazzis Road	Bruce Highway (S)	Left Turn	0.202	5.60	A	0.202	5.60	A
			Through	0.202	0.00	A	0.202	0.00	A
			Right Turn	0.003	7.10	A	0.005	7.20	A
			Overall	0.202	0.10	NA	0.202	0.10	NA
		Scovazzis Road (E)	Left Turn	0.057	4.30	A	0.102	4.30	A
			Through	0.057	13.10	B	0.102	13.60	B
			Right Turn	0.057	16.20	C	0.102	16.90	C
			Overall	0.057	13.60	B	0.102	14.00	B
		Bruce Highway (N)	Left Turn	0.006	5.50	A	0.011	5.50	A
			Through	0.191	0.00	A	0.191	0.00	A
			Right Turn	0.001	6.70	A	0.001	6.70	A
			Overall	0.191	0.20	NA	0.191	0.40	NA
		Service Road (W)	Left Turn	0.009	4.20	A	0.009	4.20	A
			Through	0.009	12.60	B	0.009	12.90	B
			Right Turn	0.009	15.30	C	0.009	15.40	C
			Overall	0.009	10.70	B	0.009	10.80	B
102	Scovazzis Road / Service Road	Service Road (S)	Left Turn	0.007	5.50	A	0.008	5.60	A
			Right Turn	0.007	5.50	A	0.008	5.50	A
			Overall	0.007	5.50	A	0.008	5.60	A
		Scovazzis Road (E)	Left Turn	0.002	5.50	A	0.009	4.40	A
			Right Turn	0.002	0.00	A	0.009	0.00	A
			Overall	0.002	1.80	N/A	0.009	0.30	N/A
		Scovazzis Road (W)	Left Turn	0.006	0.00	A	0.014	0.00	A
			Through	0.006	2.60	A	0.014	2.60	A
			Overall	0.006	2.10	N/A	0.014	1.10	N/A
103	Proposed Site Access / Scovazzis Road	Scovazzis Road (E)	Through	-	-	-	0.002	0.00	A
			Right Turn	-	-	-	0.002	4.10	A
			Overall	-	-	-	0.002	1.40	N/A
		Proposed Site Access (N)	Left Turn	-	-	-	0.011	5.50	A
			Right Turn	-	-	-	0.011	5.50	A
			Overall	-	-	-	0.011	5.50	A
		Scovazzis Road (W)	Left Turn	-	-	-	0.008	4.40	A
			Through	-	-	-	0.008	0.00	A
			Overall	-	-	-	0.008	3.40	N/A

As seen in the Tables above, the level of service (LOS) along the road networks remains unchanged in pre-development and post development scenario. Most of the LOS in the road network falls in LOS A, with a few LOS B and LOS C. Additionally, all the DOs of the road network for both pre- and post-

development layout does not exceed the 0.80 constrained value for unsignalised road. As such, the proposed development has insignificant impact in the existing road network.

9.2 TURN WARRANT ASSESSMENT

9.2.1 Bruce Highway/ Scovazzis Road

Currently, the turn treatment along Bruce Highway is a CHR(s)/AUL(s). A turn warrant check was conducted on the intersection to determine if any specific turn treatment might be recommended. The turn warrant check has been completed in accordance with Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings. The road type of Bruce Highway is a two-lane two way with no splitter island on both left and right turn movement.

Table 14 shows the Bruce Highway/ Scovazzis Road Warrant check.

***Table 14**. Bruce Highway/ Scovazzis Road warrant check*

Scenario	Right Turn In		Left Turn In		Warrants
	QR	QM	QL	QM	
2025 AM	4	501	18	240	BAR(s)/BAL(s)
2025 PM	4	529	18	253	BAR(s)/BAL(s)
2035 AM	5	655	20	313	CHR(s)/AUL(s)
2035 PM	5	688	20	331	CHR(s)/AUL(s)

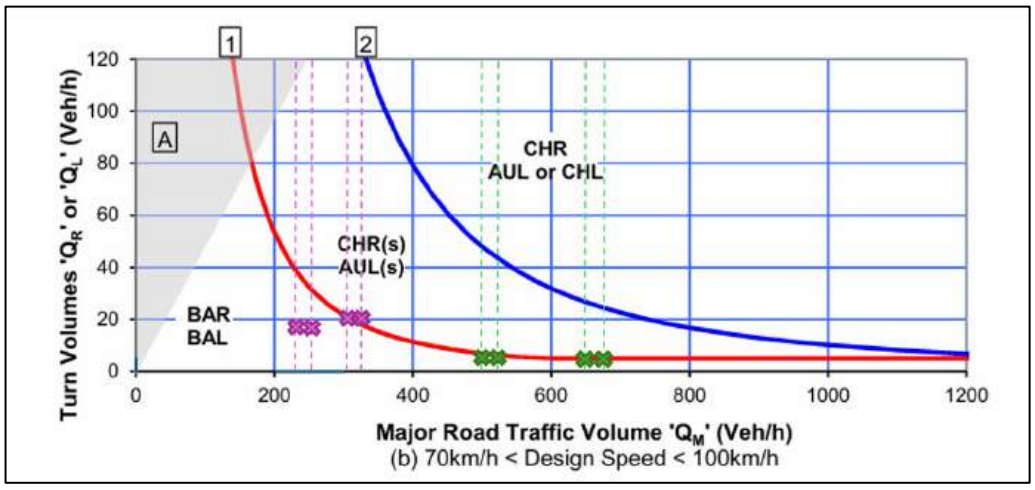


***Figure 19.** Warrant Check Turn Treatment*

As seen in Table 14 and Figure 19, for the 2025 AM and PM scenario, turn treatment warrants indicates that a BAR(s)/BAL(s) treatment is required and CHR(s)/AUL(s) treatment for the 2035 AM and PM scenario. Since the existing turn warrant in the intersection is CHR(s)/AUL(s) which is appropriate for both scenarios, no intersection upgrade is required.

10.0 SIGHT DISTANCE

10.1 SAFE INTERSECTION SIGHT DISTANCE (SISD)

A safe intersection sight distance (SISD) check was conducted for Scovazzis Road/ Proposed Site Access in accordance with Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections. The safe intersection sight distance assessment summary is shown in Table 15.

As shown in Figure 20, the proposed development has adequate safe intersection sight distance in the west of the proposed site access. It is believed that the trees's shrubs on the western side of the access are above the line of sight and thus does not obstruct the driver's line of sight.

The SISD for east of the proposed site access is shown in Figure 21. For the intersection to have adequate SISD, the two trees on the eastern side of the proposed site access has to be removed.

Table 15. *SISD Assessment Summary for Scovazzis Road/ Proposed Site Access*

Case	Vehicle Type	Time of day	Design Speed (km/h)	R_t (sec)	O_t (sec)	D_t (sec)	a (%)	d	Min Required SISD (m)	West of Access Available SISD (m)	East of Access Available SISD (m)
Base	Car	Day	60	2.0	3.0	5.0	0	0.36	114	144	146
Check	Car	Night	60	2.0	2.5	4.5	0	0.46	106		
Base	Truck	Day	60	2.0	3.0	5.0	0	0.24	142		
Check	Truck	Night	60	2.0	3.0	5.0	0	0.29	132		

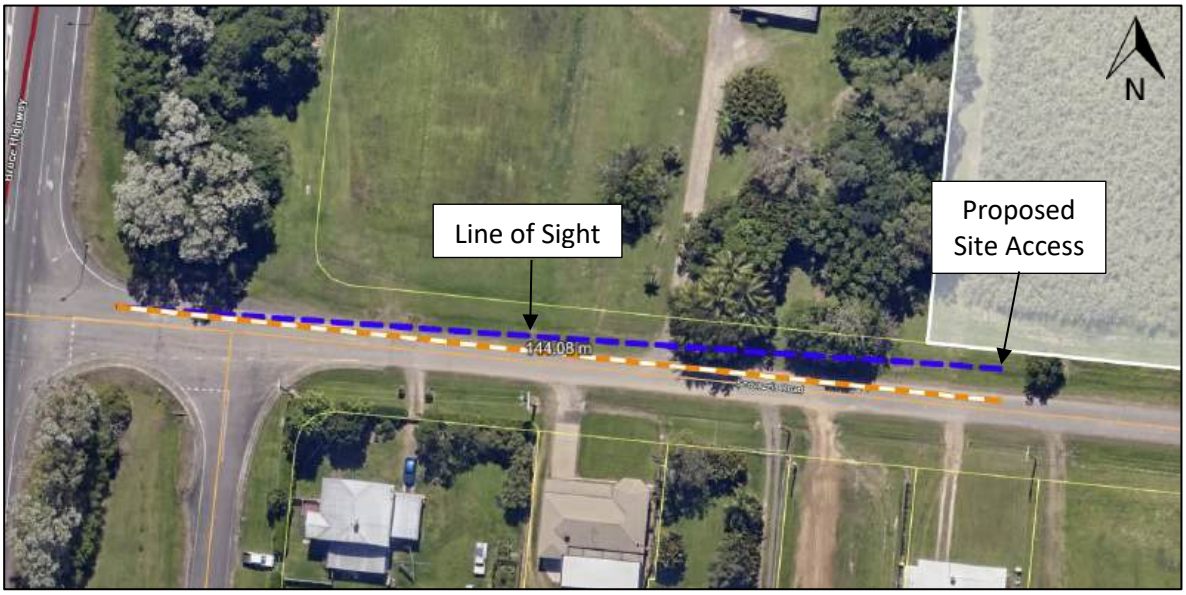


Figure 20. *Available SISD- West of Proposed Site Access*

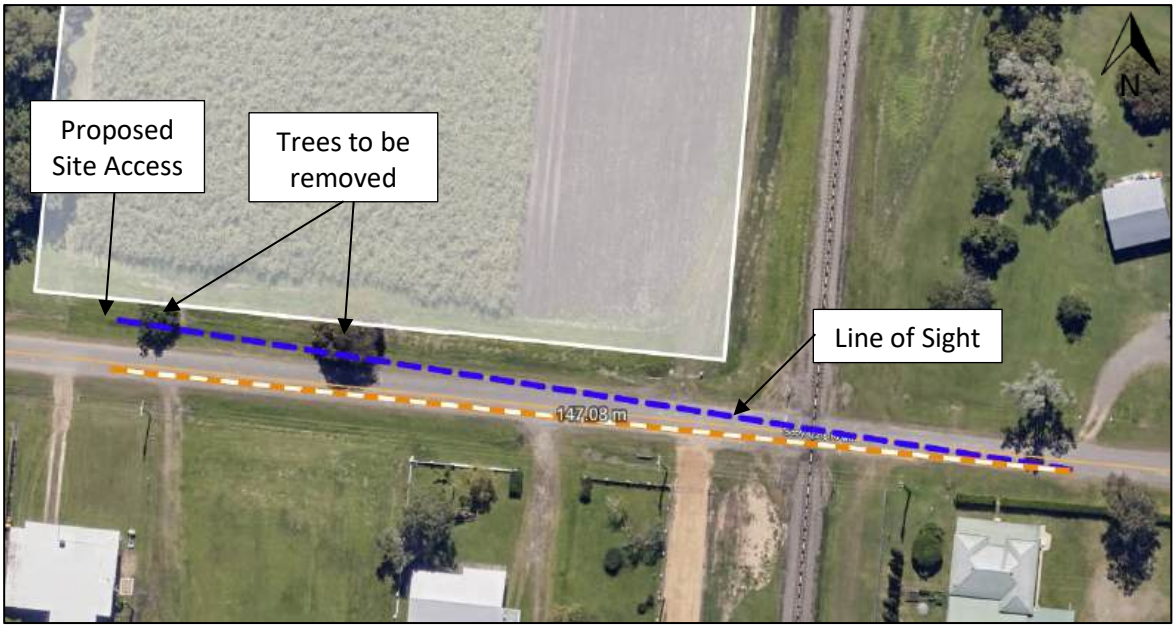


***Figure 21**. Available SISD- East of Proposed Site Access*

10.2 APPROACH SIGHT DISTANCE (ASD)

An ASD check was conducted for the Scovazzis Road/ Proposed Site Access intersection in accordance with Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections.

As seen in **Table 16**, **Figure 22** and **Figure 23** below, the proposed development has adequate approach sight distance for west of the proposed site access. The trees along the eastern side of the proposed site access have to be removed to have adequate approach sight distance on the east of the proposed site access.

***Table 16.** ASD Assessment Summary for Scovazzis Road/ Proposed Site Access*

Case	Vehicle Type	Time of day	Design Speed (km/h)	R_t (sec)	a (%)	d	Min Required ASD (m)	West of Access Available ASD (m)	East of Access Available ASD (m)
Base	Car	Day	60	2.0	0	0.36	73	95	95
Base	Truck	Day	60	2.0	0	0.24	92		
Check	Car	Night	60	2.0	0	0.46	64		
Check	Truck	Night	60	2.0	0	0.29	82		

Figure 22. *Available ASD-West of Proposed Site Access*

Figure 23*. Available ASD- East of Proposed Site Access*

11.0 TEMPORARY TURN ARRANGEMENT

To facilitate for the road connectivity of the future development of the residential lot on the north (Lot 3 RP747814) of the subject site, a temporary turn arrangement on the proposed development has been designed.

Moreover, a swept path analysis for a Medium rigid vehicle (i.e waste truck) has been completed and shows that an MRV has sufficient turning movement in the proposed temporary turn arrangement.

Refer to Figure 24 for the temporary turn arrangement details and MRV swept path.

***Figure 24**. Temporary Turn Arrangement and MRV Swept Path*

12.0 SCOVAZZIS ROAD PROFILE ASSESSMENT

Currently, Scovazzis Road has sealed width of 5m, road reserve width of 20m and is classified as Class 7-Rural Road by HSC. Scovazzis road has been assessed in accordance with IPWEA Lower Order Road Design Guidelines. According to IPWEA Lower Order Road Guidelines, for a road to be classified as minor road, two (2) of the following requirements should apply: *Connectivity between local roads of significance or state-controlled roads; Access to >25 properties; and Potential for commercial trip generation.*

Since Scovazzis road is connected to Bruce highway which is a state-controlled road and provides access to greater than 25 lots (i.e proposed development = 27 lots, along Scovazzis Rd.= 10 lots, service roads to Scovazzis Road =16 lots), Scovazzis Road can be classified as minor road for this assessment. Refer to Table 17 for the desirable road characteristics, features and values.

***Table 17**. Road Asset Classification: Desirable Characteristics, Features and Values (Source. IPWEA Lower Order Road Design Table 4)*

Table 4 – Road Asset Classification: Desirable Characteristics, Features and Values

Asset Classification Characteristic	Minor Road	Local Access	Formed Track
Vehicles per Day	50-150	10-50	0-10
Design Speed (km/hr)	100-60	70-40	50-30
Road Type	Sealed or unsealed	Sealed or unsealed	Formed
Formation Width (metres) (minimum)	7.0m	6.5m	4.0m
Seal Width (minimum)	4.0m	3.5m	n/a
Pavement Width (metres) (minimum)	6.0m	3.5m	n/a
Minimum Crossfall	Sealed 3% Gravelled 4%	Sealed 3% Gravelled 4%	Formed No Gravel 4%
Maximum Superelevation (Depending on the nature of truck traffic)	10% sealed 7% unsealed	10% sealed 9% unsealed	n/a
Gradient (maximum)	16% Sealed 10% Unsealed	16% Sealed 10% Unsealed	n/a

***Figure 25**. Scovazzis Road Geometry.*

Based on Table 17, since the current road characteristics of Scovazzis Road is above or within the minimum and have minimal traffic volume, no upgrade (i.e road widening) is necessary for Scovazzis Road.

13.0 EXISTING CANE HAULAGE

Currently, a cane railway network exists at the western end of Scovazzis Road. It is assumed that during the crushing season, sugar cane hauled from the plantation at the east of the Bruce Highway also utilises the existing sugar cane railway at the western end of Scovazzis Road. As such, cane haulage from the east of the Bruce Highway crosses over the Bruce Highway, continues onto Scovazzis Road and to the existing western cane railway network. Refer to **Figure 24** for existing cane railway network locality.

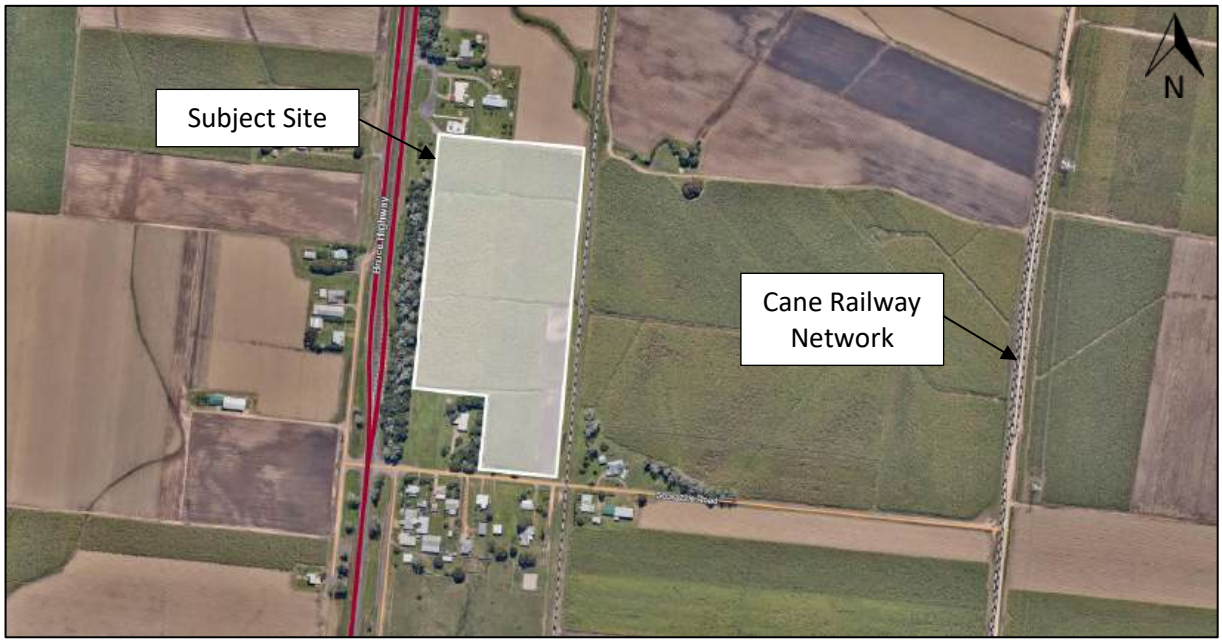


Figure 26. *Sugar Cane Haulage Locality (Source. Queensland Globe)*

During the crushing season, it is estimated that a maximum of 2 to 3 vehicles during the peak hour are transporting cane cuttings from the east of Bruce Highway to the existing cane railway. The proposed development has been thoroughly assessed, confirming that exiting vehicles has adequate safe intersection sight distances from vehicles travelling to the east and west and thus no conflict is anticipated with the cane haulage operations during the crushing season.

14.0 SAFETY ASSESSMENT

In accordance with the TMR Guide to Impact Assessment (GTIA), Table 9.3.3(a) and Table 9.3.3(b), (shown as Table 17 and Table 18 below) the Road environment safety rating matrix (level of risk) for Key Intersection (Bruce Highway/ Scovazzis Road) is Medium and the type of assessment required is a road safety assessment

Table 18. *Road environment safety rating matrix (level of risk). (Source: TMR GTIA, 2048, Table 9.3.3(a))*

Traffic volume (AADT)	Speed (km/h)		
	Up to 50 km/h	60 km/h to 70 km/h	80 km/h+
≤ 8000	Low	Medium	Medium
> 8000	Medium	Medium	High

Table 19*. Type of road safety assessment based on road environment safety rating (Source: TMR GTIA, 2018, Table 9.3.3(b))*

Development type	Road environment safety rating		
	Low	Medium	High
Major Development	road safety assessment	road safety audit	road safety audit
Planning Act Development	road safety assessment	road safety assessment	road safety audit

14.1 ROAD SAFETY ASSESSMENT

A road safety risk assessment has been performed in accordance with the Safety Risk Score Matrix in accordance with Table 19 below.

Table 20. *Safety risk score matrix (Source: TMR GTIA, 2018, Table 9.3.2(a))*

		Potential consequence				
		Property only (1)	Minor injury (2)	Medical treatment (3)	Hospitalisation (4)	Fatality (5)
Potential likelihood	Almost certain (5)	M	M	H	H	H
	Likely (4)	M	M	M	H	H
	Moderate (3)	L	M	M	M	H
	Unlikely (2)	L	L	M	M	M
	Rare (1)	L	L	L	M	M

L: Low risk
M: Medium risk
H: High risk

Safety risks identified for the development have been summarised in Table 20.

Table 21. *Safety risk assessment*

	Without Development			With Development				With Development and mitigation		
Risk Item	**Likelihood**	**Consequence**	**Risk Score**	**Likelihood**	**Consequence**	**Risk Score**	**Mitigation Measure**	**Likelihood**	**Consequence**	**Risk Score**
Traffic turning left from Bruche Highway to Scovazzis Road; Rear End collision	1	3	L	2	3	L	No Action	2	3	L
Traffic exiting Scovazzis Road; queuing along Scovazzis Road and collision with traffic exiting/entering service road	1	3	L	2	3	L	No Action	2	3	L
Traffic exiting the Proposed site access collision with traffic through Scovazzis Road.	1	3	L	2	3	M	Trimmings or removal of trees obstructing the Driver's line of sight. Adequate SISD and ASD	2	3	L

15.0 SUMMARY

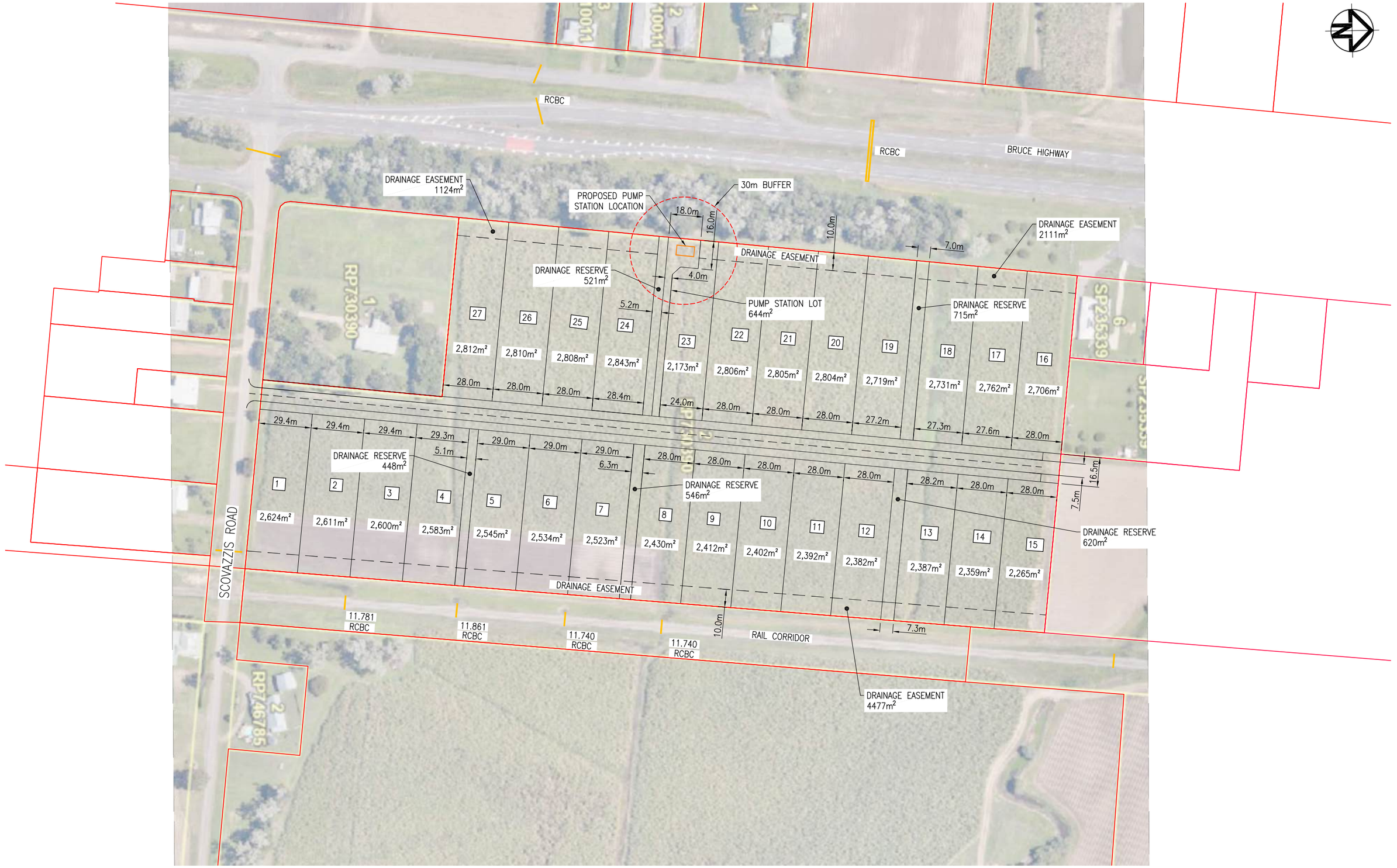
This report has assessed the impact of the traffic generated by the proposed development on the existing road network including at key intersection and access. Consideration has been given to operational performance and road safety. The report has found the following:

- The crash history findings did not indicate any safety issues for the proposed development;
- A SIDRA analysis has been conducted for the key road intersections. The proposed development has insignificant impact on the existing road network and as such the LOS along the key intersections remains unchanged;
- A turn warrant check has been conducted. The existing CHR(s)/AUL(s) turn warrant is appropriate for the Bruce Highwa/ Scovazzis Road in the post development scenario and as such no intersection upgrade is necessary;
- A sight distance check has been conducted for the proposed site access, and results shows that the proposed site access has adequate safe intersection and approach sight distance provided with the removal of the trees along the eastern side of the proposed site access;

In conclusion, the proposed development accesses have been found to be adequate and no significant adverse impact on the operational performance or safety of the surrounding road network has been identified. No other mitigation measures other than those mentioned above have been deemed necessary.

APPENDIX A

PROPOSED DEVELOPMENT LAYOUT



LAYOUT PLAN
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REVISIONS				
A	B.L	20.02.25	FOR INFORMATION	
No.	BY	DATE	DESCRIPTION	

HORIZ. DATUM	MGA	
VERT. DATUM	AHD	
DRG. FILE		DATE
DESIGN		10.12.24
DRAWN	M.AMIN	10.12.24

CERTIFICATION

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MILFORD PLANNING

SCOVAZZIS ROAD SUBDIVISION
BRUCE HIGHWAY, TOOBANNA, 4850
LAYOUT PLAN

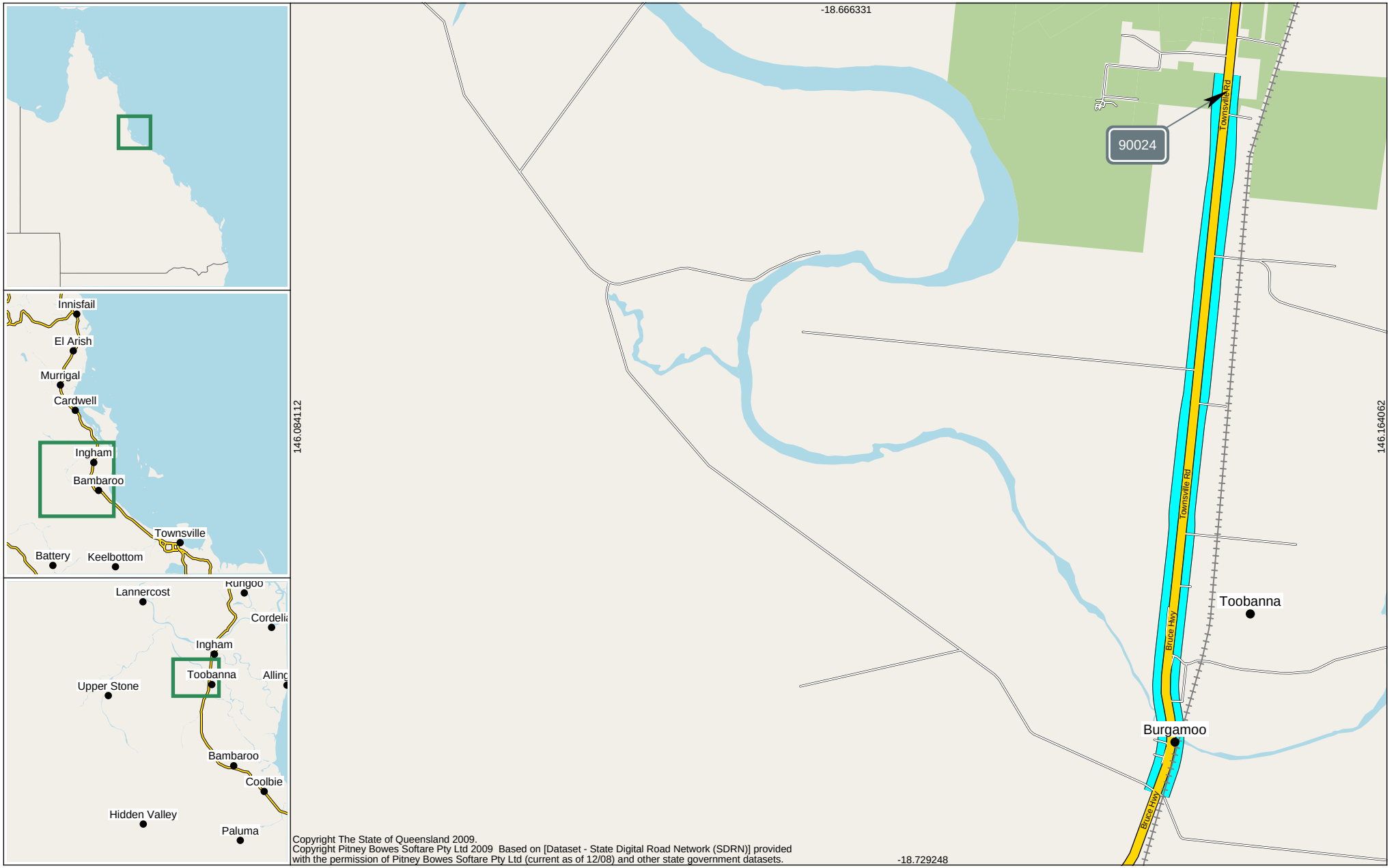
SCALE	AS SHOWN
SHEET	1 OF 1
REVISION	0
DRG No.	1271–C–001

APPENDIX B

SITE 90024 2020 AADT SEGMENT ANALYSIS REPORT

Area 408 - Northern District Road Section 10M - BRUCE HIGHWAY (TOWNSVILLE - INGHAM)

Road Segment from 112.283km to 118.132km Segment Site 90024 Traffic Year 2020 Data Collection Year 2020



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AADT Segment Report

Area 408 - Northern District Road Section 10M - BRUCE HIGHWAY (TOWNSVILLE - INGHAM)

Road Segment from 112.283km to 118.132km Segment Site 90024 Traffic Year 2020 Data Collection Year 2020

The width of each Road Segment is proportional to its AADT.

Site 90024. Point 290000053. Pound Creek adj Main Roads Ingham Depot.

117.99 km

112.28 km

Start Point 290001218. Bruce Hwy from TSV @ Pomona Rd.

118.13 km

End Point 290000758. Bruce Hway 230m N Pound Creek Ingham.

This report shows Annual Average Daily Traffic values (AADTs). Because the AADT values are converted to whole numbers, there will be occasional inaccuracies due to rounding. These inaccuracies are statistically insignificant.

All Vehicles (00)

G	2,603	100%
A	2,636	100%
B	5,239	100%

Light Vehicles (0A)

G	2,111	81.10%
A	2,305	87.44%
B	4,416	84.29%

Heavy Vehicles (0B)

G	494	18.98%
A	332	12.59%
B	826	15.77%

Short Vehicles (1A)

G	2,111	81.10%
A	2,305	87.44%
B	4,416	84.29%

Trucks and Buses (1B)

G	299	11.49%
A	138	5.24%
B	437	8.34%

Articulated Vehicles (1C)

G	114	4.38%
A	103	3.91%
B	217	4.14%

Road Trains (1D)

G	81	3.11%
A	91	3.45%
B	172	3.28%

Short 2-Axle Vehicles (2A)

G	1,977	75.95%
A	2,161	81.98%
B	4,138	78.98%

Short Vehicles Towing (2B)

G	134	5.15%
A	144	5.46%
B	278	5.31%

2-Axle Trucks and Buses (2C)

G	256	9.83%
A	83	3.15%
B	339	6.47%

3-Axle Trucks and Buses (2D)

G	36	1.38%
A	37	1.40%
B	73	1.39%

4-Axle Trucks (2E)

G	7	0.27%
A	18	0.68%
B	25	0.48%

3-Axle Articulated (2F)

G	23	0.88%
A	7	0.27%
B	30	0.57%

4-Axle Articulated (2G)

G	20	0.77%
A	10	0.38%
B	30	0.57%

5-Axle Articulated (2H)

G	12	0.46%
A	14	0.53%
B	26	0.50%

6-Axle Articulated (2I)

G	59	2.27%
A	72	2.73%
B	131	2.50%

B Double (2J)

G	80	3.07%
A	90	3.41%
B	170	3.24%

Double Road Trains (2K)

G	1	0.04%
A	1	0.04%
B	2	0.04%

Triple Road Trains (2L)

G	0	0%
A	0	0%
B	0	0%

AADT Segment Annual Volume Report
Provides summary data for the selected AADT Segment of a Road Section. Summary data is presented as both directional information and a combined bi-directional figure. The data is then broken down by Traffic Class, when available. The report also includes maps displaying the location of both the AADT Segment and the traffic count site.

Annual Average Daily Traffic (AADT)
Annual Average Daily Traffic (AADT) is the number of vehicles passing a point on a road in a 24 hour period, averaged over a calendar year.

AADT Segments
The State declared road network is broken into Road Sections and then further broken down into AADT Segments. An AADT Segment is a sub-section of the declared road network where traffic volume is similar along the entire AADT Segment.

Area
For administration purposes the Department of Transport and Main Roads has divided Queensland into 12 Districts. The Area field in TSDM reports displays the District Name and Number.

District Name	District
Central West District	401
Darling Downs District	402
Far North District	403
Fitzroy District	404
Mackay/Whitsunday District	405
Metropolitian District	406
North Coast District	407
North West District	409
Northern District	408
South Coast District	410
South West District	411
Wide Bay/Burnett District	412

AADT Values
AADT values are displayed by direction of travel as:

- G Traffic flow in gazettal direction
- A Traffic flow against gazettal direction
- B Traffic flow in both directions

Data Collection Year
Is the most recent year that data was collected at the data collection site.

Please Note:
Due to location and/or departmental policy, some sites are not counted every year.

Gazettal Direction
Is the direction of the traffic flow. It can be easily recognised by referring to the name of the road eg. Road Section: 10A Brisbane - Gympie denotes that the gazettal direction is from Brisbane to Gympie.

Maps
Display the selected location from a range of viewing levels, the start and end position details for the AADT Segment and the location of the traffic count site.

Road Section
Is the Gazetted road from which the traffic data is collected. Each Road Section is given a code, allocated sequentially in Gazettal Direction. Larger roads are broken down into sections and identified by an ID code with a suffix for easier data collection and reporting (eg. 10A, 10B, 10C). Road Sections are then broken into AADT Segments which are determined by traffic volume.

Segment Site
Is the unique identifier for the traffic count site representing the traffic flow within the AADT Segment.

Site
The physical location of a traffic counting device. Sites are located at a specified Through Distance along a Road Section.

Site Description
The description of the physical location of the traffic counting device.

Start and End Point
The unique identifier for the Through Distance along a Road Section.

Vehicle Class
Traffic is categorised as per the Austroads Vehicle Classification scheme. Traffic classes are in the following hierarchical format:

Volume or All Vehicles
00 = 0A + 0B

Light Vehicles
0A = 1A
1A = 2A + 2B

Heavy Vehicles
0B = 1B + 1C + 1D
1B = 2C + 2D + 2E
1C = 2F + 2G + 2H + 2I
1D = 2J + 2K + 2L

The following classes are the categories for which data can be captured:

Volume
00 All vehicles

2-Bin
0A Light vehicles
0B Heavy vehicles

4-Bin
1A Short vehicles
1B Truck or bus
1C Articulated vehicles
1D Road train

12-Bin
2A Short 2 axle vehicles
2B Short vehicles towing
2C 2 axle truck or bus
2D 3 axle truck or bus
2E 4 axle truck
2F 3 axle articulated vehicle
2G 4 axle articulated vehicle
2H 5 axle articulated vehicle
2I 6 axle articulated vehicle
2J B double
2K Double road train
2L Triple road train

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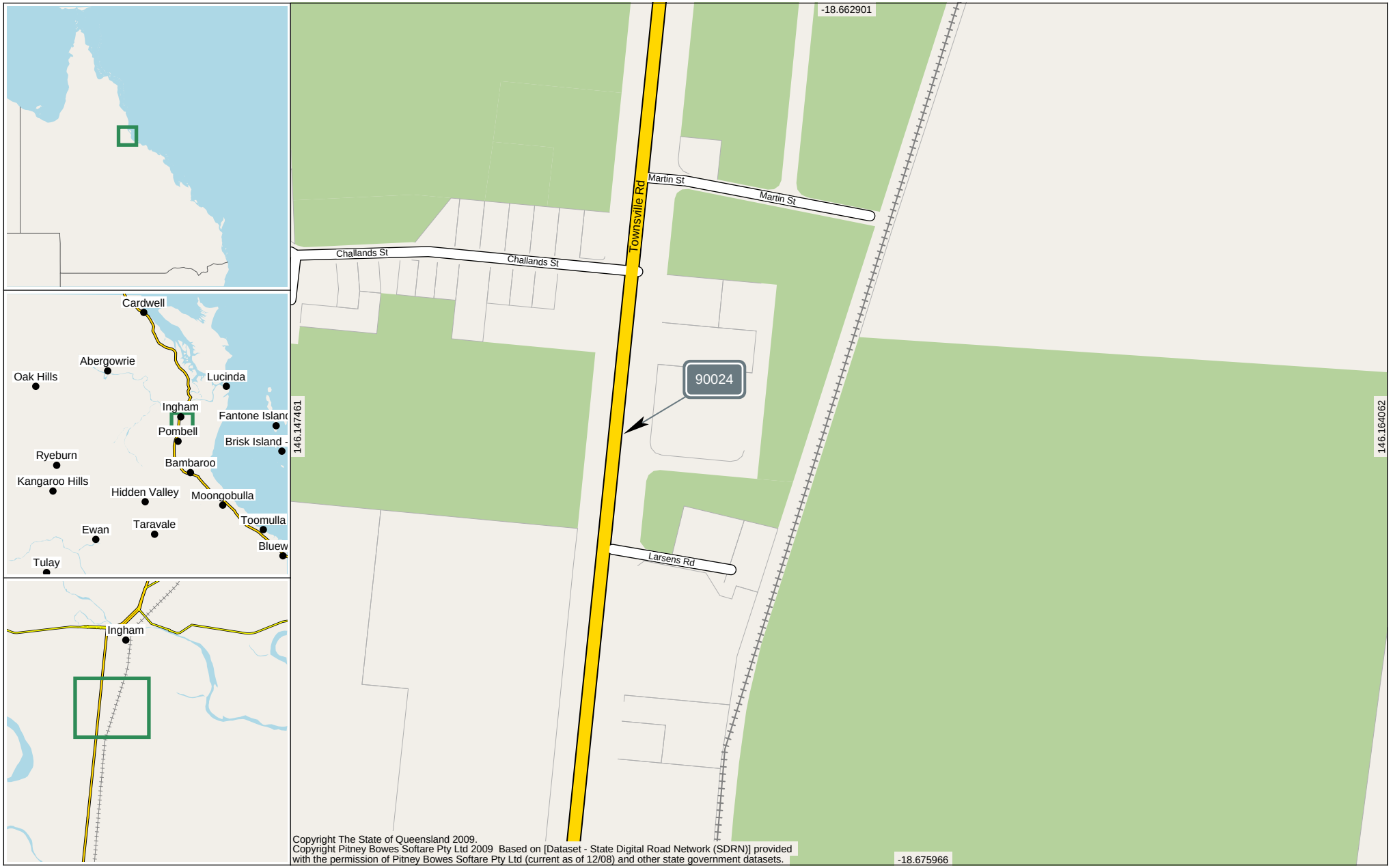

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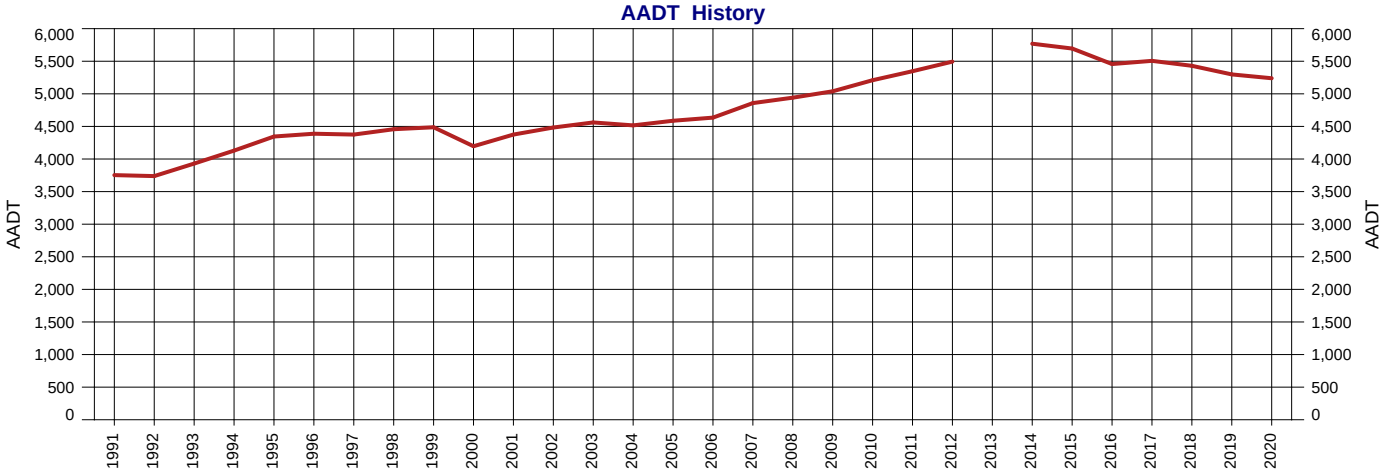
Area	408 - Northern District
Road Section	10M - BRUCE HIGHWAY (TOWNSVILLE - INGHAM)
Site	90024 - Pound Creek, Ingham
Thru Dist	117.99
Type	P - Permanent
Stream	TB - Bi-directional traffic flow

Year	2020	Growth last Year	-1.11%
AADT	5,239	Growth last 5 Yrs	-1.47%
Avg Week Day	5,396	Growth last 10 Yrs	-0.56%
Avg Weekend Day	4,715		

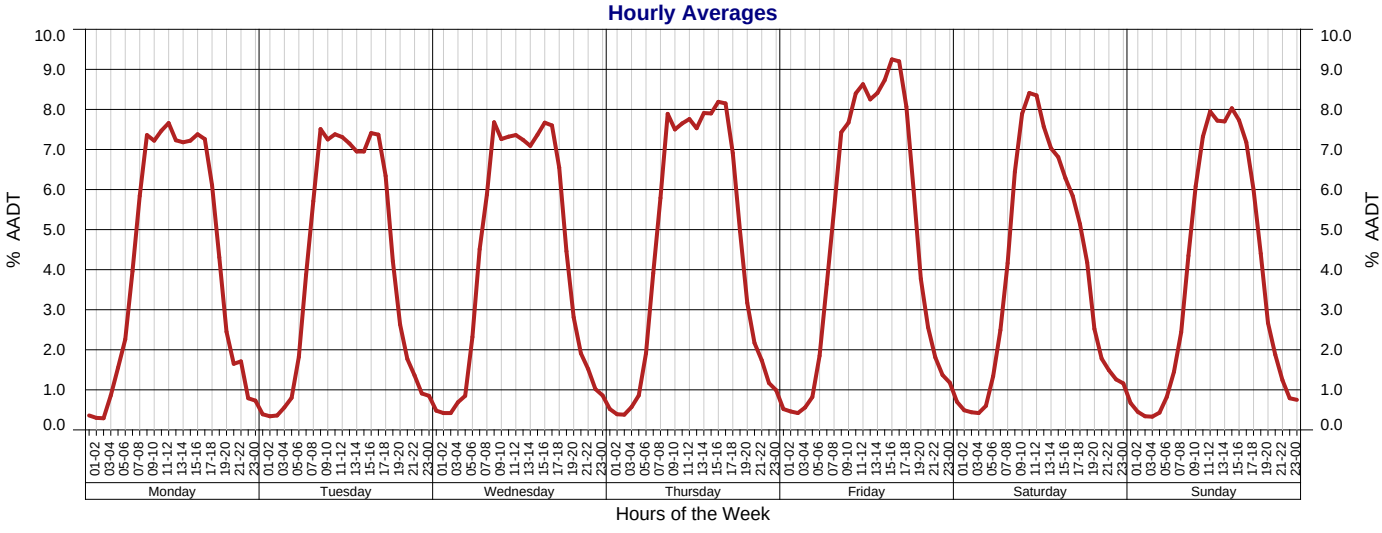
AADT History



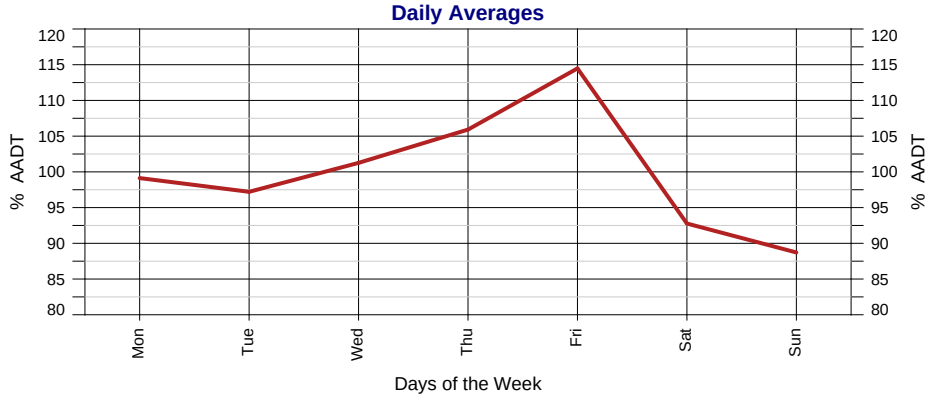
Year	AADT	1-Year Growth	5-Year Growth	10-Year Growth
2020	5,239	-1.11%	-1.47%	-0.56%
2019	5,298	-2.43%	-1.63%	-0.17%
2018	5,430	-1.38%		0.44%
2017	5,506	0.90%	-0.48%	0.90%
2016	5,457	-4.18%	-0.17%	1.13%
2015	5,695	-1.28%	1.57%	2.07%
2014	5,769		2.65%	2.59%
2013				
2012	5,494	2.75%	2.64%	2.36%
2011	5,347	2.65%	2.73%	2.22%
2010	5,209	3.37%	2.67%	2.15%
2009	5,039	1.98%	2.33%	1.73%
2008	4,941	1.71%	2.07%	1.51%
2007	4,858	4.81%	1.90%	1.35%
2006	4,635	1.05%	0.97%	0.71%

Year	AADT	1-Year Growth	5-Year Growth	10-Year Growth
2005	4,587	1.57%	1.34%	0.62%
2004	4,516	-0.99%	0.78%	0.57%
2003	4,561	1.74%	0.97%	1.00%
2002	4,483	2.47%	0.55%	1.12%
2001	4,375	4.27%	-0.14%	1.09%
2000	4,196	-6.49%	-1.20%	
1999	4,487	0.67%	1.22%	
1998	4,457	1.87%	1.95%	
1997	4,375	-0.30%	2.58%	
1996	4,388	0.99%	3.49%	
1995	4,345	5.23%		
1994	4,129	5.06%		
1993	3,930	5.14%		
1992	3,738	-0.40%		
1991	3,753			

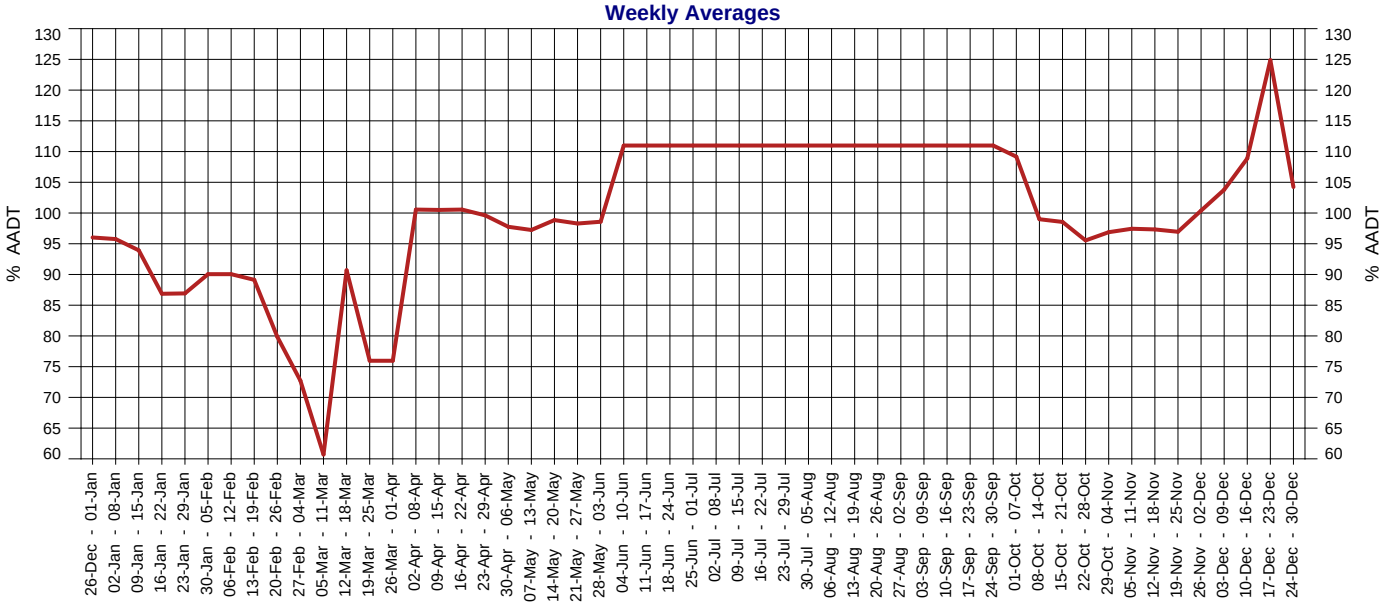
Hourly Averages



Daily Averages



Weekly Averages



2020 Calendar

January

M	T	W	T	F	S	S
		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		

February

M	T	W	T	F	S	S
					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	

March

M	T	W	T	F	S	S
30	31					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

April

M	T	W	T	F	S	S
		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			

May

M	T	W	T	F	S	S
				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

June

M	T	W	T	F	S	S
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					

July

M	T	W	T	F	S	S
		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		

August

M	T	W	T	F	S	S
31					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

September

M	T	W	T	F	S	S
	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				

October

M	T	W	T	F	S	S
			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	

November

M	T	W	T	F	S	S
30						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

December

M	T	W	T	F	S	S
	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			

Days on which traffic data was collected.

Annual Volume Report
Displays AADT history with hourly, daily and weekly patterns by Stream in addition to annual data for AADT figures with 1 year, 5 year and 10 year growth rates.

Annual Average Daily Traffic (AADT)
Annual Average Daily Traffic (AADT) is the number of vehicles passing a point on a road in a 24 hour period, averaged over a calendar year.

AADT History
Displays the years when traffic data was collected at this count site.

Area
For administration purposes the Department of Transport and Main Roads has divided Queensland into 12 Districts. The Area field in TSDM reports displays the District Name and Number.

District Name	District
Central West District	401
Darling Downs District	402
Far North District	403
Fitzroy District	404
Mackay/Whitsunday District	405
Metropolitian District	406
North Coast District	407
North West District	409
Northern District	408
South Coast District	410
South West District	411
Wide Bay/Burnett District	412

Avg Week Day
Average daily traffic volume during the week days, Monday to Friday.

Avg Weekend Day
Average daily traffic volume during the weekend, Saturday and Sunday.

Calendar
Days on which traffic data was collected are highlighted in green.

Gazettal Direction
The Gazettal Direction is the direction of the traffic flow. It can be easily recognised by referring to the name of the road eg. Road Section: 10A Brisbane - Gympie denotes that the gazettal direction is from Brisbane to Gympie.

- G Traffic flowing in Gazettal Direction
- A Traffic flowing against Gazettal Direction
- B The combined traffic flow in both Directions

Growth Percentage
Represents the increase or decrease in AADT, using a exponential fit over the previous 1, 5 or 10 year period.

Hour, Day & Week Averages
The amount of traffic on the road network will vary depending on the time of day, the day of the week and the week of the year. The ebb and flow of traffic travelling through a site over a period of time forms a pattern. The Hour, Day and Week Averages are then used in the calculation of AADT.

Road Section
Is the Gazetted road from which the traffic data is collected. Each Road Section is given a code, allocated sequentially in Gazettal Direction. Larger roads are broken down into sections and identified by an ID code with a suffix for easier data collection and reporting (eg. 10A, 10B, 10C). Road Sections are then broken into AADT Segments which are determined by traffic volume.

Site
The unique identifier and description of the physical location of a traffic counting device. Sites are located at a Through Distance along a Road Section.

Stream
The lane in which the traffic is travelling in. This report provides data for the combined flow of traffic in both directions.

Thru Dist or TDist
The distance from the beginning of the Road Section, in kilometres.

Type
There are two types of traffic counting sites, Permanent and Coverage. Permanent means the traffic counting device is in place 24/7. Coverage means the traffic counting device is in place for a specified period of time.

Year
Is the current year for the report. Where an AADT Year record is missing a traffic count has not been conducted, for that year.

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APPENDIX C

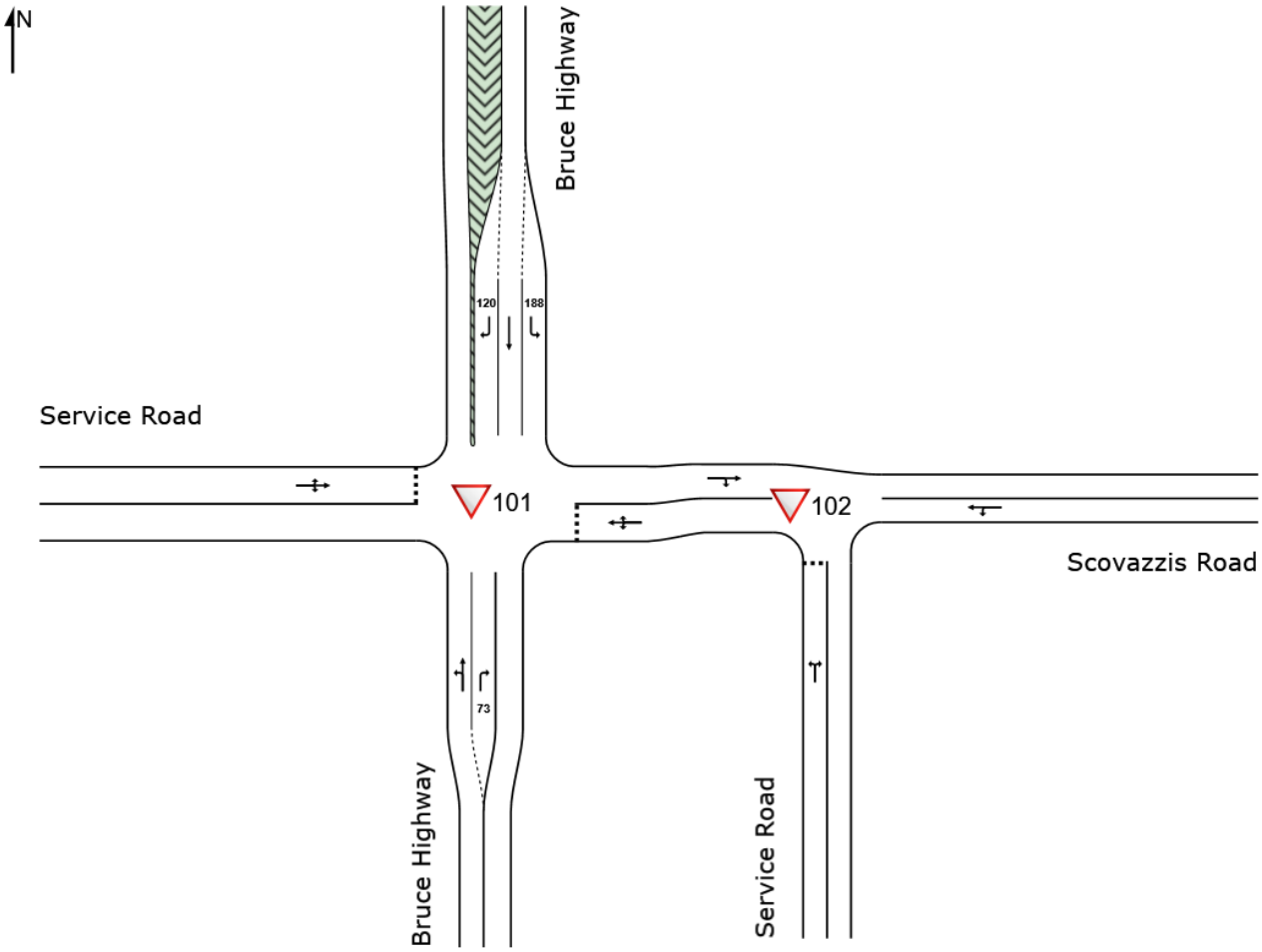
SIDRA RESULTS SUMMARY

NETWORK LAYOUT

Network: N101 [2025 AM Background (Network Folder: Background Traffic)]

New Network
Network Category: Base Year

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽101	NA	Bruce Highway 2025 AM Background
▽102	NA	Scovazzis Road 2025 AM Background

SIDRA INTERSECTION 9.1 | Copyright © 2000-2024 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: LANGTREE CONSULTING | Licence: NETWORK / 1PC | Created: Monday, 13 January 2025 3:08:35 PM
Project: C:\Users\Langtree Consulting\Documents\SIDRA Analysis Projects\Scovazzis Road.sip9

MOVEMENT SUMMARY

Site: 102 [Scovazzis Road 2025 AM Background (Site Folder: Background Traffic)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 AM Background (Network Folder: Background Traffic)]

NA
Site Category: Base Year
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Service Road															
1	L2	All MCs	9	0.0	9	0.0	0.007	5.5	LOS A	0.0	0.1	0.02	0.57	0.02	42.5
3	R2	All MCs	1	0.0	1	0.0	0.007	5.5	LOS A	0.0	0.1	0.02	0.57	0.02	42.4
Approach			11	0.0	11	0.0	0.007	5.5	LOS A	0.0	0.1	0.02	0.57	0.02	42.4
East: Scovazzis Road															
4	L2	All MCs	1	0.0	1	0.0	0.002	5.5	LOS A	0.0	0.0	0.00	0.20	0.00	49.2
5	T1	All MCs	2	0.0	2	0.0	0.002	0.0	LOS A	0.0	0.0	0.00	0.20	0.00	48.4
Approach			3	0.0	3	0.0	0.002	1.8	NA	0.0	0.0	0.00	0.20	0.00	48.9
West: Scovazzis Road															
11	T1	All MCs	2	0.0	2	0.0	0.006	0.0	LOS A	0.0	0.1	0.03	0.42	0.03	48.3
12	R2	All MCs	9	0.0	9	0.0	0.006	2.6	LOS A	0.0	0.1	0.03	0.42	0.03	44.8
Approach			12	0.0	12	0.0	0.006	2.1	NA	0.0	0.1	0.03	0.42	0.03	45.2
All Vehicles			25	0.0	25	0.0	0.007	3.5	NA	0.0	0.1	0.02	0.46	0.02	44.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Bruce Highway 2025 AM Background (Site Folder: Background Traffic)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 AM Background (Network Folder: Background Traffic)]

NA
Site Category: Base Year
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bruce Highway															
1	L2	All MCs	1	0.0	1	0.0	0.147	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	25.6
2	T1	All MCs	257	19.0	257	19.0	0.147	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	2	0.0	2	0.0	0.002	6.6	LOS A	0.0	0.0	0.35	0.54	0.35	38.6
Approach			260	18.7	260	18.7	0.147	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.6
East: Scovazzis Road															
4	L2	All MCs	2	0.0	2	0.0	0.032	3.7	LOS A	0.0	0.3	0.56	0.70	0.56	32.7
5	T1	All MCs	1	0.0	1	0.0	0.032	8.4	LOS A	0.0	0.3	0.56	0.70	0.56	8.2
6	R2	All MCs	9	0.0	9	0.0	0.032	10.3	LOS B	0.0	0.3	0.56	0.70	0.56	37.5
Approach			13	0.0	13	0.0	0.032	9.1	LOS A	0.0	0.3	0.56	0.70	0.56	34.7
North: Bruce Highway															
7	L2	All MCs	9	0.0	9	0.0	0.005	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	45.7
8	T1	All MCs	253	12.6	253	12.6	0.139	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	1	0.0	1	0.0	0.001	6.3	LOS A	0.0	0.0	0.36	0.51	0.36	41.5
Approach			263	12.1	263	12.1	0.139	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.5
West: Service Road															
10	L2	All MCs	1	0.0	1	0.0	0.007	3.7	LOS A	0.0	0.1	0.53	0.59	0.53	39.4
11	T1	All MCs	1	0.0	1	0.0	0.007	8.1	LOS A	0.0	0.1	0.53	0.59	0.53	13.4
12	R2	All MCs	1	0.0	1	0.0	0.007	9.7	LOS A	0.0	0.1	0.53	0.59	0.53	35.1
Approach			3	0.0	3	0.0	0.007	7.2	LOS A	0.0	0.1	0.53	0.59	0.53	33.8
All Vehicles			539	14.9	539	14.9	0.147	0.4	NA	0.0	0.3	0.02	0.03	0.02	58.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [Bruce Highway 2025 PM Background (Site Folder: Background Traffic)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 PM Background (Network Folder: Background Traffic)]

NA
Site Category: Base Year
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bruce Highway															
1	L2	All MCs	1	0.0	1	0.0	0.155	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	25.6
2	T1	All MCs	272	19.0	272	19.0	0.155	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	2	0.0	2	0.0	0.002	6.6	LOS A	0.0	0.0	0.36	0.54	0.36	38.5
Approach			275	18.8	275	18.8	0.155	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.6
East: Scovazzis Road															
4	L2	All MCs	2	0.0	2	0.0	0.033	3.8	LOS A	0.0	0.3	0.58	0.71	0.58	32.0
5	T1	All MCs	1	0.0	1	0.0	0.033	9.0	LOS A	0.0	0.3	0.58	0.71	0.58	8.0
6	R2	All MCs	9	0.0	9	0.0	0.033	11.0	LOS B	0.0	0.3	0.58	0.71	0.58	36.8
Approach			13	0.0	13	0.0	0.033	9.6	LOS A	0.0	0.3	0.58	0.71	0.58	34.0
North: Bruce Highway															
7	L2	All MCs	9	0.0	9	0.0	0.005	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	45.7
8	T1	All MCs	266	12.6	266	12.6	0.146	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	1	0.0	1	0.0	0.001	6.4	LOS A	0.0	0.0	0.37	0.51	0.37	41.4
Approach			277	12.1	277	12.1	0.146	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.5
West: Service Road															
10	L2	All MCs	1	0.0	1	0.0	0.007	3.7	LOS A	0.0	0.1	0.54	0.60	0.54	38.8
11	T1	All MCs	1	0.0	1	0.0	0.007	8.7	LOS A	0.0	0.1	0.54	0.60	0.54	12.8
12	R2	All MCs	1	0.0	1	0.0	0.007	10.4	LOS B	0.0	0.1	0.54	0.60	0.54	34.4
Approach			3	0.0	3	0.0	0.007	7.6	LOS A	0.0	0.1	0.54	0.60	0.54	33.1
All Vehicles			567	15.0	567	15.0	0.155	0.4	NA	0.0	0.3	0.02	0.03	0.02	58.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2024 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: 102 [Scovazzis Road 2025 PM Background (Site Folder: Background Traffic)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 PM Background (Network Folder: Background Traffic)]

NA
Site Category: Base Year
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Service Road															
1	L2	All MCs	9	0.0	9	0.0	0.007	5.5	LOS A	0.0	0.1	0.02	0.57	0.02	42.5
3	R2	All MCs	1	0.0	1	0.0	0.007	5.5	LOS A	0.0	0.1	0.02	0.57	0.02	42.4
Approach			11	0.0	11	0.0	0.007	5.5	LOS A	0.0	0.1	0.02	0.57	0.02	42.4
East: Scovazzis Road															
4	L2	All MCs	1	0.0	1	0.0	0.002	5.5	LOS A	0.0	0.0	0.00	0.20	0.00	49.2
5	T1	All MCs	2	0.0	2	0.0	0.002	0.0	LOS A	0.0	0.0	0.00	0.20	0.00	48.4
Approach			3	0.0	3	0.0	0.002	1.8	NA	0.0	0.0	0.00	0.20	0.00	48.9
West: Scovazzis Road															
11	T1	All MCs	2	0.0	2	0.0	0.006	0.0	LOS A	0.0	0.1	0.03	0.42	0.03	48.3
12	R2	All MCs	9	0.0	9	0.0	0.006	2.6	LOS A	0.0	0.1	0.03	0.42	0.03	44.8
Approach			12	0.0	12	0.0	0.006	2.1	NA	0.0	0.1	0.03	0.42	0.03	45.2
All Vehicles			25	0.0	25	0.0	0.007	3.5	NA	0.0	0.1	0.02	0.46	0.02	44.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Bruce Highway 2035 AM Background (Site Folder: Background Traffic)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2035 AM Background (Network Folder: Background Traffic)]

NA
Site Category: Base Year
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bruce Highway															
1	L2	All MCs	1	0.0	1	0.0	0.194	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	25.6
2	T1	All MCs	339	19.0	339	19.0	0.194	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	All MCs	3	0.0	3	0.0	0.003	7.0	LOS A	0.0	0.0	0.41	0.56	0.41	38.2
Approach			343	18.7	343	18.7	0.194	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.6
East: Scovazzis Road															
4	L2	All MCs	3	0.0	3	0.0	0.053	4.2	LOS A	0.1	0.5	0.66	0.81	0.66	28.6
5	T1	All MCs	1	0.0	1	0.0	0.053	12.2	LOS B	0.1	0.5	0.66	0.81	0.66	7.1
6	R2	All MCs	12	0.0	12	0.0	0.053	15.0	LOS C	0.1	0.5	0.66	0.81	0.66	33.5
Approach			16	0.0	16	0.0	0.053	12.7	LOS B	0.1	0.5	0.66	0.81	0.66	31.1
North: Bruce Highway															
7	L2	All MCs	12	0.0	12	0.0	0.006	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	45.7
8	T1	All MCs	329	12.6	329	12.6	0.181	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	1	0.0	1	0.0	0.001	6.7	LOS A	0.0	0.0	0.42	0.52	0.42	41.1
Approach			342	12.1	342	12.1	0.181	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.5
West: Service Road															
10	L2	All MCs	1	0.0	1	0.0	0.009	4.1	LOS A	0.0	0.1	0.61	0.66	0.61	35.9
11	T1	All MCs	1	0.0	1	0.0	0.009	11.7	LOS B	0.0	0.1	0.61	0.66	0.61	10.3
12	R2	All MCs	1	0.0	1	0.0	0.009	14.2	LOS B	0.0	0.1	0.61	0.66	0.61	31.3
Approach			3	0.0	3	0.0	0.009	10.0	LOS A	0.0	0.1	0.61	0.66	0.61	29.7
All Vehicles			704	15.0	704	15.0	0.194	0.5	NA	0.1	0.5	0.02	0.03	0.02	58.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 102 [Scovazzis Road 2035 AM Background (Site Folder: Background Traffic)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2035 AM Background (Network Folder: Background Traffic)]

NA
Site Category: Base Year
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Service Road															
1	L2	All MCs	12	0.0	12	0.0	0.008	5.5	LOS A	0.0	0.1	0.02	0.57	0.02	42.4
3	R2	All MCs	1	0.0	1	0.0	0.008	5.5	LOS A	0.0	0.1	0.02	0.57	0.02	42.3
Approach			13	0.0	13	0.0	0.008	5.5	LOS A	0.0	0.1	0.02	0.57	0.02	42.4
East: Scovazzis Road															
4	L2	All MCs	1	0.0	1	0.0	0.002	5.5	LOS A	0.0	0.0	0.00	0.15	0.00	50.1
5	T1	All MCs	3	0.0	3	0.0	0.002	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	50.9
Approach			4	0.0	4	0.0	0.002	1.4	NA	0.0	0.0	0.00	0.15	0.00	50.5
West: Scovazzis Road															
11	T1	All MCs	12	0.0	12	0.0	0.007	0.0	LOS A	0.0	0.0	0.01	0.12	0.01	56.3
12	R2	All MCs	3	0.0	3	0.0	0.007	2.6	LOS A	0.0	0.0	0.01	0.12	0.01	48.7
Approach			15	0.0	15	0.0	0.007	0.6	NA	0.0	0.0	0.01	0.12	0.01	53.8
All Vehicles			32	0.0	32	0.0	0.008	2.7	NA	0.0	0.1	0.02	0.30	0.02	47.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Bruce Highway 2035 PM Background (Site Folder: Background Traffic)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2035 PM Background (Network Folder: Background Traffic)]

NA
Site Category: Base Year
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bruce Highway															
1	L2	All MCs	1	0.0	1	0.0	0.202	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	25.6
2	T1	All MCs	354	19.0	354	19.0	0.202	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	All MCs	3	0.0	3	0.0	0.003	7.1	LOS A	0.0	0.0	0.42	0.57	0.42	38.1
Approach			358	18.8	358	18.8	0.202	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.6
East: Scovazzis Road															
4	L2	All MCs	3	0.0	3	0.0	0.057	4.3	LOS A	0.1	0.5	0.68	0.83	0.68	27.7
5	T1	All MCs	1	0.0	1	0.0	0.057	13.1	LOS B	0.1	0.5	0.68	0.83	0.68	6.9
6	R2	All MCs	12	0.0	12	0.0	0.057	16.2	LOS C	0.1	0.5	0.68	0.83	0.68	32.6
Approach			16	0.0	16	0.0	0.057	13.6	LOS B	0.1	0.5	0.68	0.83	0.68	30.2
North: Bruce Highway															
7	L2	All MCs	12	0.0	12	0.0	0.006	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	45.7
8	T1	All MCs	348	12.6	348	12.6	0.191	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	1	0.0	1	0.0	0.001	6.7	LOS A	0.0	0.0	0.43	0.52	0.43	41.0
Approach			361	12.1	361	12.1	0.191	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.5
West: Service Road															
10	L2	All MCs	1	0.0	1	0.0	0.009	4.2	LOS A	0.0	0.1	0.63	0.67	0.63	35.1
11	T1	All MCs	1	0.0	1	0.0	0.009	12.6	LOS B	0.0	0.1	0.63	0.67	0.63	9.7
12	R2	All MCs	1	0.0	1	0.0	0.009	15.3	LOS C	0.0	0.1	0.63	0.67	0.63	30.5
Approach			3	0.0	3	0.0	0.009	10.7	LOS B	0.0	0.1	0.63	0.67	0.63	28.8
All Vehicles			738	15.0	738	15.0	0.202	0.5	NA	0.1	0.5	0.02	0.03	0.02	58.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 102 [Scovazzis Road 2035 PM Background (Site Folder: Background Traffic)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2035 PM Background (Network Folder: Background Traffic)]

NA
Site Category: Base Year
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Service Road															
1	L2	All MCs	9	0.0	9	0.0	0.007	5.5	LOS A	0.0	0.1	0.02	0.57	0.02	42.5
3	R2	All MCs	1	0.0	1	0.0	0.007	5.5	LOS A	0.0	0.1	0.02	0.57	0.02	42.4
Approach			11	0.0	11	0.0	0.007	5.5	LOS A	0.0	0.1	0.02	0.57	0.02	42.4
East: Scovazzis Road															
4	L2	All MCs	1	0.0	1	0.0	0.002	5.5	LOS A	0.0	0.0	0.00	0.20	0.00	49.2
5	T1	All MCs	2	0.0	2	0.0	0.002	0.0	LOS A	0.0	0.0	0.00	0.20	0.00	48.4
Approach			3	0.0	3	0.0	0.002	1.8	NA	0.0	0.0	0.00	0.20	0.00	48.9
West: Scovazzis Road															
11	T1	All MCs	2	0.0	2	0.0	0.006	0.0	LOS A	0.0	0.1	0.03	0.42	0.03	48.3
12	R2	All MCs	9	0.0	9	0.0	0.006	2.6	LOS A	0.0	0.1	0.03	0.42	0.03	44.8
Approach			12	0.0	12	0.0	0.006	2.1	NA	0.0	0.1	0.03	0.42	0.03	45.2
All Vehicles			25	0.0	25	0.0	0.007	3.5	NA	0.0	0.1	0.02	0.46	0.02	44.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

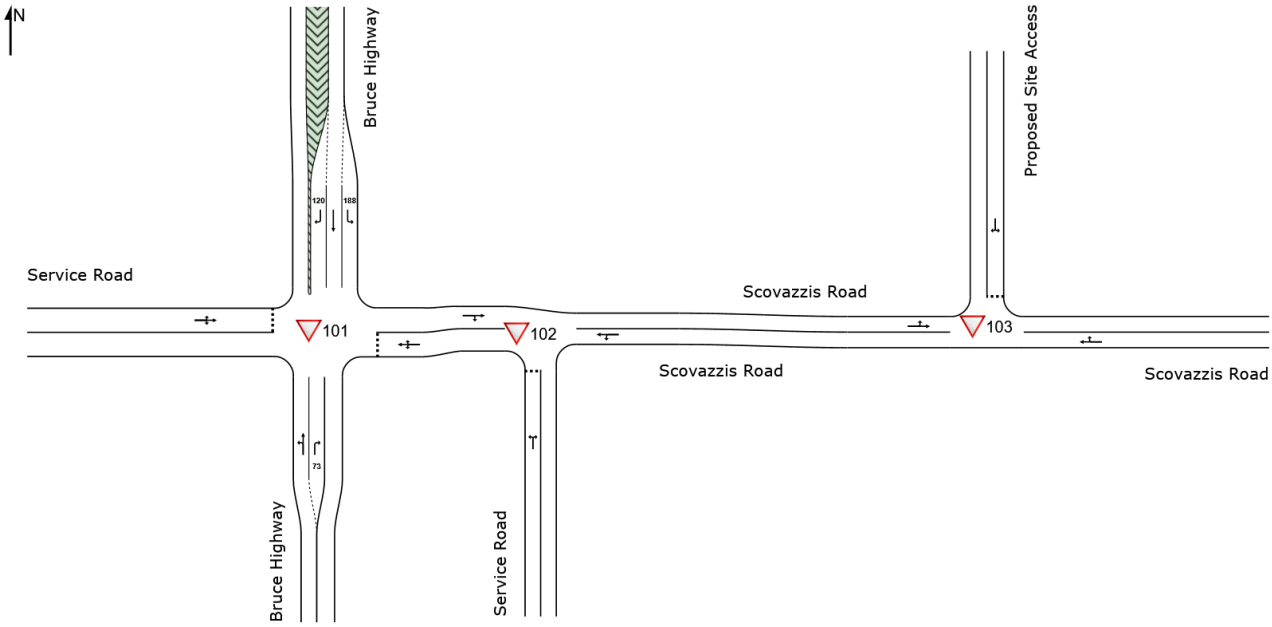
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

NETWORK LAYOUT

Network: N101 [2025 AM Post Devt (Network Folder: Post Development Traffic)]

New Network
Network Category: Future Conditions 1

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽101	NA	Bruce Highway 2025 AM Post Devt
▽102	NA	Scovazzis Road 2025 AM Post Devt
▽103	NA	Proposed Site Access 2025 AM Post Devt

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MOVEMENT SUMMARY

Site: 101 [Bruce Highway 2025 AM Post Devt (Site Folder: Post Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 AM Post Devt (Network Folder: Post Development Traffic)]

NA
Site Category: Future Conditions 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bruce Highway															
1	L2	All MCs	1	0.0	1	0.0	0.147	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	25.6
2	T1	All MCs	257	19.0	257	19.0	0.147	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	4	0.0	4	0.0	0.004	6.6	LOS A	0.0	0.0	0.36	0.55	0.36	38.5
Approach			262	18.6	262	18.6	0.147	0.1	NA	0.0	0.0	0.01	0.01	0.01	59.5
East: Scovazzis Road															
4	L2	All MCs	5	0.0	5	0.0	0.062	3.8	LOS A	0.1	0.6	0.57	0.73	0.57	32.5
5	T1	All MCs	1	0.0	1	0.0	0.062	8.7	LOS A	0.1	0.6	0.57	0.73	0.57	8.1
6	R2	All MCs	19	0.0	19	0.0	0.062	10.7	LOS B	0.1	0.6	0.57	0.73	0.57	37.4
Approach			25	0.0	25	0.0	0.062	9.2	LOS A	0.1	0.6	0.57	0.73	0.57	35.4
North: Bruce Highway															
7	L2	All MCs	19	0.0	19	0.0	0.010	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	45.7
8	T1	All MCs	253	12.6	253	12.6	0.139	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	1	0.0	1	0.0	0.001	6.3	LOS A	0.0	0.0	0.36	0.51	0.36	41.5
Approach			273	11.7	273	11.7	0.139	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.1
West: Service Road															
10	L2	All MCs	1	0.0	1	0.0	0.007	3.7	LOS A	0.0	0.1	0.53	0.59	0.53	39.3
11	T1	All MCs	1	0.0	1	0.0	0.007	8.3	LOS A	0.0	0.1	0.53	0.59	0.53	13.3
12	R2	All MCs	1	0.0	1	0.0	0.007	9.8	LOS A	0.0	0.1	0.53	0.59	0.53	34.9
Approach			3	0.0	3	0.0	0.007	7.3	LOS A	0.0	0.1	0.53	0.59	0.53	33.7
All Vehicles			563	14.3	563	14.3	0.147	0.7	NA	0.1	0.6	0.03	0.06	0.03	58.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 102 [Scovazzis Road 2025 AM Post Devt (Site Folder: Post Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 AM Post Devt (Network Folder: Post Development Traffic)]

NA
Site Category: Future Conditions 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Service Road															
1	L2	All MCs	9	0.0	9	0.0	0.007	5.6	LOS A	0.0	0.1	0.06	0.55	0.06	42.1
3	R2	All MCs	1	0.0	1	0.0	0.007	5.5	LOS A	0.0	0.1	0.06	0.55	0.06	42.1
Approach			11	0.0	11	0.0	0.007	5.6	LOS A	0.0	0.1	0.06	0.55	0.06	42.1
East: Scovazzis Road															
4	L2	All MCs	1	0.0	1	0.0	0.008	4.4	LOS A	0.0	0.0	0.00	0.04	0.00	51.2
5	T1	All MCs	15	0.0	15	0.0	0.008	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	56.2
Approach			16	0.0	16	0.0	0.008	0.3	NA	0.0	0.0	0.00	0.04	0.00	55.0
West: Scovazzis Road															
11	T1	All MCs	14	0.0	14	0.0	0.012	0.0	LOS A	0.0	0.1	0.05	0.22	0.05	37.4
12	R2	All MCs	9	0.0	9	0.0	0.012	2.6	LOS A	0.0	0.1	0.05	0.22	0.05	47.3
Approach			23	0.0	23	0.0	0.012	1.1	NA	0.0	0.1	0.05	0.22	0.05	45.4
All Vehicles			49	0.0	49	0.0	0.012	1.8	NA	0.0	0.1	0.04	0.23	0.04	45.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103 [Proposed Site Access 2025 AM Post Devt (Site Folder: Post Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 AM Post Devt (Network Folder: Post Development Traffic)]

NA
Site Category: Future Conditions 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Scovazzis Road															
5	T1	All MCs	2	0.0	2	0.0	0.002	0.0	LOS A	0.0	0.0	0.04	0.19	0.04	43.9
6	R2	All MCs	1	0.0	1	0.0	0.002	4.1	LOS A	0.0	0.0	0.04	0.19	0.04	47.6
Approach			3	0.0	3	0.0	0.002	1.4	NA	0.0	0.0	0.04	0.19	0.04	46.4
North: Proposed Site Access															
7	L2	All MCs	1	0.0	1	0.0	0.011	5.5	LOS A	0.0	0.1	0.04	0.58	0.04	40.7
9	R2	All MCs	13	0.0	13	0.0	0.011	5.5	LOS A	0.0	0.1	0.04	0.58	0.04	42.5
Approach			14	0.0	14	0.0	0.011	5.5	LOS A	0.0	0.1	0.04	0.58	0.04	42.3
West: Scovazzis Road															
10	L2	All MCs	12	0.0	12	0.0	0.007	4.4	LOS A	0.0	0.0	0.00	0.48	0.00	44.0
11	T1	All MCs	2	0.0	2	0.0	0.007	0.0	LOS A	0.0	0.0	0.00	0.48	0.00	40.9
Approach			14	0.0	14	0.0	0.007	3.7	NA	0.0	0.0	0.00	0.48	0.00	43.8
All Vehicles			31	0.0	31	0.0	0.011	4.3	NA	0.0	0.1	0.02	0.49	0.02	43.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Bruce Highway 2025 PM Post Devt (Site Folder: Post Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 PM Post Devt (Network Folder: Post Development Traffic)]

NA
Site Category: Base Year
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bruce Highway															
1	L2	All MCs	1	0.0	1	0.0	0.155	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	25.6
2	T1	All MCs	272	19.0	272	19.0	0.155	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	4	0.0	4	0.0	0.004	6.7	LOS A	0.0	0.0	0.37	0.55	0.37	38.5
Approach			277	18.6	277	18.6	0.155	0.1	NA	0.0	0.0	0.01	0.01	0.01	59.5
East: Scovazzis Road															
4	L2	All MCs	5	0.0	5	0.0	0.066	3.9	LOS A	0.1	0.6	0.58	0.74	0.58	31.8
5	T1	All MCs	1	0.0	1	0.0	0.066	9.3	LOS A	0.1	0.6	0.58	0.74	0.58	7.9
6	R2	All MCs	19	0.0	19	0.0	0.066	11.4	LOS B	0.1	0.6	0.58	0.74	0.58	36.7
Approach			25	0.0	25	0.0	0.066	9.8	LOS A	0.1	0.6	0.58	0.74	0.58	34.7
North: Bruce Highway															
7	L2	All MCs	19	0.0	19	0.0	0.010	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	45.7
8	T1	All MCs	266	12.6	266	12.6	0.146	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	1	0.0	1	0.0	0.001	6.4	LOS A	0.0	0.0	0.37	0.51	0.37	41.4
Approach			286	11.7	286	11.7	0.146	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.1
West: Service Road															
10	L2	All MCs	1	0.0	1	0.0	0.007	3.7	LOS A	0.0	0.1	0.55	0.60	0.55	38.7
11	T1	All MCs	1	0.0	1	0.0	0.007	8.9	LOS A	0.0	0.1	0.55	0.60	0.55	12.7
12	R2	All MCs	1	0.0	1	0.0	0.007	10.5	LOS B	0.0	0.1	0.55	0.60	0.55	34.3
Approach			3	0.0	3	0.0	0.007	7.7	LOS A	0.0	0.1	0.55	0.60	0.55	33.0
All Vehicles			592	14.4	592	14.4	0.155	0.7	NA	0.1	0.6	0.03	0.06	0.03	58.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 102 [Scovazzis Road 2035 AM Post Devt (Site Folder: Post Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 PM Post Devt (Network Folder: Post Development Traffic)]

NA
Site Category: Future Conditions 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Service Road															
1	L2	All MCs	9	0.0	9	0.0	0.007	5.6	LOS A	0.0	0.1	0.06	0.55	0.06	42.1
3	R2	All MCs	1	0.0	1	0.0	0.007	5.5	LOS A	0.0	0.1	0.06	0.55	0.06	42.1
Approach			11	0.0	11	0.0	0.007	5.6	LOS A	0.0	0.1	0.06	0.55	0.06	42.1
East: Scovazzis Road															
4	L2	All MCs	1	0.0	1	0.0	0.008	4.4	LOS A	0.0	0.0	0.00	0.04	0.00	51.2
5	T1	All MCs	15	0.0	15	0.0	0.008	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	56.2
Approach			16	0.0	16	0.0	0.008	0.3	NA	0.0	0.0	0.00	0.04	0.00	55.0
West: Scovazzis Road															
11	T1	All MCs	14	0.0	14	0.0	0.012	0.0	LOS A	0.0	0.1	0.05	0.22	0.05	37.4
12	R2	All MCs	9	0.0	9	0.0	0.012	2.6	LOS A	0.0	0.1	0.05	0.22	0.05	47.3
Approach			23	0.0	23	0.0	0.012	1.1	NA	0.0	0.1	0.05	0.22	0.05	45.4
All Vehicles			49	0.0	49	0.0	0.012	1.8	NA	0.0	0.1	0.04	0.23	0.04	45.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103 [Proposed Site Access 2025 PM Post Devt (Site Folder: Post Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 PM Post Devt (Network Folder: Post Development Traffic)]

NA
Site Category: Future Conditions 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Scovazzis Road															
5	T1	All MCs	2	0.0	2	0.0	0.002	0.0	LOS A	0.0	0.0	0.04	0.19	0.04	43.9
6	R2	All MCs	1	0.0	1	0.0	0.002	4.1	LOS A	0.0	0.0	0.04	0.19	0.04	47.6
Approach			3	0.0	3	0.0	0.002	1.4	NA	0.0	0.0	0.04	0.19	0.04	46.4
North: Proposed Site Access															
7	L2	All MCs	1	0.0	1	0.0	0.011	5.5	LOS A	0.0	0.1	0.04	0.58	0.04	40.7
9	R2	All MCs	13	0.0	13	0.0	0.011	5.5	LOS A	0.0	0.1	0.04	0.58	0.04	42.5
Approach			14	0.0	14	0.0	0.011	5.5	LOS A	0.0	0.1	0.04	0.58	0.04	42.3
West: Scovazzis Road															
10	L2	All MCs	12	0.0	12	0.0	0.007	4.4	LOS A	0.0	0.0	0.00	0.48	0.00	44.0
11	T1	All MCs	2	0.0	2	0.0	0.007	0.0	LOS A	0.0	0.0	0.00	0.48	0.00	40.9
Approach			14	0.0	14	0.0	0.007	3.7	NA	0.0	0.0	0.00	0.48	0.00	43.8
All Vehicles			31	0.0	31	0.0	0.011	4.3	NA	0.0	0.1	0.02	0.49	0.02	43.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Bruce Highway 2035 AM Post Devt (Site Folder: Post Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2035 AM Post Devt (Network Folder: Post Development Traffic)]

NA
Site Category: Future Conditions 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bruce Highway															
1	L2	All MCs	1	0.0	1	0.0	0.194	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	25.6
2	T1	All MCs	339	19.0	339	19.0	0.194	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	All MCs	5	0.0	5	0.0	0.005	7.1	LOS A	0.0	0.1	0.41	0.57	0.41	38.1
Approach			345	18.6	345	18.6	0.194	0.1	NA	0.0	0.1	0.01	0.01	0.01	59.5
East: Scovazzis Road															
4	L2	All MCs	6	0.0	6	0.0	0.095	4.2	LOS A	0.1	0.9	0.67	0.84	0.67	28.4
5	T1	All MCs	1	0.0	1	0.0	0.095	12.6	LOS B	0.1	0.9	0.67	0.84	0.67	7.0
6	R2	All MCs	21	0.0	21	0.0	0.095	15.6	LOS C	0.1	0.9	0.67	0.84	0.67	33.2
Approach			28	0.0	28	0.0	0.095	13.0	LOS B	0.1	0.9	0.67	0.84	0.67	31.4
North: Bruce Highway															
7	L2	All MCs	21	0.0	21	0.0	0.011	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	45.7
8	T1	All MCs	329	12.6	329	12.6	0.181	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	1	0.0	1	0.0	0.001	6.7	LOS A	0.0	0.0	0.42	0.52	0.42	41.1
Approach			352	11.8	352	11.8	0.181	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.2
West: Service Road															
10	L2	All MCs	1	0.0	1	0.0	0.009	4.1	LOS A	0.0	0.1	0.61	0.66	0.61	35.7
11	T1	All MCs	1	0.0	1	0.0	0.009	12.0	LOS B	0.0	0.1	0.61	0.66	0.61	10.2
12	R2	All MCs	1	0.0	1	0.0	0.009	14.3	LOS B	0.0	0.1	0.61	0.66	0.61	31.2
Approach			3	0.0	3	0.0	0.009	10.1	LOS B	0.0	0.1	0.61	0.66	0.61	29.6
All Vehicles			728	14.5	728	14.5	0.194	0.8	NA	0.1	0.9	0.03	0.06	0.03	58.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 102 [Scovazzis Road 2035 AM Post Devt (Site Folder: Post Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2035 AM Post Devt (Network Folder: Post Development Traffic)]

NA
Site Category: Future Conditions 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Service Road															
1	L2	All MCs	12	0.0	12	0.0	0.008	5.6	LOS A	0.0	0.1	0.06	0.55	0.06	42.1
3	R2	All MCs	1	0.0	1	0.0	0.008	5.5	LOS A	0.0	0.1	0.06	0.55	0.06	42.1
Approach			13	0.0	13	0.0	0.008	5.6	LOS A	0.0	0.1	0.06	0.55	0.06	42.1
East: Scovazzis Road															
4	L2	All MCs	1	0.0	1	0.0	0.009	4.4	LOS A	0.0	0.0	0.00	0.04	0.00	51.2
5	T1	All MCs	16	0.0	16	0.0	0.009	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	56.4
Approach			17	0.0	17	0.0	0.009	0.3	NA	0.0	0.0	0.00	0.04	0.00	55.2
West: Scovazzis Road															
11	T1	All MCs	15	0.0	15	0.0	0.014	0.0	LOS A	0.0	0.2	0.06	0.23	0.06	36.3
12	R2	All MCs	12	0.0	12	0.0	0.014	2.6	LOS A	0.0	0.2	0.06	0.23	0.06	47.0
Approach			26	0.0	26	0.0	0.014	1.2	NA	0.0	0.2	0.06	0.23	0.06	45.1
All Vehicles			56	0.0	56	0.0	0.014	1.9	NA	0.0	0.2	0.04	0.25	0.04	45.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103 [Proposed Site Access 2035 AM Post Devt (Site Folder: Post Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2035 AM Post Devt (Network Folder: Post Development Traffic)]

NA
Site Category: Future Conditions 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Scovazzis Road															
5	T1	All MCs	3	0.0	3	0.0	0.002	0.0	LOS A	0.0	0.0	0.03	0.14	0.03	47.0
6	R2	All MCs	1	0.0	1	0.0	0.002	4.1	LOS A	0.0	0.0	0.03	0.14	0.03	48.4
Approach			4	0.0	4	0.0	0.002	1.0	NA	0.0	0.0	0.03	0.14	0.03	47.8
North: Proposed Site Access															
7	L2	All MCs	1	0.0	1	0.0	0.011	5.5	LOS A	0.0	0.1	0.04	0.57	0.04	40.6
9	R2	All MCs	13	0.0	13	0.0	0.011	5.5	LOS A	0.0	0.1	0.04	0.57	0.04	42.4
Approach			14	0.0	14	0.0	0.011	5.5	LOS A	0.0	0.1	0.04	0.57	0.04	42.2
West: Scovazzis Road															
10	L2	All MCs	12	0.0	12	0.0	0.008	4.4	LOS A	0.0	0.0	0.00	0.45	0.00	44.5
11	T1	All MCs	3	0.0	3	0.0	0.008	0.0	LOS A	0.0	0.0	0.00	0.45	0.00	41.8
Approach			15	0.0	15	0.0	0.008	3.4	NA	0.0	0.0	0.00	0.45	0.00	44.2
All Vehicles			33	0.0	33	0.0	0.011	4.0	NA	0.0	0.1	0.02	0.46	0.02	43.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Scovazzis Road 2035 AM Post Devt (Site Folder: Post Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2035 PM Post Devt (Network Folder: Post Development Traffic)]

NA
Site Category: Future Conditions 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Service Road															
1	L2	All MCs	12	0.0	12	0.0	0.008	5.6	LOS A	0.0	0.1	0.06	0.55	0.06	42.1
3	R2	All MCs	1	0.0	1	0.0	0.008	5.5	LOS A	0.0	0.1	0.06	0.55	0.06	42.1
Approach			13	0.0	13	0.0	0.008	5.6	LOS A	0.0	0.1	0.06	0.55	0.06	42.1
East: Scovazzis Road															
4	L2	All MCs	1	0.0	1	0.0	0.009	4.4	LOS A	0.0	0.0	0.00	0.04	0.00	51.2
5	T1	All MCs	16	0.0	16	0.0	0.009	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	56.4
Approach			17	0.0	17	0.0	0.009	0.3	NA	0.0	0.0	0.00	0.04	0.00	55.2
West: Scovazzis Road															
11	T1	All MCs	15	0.0	15	0.0	0.014	0.0	LOS A	0.0	0.2	0.06	0.23	0.06	36.3
12	R2	All MCs	12	0.0	12	0.0	0.014	2.6	LOS A	0.0	0.2	0.06	0.23	0.06	47.0
Approach			26	0.0	26	0.0	0.014	1.2	NA	0.0	0.2	0.06	0.23	0.06	45.1
All Vehicles			56	0.0	56	0.0	0.014	1.9	NA	0.0	0.2	0.04	0.25	0.04	45.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103 [Proposed Site Access 2035 PM Post Devt (Site Folder: Post Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2035 PM Post Devt (Network Folder: Post Development Traffic)]

NA
Site Category: Future Conditions 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Scovazzis Road															
5	T1	All MCs	3	0.0	3	0.0	0.002	0.0	LOS A	0.0	0.0	0.03	0.14	0.03	47.0
6	R2	All MCs	1	0.0	1	0.0	0.002	4.1	LOS A	0.0	0.0	0.03	0.14	0.03	48.4
Approach			4	0.0	4	0.0	0.002	1.0	NA	0.0	0.0	0.03	0.14	0.03	47.8
North: Proposed Site Access															
7	L2	All MCs	1	0.0	1	0.0	0.011	5.5	LOS A	0.0	0.1	0.04	0.57	0.04	40.6
9	R2	All MCs	13	0.0	13	0.0	0.011	5.5	LOS A	0.0	0.1	0.04	0.57	0.04	42.4
Approach			14	0.0	14	0.0	0.011	5.5	LOS A	0.0	0.1	0.04	0.57	0.04	42.2
West: Scovazzis Road															
10	L2	All MCs	12	0.0	12	0.0	0.008	4.4	LOS A	0.0	0.0	0.00	0.45	0.00	44.5
11	T1	All MCs	3	0.0	3	0.0	0.008	0.0	LOS A	0.0	0.0	0.00	0.45	0.00	41.8
Approach			15	0.0	15	0.0	0.008	3.4	NA	0.0	0.0	0.00	0.45	0.00	44.2
All Vehicles			33	0.0	33	0.0	0.011	4.0	NA	0.0	0.1	0.02	0.46	0.02	43.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
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Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.