

From: "Robert Henwood" <rahplanning@bigpond.com>
Sent: Thu, 29 Jan 2026 17:12:12 +1000
To: "Maris-Claire Salazar" <maris-claire.salazar@townsville.qld.gov.au>
Cc: "Bruce Kingsun" <admin@kingsunproperties.com.au>; "Tony Parker" <tony@imcommercial.com.au>
Subject: RFI - 325 Shaw Road Shaw 4818 - Lot 19 SP107219
Attachments: 25-391 site plan - 28-01-2026.pdf, 01_TIA_Shaw.pdf, SK06-09_27.08.2025.pdf

Application no: MCU21/0089.03

Assessment no: 13901029

Proposal: Change Other to Development Approval associated with MI16/0015

Street address: 325 Shaw Road SHAW QLD 4818

Real property description: Lot 19 SP 107219

Reference is made to Council's Information Request of the 15th August 2024

As you are aware the application was subject to assessment under the Schedule 10, of the Planning Act

Material change of use of premises near a state transport corridor or that is a future state transport corridor (10.9.4.2.4.1) (Planning Regulation 2017)

The decision to grant a conditional approval was issued on the 22nd September 2025

Request to extend the decision making period

Due to logistics, a response to the matters raised in Item 2 of the RFI are still being finalised. Therefore, it is requested extension to the decision making period of 1 month to enable the finalisation of those details including elevation etc

In the order of matters raised by Councils RFI please find attached the following responses:

Request Item 1 – Amended Site Plan

The applicant is requested to provide an amended site plan to include the following:

- Detail of the proposed carwash layout, including appropriately notating vacuum bay(s), auto carwash bay(s) and carparking including dimensions.
- Detail of the proposed layout of the Service station, including appropriately notating all building and/or structures including but not limited to shop front(s), fuel bowers, underground/overground fuel tanks, pylon sign (if proposed), air/water point, refuse area, delivery area etc.
- A 1.0m end aisle widening as identified in Page 11 of the Traffic impact Assessment Report.

Reason

To allow Council to undertake a full and detailed assessment of the application.

Advice

The applicant is advised that Council requires further details to the internal layout of the development to clearly identify the extent of the proposed changes.

Response

The requested amended sited plan is attached, it will be noted it provides

- *Details of the proposed car wash notating the vacuum bays*

- *Shows details of the service station layout including fuel bowser layout, underground tank locations, refuse location etc*
- *The location of the pylon sign*
- *The 1m aisle widening as required*

Request Item 2 – Elevation Plans

The applicant is requested to provide elevations of the proposed development.

Document Set ID: 25339032Version: 5, Version Date: 15/08/2024

Reason

To allow Council to undertake a full and detailed assessment of the application.

Advice

Given the internal layout changes and potential changes to tenancies, elevations are required of the service station, carwash building and any advertising signage proposed as part of the development.

Response

It is not considered elevations etc are essential in the assessment of this application as a prospective developer will design and develop the site in accordance with corporate themes (including elevations, colours and logos etc) which will obviously be designed to identify the brand, attract custom and provide an attractive visual appearance associated with such developments. However in the interests of facilitating a comprehensive assessment of the application elevations etc are currently being prepared and hopefully will be finalised and submitted within three weeks.

Request Item 3 – Amended Traffic Impact Assessment

The applicant is requested to provide an amended Traffic Impact Assessment to include swept path assessments for all car wash bays.

Reason

To demonstrate compliance with Performance Outcome PO8 of the Transport impact, access and parking code of the Townsville City Plan.

Response

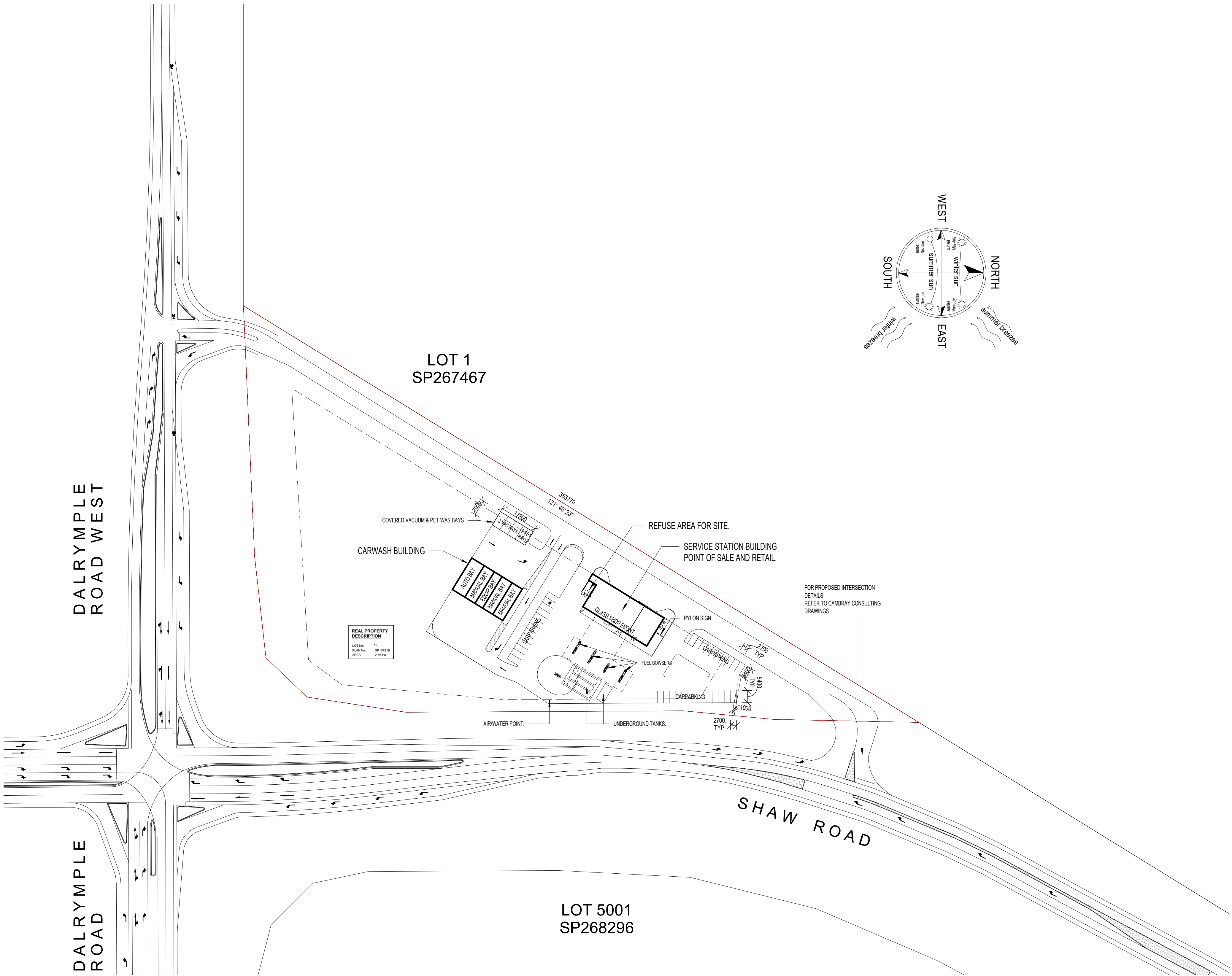
Attached are the amended Traffic Impact Assessment report and drawings prepared showing the Swept paths to car wash bays etc

Can you please confirm the extension to the Decision making timeframe and also if you require any other supporting details or information to address the requirements of the RFI

Robert Henwood

Robert Henwood
RAHAB Planning Consultants

rahplanning@bigpond.com
040638367



1 SITE PLAN
1 : 1000

NOTES:
THIS DRAWING IS ONLY INTENDED TO OBTAIN A LOCAL
AUTHORITY BUILDING PERMIT.
COMPLY WITH ALL RELEVANT AUTHORITY REG. & B.S.A.
FIGURED DIMENSIONS TO TAKE PRECEDENCE OVER
SCALED MEASUREMENTS.
VERIFY ALL ON SITE DIMENSIONS & LEVELS PRIOR TO
THE COMMENCEMENT OF ANY CONSTRUCTION.

PROJECT ISSUE & DESCRIPTION
P2 - SITE PLAN FOR PLANNING APPLICATION -
28/01/2026

CB
DESIGNS
BUILDING DESIGN & DRAFTING
ABN: 112 837 291
Licence No: 1572258
66 Baywater Road, Hyde Park QLD 4812
PO Box 4257, Vincent QLD 4814
Tel: (07) 4778 4199

PROJECT:
PROPOSED COMMERCIAL
DEVELOPMENT
CLIENT:
KINGSUN

SITE:
LOT 19 ON SP 107219
325 SHAW ROAD TOWNSVILLE

BUILDER:

DATE:	28/01/2026 3:40:11 PM	JOB NO.
DRAWN:	BM	25-391
SCALE:	As indicated	
SHEET No:	1	CLIENT JOB NO.



CAMBRAY CONSULTING

TRAFFIC ENGINEERING + TRANSPORT PLANNING



Proposed Service Station & Car Wash Access Amendments 325 Shaw Road, Shaw

TRAFFIC IMPACT ASSESSMENT REPORT

Prepared for Kingsun Investments Pty Ltd

1 July 2025

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Appendix A

Proposed Development Plan

Appendix B

SARA Approved Layout

Appendix C

Council Approved Layout

Appendix D

Concept External Functional Layout

Appendix E

Swept Path Assessment

Appendix F

Traffic Count Data

Appendix G

Turning Movements

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SIDRA Output

Appendix I

Aggregate Delay Assessment



1.0 Introduction

Cambray Consulting was engaged to assess the traffic arrangements for the modification of an approved Service Station development located at 325 Shaw Road, Shaw.

This assessment involved:

- An assessment of the physical layout of the site from a traffic perspective, taking into consideration:
 - Vehicle access arrangements including sizing, location and sight distance adequacy;
 - Carparking provision and layout, and on-site vehicle circulation arrangements; and
 - Servicing requirements and vehicle swept path analyses.
- An assessment of the traffic impact of the proposed development upon the adjacent road network, including:
 - SIDRA Intersection assessment of the proximate road network:
 - The proposed Shaw Road / Site Access;
 - The Dalrymple Road / Shaw Road traffic signals.
 - An Aggregate Delay Assessment as per the Department of Transport and Main Roads (DTMR's) Guidelines to Traffic Impact Assessment (GTIA) document.
- A Road Safety Assessment as per DTMR's GTIA document.

The proposed development plan is provided in **Appendix A**.

1.1 Limits of Report

This report takes into account the particular instructions and requirements of our client. Cambray Consulting has taken care in the preparation of this report, however it neither accepts liability nor responsibility whatsoever in respect of:

- Any use of this report by a third party;
- Any third party whose interests may be affected by any decision made regarding the contents of this report; and/or
- Any conclusion drawn resulting from omission or lack of full disclosure by the client or the client's consultants.

1.2 Safety in Design

Within our scope, we have identified safety in design issues and potential hazards, whenever reasonably practicable within our field of expertise. Due to our limited and upfront role on this project, it is not considered reasonably practicable to identify all potential hazards which may occur throughout the life of the project, including during detailed design and construction activities. It is strongly recommended that safety in design issues be reviewed during all ensuing design and construction stages of the project.

1.3 Qualifications

This report was prepared by:

- Simon Nitkiewicz, Principal Transport Engineer – BE Civil (Hons I), BSc Biochem, TMD 842, **RPEQ 31604**.



2.0 Context

The subject site is located at 325 Shaw Road, Shaw and is legally described as Lot 19 on SP107219.

On 21 June 2016 an application for a Material Change of Use for a Service Station was lodged with the City of Townsville Council (Council). The application received approval from:

- The Department of Infrastructure, Local Government and Planning (DILGP) on 8 March 2017 (DILGP reference SDA-0816-032892). Approved Plans are provided in **Appendix B**;
- The City of Townsville Council (Council) on 1 August 2017 (Council reference MI16/0015). Approved plans are provided in **Appendix C**.

An extension application was lodged with Council and subsequently approved on 24 July 2023 (Council reference MCU21/0089.01).

The approved development included an all-movements access to / from Dalrymple Road (Council controlled) and no direct access to / from Shaw Road (TMR Controlled).

This proposal includes an access to / from Shaw Road, limited to left-in, right-in, and left-out movements (i.e. no right-out movements). It is not proposed to make any changes to the Dalrymple Road access that has been approved previously.

2.1 Site Location

The site is located within the City of Townsville Council (Council) local government area. The development locality is illustrated in **Figure 2.1**.



Figure 2.1 Site Locality



2.2 Surrounding Road Network

Key characteristics of the adjacent road network are summarised in **Table 2.1**.

Table 2.1 Surrounding Road Network

Road	Jurisdiction	Hierarchy	Speed Limit
Dalrymple Road	Council	Arterial Road	80 km/hr
Shaw Road	TMR	Arterial Road	80 km/hr



3.0 Proposed Development

The site benefits from an existing approval for a Service Station (MI16/0015). It is not proposed to amend the land uses associated with this application, being Service Station with ancillary Shop / Food and Drink Outlet and Car Wash.

Compared to the previous proposal, the key changes from a transport planning perspective are as follows:

- Provision of a new access to / from Shaw Road, accommodating left-in, right-in and left-out movements (i.e. no right-turn out movements); and
- Formalisation of the Car Wash area, with dimensions of wash bays and vacuum bays more in alignment with general tenant specifications (albeit somewhat conservatively sized).

The proposed development yields are summarised in **Table 3.1**.

Table 3.1 Summary of amended Stage 1 and proposed Stage 2 development yields

Land Use	Development Yield
Service Station	356m ² of GFA*
Food and Drink Outlet	150m ²
Car Wash	522m ² of GFA two (2) automatic wash bays, two (2) manual wash bays and three (3) vacuum bays

*Equivalent to ~250m² of convenience store area **Conservatively includes plant, office and wash bays

The proposed plan of development is provided in **Appendix A** and an extract of the site layout is provided in **Figure 3.1**.

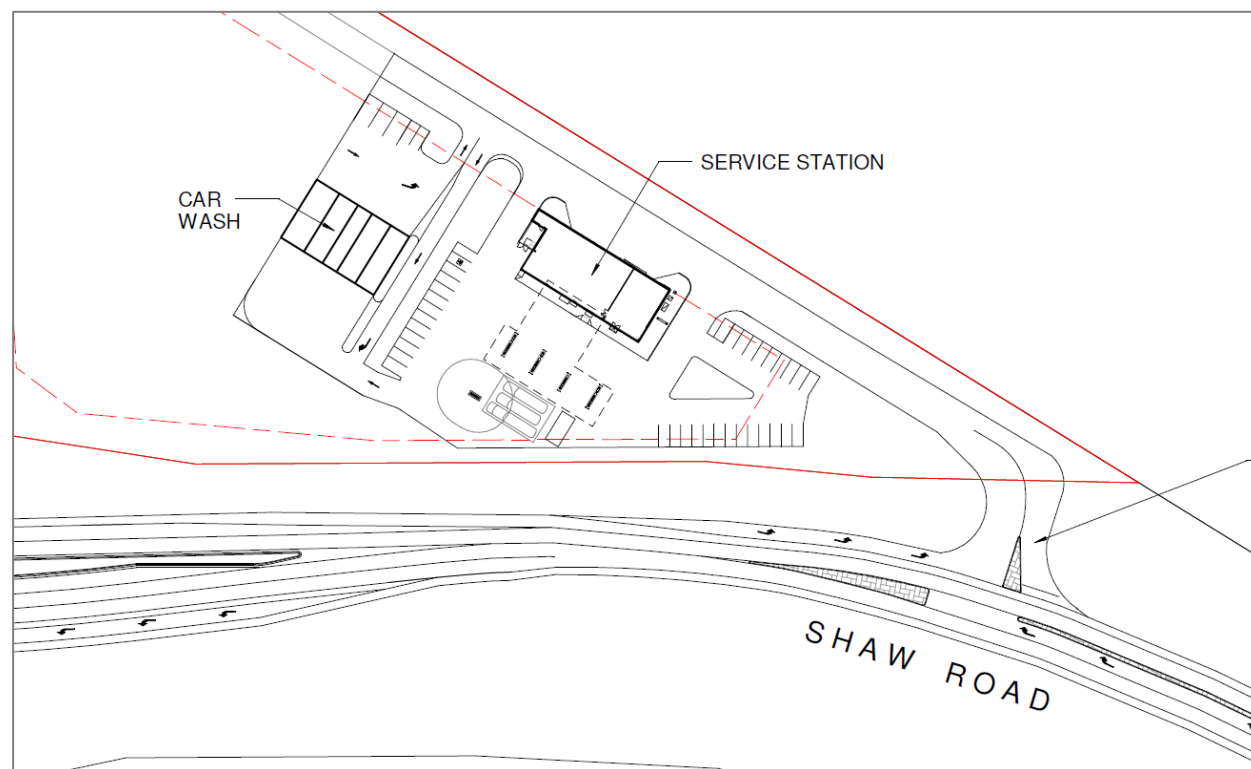


Figure 3.1 Proposed Development



4.0 Shaw Road Access Arrangements

It is proposed to achieve direct access to / from Shaw Road. A concept external layout of the proposed access arrangement is provided in **Appendix D**. Supporting swept paths of a 19m AV are also provided.

The proposed Shaw Road access arrangements include left-in, right-in and left-out movements. No right-turn out movements are proposed.

Figure 4.1 illustrates the proposed layout and site access arrangements for the development.



Figure 4.1 Shaw Road Concept External Layout

4.1 Geometric Parameters

Key design parameters for the Shaw Road access concept are provided in **Table 4.1**.

Table 4.1 Myall Street / Ferrells Road

Parameter	Adopted	Comment
AUL – Posted Speed 80 km/hr & design speed 90 km/hr		
Width (turn lane)	3.5m (min)	This is compliant with RPDM / AGRD4a (2.8m minimum)
Width (through lane)	3.5m (min)	In line with existing provisions and compliant with RPDM / AGRD4a (3.0m)
Diverge	90.0 (min)	- Design diverge for AUL at 90 km/hr is 90m - Detailed consideration of left-turn adequacy is provided in the response to the 13 September 2024 SARA Information Request
CHR – Posted Speed 80 km/hr & Design Speed 90 km/hr		
Width (turn lane)	3.5m (min)	In line with existing provisions and compliant with RPDM / AGRD4a (3.5m proposed > 2.8m minimum)
Diverge + Storage	144.0m	- Storage of 19.0m (AV type vehicle) - Deceleration of 125m – compliant with ‘comfortable’ condition per RPDM CHR at 90 km/hr, i.e. a high-standard of design



4.2 Shaw Road Sight Distance Review

A desktop sight line investigation has been conducted and indicates:

- Shaw road is visually open and flat approaching the proposed access point (**Figure 4.2**);
- Sight distances are generally unobstructed and able to achieve 214m or more.

The concept functional layout (**Appendix D**) also includes a desktop sight line assessment that shows that the horizontal road geometry supports sight distances in excess of 214m.



Figure 4.2 Sight Line Facing South (from approximately new site access location)

A summary of sight line standards is provided in **Table 4.2**.

Table 4.2 Sight Line Standard

Assessment	Design Speed	Recommended Quantum
RPDM / AGRD4a Safe Intersection Sight Distance (SISD), 2.0 Second Reaction Time	90 km/hr Approach Speed	214.0m
RPDM / AGRD4a Minimum Gap Sight Distance (MGSD), 5.0 Second Gap	90 km/hr Approach Speed	125.0m
Australian Standard 2890.1: Parking Facilities Off-street Carparking, Desirable 5 Second Gap	80 km/hr Posted Speed	111.0m

Based on the above, the proposed access location achieves all noted sight line models, including the minimum sight line standards described in the Australian Standards and even the conservative SISD model, being the highest standard of sight line within RPDM / AGRD4a guidelines.



5.0 Vehicle Parking

The proposed development includes provision of 36 parking spaces, allocated as follows:

- 35 general parking spaces;
- One (1) parking space for persons with a disability.

The proposed parking provision has been reviewed against Council's Parking Rates Planning Scheme Policy as summarised in **Table 5.1**.

Table 5.1 Parking Code Review

Land Use	Yield	Car Park Rate	Car Parking Required
Service Station	356m ²	One (1) space per 40m ² of GFA.	8.9
Food and Drink Outlet	150m ² of GFA Adopted Split: 40% dining (60m ²); 40% prep (60m ²); 20% storage (30m ²).	One (1) space per 10m ² of GFA available to the public (including outdoor dining); One (1) space per 50m ² of GFA for food preparation; AND One (1) space per 100m ² of GFA used for storage.	6+ 1.2+ 0.3= 7.5
Car Wash	4 Wash Bays	Two (2) spaces	2
Total			19

Based on the above, the proposed provision of parking spaces complies with the requirements set out in Council's Parking Rates Planning Scheme Policy and is thereby acceptable from a transport planning perspective.

5.1 Disability Parking Requirements

The proposed site layout includes one (1) parking space marked and sized for persons with a disability (PWD space) in accordance with Australian Standards 2890.6:2009 Parking facilities Part 6: Off-street parking for people with disabilities. This equates to greater than one (1) PWD space per 50 ordinary parking spaces and is therefore compliant with the Building Code of Australia (BCA).



6.0 Geometric Configuration Review

The traffic elements of the site layout were reviewed against:

- The City of Townsville Council's Car Parking Planning Scheme Policy;
- AS2890.1: Parking Facilities, Off-street parking (AS2890.1);
- AS2890.6: Parking Facilities, Off-street parking for people with disabilities (AS2890.6).

The results are summarised in **Table 6.1**.

Table 6.1 Geometric layout review

Parameter	Recommended	Proposed
Bay Dimensions (General, Class 3)	2.6m x 5.4m	2.6m x 5.4m
Bay Dimensions (Staff parking spaces)	2.4m x 5.4m (min)	2.4m x 5.4m
Car Parking Aisle	6.6m (min)	6.6m
Service Aisle	6.5m (min)	6.5m
Bay Dimensions (PWD)	2.4m x 5.4m	2.4m x 5.4m
Shared Area (PWD)	2.4m x 5.4m	2.4m x 5.4m
End of Aisle Turnaround	Not Provided* See below	1.0m

The parking module proximate to the service station would benefit from provision of a 1.0m end aisle extension in accordance with AS2890.1, which can be included as a condition of approval (**Figure 6.1**).

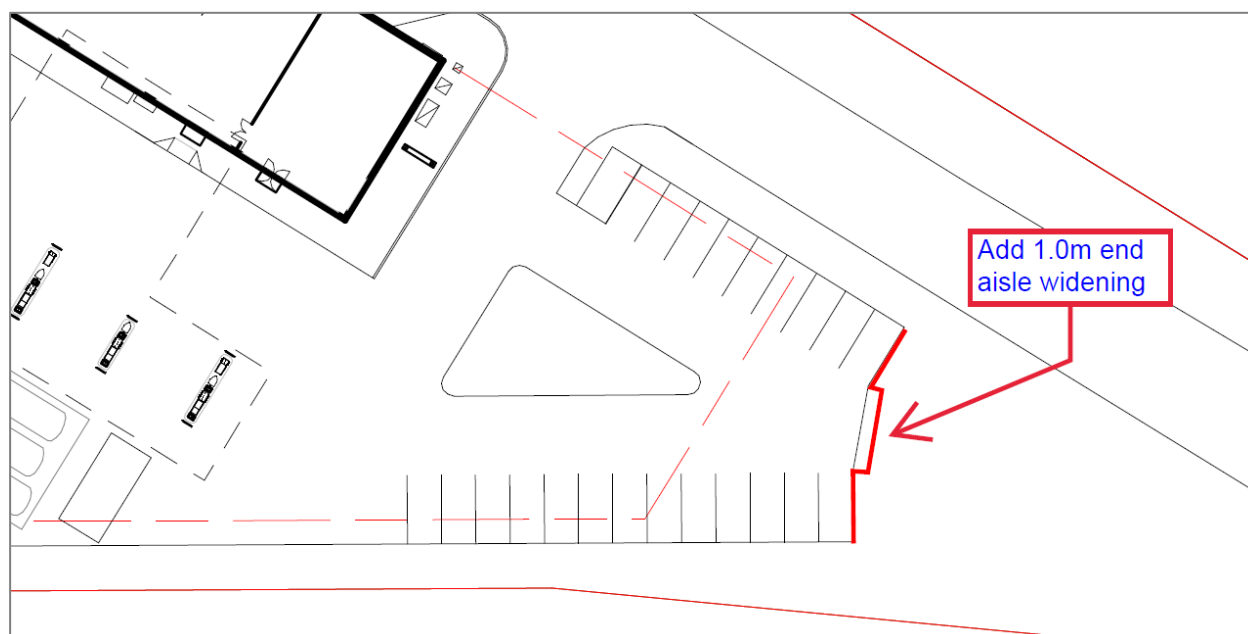


Figure 6.1 End Aisle Extension

In summary, with the above change, the assessed dimensions comply with the relevant Australian Standards (2890.1, 2890.2, 2890.6). On this basis the internal layout is acceptable from a traffic engineering perspective.



7.0 Servicing & Swept Path Arrangements

7.1 Servicing Review

The proposed site layout has been configured to accommodate the movements of the following design vehicles:

- 19m Articulated Vehicle (fuel tanker);
- Heavy Rigid Vehicle (general servicing / refuse collection).

Swept paths are provided in **Appendix E** and demonstrate that the adopted design vehicles are able to:

- Access the site in a forward gear;
- Manoeuvre into position (to load/unload, wholly within the site boundary) whilst maintaining acceptable or greater clearances to obstructions; and
- Depart the site in a forward gear.

The proposed development is therefore adequate from a swept path perspective.



8.0 Traffic Volumes

8.1 Background Traffic Volumes

Austraffic were commissioned to undertake traffic surveys at the Shaw Road / Dalrymple Road intersection on Thursday 16 November 2023.

A summary of the traffic survey results is provided in **Table 7.1**. A copy of the data is provided in **Appendix F**.

Table 8.1 Network Peak Demands

Survey Location	Demand [vph]
Weekday 7:30-8:30am	
Shaw Road / Dalrymple Road	2,321
Weekday 4:00-5:00pm	
Shaw Road / Dalrymple Road	2,156

The City of Townsville “TownsvilleMAPS – Community”¹ tool provides projected traffic flows. Within the tool peak hour traffic on Shaw Road, north of the Dalrymple Road / Shaw Road traffic signals are as follows:

- 4,195 total movements (AM and PM peak hour) in 2023;
- 5,298 total movements (AM and PM peak hour) in 2036.

This equates to a linear growth rate of 2% per annum, which has been applied to the recorded survey data to forecast future traffic flows.

Turning movements are provided in **Appendix G**.

8.2 Development Traffic

8.2.1 Development Traffic Generation

Adopted trip generation rates are provided in **Table 8.2**.

Table 8.2 Adopted Trip Generation Rates

Land Use	Weekday AM Peak Hour Trips	Weekday PM Peak Hour Trips	Source
Service Station	66 trips per 100m ²	66 trips per 100m ²	RMS
Food and Drink Outlet	38.5 trips per 100m ²	38.5 trips per 100m ²	TMR Traffic Generation Data
Car Wash (Manual Bay)	8 trips per Manual Bay	8 trips per Manual Bay	ITE & Industry Experience
Car Wash (Automatic Bay)	15.2 Trips per 100m ²	15.2 Trips per 100m ²	ITE & Industry Experience

¹ https://maps.townsville.qld.gov.au/Mapping/index.html?viewer=TownsvilleMAPS_Community.Mapping



The RTA's Guide specifies service station trip generation based on convenience store area rather than Gross Floor Area (GFA). Convenience store area excludes the console, office, storage and amenities and normally occupies in the order of 60% or less of the total GFA of the fuel shop. We conservatively assessed the Service Station convenience store area as 70% of the GFA.

The trip generation yields of the proposed development are summarised in **Table 4.2**

Table 4.2 Trip Generation Yields

Land Use	Yield	Unit
Service Station	250 m ²	m ² of Convenience Store Area
Food and Drink Outlet	150 m ²	m ² of Gross Leasable Floor Area
Car Wash Automatic Bay	195 m ² (2 bays)	m ² of GFA / Automatic Wash Bays
Car Wash Manual Bay	2 bays	Manual Wash Bays

The proposed uses are convenience-based and a significant proportion of the traffic accessing the site will be motorists already on the road network whom would otherwise pass the development site (linked trips). For service stations and car washes standard industry practice is to adopt a new trip generation rate of 5-10% of total generated trip-ends (the remaining being drop-in trips). For food and drink outlets the Queensland Governments Guidelines for Assessment of Road Impacts of Development (GARID) document provides guidance on the proportion of new and linked trips.

Adopted trip segmentation is summarised in **Table 8.3**.

Table 8.3 Adopted Trip Segmentation Rates

Land Use	Trip Segmentation		Source
	New	Linked	
Service Station	10%	90%	Conservative Industry Approach
Ancillary Food and Drink Outlet	40%	60%	GARID
Car Wash	10%	90%	Conservative Industry Approach

Table 8.4 summarises the estimated Weekday PM Peak hour trip generation. This has also been conservatively applied to the AM peak hour.

Table 8.4 Adopted Peak Hour Trip Generation

Land Use	Trip Segmentation		Total Trips
	New	Linked	
Service Station	17	149	165
Ancillary Food and Drink Outlet	23	35	58
Car Wash (Auto)	3	27	30
Car Wash (Manual)	2	14	16
Total	44	224	268

An in / out split of 50% / 50% has been applied.



8.2.2 Development Traffic Distribution

Development trips were assigned to the external network with consideration of the proposed land uses, access movements and recorded background traffic flows. The adopted proportions are summarised below:

- For new trips:
 - 20% to/from the north to / from Shaw Road;
 - 100% enter via Shaw Road;
 - 100% egress via Shaw Road.
 - 35% to / from the east to / from Dalrymple Road, of these:
 - 50% enter via Shaw road;
 - 50% enter via Dalrymple Road;
 - 100% egress via Dalrymple Road;
 - 30% to / from the south, of these;
 - 50% enter via A1 and Dalrymple Road;
 - 25% enter via Shaw Road and Dalrymple Road;
 - 25% enter via Shaw Road;
 - 67% egress via Dalrymple Road to the A1;
 - 33% egress via Dalrymple Road to Shaw Road;
 - 15% to / from the west;
 - 50% enter via the A1 and Dalrymple Road;
 - 50% enter via State Road 14 / Woolcock Street then Shaw Road;
 - 50% egress from Dalrymple Road to the A1;
 - 50% egress Shaw Road to State Road 14 / Woolcock Street.
- For linked trips during the AM peak period;
 - 32% approach from the north via Shaw Road;
 - 22% approaching from the East via Dalrymple Road;
 - 22% approach from the south via Shaw Road;
 - 24% approach from the west via Dalrymple Road;
- For linked trips during the PM peak period;
 - 36% approach from the north via Shaw Road;
 - 33% approaching from the East via Dalrymple Road;
 - 23% approach from the south via Shaw Road;
 - 8% approach from the west via Dalrymple Road.

All linked trips are now proportioned based on exact recorded traffic counts. This is conservative as it will mean drivers will not act in a way that improves convenience and minimizes travel time, and therefore may undertake multiple right-turns to access and depart the site, when in reality a proportion of motorists would simply access the services as part of a more convenient route. For example, rather than turning right-in to access the site at Shaw Road as part of a return trip, they could have accessed the site left-in as part of the original trip.

Turning movements are supplied in **Appendix G**.



8.2.3 Traffic Scenario

The following traffic volume scenarios were developed:

- 2023 Survey (AM and PM peak hour);
- 2025 Background (AM and PM peak hour);
- 2025 Background + Year of Completion (AM and PM peak hour);
- 2035 Background (AM and PM peak hour); and
- 2035 Background + Design Horizon (AM and PM peak hour).

Turning movements are supplied in **Appendix G**.



9.0 Traffic Impact Assessment

9.1 Assessment Criteria

The main criteria utilised to assess intersection performance is the Degree of Saturation (DOS), which is the ratio of maximum demand volume to capacity at an intersection.

Austrroads Guide to Traffic Management Part 12 (AGRTM12) provides guidance in relation to the practical capacities based on intersection control and are summarised in **Table 9.1**.

Table 9.1 Adopted Assessment Criteria (DOS)

Intersection Type	Practical DOS Threshold
Priority Controlled	0.80
Roundabouts	0.85
Signals	0.90 "should generally not be exceeded"

For priority control intersections, the critical delay represents the worst average delay for an individual movement. For traffic signals, average delay over all movements should be taken. The NSW Roads and Maritime Services (RMS) Guide to Traffic Engineering Developments provides guidance in relation to average delay and LOS thresholds. The recommended thresholds are reproduced in **Table 9.2**.

Table 9.2 Adopted Assessment Criteria (Average Delay and LOS)

Level of Service (LOS)	Average Delay / Vehicle
A	< 14 seconds
B	15 to 28 seconds
C	29 to 42 seconds
D	43 to 56 seconds
E	57 to 70 seconds
F	> 70 seconds

The Department of Transport and Main Roads (TMR's) Guide to Traffic Impact Assessment (GTIA) document does not specify thresholds for each specific LOS, however, does acknowledge that the LOS C to D delay threshold is >42 seconds (which is consistent with the RMS guidelines). Albeit, GTIA acknowledges that in contemporary urban networks, many intersections are already operating at a DOS of greater than one, and therefore with delays likely exceeding this threshold.



9.2 Shaw Road / Site Access

The SIDRA layout for the assessed intersection configuration is provided in **Figure 9.1**.

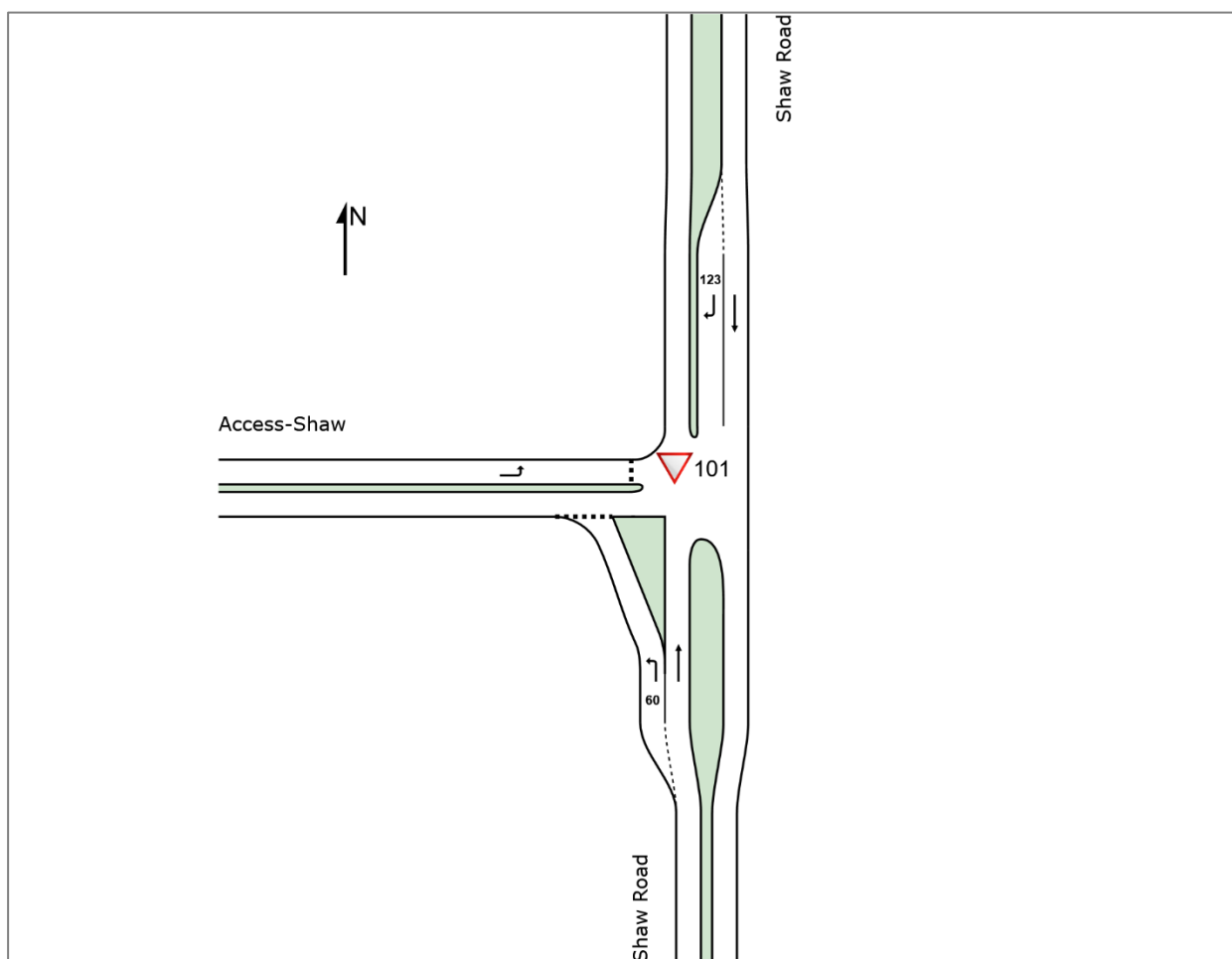


Figure 9.1 Shaw Road / Site Access

The SIDRA analysis results are summarised in **Table 9.3**.

Table 9.3 SIDRA Results – Shaw Road / Site Access

Scenario	Demand (vehs/hr)	DOS	Critical Delay (s)	Critical Queue
Weekday AM Peak Hour (7:30-8:30am)				
2035 BG + Dev	2,036	0.530	12.2	Left turn from access: 2.2m
Weekday PM Peak Hour (4:00-5:00pm)				
2035 BG + Dev	2,016	0.511	11.5	Right turn from Shaw Road: 2.3m

SIDRA Outputs are provided in **Appendix H**.



The results indicate that the access is expected to operate below standard industry degree of saturation thresholds for a priority intersection (i.e. DOS less than 0.80) across a 10-year design horizon for all assessment scenarios.

The assessment also indicates that the access maintains reserve capacity for growth beyond this standard planning horizon.

Based on the above, the access arrangement is acceptable from a traffic operations perspective.

SIDRA outputs are provided in **Appendix I**.



9.3 Dalrymple Road / Site Access

The SIDRA layout for the assessed intersection configuration is provided in **Figure 9.1**.

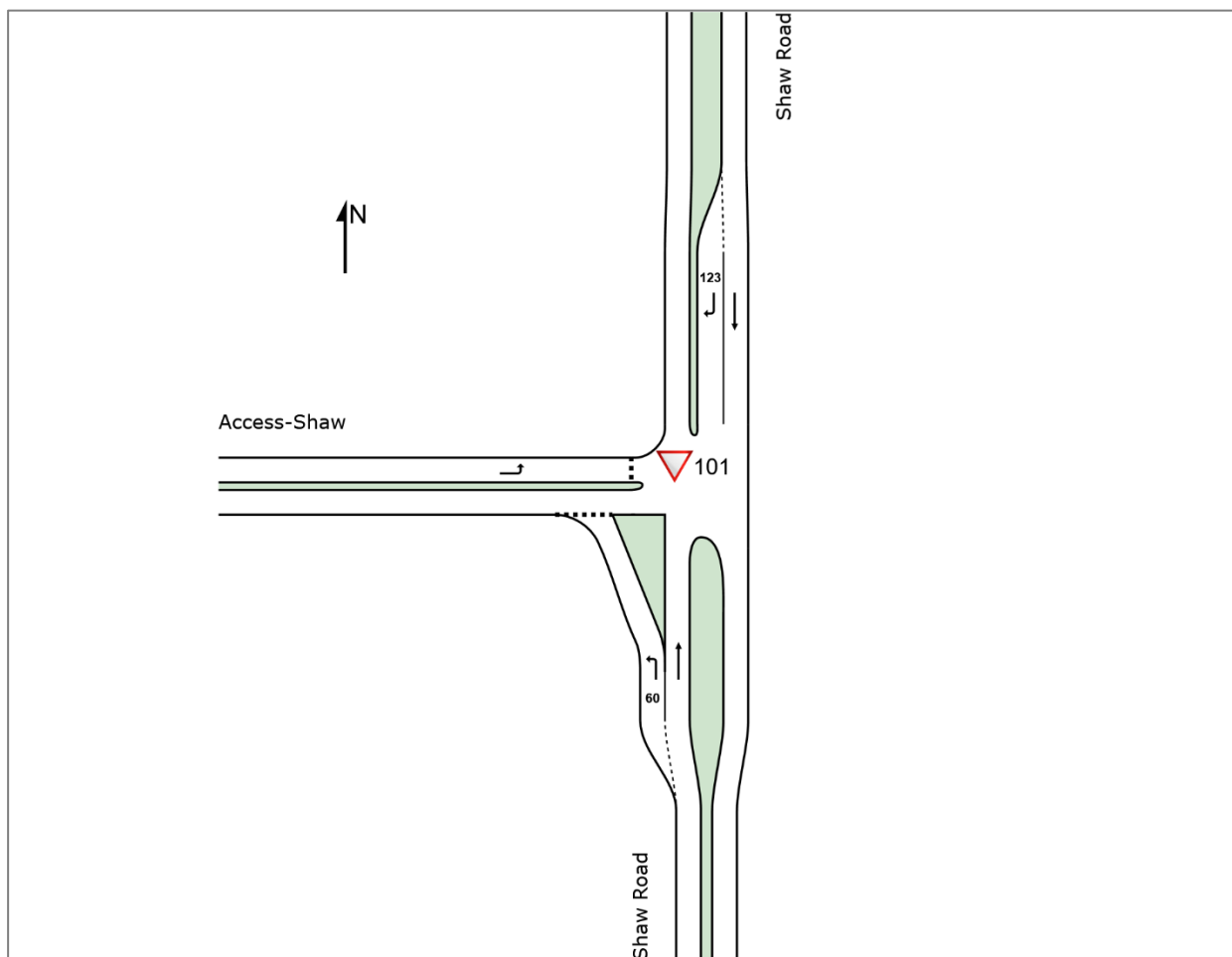


Figure 9.2 Dalrymple Road / Site Access

The SIDRA analysis results are summarised in **Table 9.3**.

Table 9.4 SIDRA Results – Dalrymple Road / Site Access

Scenario	Demand (vehs/hr)	DOS	Critical Delay (s)	Critical Queue
Weekday AM Peak Hour (7:30-8:30am)				
2035 BG + Dev	1,024	0.366	17.9	Left turn from access: 3.6m
Weekday PM Peak Hour (4:00-5:00pm)				
2035 BG + Dev	800	0.225	11.8	Left-turn from access: 1.7m

SIDRA Outputs are provided in **Appendix H**.



The results indicate that the access is expected to operate below standard industry degree of saturation thresholds for a priority intersection (i.e. DOS less than 0.80) across a 10-year design horizon for all assessment scenarios.

The assessment also indicates that the access maintains reserve capacity for growth beyond this standard planning horizon.

Based on the above, the access arrangement is acceptable from a traffic operations perspective.

SIDRA outputs are provided in **Appendix I**.



9.4 Dalrymple Road / Shaw Road

The SIDRA layout for the assessed intersection configuration is provided in **Figure 9.3**.

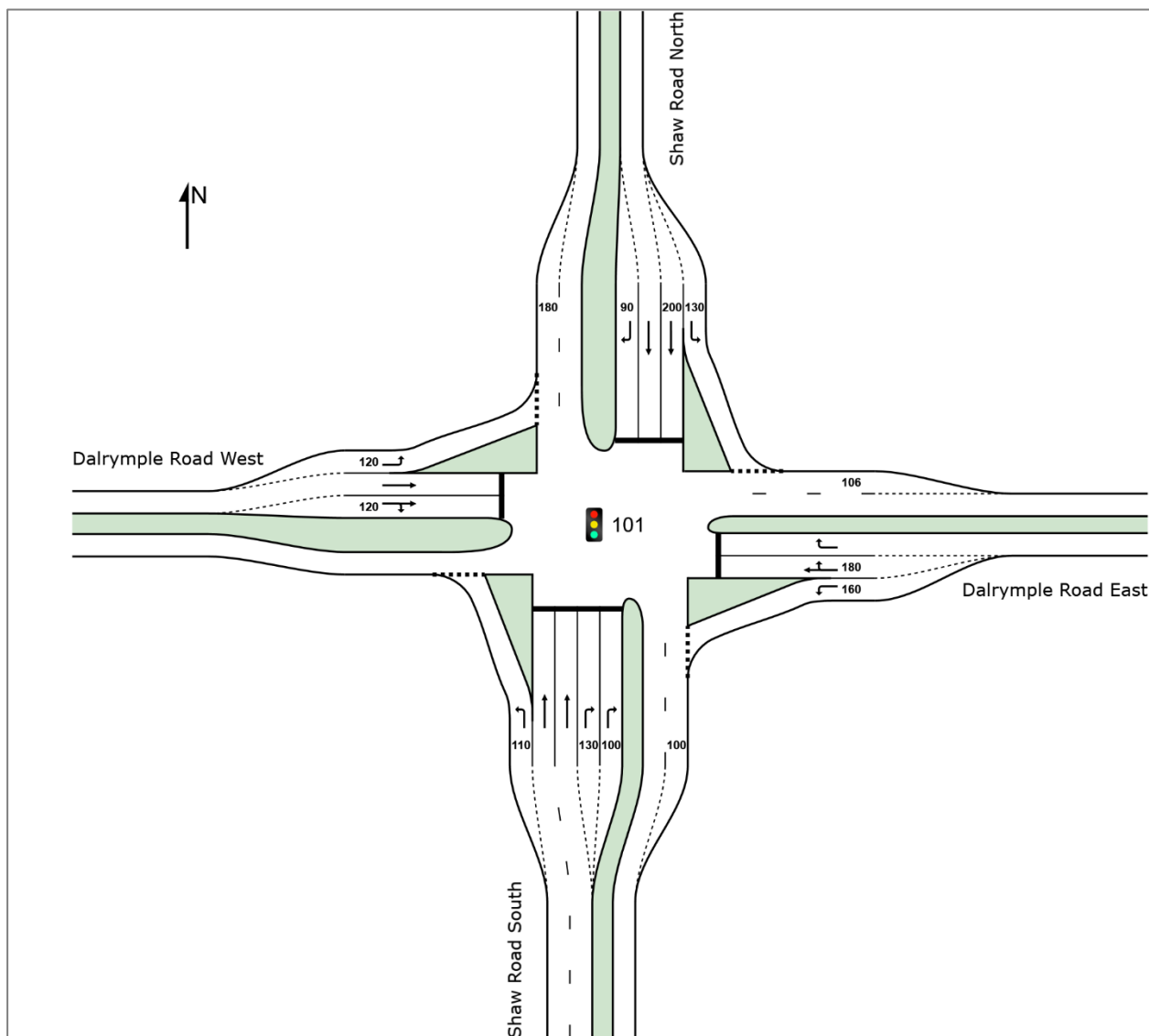


Figure 9.3 Dalrymple Road / Shaw Road SIDRA

SIDRA analysis results are summarised in **Table 9.5**.

**Table 9.5 SIDRA Results – Dalrymple Road / Shaw Road**

Scenario	Demand (vehs/hr)	DOS	Critical Delay (sec)	95 th %ile Queue (m)
Weekday AM Peak Hour (7:30-8:30am)				
2025 BG	2,543	0.594	37.6	113.5m North Approach Through Movement
2025 BG+DEV	2,569	0.604	38.4	109.9 North Approach Through Movement
Weekday PM Peak Hour (4:00-5:00pm)				
2025 BG	2,361	0.524	34.4	107.4m North Approach Through Movement
2025 BG+DEV	2,391	0.678	35.5	106.5 East Approach Through Movement

The results indicate that the intersection is expected to operate below standard industry degree of saturation thresholds for a signalised intersection (i.e. DOS less than 0.9) under all assessment scenarios. Also, the analysis indicates that the development is expected to have a minimal impact on the operations of the intersection as demonstrated by key performance criteria (DOS, queueing, delay) being generally consistent between with and without development scenarios.

Based on the above, the development is acceptable from a traffic impact perspective.

SIDRA outputs are provided in **Appendix D**.

An aggregate delay assessment is provided in **Section 10.0**.



10.0 Aggregate Delay Assessment

The Department of Transport and Main Roads (TMR's) Guide to Traffic Impact assessment (GTIA) sets out the standard process for assessing delay impacts on the State-controlled road network. The desired outcome of the GTIA is to ensure that the sum of intersection delays on base traffic does not significantly worsen due to development.

An assessment of aggregate delay at the Dalrymple Road / Shaw Road traffic signals has been completed with results summarised in **Table 10.1**.

Table 10.1 Aggregate Network Delay

Scenario		Scenario 1 2025 BG vs 2025 BG + Dev
Base Case (2025 BG)		
AM Peak		95743.7
PM Peak		81294.6
With Development (e.g. 2025 BG + Dev)		
AM Peak		96770.9
PM Peak		81830.4
ID		
AM Peak	Δ seconds	1027.2
	Δ %	1.1%
PM Peak	Δ seconds	535.8
	Δ %	0.7%
Total	Δ seconds	1563.0
	Δ %	0.9%

The assessment indicates that the aggregate delay is 0.9%, far below the typical 5% threshold. This is expected noting the proposal is a small scale convenience based development.

It is also noted that the aggregate delay assessment is comparing the proposal against a background traffic where the site has no development on it whatsoever. Noting TMR has already approved a development, albeit with varied access arrangements, it would be valid to compare the impact of the proposal against this as a base line. This would show even further reduced traffic impacts and highlights the minor scale of the proposal.

Detailed delay calculations are provided in **Appendix I**.



11.0 Road Safety Assessment

In line with the Department of Transport and Main Roads Guide to Traffic Impact Assessment (GTIA) Document a road safety assessment has been completed and includes:

- Adoption of Safety Risk Score Matrix reported in the Queensland Guide to Traffic Impact Assessment (**Figure 11.1**);
- Crash likelihood being assigned based on recorded crash incidence, existing road infrastructure elements and operational characteristics;
- Crash severity based on the severity guidance sheet within the Queensland Guide to Road Safety and from the Queensland Road Safety Technical User Volumes (QRSTUV) Guide to Speed Management.

		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

Figure 11.1 GTIA Risk Matrix, L: Low Risk, M:Medium Risk, H: High Risk

There were two (2) serious crashes recorded over a period of five (5) years (2019 to 2023). These are discussed below:

- A DCA 803 Off-path: On Curve: Hit Object crash in 2020. The driver was under the influence of alcohol;
- A DCA 301 rear-end type crash in 2020. There is limited information, but the data indicates the at fault driver had a medical condition that contributed to the crash.

Specific locations of each crash is shown in **Figure 11.2**.



Figure 11.2 Crash Review

The overall incidence of crashes is low in the context of a major four-way traffic signalized intersection.



A comparative risk assessment has been completed with results provided in **Appendix F**.

The assessment indicates that:

- The mitigation measures, such as banning the right-turn out from the proposed access, maximise safety in a pragmatic manner;
- There are no high-risk score items that would require further mitigation;
- Road safety is not 'significantly worsened' under the proposed development.

In terms of broader safety impacts, we note that the proposal is only generating less than a single year of background traffic growth at the Shaw Road / Dalrymple Road intersection and that there is only a single serious crash incident within the last 5 years (2020 specifically, prior to the recent upgrade). We are of the view that incremental utilisation of the existing traffic signals (the highest form of control) will in no practical way result in a 'significant worsening' of the safety of this intersection.



12.0 Summary and Recommendations

12.1 Physical Layout

The subject site is 325 Shaw Road, Shaw. On 21 June 2016 an application was lodged with the City of Townsville Council over the site for a Material Change of Use for a Service Station. The proposal received approval from both Council and The Department of Infrastructure, Local Government and Planning.

The abovementioned approval included an all-movements access to / from Dalrymple Road (Council controlled) and no direct access to / from Shaw Road (TMR Controlled).

It is now proposed to develop the site and provide an access to / from Shaw Road, limited to left-in, right-in, and left-out movements (i.e. no right-out movements).

Key findings of this report are summarised below:

- No changes are proposed to the Dalrymple Road access that has been previously approved;
- The proposal includes an access to / from Shaw Road limited to left-in, right-in, and left-out movements (i.e. no right-out movements);
- The access is supported by deceleration lanes configured in accordance with TMR's RPDM document;
- The access facilitates sight lines that comply with not only minimum AS2890 standard, but also the Safe Intersection Sight Distance Model per TMR's RPDM;
- On-site carparking provision is in accordance with Council's Planning Scheme;
- On-site traffic element geometry is in accordance with Council's Planning Scheme;
- A swept path assessment shows the design vehicles (being HRV and AV) are able to access and depart the site in a forward gear.

12.2 Traffic Impact Assessment

The traffic assessment indicates that the development is anticipated to generate in the order of 268 vehicle trips during weekday AM and PM peak hours. Of these 44 are new with the balance being linked.

A detailed SIDRA intersection assessment has been completed and indicates:

- The proposed Shaw Road / Site access operates adequately across the 10-year planning horizon, and maintains capacity for future growth;
- The proposed development has a minimal / acceptable impact on network delay, as highlighted by an aggregate delay assessment demonstrating a less than 5% delay impact at the Dalrymple Road / Shaw Road traffic signals.

Based on the above the proposed development is acceptable from a traffic impact perspective.



12.3 Recommendation

In light of the above, we recommend that the development be approved with reasonable and relevant conditions.

If you have any queries or require any further information regarding the above please do not hesitate to contact the undersigned on 07 3221 3503.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'S. Nitkiewicz', with a stylized flourish at the end.

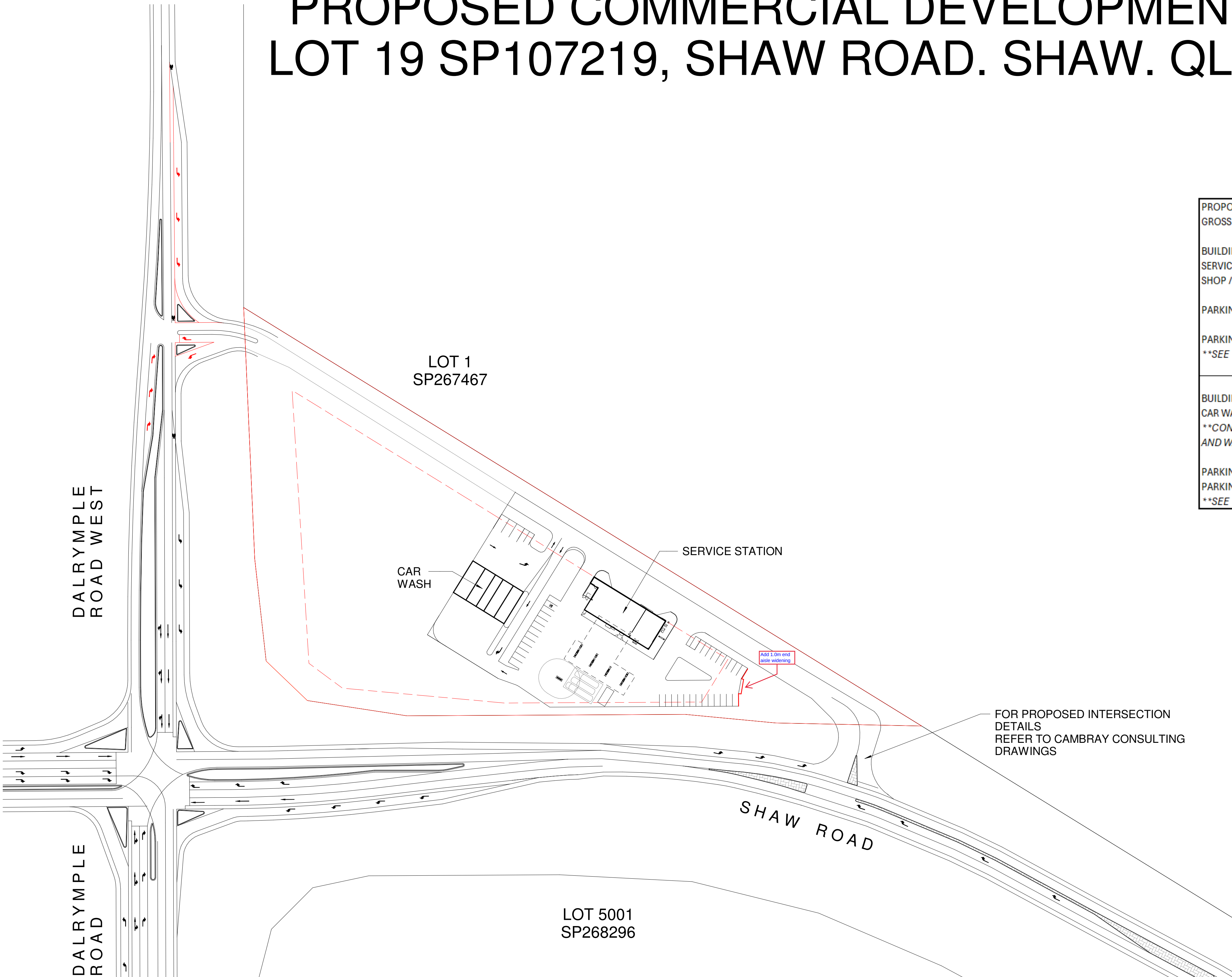
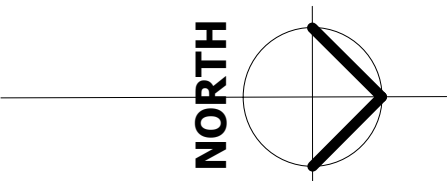
Simon Nitkiewicz

Principal Transport Engineer | Cambray Consulting Pty Ltd
BECivil (Hons I) | BSc Biochem | TMD #842 | RPEQ 31604

APPENDIX A

Proposed Development Plan

PROPOSED COMMERCIAL DEVELOPMENT LOT 19 SP107219, SHAW ROAD. SHAW. QLD.



PROPOSED LAYOUT AREA SCHEDULE		
GROSS FLOOR AREA - GFA		
BUILDING 1		
SERVICE STATION	=	356 sqm.
SHOP / FOOD AND DRINK OUTLET	=	150 sqm.
PARKING SPACES REQUIRED	=	17
PARKING SPACES PROVIDED	=	34
**SEE TRAFFIC REPORT FOR DETAIL **		
BUILDING 2		
CAR WASH	=	522 sqm.
**CONSERVATIVELY INCLUDES PLANT, OFFICE AND WASH BAYS **		
PARKING SPACES REQUIRED	=	2
PARKING SPACES PROVIDED	=	2
**SEE TRAFFIC REPORT FOR DETAIL **		

SITE PLAN
Scale: 1 : 1000

REAL PROPERTY DESCRIPTION

LOT No: 19
PLAN No: SP107219
AREA: 2.56 Ha

Amendments			COPYRIGHT © Copyright Laws Prohibit the copying and use of this drawing and design in any form without written consent from Brett Hodgkinson. All dimensions are to be verified on site prior to any commencement of any construction works.					Brett HODKINSON BUILDING DESIGN BHBD Pty. Ltd. QBCC Lic. No. 15007761 Medium Rise ABN 52 609 527 451	M: 0402 255 609 E: brett@bhbd.com.au	Drawn	B.H.	KINGSUN
Date	Revision	Description								Checked	B.H.	PROPOSED COMMERCIAL DEVELOPMENT
06.04.24	A	FOR APPROVAL DTMR								Scale	As shown	LOT 19 SP107219, SHAW ROAD. SHAW. QLD.
14.06.24	B	SITE BUILDINGS REVISED								Date	APRIL 2024	Project No. 24-06 KIN
										Sheet No. A01		

THIS DRAWING IS TO SCALE WHEN PRINTED ON A1 PAPER

APPENDIX B

SARA Approved Layout



PROPOSED LAYOUT AREA SCHEDULE (GROSS FLOOR AREA - G.F.A)		
BUILDING A		
SERVICE STATION	=	247m²
SHOP / FAST FOOD	=	280m²
PARKING SPACES REQUIRED		
527m² (GFA) @ 1 PER 15 =		34
PARKING SPACES PROVIDED		36
BUILDING B (CAR WASH) =		
		304m²
PARKING SPACES REQUIRED		
QUEUING	=	16
PARKING SPACES	=	2
PARKING SPACES PROVIDED		
(16 QUEUING + 3 SPACES)		19

REAL PROPERTY DESCRIPTION	
LOT:	LOT 19 ON SP107219
COUNTY:	ELPHINSTONE
PARISH:	BOHLE
SITE AREA:	2.582ha

1 PROPOSED OVERALL SITE PLAN
1 : 750

PLANS AND DOCUMENTS
referred to in the
DEVELOPMENT APPROVAL

Approval no: SDA-0816-032892

Date: 8 March 2017

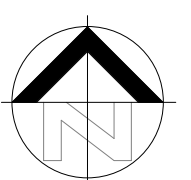
ISSUED FOR
APPROVAL

AMENDMENTS		
ISSUE	DESCRIPTION	DATE
1	DA APPROVAL	18-06-2016
2	REVISED ISSUE	27-06-2016
3	REVISED ISSUE	28-06-2016
4	REVISED ISSUE	08-12-2016
5	REVISED ISSUE	11-12-2016

PROPOSED COMMERCIAL
DEVELOPMENT, LOT 19 ON
SP107219

KINGSUN INVESTMENTS PTY LTD

OVERALL SITE PLAN



DRAWING
NUMBER:
DA-002

PROJECT No:
2016-08

DATE:
APR'16

ISSUE:
5

SCALE:
As indicated

DRAWN:
TDK



p. 07 4927 9942
m. 041 774 8107
e. info@360design.com.au

A.B.N 12 926 793 207
Licenced under QBCC Act 1991
Licence No. 1271179

APPENDIX C

Council Approved Layout



PROPOSED LAYOUT AREA SCHEDULE (GROSS FLOOR AREA - G.F.A)		
BUILDING A		
SERVICE STATION	=	250m²
SHOP / FAST FOOD	=	150m²
PARKING SPACES REQUIRED		
400m² (GFA) @ 1 PER 40 =		10
PARKING SPACES PROVIDED		13
BUILDING B (CAR WASH) =		
		304m²
PARKING SPACES REQUIRED		
QUEUING	=	16
PARKING SPACES	=	2
PARKING SPACES PROVIDED		
(16 QUEUING + 3 SPACES)		19

REAL PROPERTY DESCRIPTION	
LOT:	LOT 19 ON SP107219
COUNTY:	ELPHINSTONE
PARISH:	BOHLE
SITE AREA:	2.582ha

APPROVED
SUBJECT TO
CONDITIONS



MI16/0015
25/07/2017

1 PROPOSED OVERALL SITE PLAN
1 : 750

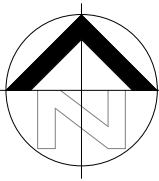
ISSUED FOR
APPROVAL

AMENDMENTS		
ISSUE	DESCRIPTION	DATE
1	DA APPROVAL	18-06-2016
2	REVISED ISSUE	27-06-2016
3	REVISED ISSUE	28-06-2016
4	REVISED ISSUE	08-12-2016
5	REVISED ISSUE	11-12-2016
6	REVISED ISSUE	04-06-2017
7	REVISED ISSUE	06-06-2017

PROPOSED COMMERCIAL
DEVELOPMENT, LOT 19 ON
SP107219

KINGSUN INVESTMENTS PTY LTD

OVERALL SITE PLAN



DRAWING NUMBER:
DA-002

PROJECT No:
2016-08

DATE:
APR'16

ISSUE:
7

SCALE:
As indicated

DRAWN:
TDK

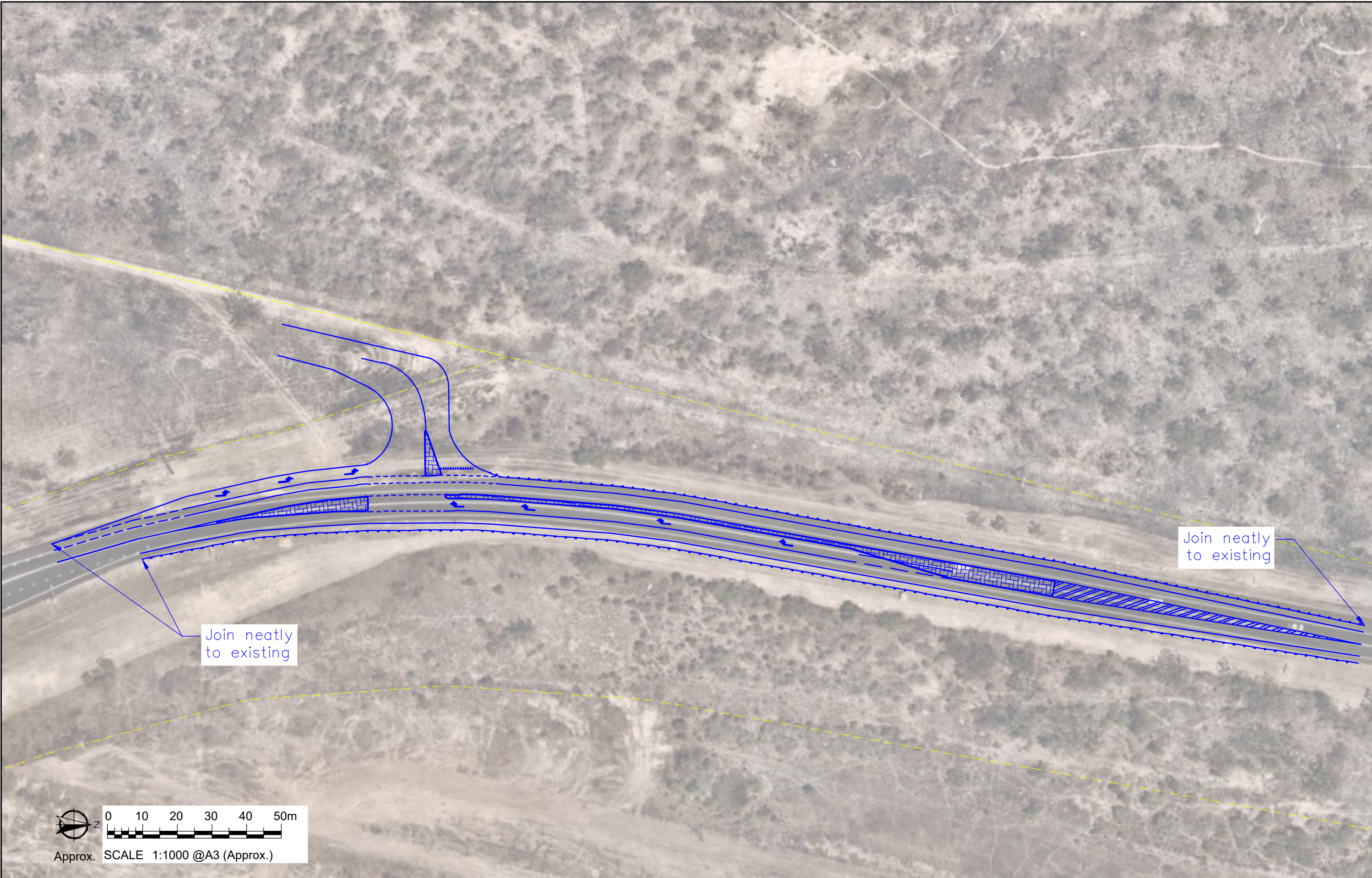


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m. 041 774 8107
e. info@360design.com.au

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Licence No. 1271179

APPENDIX D

Concept External Functional Layout



CAMBRAYconsulting

Traffic Engineering and Transport Planning

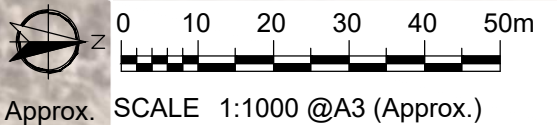
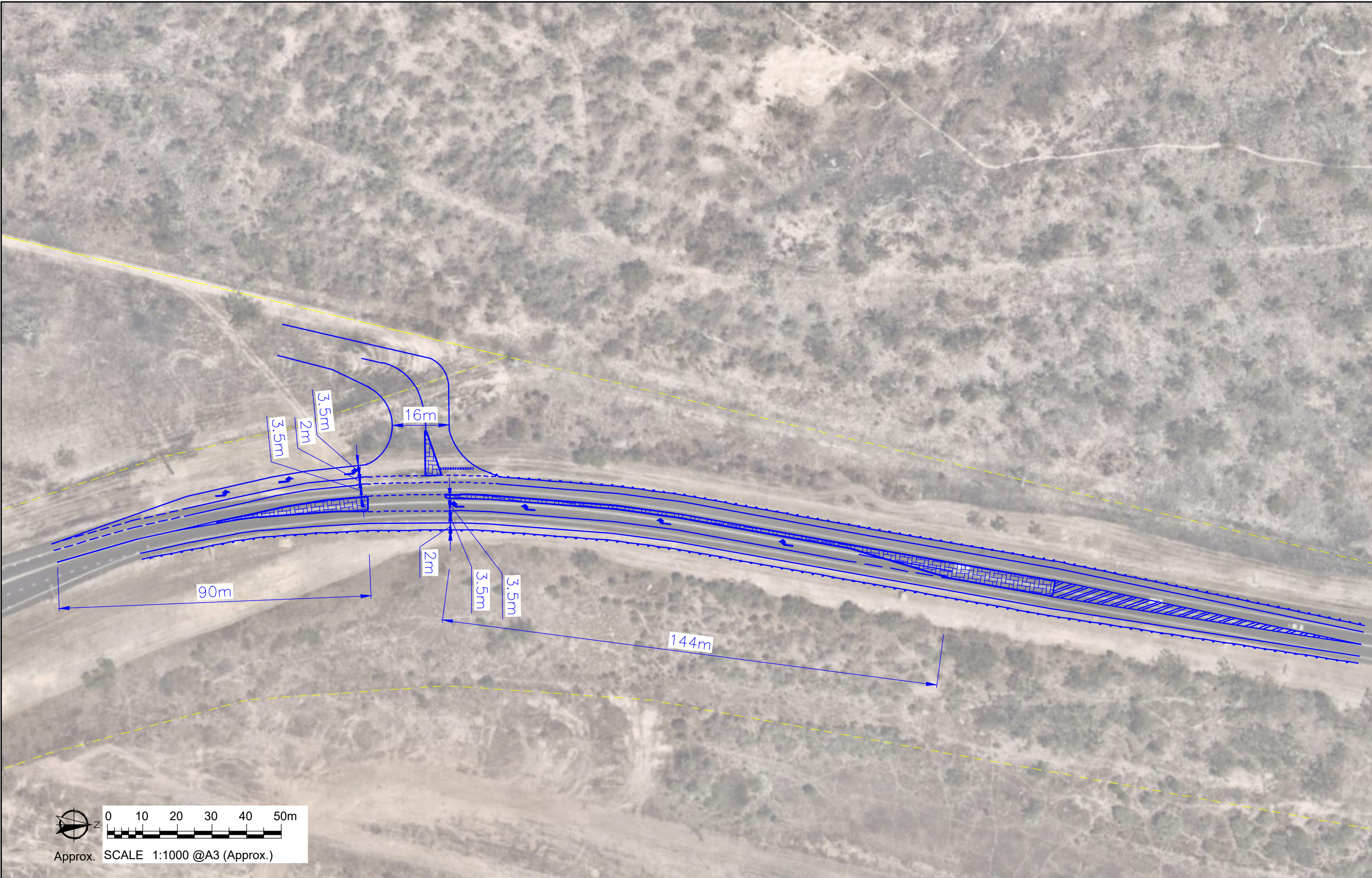
Suite 2601, 21 Mary Street Brisbane Q 4000
t : 07 3221 3503 | e : contact@cambray.com.au

DRAWING TITLE
Proposed Commercial Development
Functional Layout
Shaw Road

LOCATION
325 Shaw Road
Shaw, QLD 4817

REV	DATE	AMENDMENT / ISSUE	DWN	CHK
A	-	-	-	-
DISCLAIMER This concept takes into account the instructions and requirements of our client. Cambray has taken care in preparing this concept, however it neither accepts liability nor responsibility whatsoever in respect of; any use of this document by any third party, any third party whose interests may be affected by any decision made regarding the contents of this document and/or any conclusion drawn resulting from omission or lack of full disclosure by the client or the client's consultants.				

PRELIMINARY NOT FOR CONSTRUCTION		JOB No. // DRAWING No. KIN0323-01// SK01
DATE 10.01.24	*Scale (A3) As shown	PREPARED FOR For Discussion



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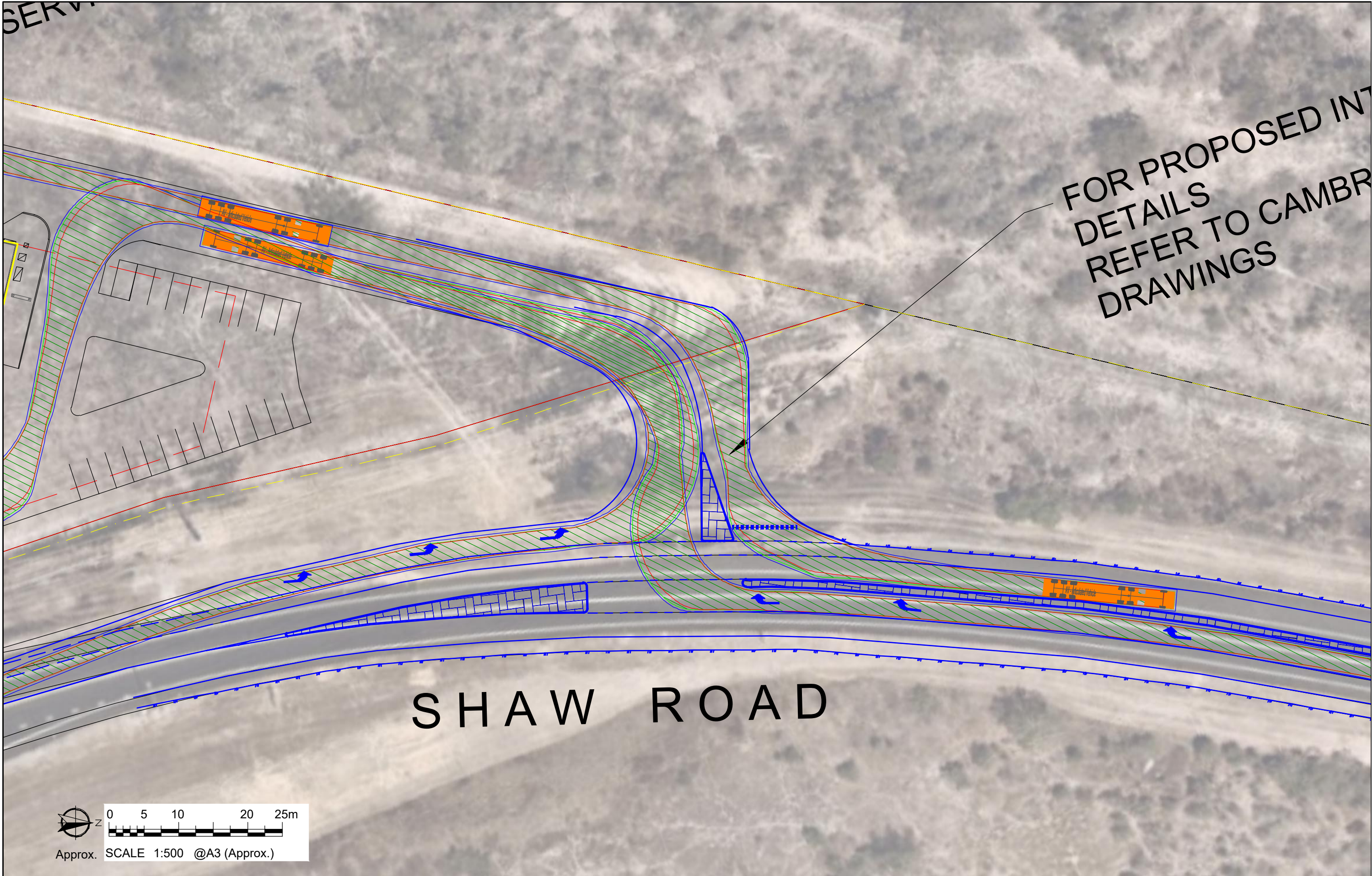
Suite 2601, 21 Mary Street Brisbane Q 4000
t : 07 3221 3503 | e : contact@cambray.com.au

DRAWING TITLE
Proposed Commercial Development
Functional Layout
Shaw Road
Dimensions

LOCATION
325 Shaw Road
Shaw, QLD 4817

REV	DATE	AMENDMENT / ISSUE	DWN	CHK
A	-	-	-	-
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t : 07 3221 3503 | e : contact@cambray.com.au

DRAWING TITLE
Proposed Commercial Development
Functional Layout
Shaw Road
Swept Path Assessment - 19m AV

LOCATION
325 Shaw Road
Shaw, QLD 4817

REV	DATE	AMENDMENT / ISSUE	DWN	CHK
A	-	-	-	-
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DATE 10.01.24	*Scale (A3) As shown	PREPARED FOR For Discussion



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Suite 2601, 21 Mary Street Brisbane Q 4000
t : 07 3221 3503 | e : contact@cambray.com.au

DRAWING TITLE
Proposed Commercial Development
Functional Layout
Shaw Road
Safe Intersection Sight Distance

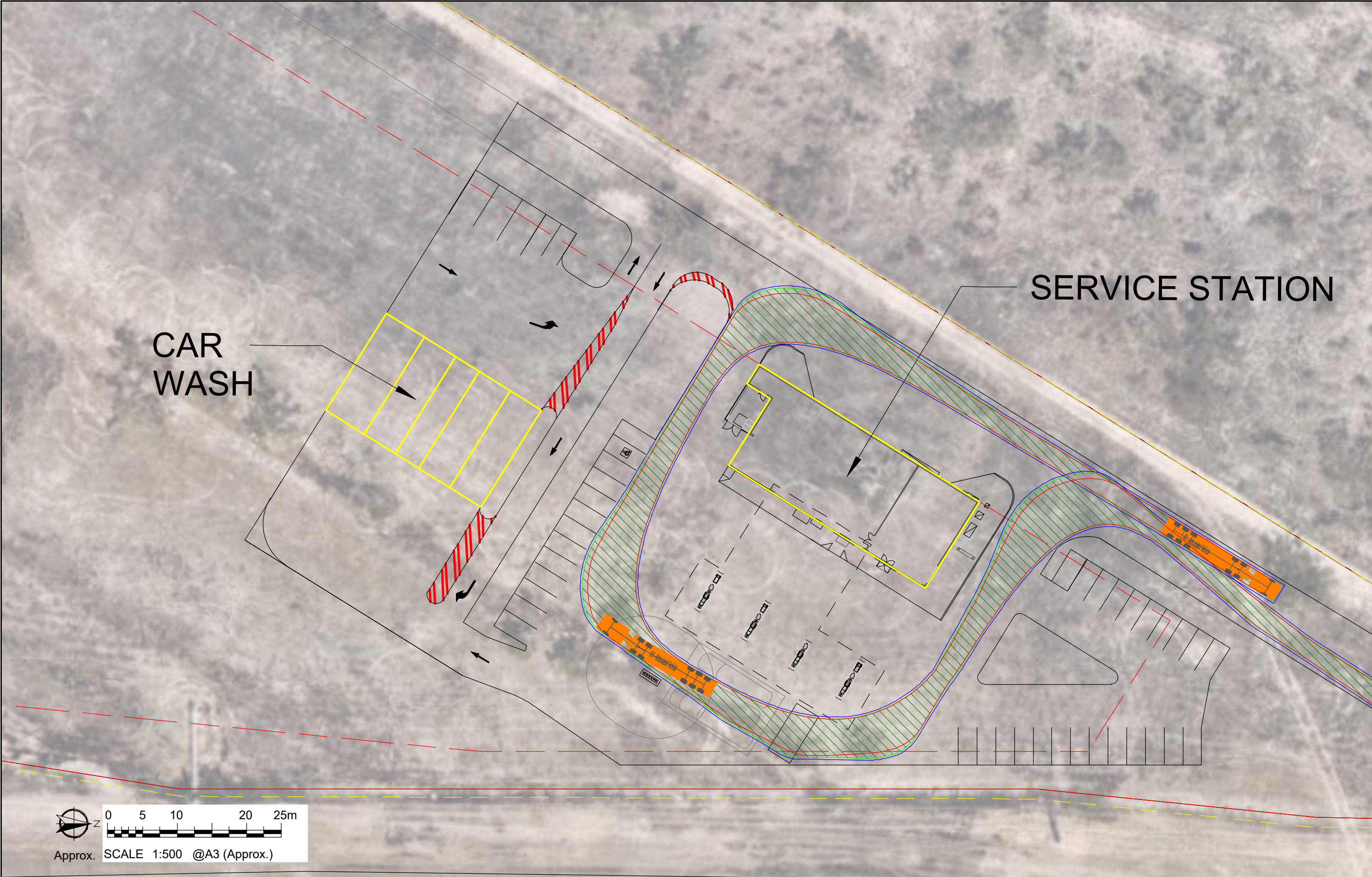
LOCATION
325 Shaw Road
Shaw, QLD 4817

REV	DATE	AMENDMENT / ISSUE	DWN	CHK
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DATE 10.01.24	*Scale (A3) As shown	PREPARED FOR For Discussion	

APPENDIX E

Swept Path Assessment



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Traffic Engineering and Transport Planning

Suite 2601, 21 Mary Street Brisbane Q 4000
t : 07 3221 3503 | e : contact@cambray.com.au

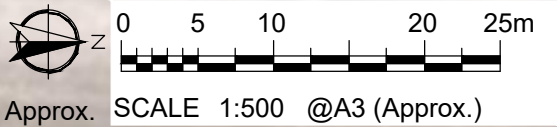
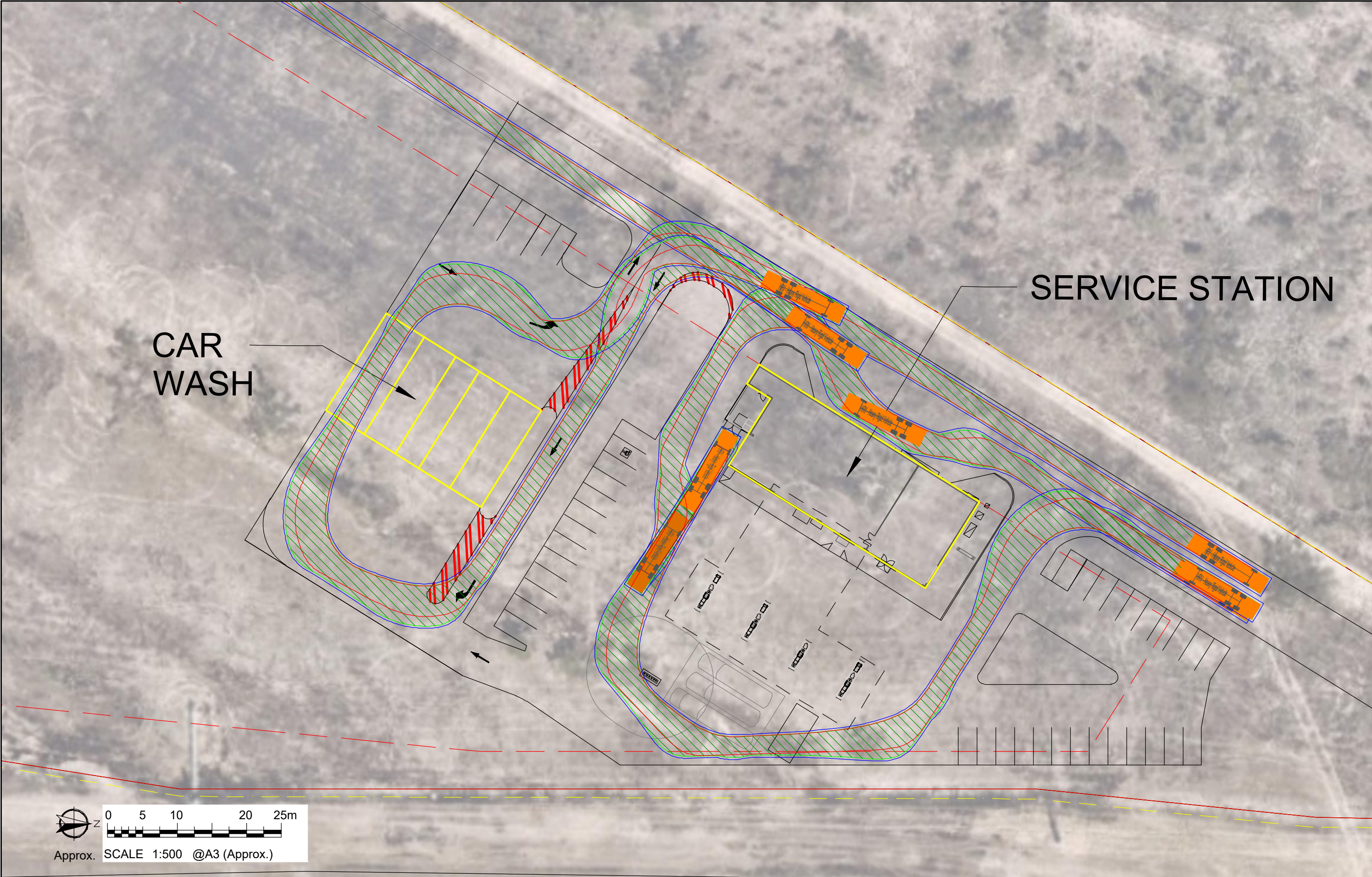
DRAWING TITLE
Proposed Service Station & Car Wash
Swept Path Assessment
19m AV

LOCATION
325 Shaw Road
Shaw, QLD 4817

REV	DATE	AMENDMENT / ISSUE	DWN	CHK
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Traffic Engineering and Transport Planning

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t : 07 3221 3503 | e : contact@cambray.com.au

DRAWING TITLE
Proposed Commercial Development
Swept Path Assessment
HRV

LOCATION
325 Shaw Road
Shaw, QLD 4817

REV	DATE	AMENDMENT / ISSUE	DWN	CHK
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PRELIMINARY NOT FOR CONSTRUCTION		JOB No. // DRAWING No. KIN0323-01// SK08
DATE 19.06.24	*Scale (A3) As shown	PREPARED FOR For Discussion

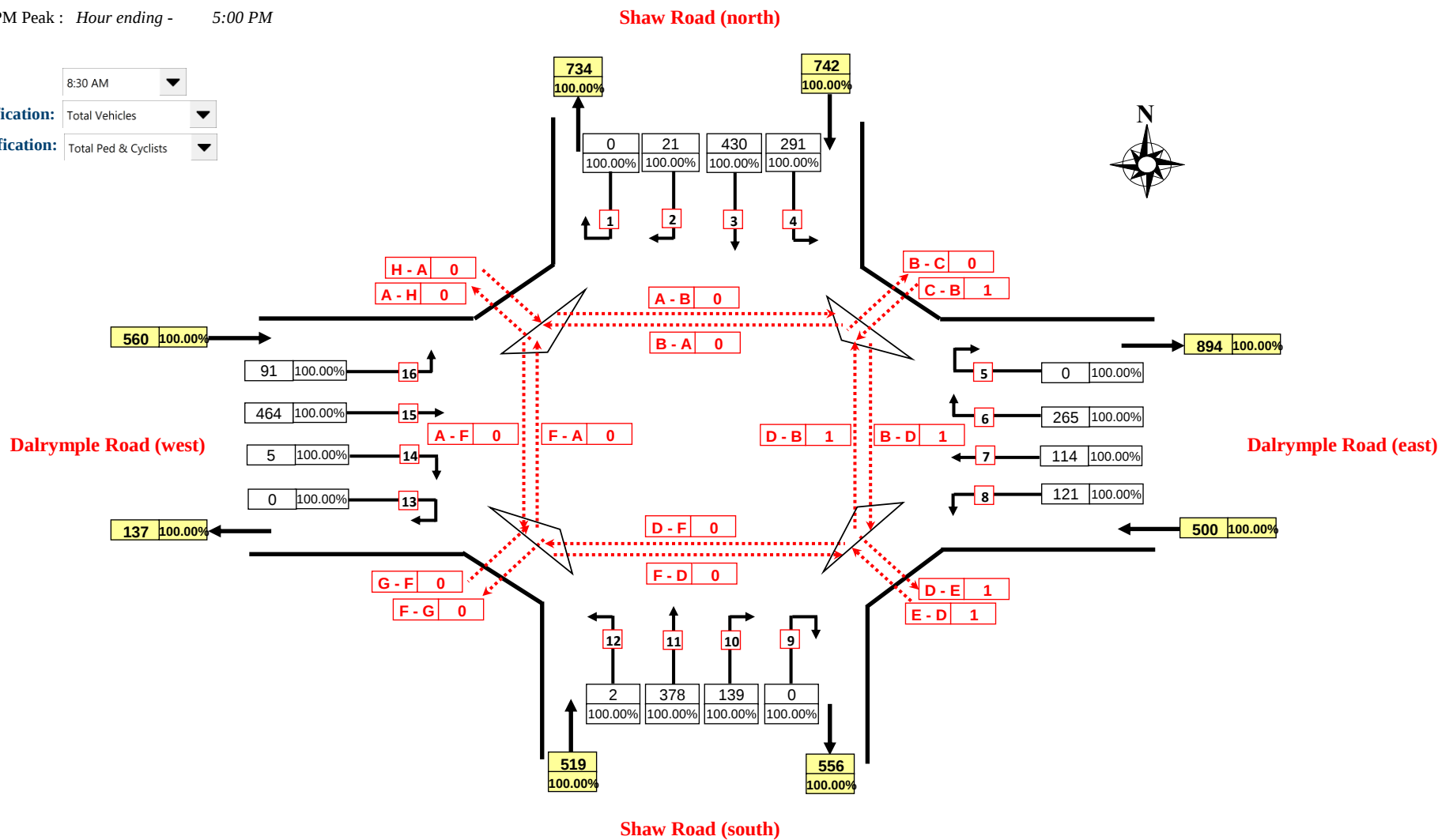
APPENDIX F

Traffic Count Data

AUSTRAFFIC VIDEO INTERSECTION COUNT

Site No.: 1
Weather: Fine
Location: Dalrymple Road/Shaw Road, Shaw
Day/Date: Thursday, 16 November 2023
Summary: AM Peak : Hour ending - 8:30 AM
PM Peak : Hour ending - 5:00 PM

Hour Ending: 8:30 AM
On-road classification: Total Vehicles
Off-road classification: Total Ped & Cyclists

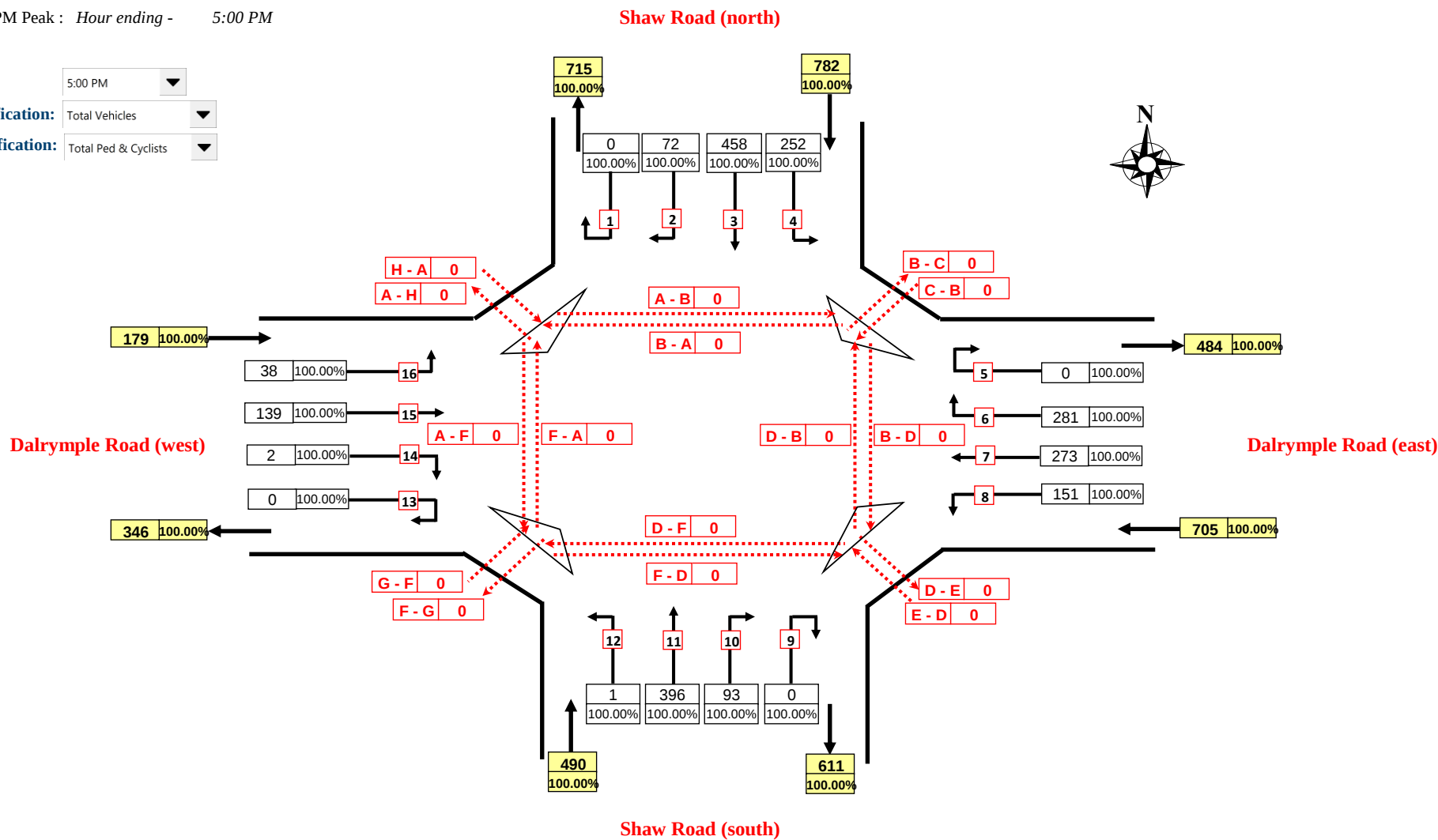


Note: 3.28% = proportion of selected vehicle classification as a percentage of total vehicles

AUSTRAFFIC VIDEO INTERSECTION COUNT

Site No.: 1
Weather: Fine
Location: Dalrymple Road/Shaw Road, Shaw
Day/Date: Thursday, 16 November 2023
Summary: AM Peak : Hour ending - 8:30 AM
PM Peak : Hour ending - 5:00 PM

Hour Ending: 5:00 PM
On-road classification: Total Vehicles
Off-road classification: Total Ped & Cyclists



Note: 3.28% = proportion of selected vehicle classification as a percentage of total vehicles

APPENDIX G

Turning Movements

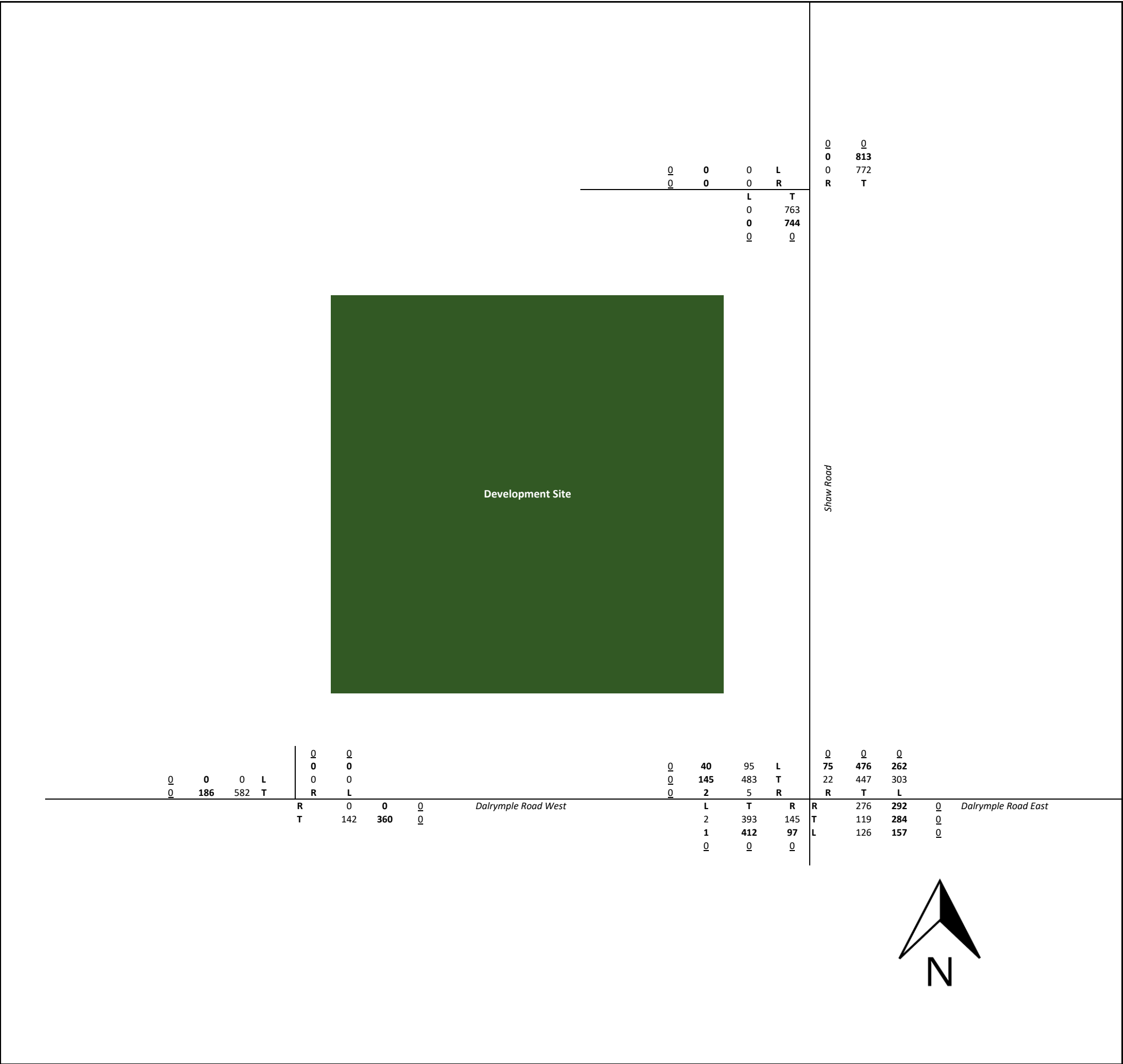


Figure No		Figure Name:		Est. Year of Completion (2025) Background Volumes		Job Name:		325 Shaw Road, Shaw			
2		Job Number:		KIN0323-01		Date:		16/01/2025			
		Prepared by:		SN		Reviewed By:		SN			
Legend											
00	AM Peak			L	Left Turn Movement		R			Right Turn Movement	
(00)	PM Peak			T	Through Movement		U			U-Turn Movement	



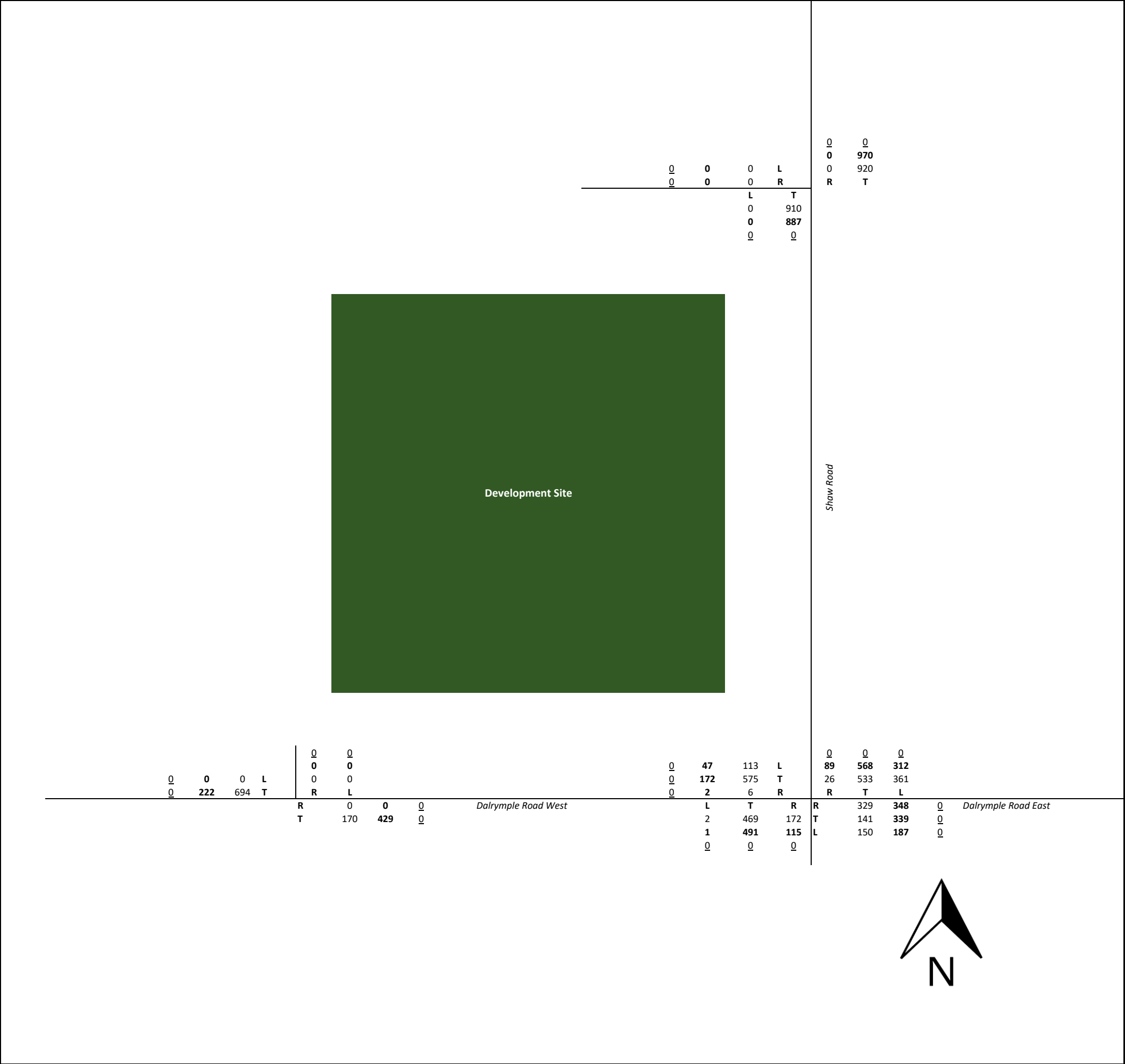


Figure No		Figure Name:		Est. Design Horizon (2035) Background Volumes		Job Name:		325 Shaw Road, Shaw			
3		Job Number:		KIN0323-01		Date:		16/01/2025			
		Prepared by:		SN		Reviewed By:		SN			
Legend											
00	AM Peak			L	Left Turn Movement		R			Right Turn Movement	
(00)	PM Peak			T	Through Movement		U			U-Turn Movement	



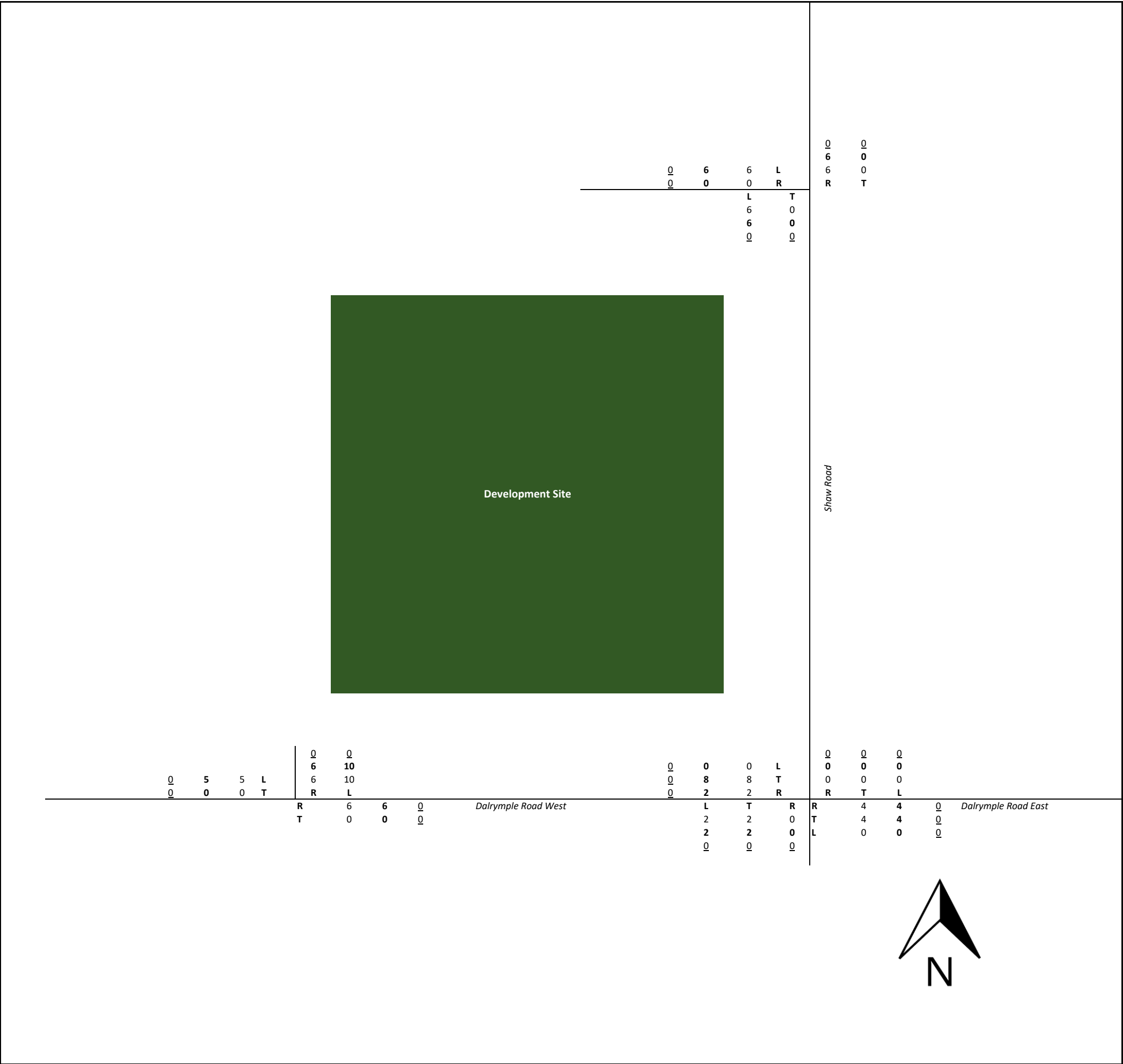


Figure No		Figure Name:		New Development Trips		Job Name:		325 Shaw Road, Shaw			
4		Job Number:		KIN0323-01		Date:		16/01/2025			
		Prepared by:		SN		Reviewed By:		SN			
Legend											
00	AM Peak			L	Left Turn Movement		R			Right Turn Movement	
(00)	PM Peak			T	Through Movement		U			U-Turn Movement	



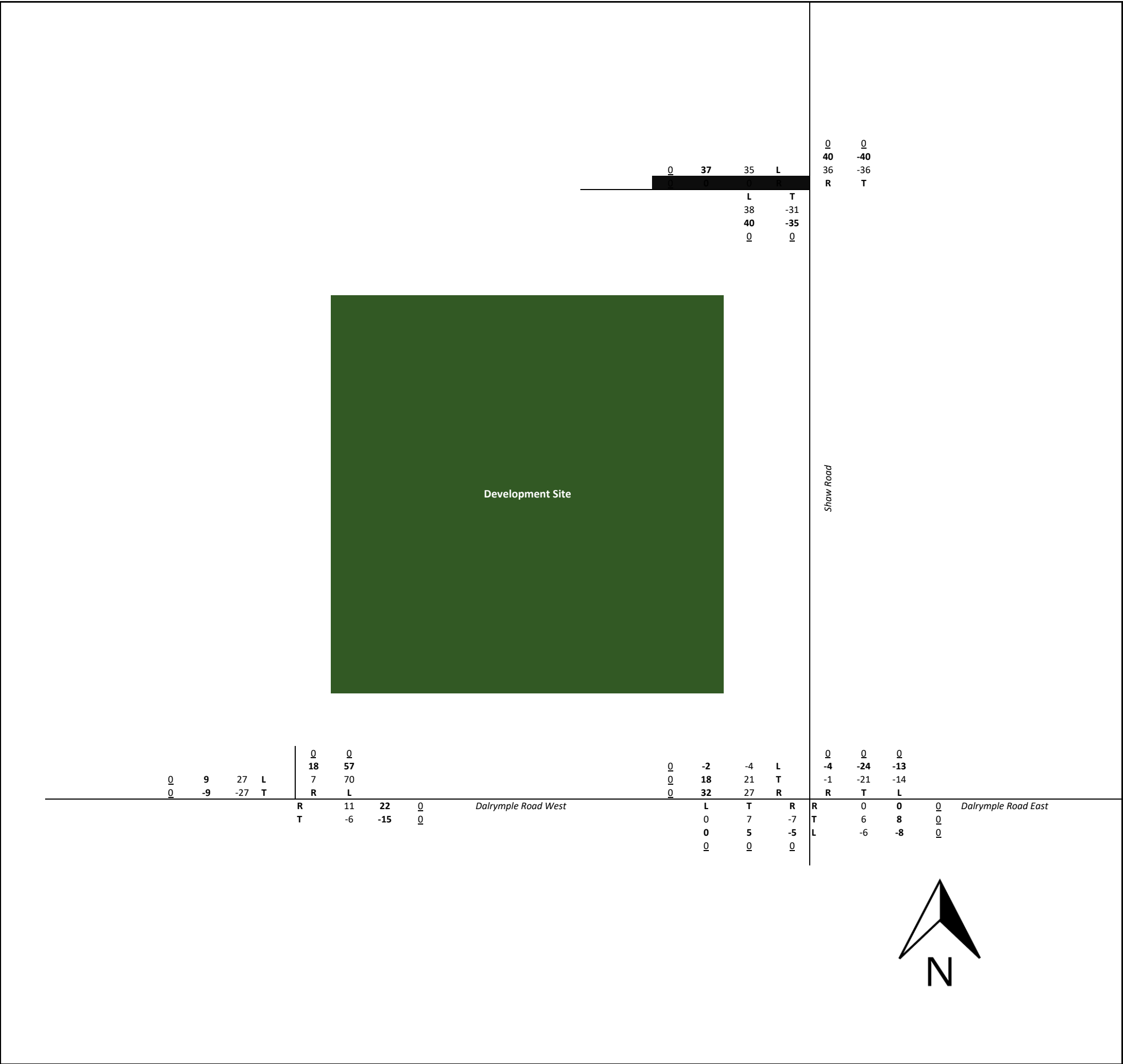


Figure No		Figure Name:		Linked Development Trips		Job Name:		325 Shaw Road, Shaw			
5		Job Number:		KIN0323-01		Date:		16/01/2025			
		Prepared by:		SN		Reviewed By:		SN			
Legend											
00	AM Peak			L	Left Turn Movement		R			Right Turn Movement	
(00)	PM Peak			T	Through Movement		U			U-Turn Movement	



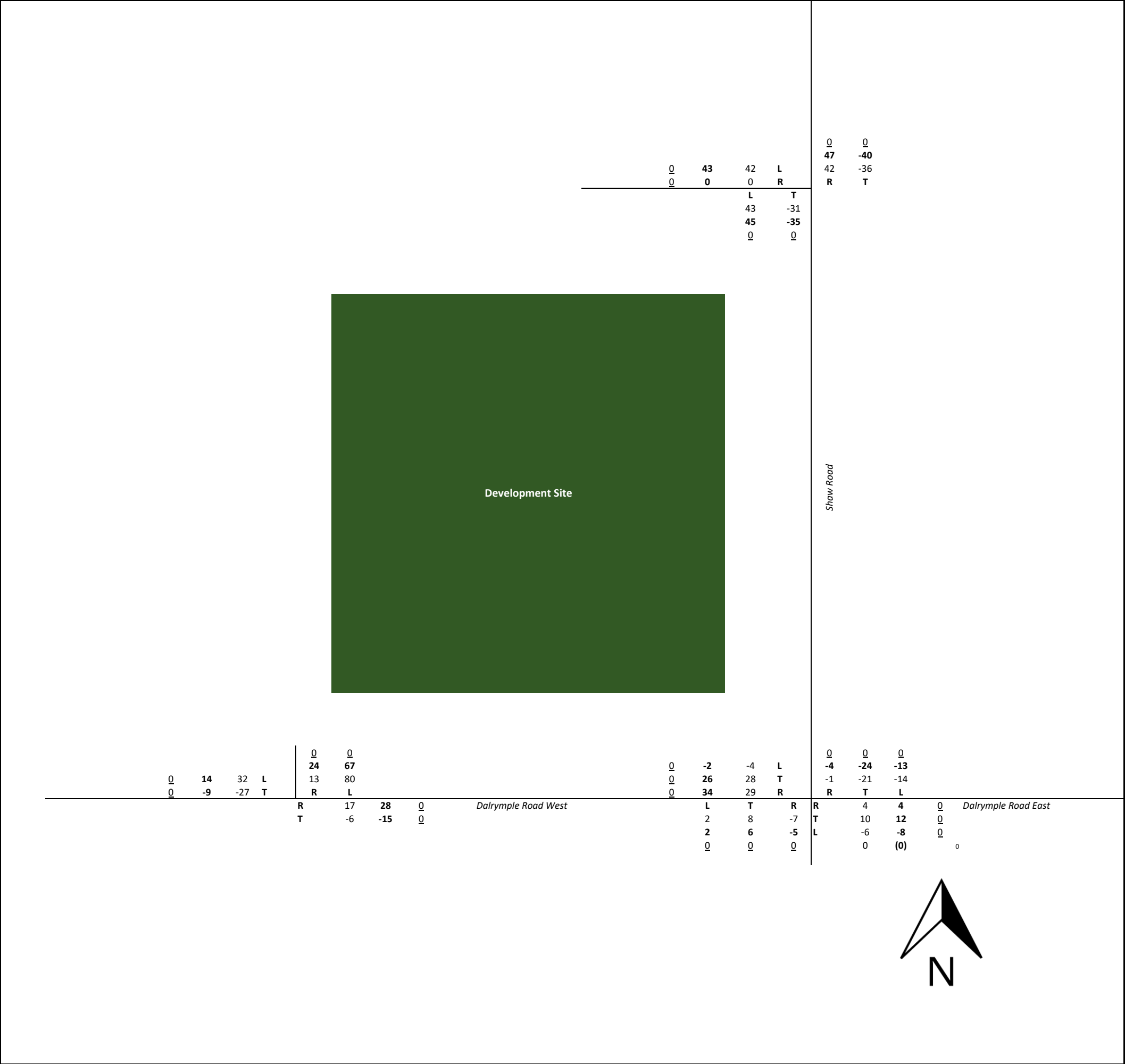


Figure No		Figure Name:		Total Development Trips		Job Name:		325 Shaw Road, Shaw			
6		Job Number:		KIN0323-01		Date:		16/01/2025			
		Prepared by:		SN		Reviewed By:		SN			
Legend											
00	AM Peak			L	Left Turn Movement		R			Right Turn Movement	
(00)	PM Peak			T	Through Movement		U			U-Turn Movement	

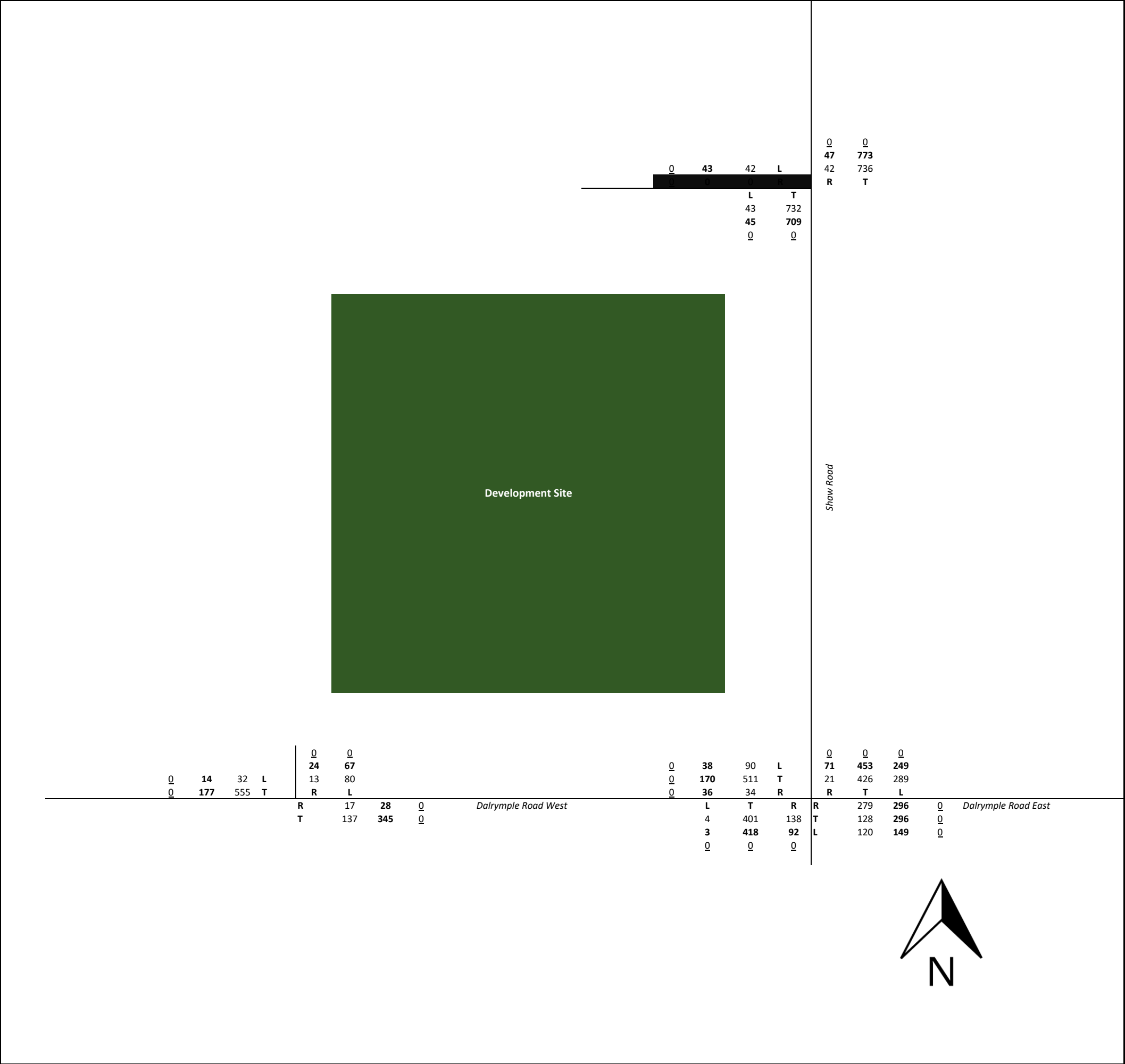


Figure No		Figure Name:		YoC BG + Dev trips		Job Name:		325 Shaw Road, Shaw			
7		Job Number:		KIN0323-01		Date:		16/01/2025			
		Prepared by:		SN		Reviewed By:		SN			
Legend								 CAMBRAYconsulting Traffic Engineering and Transport Planning			
00	AM Peak			L	Left Turn Movement		R			Right Turn Movement	
(00)	PM Peak			T	Through Movement		U			U-Turn Movement	

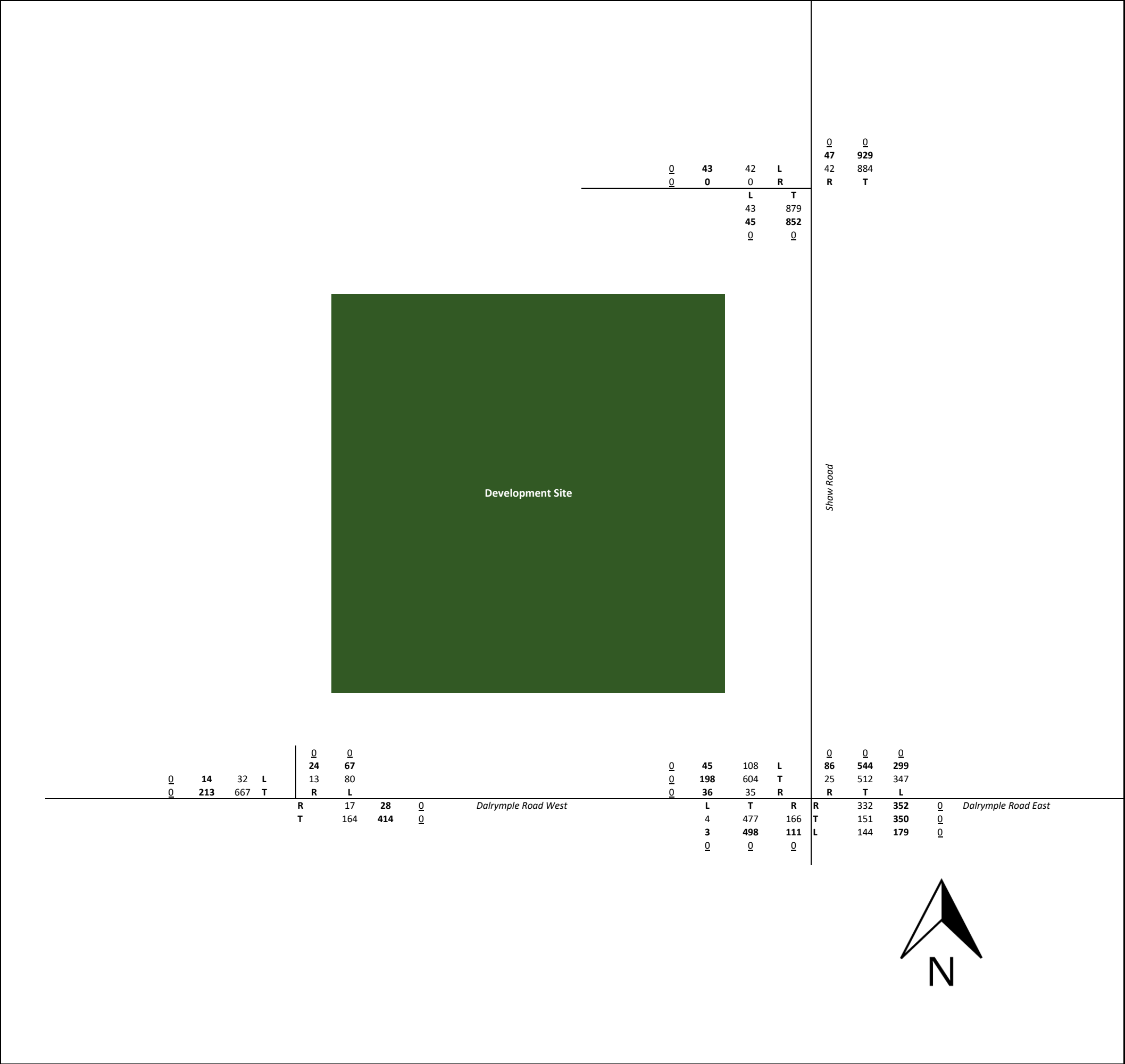


Figure No		Figure Name:		DesH BG + Dev Trips		Job Name:		325 Shaw Road, Shaw			
8		Job Number:		KIN0323-01		Date:		16/01/2025			
		Prepared by:		SN		Reviewed By:		SN			
Legend											
00	AM Peak			L	Left Turn Movement		R			Right Turn Movement	
(00)	PM Peak			T	Through Movement		U			U-Turn Movement	



APPENDIX H

SIDRA Output

SITE LAYOUT

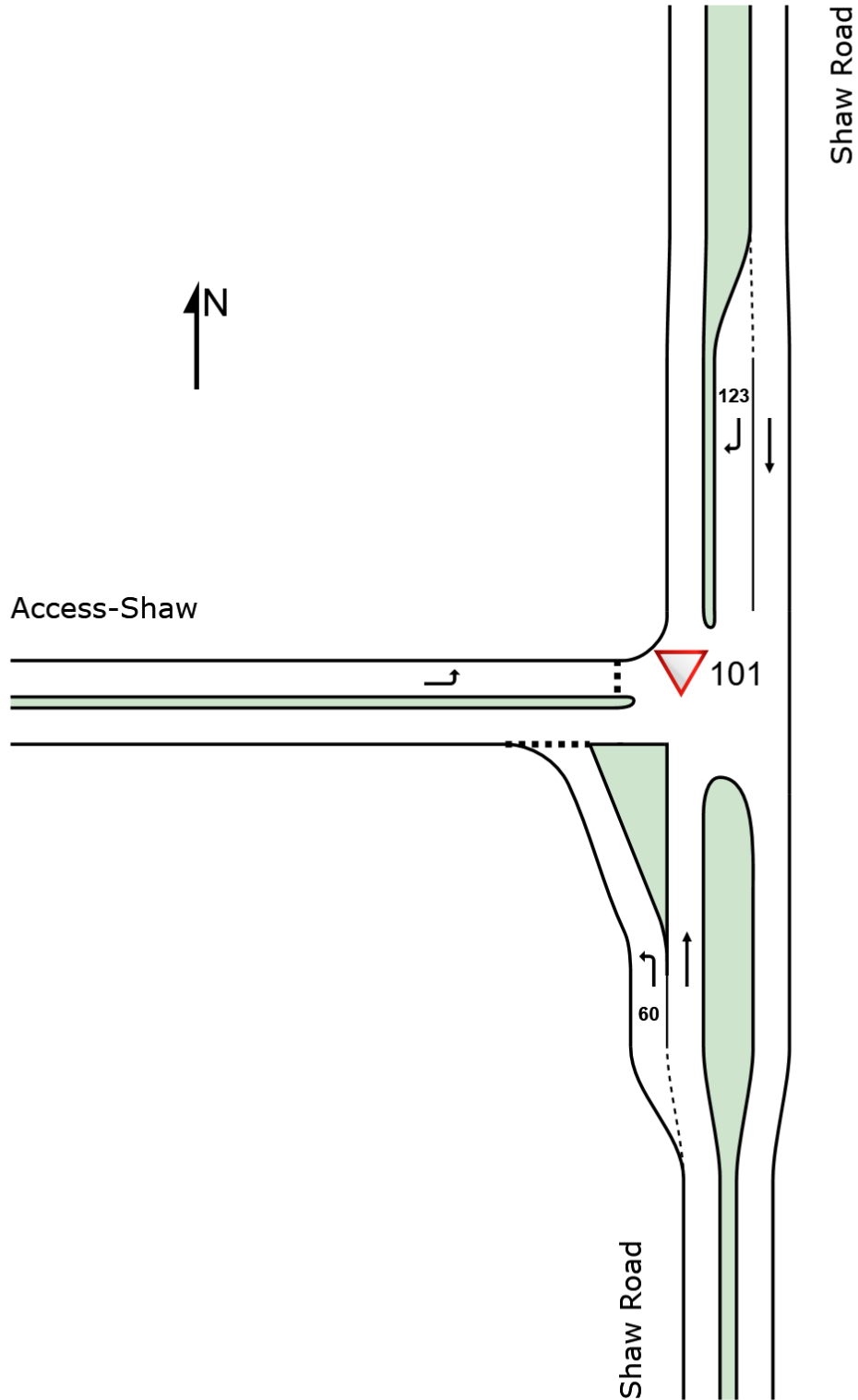
▽ Site: 101 [Shaw Access 2035 AM BG+Dev (Site Folder: DA
SIDRA - RFI)]

New Site

Site Category: (None)

Give-Way (Two-Way)

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



MOVEMENT SUMMARY

Site: 101 [Shaw Access 2035 AM BG+Dev (Site Folder: DA
SIDRA - RFI)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Shaw Road															
1	L2	All MCs	45	1.0	45	1.0	0.029	5.7	LOS A	0.1	0.8	0.12	0.52	0.12	44.2
2	T1	All MCs	925	9.3	925	9.3	0.503	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
Approach			971	8.9	971	8.9	0.503	0.4	LOS A	0.1	0.8	0.01	0.02	0.01	59.1
North: Shaw Road															
8	T1	All MCs	978	8.8	978	8.8	0.530	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.5
9	R2	All MCs	44	1.0	44	1.0	0.089	12.2	LOS B	0.3	2.2	0.74	0.89	0.74	41.7
Approach			1022	8.4	1022	8.4	0.530	0.8	NA	0.3	2.2	0.03	0.04	0.03	58.8
West: Access-Shaw															
10	L2	All MCs	43	1.0	43	1.0	0.092	10.2	LOS B	0.3	2.1	0.73	0.88	0.73	43.2
Approach			43	1.0	43	1.0	0.092	10.2	LOS B	0.3	2.1	0.73	0.88	0.73	43.2
All Vehicles			2036	8.5	2036	8.5	0.530	0.8	NA	0.3	2.2	0.03	0.05	0.03	58.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 [Shaw Access 2035 PM BG+Dev (Site Folder: DA
SIDRA - RFI)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Shaw Road															
1	L2	All MCs	48	1.0	48	1.0	0.031	5.8	LOS A	0.1	0.9	0.12	0.52	0.12	44.2
2	T1	All MCs	896	6.6	896	6.6	0.479	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
Approach			944	6.3	944	6.3	0.479	0.4	LOS A	0.1	0.9	0.01	0.03	0.01	59.1
North: Shaw Road															
8	T1	All MCs	978	3.1	978	3.1	0.511	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
9	R2	All MCs	48	1.0	48	1.0	0.089	11.5	LOS B	0.3	2.3	0.71	0.88	0.71	42.3
Approach			1026	3.0	1026	3.0	0.511	0.8	NA	0.3	2.3	0.03	0.04	0.03	58.8
West: Access-Shaw															
10	L2	All MCs	45	1.0	45	1.0	0.089	9.5	LOS A	0.3	2.1	0.70	0.86	0.70	43.9
Approach			45	1.0	45	1.0	0.089	9.5	LOS A	0.3	2.1	0.70	0.86	0.70	43.9
All Vehicles			2016	4.5	2016	4.5	0.511	0.8	NA	0.3	2.3	0.04	0.05	0.04	58.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.

SITE LAYOUT

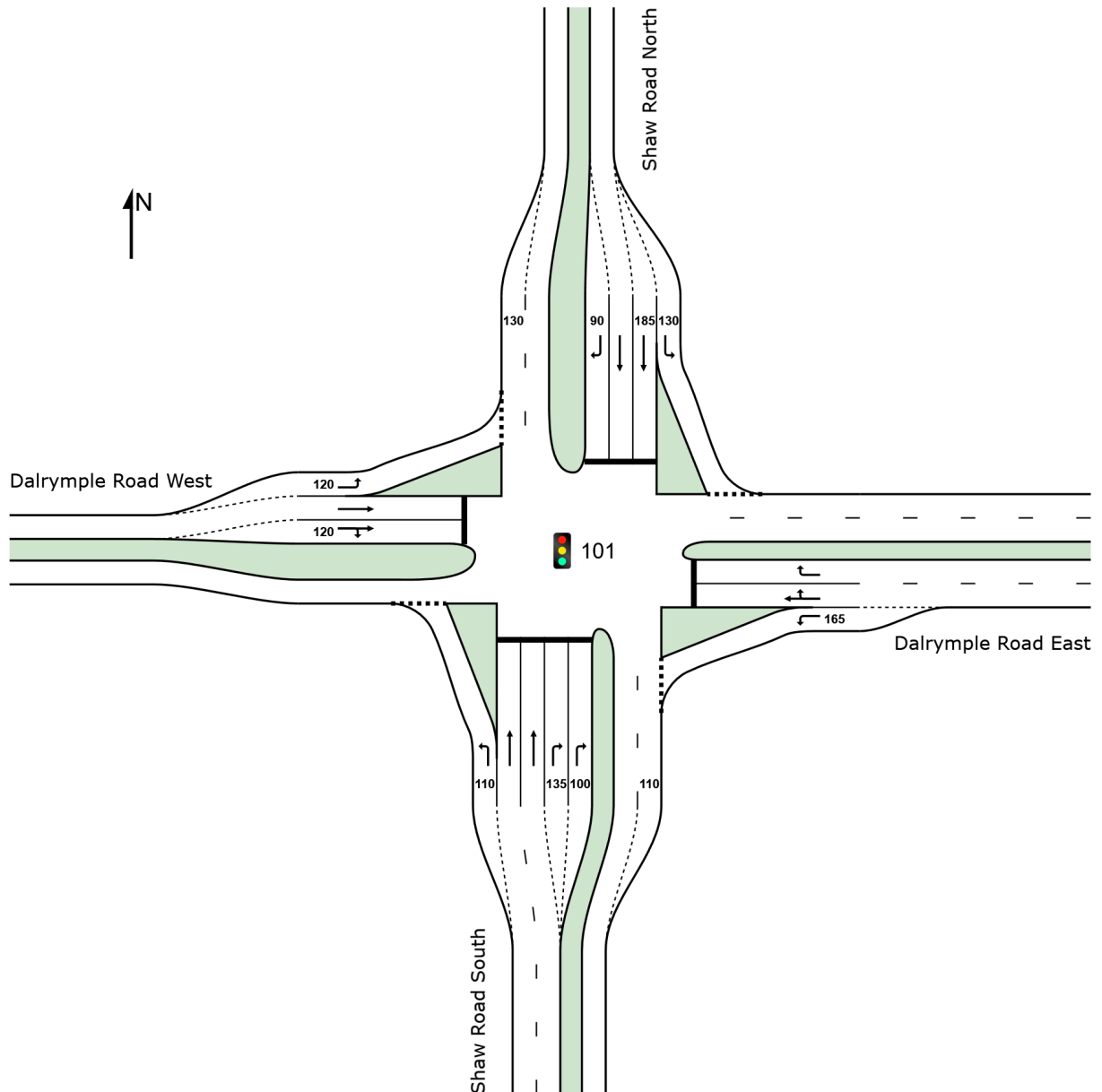
 Site: 101 [Shaw / Dalrymple 2025 AM BG (Site Folder: DA
SIDRA - RFI)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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Project: C:\Projects\KIN0323\01\3. Deliverables\1. Reports\2. TIA\KIN0323-15.01.2024.sip9

PHASING SUMMARY

 Site: 101 [Shaw / Dalrymple 2025 AM BG (Site Folder: DA
SIDRA - RFI)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

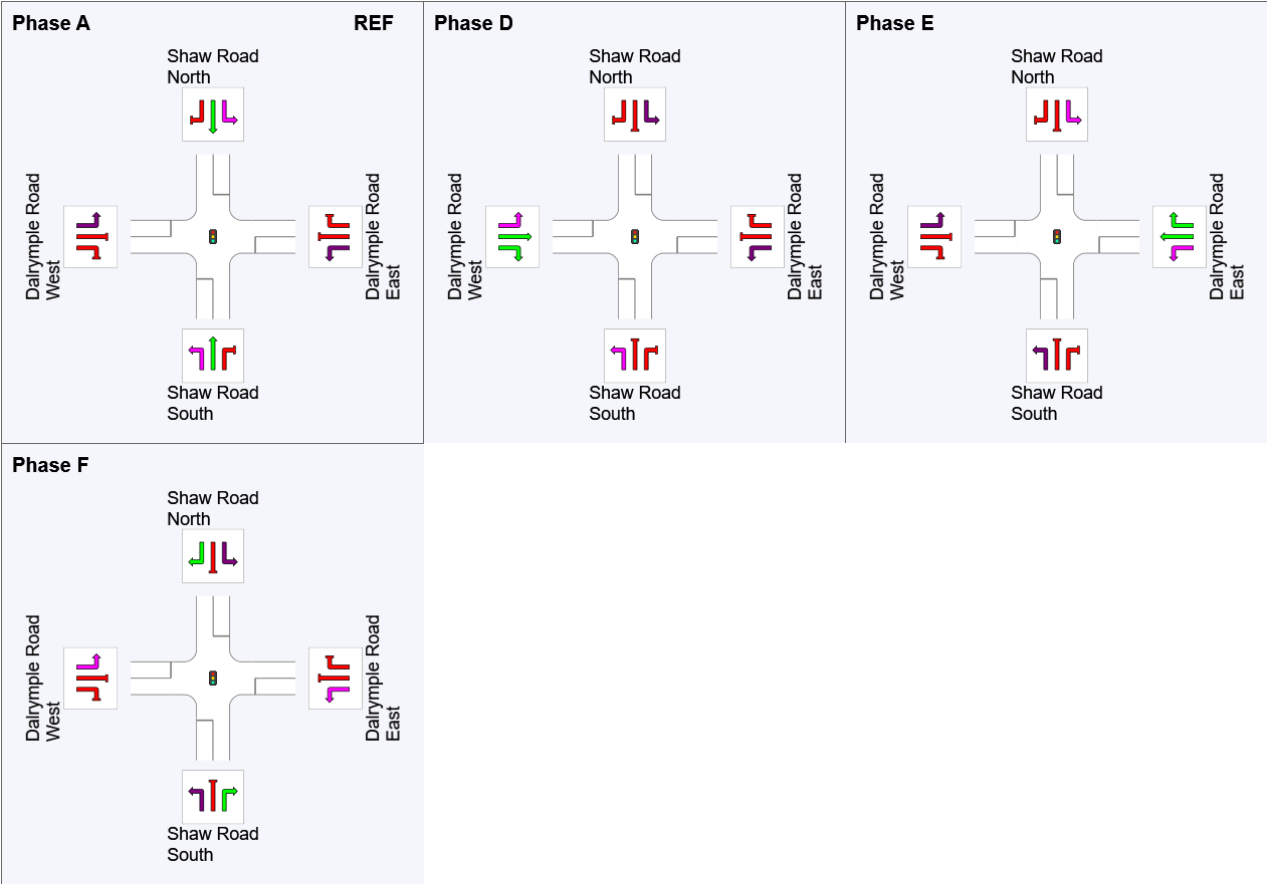
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Phase1
Input Phase Sequence: A, D, E, F
Output Phase Sequence: A, D, E, F
Reference Phase: Phase A

Phase Timing Summary

Phase	A	D	E	F
Phase Change Time (sec)	0	38	72	105
Green Time (sec)	32	28	27	9
Phase Time (sec)	38	34	33	15
Phase Split	32%	28%	28%	13%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

 Site: 101 [Shaw / Dalrymple 2025 AM BG (Site Folder: DA
SIDRA - RFI)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Shaw Road South															
1	L2	All MCs	2	0.0	2	0.0	0.001	6.6	LOS A	0.0	0.1	0.17	0.56	0.17	49.5
2	T1	All MCs	414	14.0	414	14.0	0.499	40.2	LOS D	11.8	92.9	0.88	0.74	0.88	33.5
3	R2	All MCs	153	1.4	153	1.4	* 0.553	66.5	LOS E	4.6	32.3	1.00	0.77	1.01	28.3
Approach			568	10.6	568	10.6	0.553	47.1	LOS D	11.8	92.9	0.91	0.75	0.91	31.7
East: Dalrymple Road East															
4	L2	All MCs	133	5.0	133	5.0	0.106	9.0	LOS A	1.6	11.3	0.27	0.62	0.27	51.1
5	T1	All MCs	125	2.6	125	2.6	0.438	43.4	LOS D	9.4	67.4	0.91	0.77	0.91	29.1
6	R2	All MCs	291	4.5	291	4.5	* 0.571	50.6	LOS D	12.2	88.4	0.94	0.81	0.94	29.5
Approach			548	4.2	548	4.2	0.571	38.9	LOS D	12.2	88.4	0.77	0.75	0.77	33.6
North: Shaw Road North															
7	L2	All MCs	319	4.8	319	4.8	0.258	9.3	LOS A	4.8	35.2	0.34	0.66	0.34	48.5
8	T1	All MCs	471	11.4	471	11.4	* 0.594	40.7	LOS D	14.8	113.5	0.90	0.76	0.90	33.2
9	R2	All MCs	23	9.5	23	9.5	0.178	64.2	LOS E	1.3	10.1	0.97	0.71	0.97	18.9
Approach			813	8.8	813	8.8	0.594	29.1	LOS C	14.8	113.5	0.68	0.72	0.68	37.3
West: Dalrymple Road West															
10	L2	All MCs	100	3.3	100	3.3	0.098	12.5	LOS B	1.7	12.4	0.37	0.65	0.37	41.7
11	T1	All MCs	508	2.2	508	2.2	* 0.573	44.2	LOS D	13.4	95.8	0.94	0.79	0.94	29.4
12	R2	All MCs	5	20.0	5	20.0	0.573	50.0	LOS D	13.4	95.8	0.94	0.79	0.94	28.4
Approach			614	2.5	614	2.5	0.573	39.0	LOS D	13.4	95.8	0.85	0.77	0.85	30.5
All Vehicles			2543	6.7	2543	6.7	0.594	37.6	LOS D	14.8	113.5	0.79	0.74	0.79	33.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Green.
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.

* Critical Movement (Signal Timing)

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Project: C:\Projects\KIN0323\01\3. Deliverables\1. Reports\2. TIA\KIN0323-15.01.2024.sip9

PHASING SUMMARY

 Site: 101 [Shaw / Dalrymple 2025 AM BG+Dev (Site Folder: DA
SIDRA - RFI)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

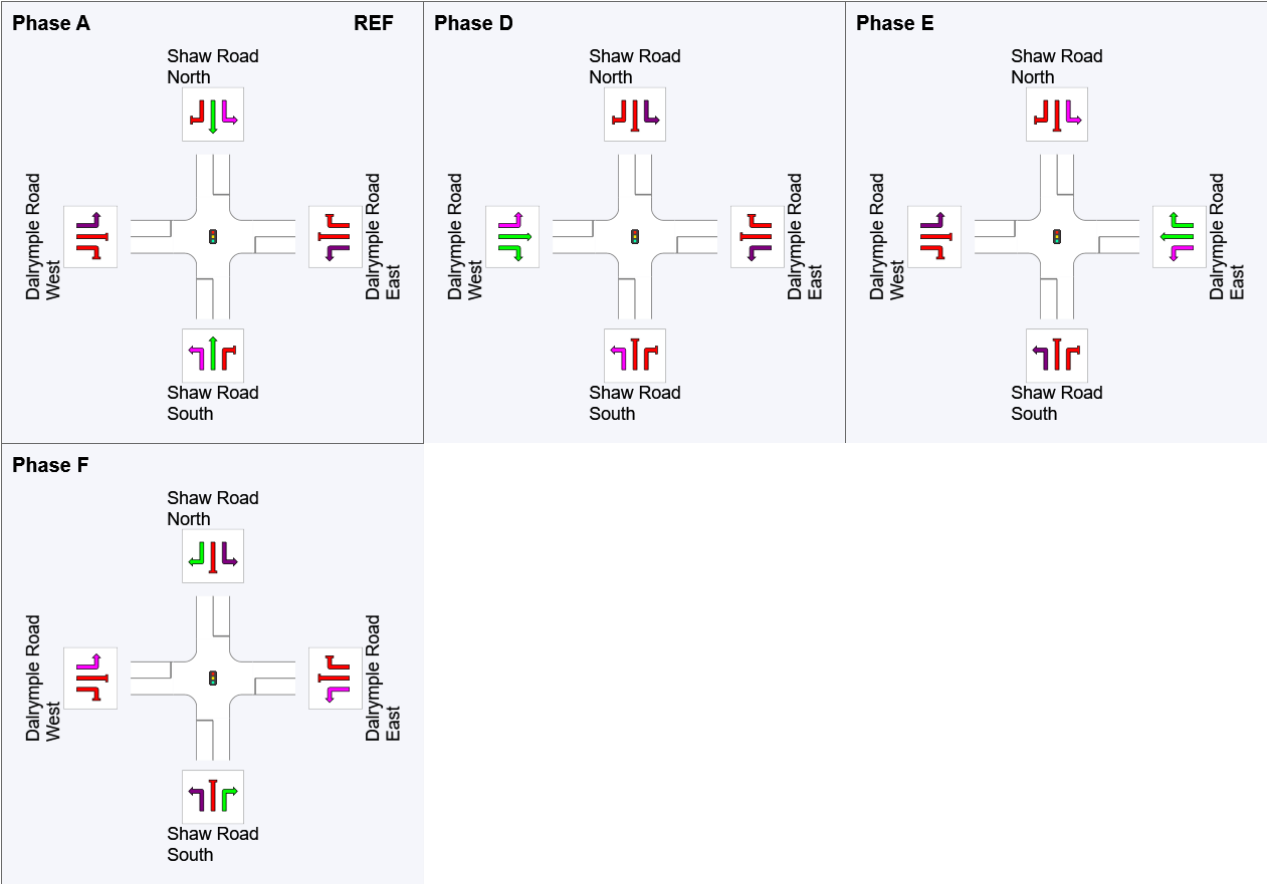
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Phase1
Input Phase Sequence: A, D, E, F
Output Phase Sequence: A, D, E, F
Reference Phase: Phase A

Phase Timing Summary

Phase	A	D	E	F
Phase Change Time (sec)	0	36	73	106
Green Time (sec)	30	31	27	8
Phase Time (sec)	36	37	33	14
Phase Split	30%	31%	28%	12%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

 Site: 101 [Shaw / Dalrymple 2025 AM BG+Dev (Site Folder: DA
SIDRA - RFI)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Shaw Road South															
1	L2	All MCs	4	0.0	4	0.0	0.003	6.6	LOS A	0.0	0.2	0.17	0.57	0.17	49.5
2	T1	All MCs	422	14.0	422	14.0	0.543	42.2	LOS D	12.4	97.5	0.90	0.76	0.90	32.7
3	R2	All MCs	145	1.4	145	1.4	* 0.592	68.1	LOS E	4.4	31.2	1.00	0.79	1.04	27.9
Approach			572	10.7	572	10.7	0.592	48.5	LOS D	12.4	97.5	0.92	0.76	0.93	31.2
East: Dalrymple Road East															
4	L2	All MCs	126	5.0	126	5.0	0.103	9.4	LOS A	1.6	11.7	0.29	0.63	0.29	50.8
5	T1	All MCs	135	2.6	135	2.6	0.450	43.5	LOS D	9.7	69.8	0.91	0.77	0.91	29.1
6	R2	All MCs	294	4.5	294	4.5	* 0.587	50.8	LOS D	12.6	91.5	0.94	0.81	0.94	29.5
Approach			555	4.2	555	4.2	0.587	39.6	LOS D	12.6	91.5	0.78	0.76	0.78	33.2
North: Shaw Road North															
7	L2	All MCs	304	4.8	304	4.8	0.253	9.6	LOS A	4.8	34.7	0.35	0.66	0.35	48.3
8	T1	All MCs	448	11.4	448	11.4	* 0.604	42.4	LOS D	14.3	109.9	0.92	0.77	0.92	32.6
9	R2	All MCs	22	9.5	22	9.5	0.191	65.6	LOS E	1.3	9.7	0.98	0.71	0.98	18.7
Approach			775	8.8	775	8.8	0.604	30.2	LOS C	14.3	109.9	0.70	0.72	0.70	36.8
West: Dalrymple Road West															
10	L2	All MCs	95	3.3	95	3.3	0.093	12.8	LOS B	1.7	12.1	0.38	0.65	0.38	41.4
11	T1	All MCs	538	2.2	538	2.2	* 0.584	42.0	LOS D	14.9	106.3	0.93	0.79	0.93	30.1
12	R2	All MCs	36	20.0	36	20.0	0.584	47.9	LOS D	14.6	105.9	0.93	0.79	0.93	28.9
Approach			668	3.3	668	3.3	0.584	38.2	LOS D	14.9	106.3	0.85	0.77	0.85	30.9
All Vehicles			2569	6.8	2569	6.8	0.604	38.4	LOS D	14.9	109.9	0.81	0.75	0.81	33.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Green.
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.

* Critical Movement (Signal Timing)

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Project: C:\Projects\KIN0323\01\3. Deliverables\1. Reports\2. TIA\KIN0323-15.01.2024.sip9

PHASING SUMMARY

 Site: 101 [Shaw / Dalrymple 2025 PM BG (Site Folder: DA
SIDRA - RFI)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Phase1
Input Phase Sequence: A, D, E, F
Output Phase Sequence: A, D, E, F
Reference Phase: Phase A

Phase Timing Summary

Phase	A	D	E	F
Phase Change Time (sec)	0	43	59	104
Green Time (sec)	37	10	39	10
Phase Time (sec)	43	16	45	16
Phase Split	36%	13%	38%	13%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

 Site: 101 [Shaw / Dalrymple 2025 PM BG (Site Folder: DA
SIDRA - RFI)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Shaw Road South															
1	L2	All MCs	1	0.0	1	0.0	0.001	8.5	LOS A	0.0	0.1	0.26	0.57	0.26	47.8
2	T1	All MCs	434	9.9	434	9.9	0.441	35.8	LOS D	11.7	88.7	0.84	0.70	0.84	35.2
3	R2	All MCs	102	2.2	102	2.2	0.335	63.9	LOS E	2.9	21.0	0.98	0.75	0.98	28.8
Approach			537	8.4	537	8.4	0.441	41.1	LOS D	11.7	88.7	0.86	0.71	0.86	33.6
East: Dalrymple Road East															
4	L2	All MCs	165	4.0	165	4.0	0.128	9.0	LOS A	2.0	14.5	0.28	0.63	0.28	51.0
5	T1	All MCs	299	1.1	299	1.1	0.475	34.7	LOS C	13.9	98.4	0.85	0.73	0.85	33.1
6	R2	All MCs	307	2.9	307	2.9	* 0.520	41.0	LOS D	14.6	104.7	0.87	0.82	0.87	32.3
Approach			772	2.4	772	2.4	0.520	31.7	LOS C	14.6	104.7	0.73	0.74	0.73	36.1
North: Shaw Road North															
7	L2	All MCs	276	1.6	276	1.6	0.183	6.7	LOS A	2.0	14.5	0.20	0.61	0.20	50.8
8	T1	All MCs	501	4.4	501	4.4	* 0.524	36.1	LOS D	14.8	107.4	0.85	0.72	0.85	34.9
9	R2	All MCs	79	0.0	79	0.0	* 0.510	65.0	LOS E	4.6	32.5	1.00	0.77	1.00	18.9
Approach			856	3.1	856	3.1	0.524	29.3	LOS C	14.8	107.4	0.66	0.69	0.66	36.9
West: Dalrymple Road West															
10	L2	All MCs	42	0.0	42	0.0	0.047	12.9	LOS B	0.7	5.1	0.37	0.63	0.37	41.5
11	T1	All MCs	153	1.4	153	1.4	* 0.481	59.1	LOS E	4.5	32.1	1.00	0.76	1.00	25.1
12	R2	All MCs	2	0.0	2	0.0	0.481	64.7	LOS E	4.5	32.0	1.00	0.76	1.00	24.6
Approach			197	1.1	197	1.1	0.481	49.3	LOS D	4.5	32.1	0.86	0.74	0.86	26.8
All Vehicles			2361	3.9	2361	3.9	0.524	34.4	LOS C	14.8	107.4	0.75	0.72	0.75	34.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Green.
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.

* Critical Movement (Signal Timing)

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PHASING SUMMARY

 Site: 101 [Shaw / Dalrymple 2025 PM BG+Dev (Site Folder: DA
SIDRA - RFI)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

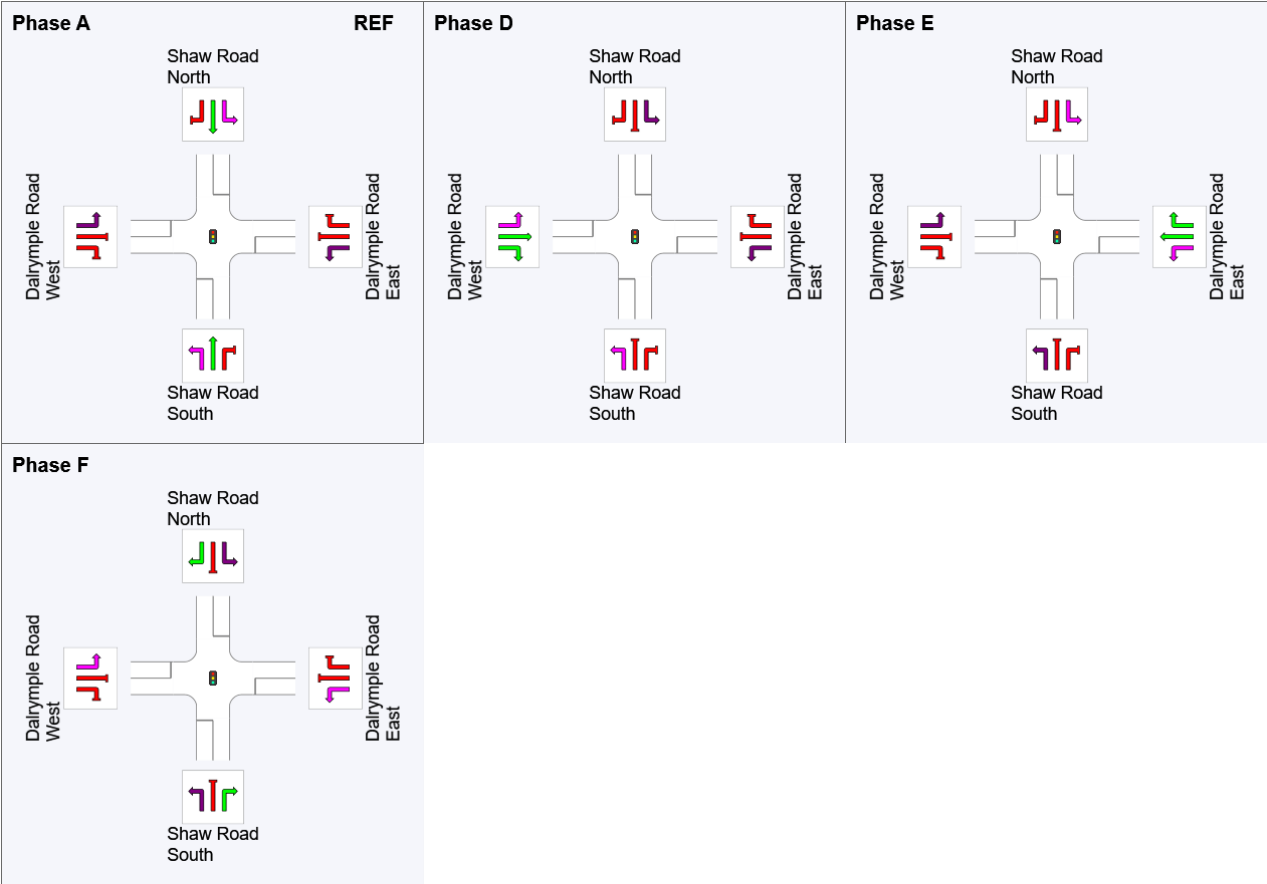
Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Phase1
Input Phase Sequence: A, D, E, F
Output Phase Sequence: A, D, E, F
Reference Phase: Phase A

Phase Timing Summary

Phase	A	D	E	F
Phase Change Time (sec)	0	43	59	104
Green Time (sec)	37	10	39	10
Phase Time (sec)	43	16	45	16
Phase Split	36%	13%	38%	13%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

 Site: 101 [Shaw / Dalrymple 2025 PM BG+Dev (Site Folder: DA
SIDRA - RFI)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Shaw Road South															
1	L2	All MCs	3	0.0	3	0.0	0.002	8.7	LOS A	0.0	0.3	0.27	0.58	0.27	47.5
2	T1	All MCs	440	9.9	440	9.9	0.448	35.9	LOS D	11.9	90.2	0.84	0.70	0.84	35.2
3	R2	All MCs	97	2.2	97	2.2	0.318	63.8	LOS E	2.8	19.9	0.98	0.74	0.98	28.9
Approach			540	8.4	540	8.4	0.448	40.7	LOS D	11.9	90.2	0.86	0.71	0.86	33.7
East: Dalrymple Road East															
4	L2	All MCs	157	4.0	157	4.0	0.123	9.3	LOS A	2.0	14.3	0.28	0.63	0.28	50.9
5	T1	All MCs	312	1.1	312	1.1	0.495	35.0	LOS C	14.6	103.4	0.86	0.73	0.86	32.9
6	R2	All MCs	312	2.9	312	2.9	* 0.527	41.1	LOS D	14.8	106.5	0.87	0.82	0.87	32.2
Approach			780	2.4	780	2.4	0.527	32.3	LOS C	14.8	106.5	0.75	0.75	0.75	35.8
North: Shaw Road North															
7	L2	All MCs	262	1.6	262	1.6	0.176	7.0	LOS A	2.2	15.7	0.22	0.62	0.22	50.5
8	T1	All MCs	477	4.4	477	4.4	* 0.499	35.9	LOS D	13.9	101.3	0.85	0.72	0.85	35.0
9	R2	All MCs	75	0.0	75	0.0	* 0.483	64.9	LOS E	4.4	30.7	1.00	0.77	1.00	19.0
Approach			814	3.1	814	3.1	0.499	29.2	LOS C	13.9	101.3	0.66	0.69	0.66	37.0
West: Dalrymple Road West															
10	L2	All MCs	40	0.0	40	0.0	0.045	13.3	LOS B	0.7	5.0	0.38	0.63	0.38	41.3
11	T1	All MCs	179	1.4	179	1.4	* 0.678	61.3	LOS E	6.6	46.8	1.00	0.84	1.09	24.4
12	R2	All MCs	38	0.0	38	0.0	0.678	66.9	LOS E	6.5	46.0	1.00	0.84	1.09	23.7
Approach			257	1.0	257	1.0	0.678	54.6	LOS D	6.6	46.8	0.90	0.81	0.98	25.5
All Vehicles			2391	3.8	2391	3.8	0.678	35.5	LOS D	14.8	106.5	0.76	0.72	0.77	34.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Green.
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.

* Critical Movement (Signal Timing)

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SITE LAYOUT

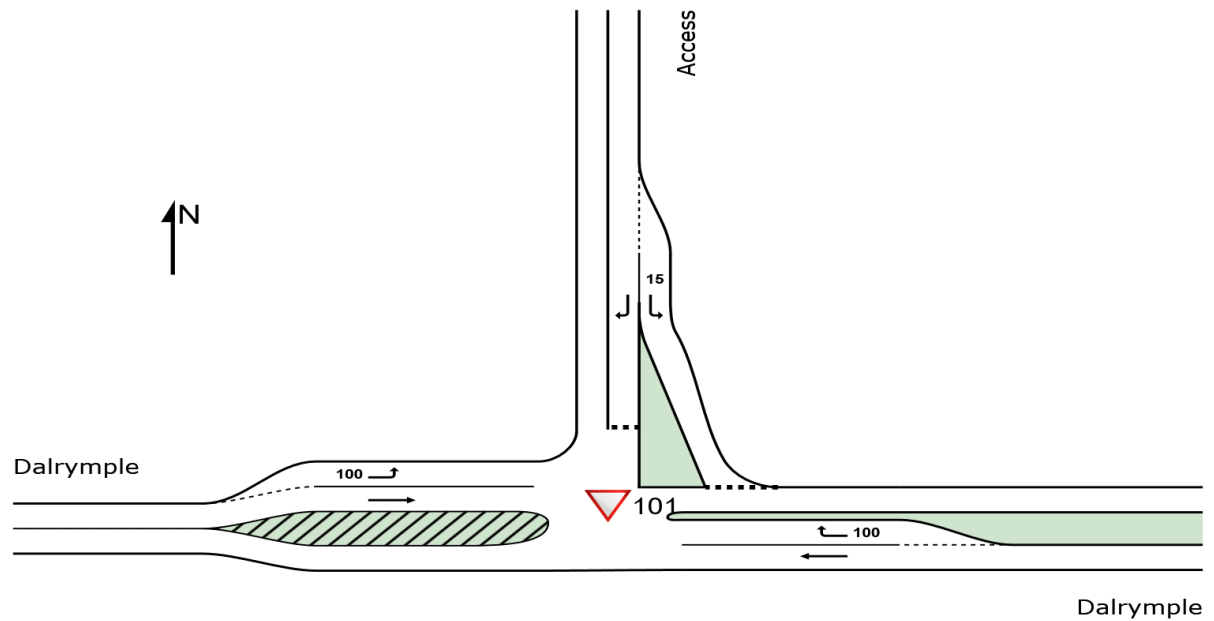
▽ Site: 101 [2035 AM BG + Dev (Site Folder: DA SIDRA - RFI)]

New Site

Site Category: (None)

Give-Way (Two-Way)

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



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MOVEMENT SUMMARY

Site: 101 [2035 AM BG + Dev (Site Folder: DA SIDRA - RFI)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				
East: Dalrymple															
5	T1	All MCs	173	3.7	173	3.7	0.091	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
6	R2	All MCs	18	1.0	18	1.0	0.031	10.2	LOS B	0.1	0.6	0.61	0.77	0.61	49.4
Approach			191	3.4	191	3.4	0.091	1.0	NA	0.1	0.6	0.06	0.07	0.06	58.8
North: Access															
7	L2	All MCs	84	1.0	84	1.0	0.153	10.6	LOS B	0.5	3.6	0.62	0.83	0.62	49.6
9	R2	All MCs	14	1.0	14	1.0	0.052	17.9	LOS C	0.2	1.2	0.76	0.90	0.76	44.9
Approach			98	1.0	98	1.0	0.153	11.6	LOS B	0.5	3.6	0.64	0.84	0.64	48.9
West: Dalrymple															
10	L2	All MCs	34	1.0	34	1.0	0.018	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
11	T1	All MCs	702	2.5	702	2.5	0.366	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			736	2.4	736	2.4	0.366	0.4	NA	0.0	0.0	0.00	0.03	0.00	59.4
All Vehicles			1024	2.5	1024	2.5	0.366	1.6	NA	0.5	3.6	0.07	0.11	0.07	58.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 [2035 PM BG + Dev (Site Folder: DA SIDRA - RFI)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				
East: Dalrymple															
5	T1	All MCs	436	0.9	436	0.9	0.225	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	All MCs	29	1.0	29	1.0	0.026	6.5	LOS A	0.1	0.6	0.26	0.58	0.26	52.0
Approach			465	0.9	465	0.9	0.225	0.5	NA	0.1	0.6	0.02	0.04	0.02	59.3
North: Access															
7	L2	All MCs	71	1.0	71	1.0	0.066	6.6	LOS A	0.2	1.7	0.31	0.57	0.31	52.1
9	R2	All MCs	25	1.0	25	1.0	0.056	11.8	LOS B	0.2	1.4	0.60	0.78	0.60	48.6
Approach			96	1.0	96	1.0	0.066	7.9	LOS A	0.2	1.7	0.39	0.63	0.39	51.1
West: Dalrymple															
10	L2	All MCs	15	1.0	15	1.0	0.008	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
11	T1	All MCs	224	1.1	224	1.1	0.116	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			239	1.1	239	1.1	0.116	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.5
All Vehicles			800	1.0	800	1.0	0.225	1.3	NA	0.2	1.7	0.06	0.11	0.06	58.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.

APPENDIX I

Aggregate Delay Assessment

SIDRA Delay																
Intersection	Average Delay (seconds)															
	South				East				North				West			
Shaw / Dalrymple	L	T	R		L	T	R		L	T	R		L	T	R	
Base Case (2025 BG)																
AM Peak	6.6	40.2	66.5		9.0	43.4	50.6		9.3	40.7	64.2		12.5	44.2	50.0	
PM Peak	8.5	35.8	63.9		9.0	34.7	41.0		6.7	36.1	65.0		12.9	59.1	64.7	
WE Peak																
With Development (2025 BG + Dev)																
AM Peak	6.6	42.2	68.1		9.4	43.5	50.8		9.6	42.4	65.6		12.8	42.0	47.9	
PM Peak	8.7	35.9	63.8		9.3	35.0	41.1		7.0	35.9	64.9		13.3	61.3	66.9	
WE Peak																

Background Volumes																
Intersection	Volumes															
	South				East				North				West			
Shaw / Dalrymple	L	T	R		L	T	R		L	T	R		L	T	R	
Base Case (2025 BG)																
AM Peak	2	414	153		133	125	291		319	471	23		100	508	5	
PM Peak	1	434	102		165	299	307		276	501	79		42	153	2	
WE Peak																

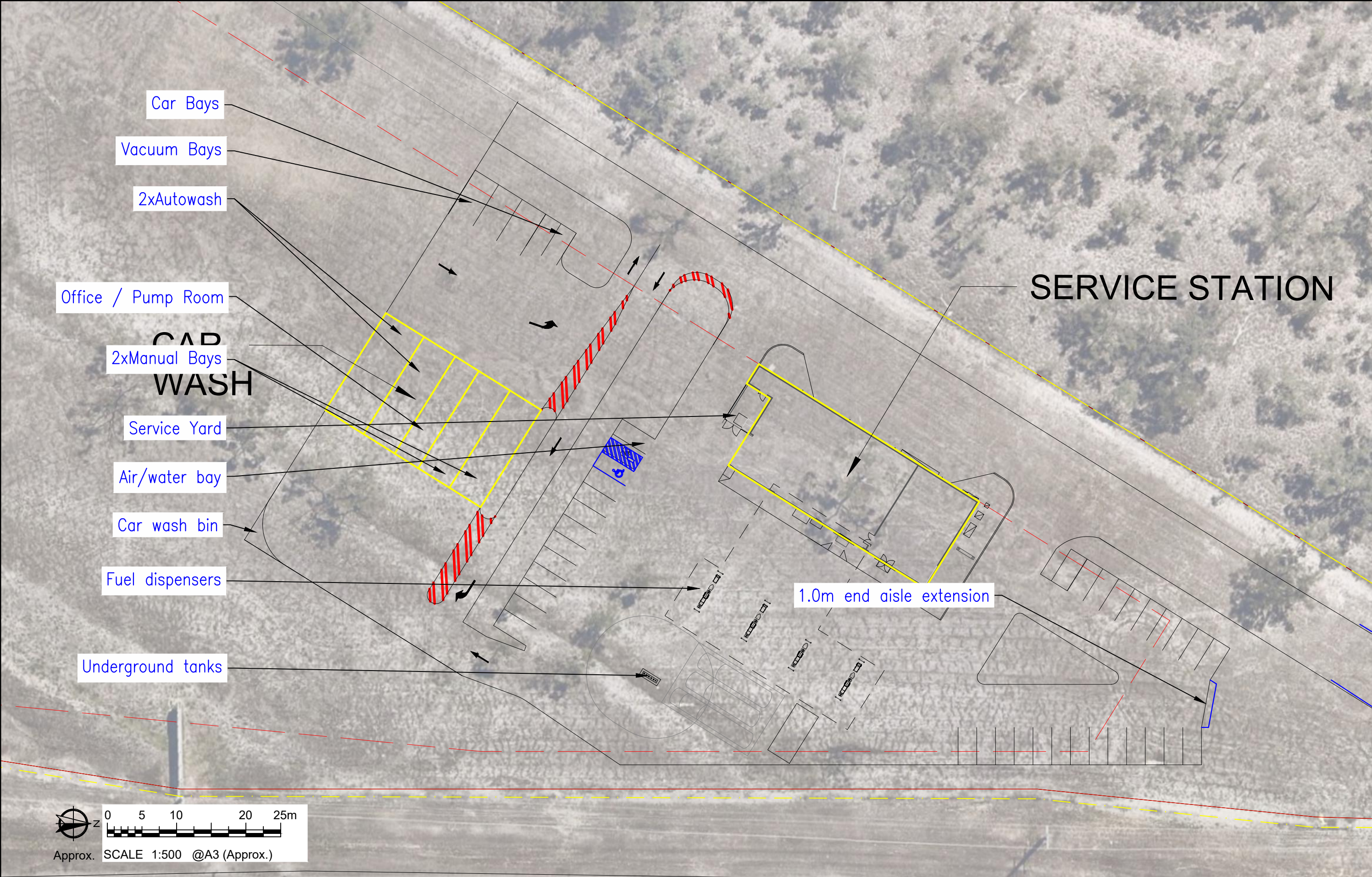
Total Network Delay		Σ Delay
Base Case (2025 BG)		
AM Peak		95743.7
PM Peak		81294.6
With Development (2025 BG + Dev)		
AM Peak		96770.9
PM Peak		81830.4
ID		
AM Peak	Δ seconds	1027.2
	Δ %	1.1%
PM Peak	Δ seconds	535.8
	Δ %	0.7%
Total	Δ seconds	1563.0
	Δ %	0.9%

GTIA Delay Calculation																	
Intersection	Total Delay																Σ Delay
	South				East				North				West				
Shaw / Dalrymple	L	T	R		L	T	R		L	T	R		L	T	R		
Base Case (2025 BG)																	
AM Peak	13.2	16642.8	10174.5		1197.0	5425.0	14724.6		2966.7	19169.7	1476.6		1250.0	22453.6	250.0		95743.7
PM Peak	8.5	15537.2	6517.8		1485.0	10375.3	12587.0		1849.2	18086.1	5135.0		541.8	9042.3	129.4		81294.6
WE Peak	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0
With Development (2025 BG + Dev)																	
AM Peak	13.2	17470.8	10419.3		1250.2	5437.5	14782.8		3062.4	19970.4	1508.8		1280.0	21336.0	239.5		96770.9
PM Peak	8.7	15580.6	6507.6		1534.5	10465.0	12617.7		1932.0	17985.9	5127.1		558.6	9378.9	133.8		81830.4
WE Peak	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0
ID																	
AM Peak	Δ seconds	0.0	828.0	244.8		53.2	12.5	58.2		95.7	800.7	32.2		30.0	-1117.6	-10.5	1027.2
	Δ %	0.0%	5.0%	2.4%		4.4%	0.2%	0.4%		3.2%	4.2%	2.2%		2.4%	-5.0%	-4.2%	1.1%
PM Peak	Δ seconds	0.2	43.4	-10.2		49.5	89.7	30.7		82.8	-100.2	-7.9		16.8	336.6	4.4	535.8
	Δ %	2.4%	0.3%	-0.2%		3.3%	0.9%	0.2%		4.5%	-0.6%	-0.2%		3.1%	3.7%	3.4%	0.7%
WE Peak	Δ seconds																
	Δ %																



CAMBRAY CONSULTING PTY LTD

Suite 2601 | 21 Mary Street
Brisbane QLD 4000
07 3221 3503
cambray.com.au





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Traffic Engineering and Transport Planning

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DRAWING TITLE

Proposed Service Station & Car Wash

Site Layout

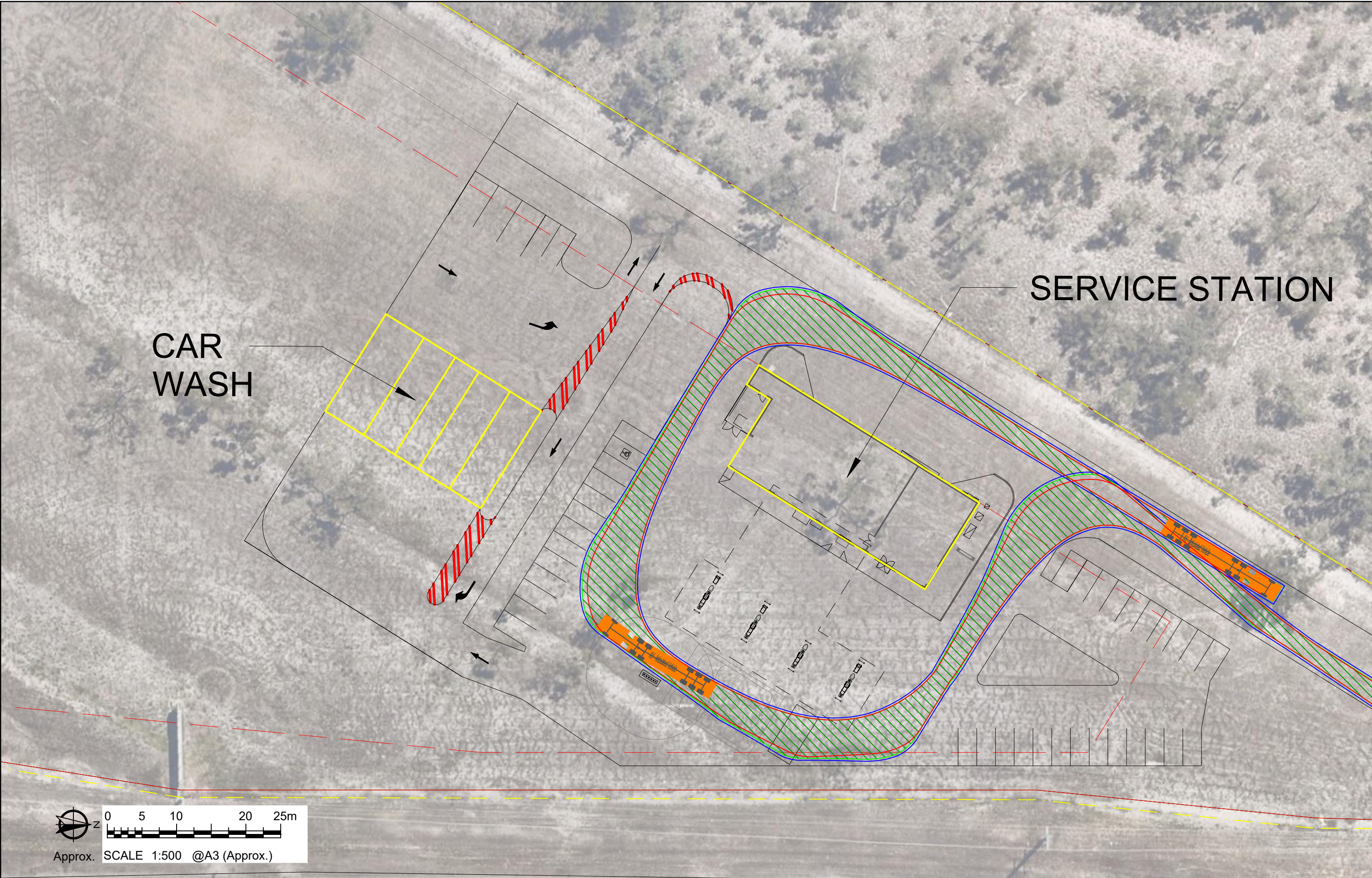
LOCATION

325 Shaw Road

Shaw, QLD 4817

REV	DATE	AMENDMENT / ISSUE	DWN	CHK
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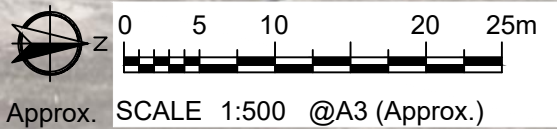
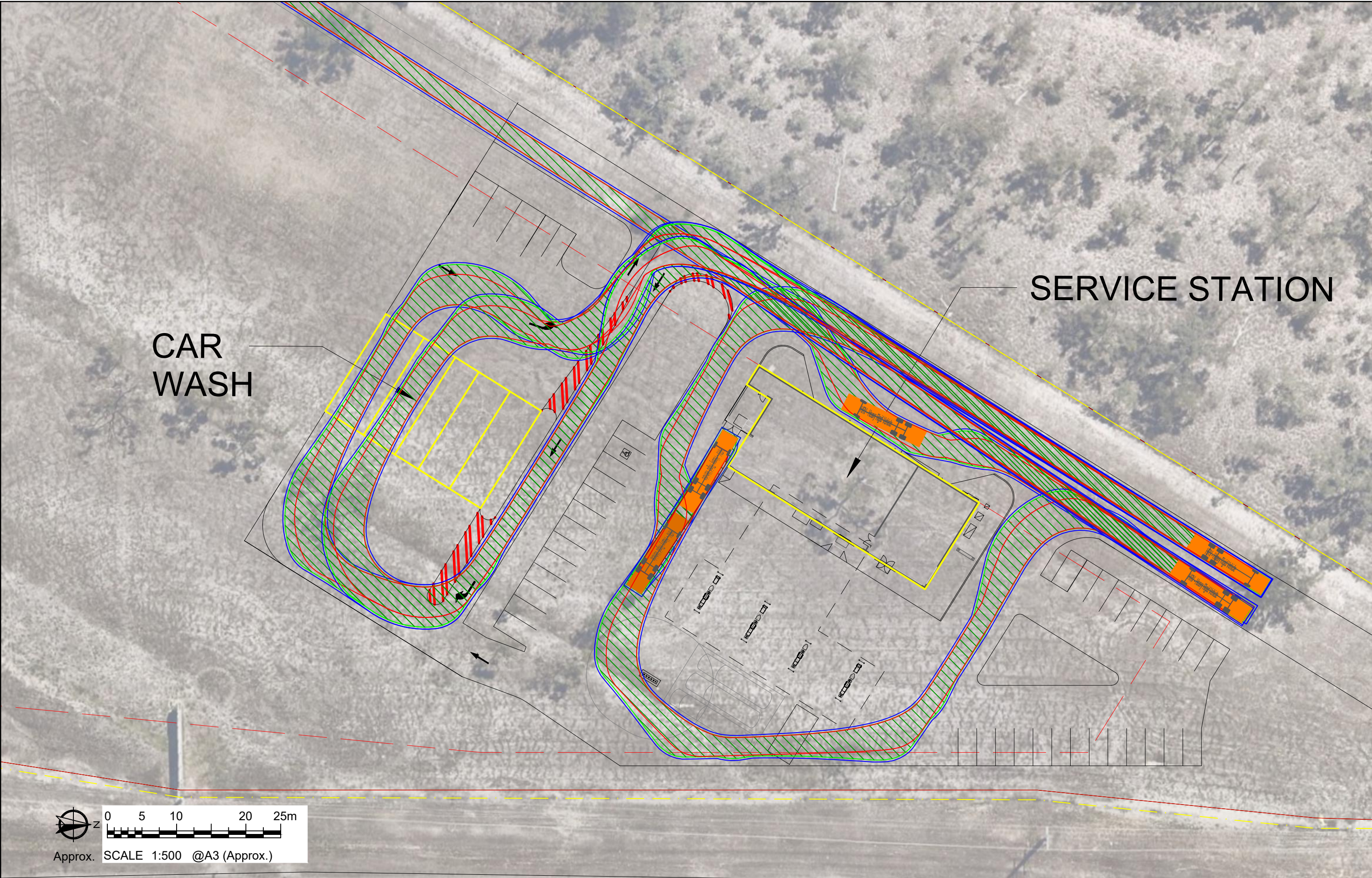
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Proposed Service Station & Car Wash
Swept Path Assessment
19m AV

LOCATION
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Shaw, QLD 4817

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DRAWING TITLE
Proposed Commercial Development
Swept Path Assessment
HRV

LOCATION
325 Shaw Road
Shaw, QLD 4817

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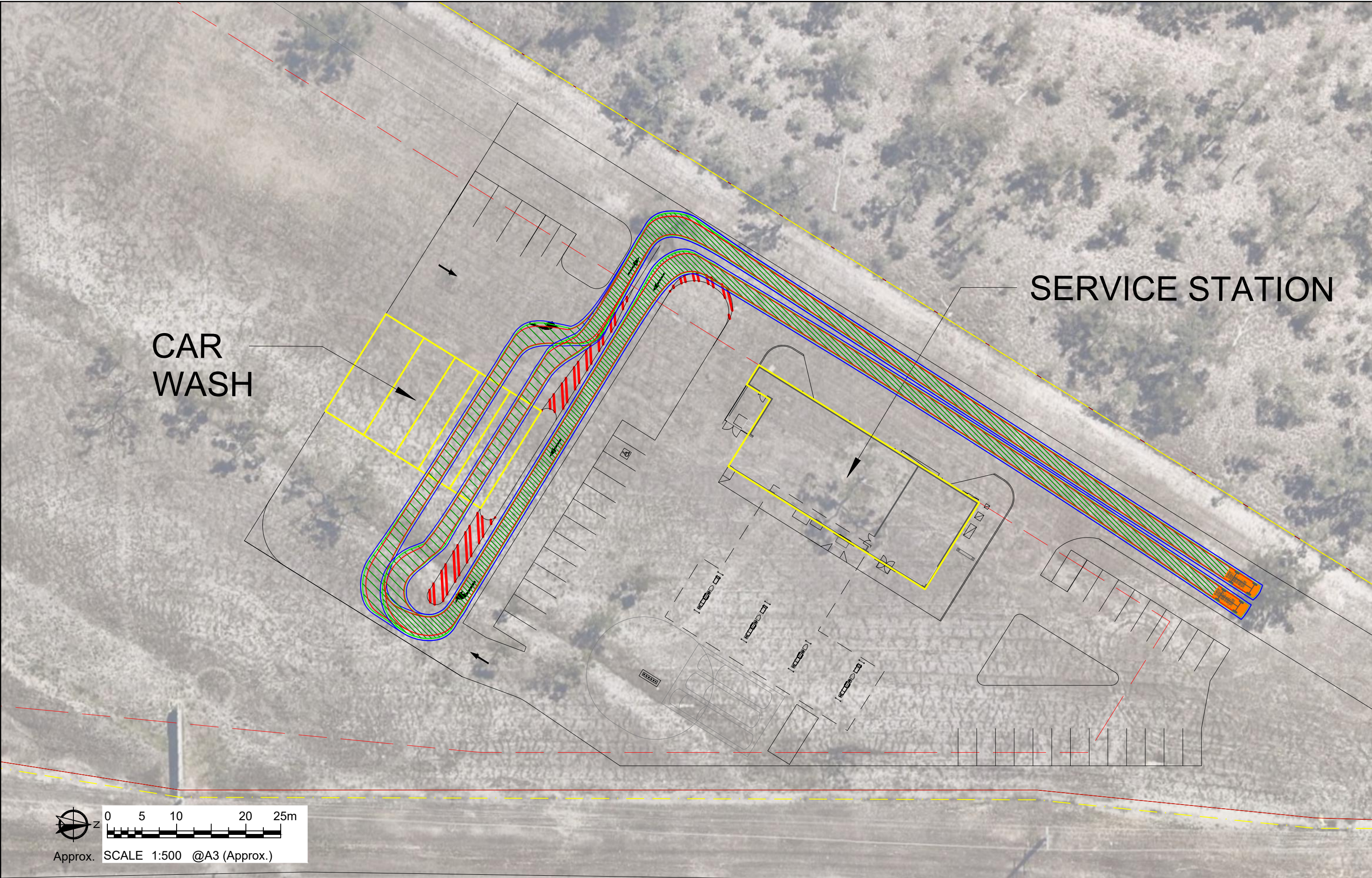
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DRAWING TITLE

Proposed Commercial Development

Swept Path Assessment

B99

LOCATION

325 Shaw Road

Shaw, QLD 4817

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A	-	-	-	-
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DATE 27.08.2025	*Scale (A3) As shown	PREPARED FOR For Discussion	