

Jet Zero™



TRAFFIC IMPACT ASSESSMENT

Jet Zero Townsville

Traffic Impact Assessment



Jet Zero Australia
24 March 2025



Gold Coast

Suite 26, 58 Riverwalk Avenue
Robina QLD 4226
P: (07) 5562 5377

Brisbane

Level 2, 428 Upper Edward Street
Spring Hill QLD 4000
P: (07) 3831 4442

Sydney

Studio 203, 3 Gladstone Street
Newtown NSW 2042
P: (02) 9557 6202

W: www.bitziosconsulting.com.au

E: admin@bitziosconsulting.com.au

Copyright in the information and data in this document is the property of Bitzios Consulting. This document and its information and data is for the use of the authorised recipient and this document may not be used, copied or reproduced in whole or in part for any purpose other than for which it was supplied by Bitzios Consulting. Bitzios Consulting makes no representation, undertakes no duty and accepts no responsibility to any third party who may use or rely upon this document or its information and data.

Document Issue History

Report File Name	Version	Document Control		Date	Issued to
P6680.001R Jet Zero Townsville TIA	001	Prepared: Reviewed: Issued	M. Else & J. Kirkham N. Edwards M. Else	20/12/2024	Willy Vukan at Star Environmental via email
P6680.002R Jet Zero Townsville TIA	002	Prepared: Reviewed: Issued	M. Else & J. Kirkham N. Edwards N. Edwards	04/03/2025	Willy Vukan at Star Environmental via email
P6680.003R Jet Zero Townsville TIA	003	Prepared: Reviewed: Issued	M. Else & J. Kirkham N. Edwards N. Edwards	24/03/2025	Willy Vukan at Star Environmental via email

EXECUTIVE SUMMARY

Bitzios Consulting (Bitzios) has been commissioned by Jet Zero Australia Pty Ltd (Jet Zero) to provide traffic engineering advice and prepare a traffic impact assessment (TIA) in relation to a proposed sustainable aviation fuel (SAF) facility development on part of Lot 35 on SP341877 (subject site).

The subject site is located within the Townsville State Development Area (SDA) which is under the jurisdiction of the Queensland Coordinator-General. The subject site is also located in the Townsville City Council (Council) local government area.

The Special Industry – Sustainable Aviation Fuel Facility development will operate 24 hours per day, with approximately 100 staff per day working at the facility across three (3) shifts.

It is noted that the development is currently in the pre-front end engineering (pre-FEED) design stage, therefore proposed plans, construction and operation methodologies etc. are subject to change.

Access to the development is proposed via a driveway crossover on Colinta Road. The driveway crossover will connect to a ~14m wide private access road. A review of the proposed development's access configuration, location and sight lines found all are expected to comply with relevant standards / guidelines.

It is recommended that site / car parking layout elements comply with AS2890 requirements. Importantly, it is expected that compliance with AS2890 will be easily achievable given the large size of the subject site.

The current development plans identify potentially 60 car parking spaces being provided. This will be further assessed during FEED. At this stage it is recommended that 70 car parking spaces are provided on site to support development operations. However, car parking requirements could change during FEED.

Development construction and operation phases traffic generation has been estimated and the likely impacts of this traffic on the surrounding road network assessed. No upgrade works are required at the Ron Maclean Drive / Heleen Drive intersection (Intersection 1) or Bruce Highway / Flinders Highway / Ron Maclean Drive intersection (Intersection 2) to offset development related traffic operation or safety impacts.

A pavement impact assessment has also been undertaken to determine whether the bulk haulage traffic movements will significantly impact the State-controlled road network. The assessment determined that some sections of Ron Mclean Drive will be significantly impacted and as such contributions towards pavement maintenance will be required.

It is concluded that there are no traffic engineering related matters to preclude approval of the development subject to reasonable and relevant conditions.

CONTENTS

	Page
EXECUTIVE SUMMARY	II
1. INTRODUCTION	6
1.1 Overview	6
1.2 Background	6
1.3 Development Overview	6
1.4 Scope of Works	6
2. EXISTING CONDITIONS	8
2.1 Road Network	8
2.2 Transport Network Planning	9
3. TRAFFIC DESIGN REVIEW	10
3.1 Site Access	10
3.1.1 Overview	10
3.1.1 Driveway Crossover Configuration	10
3.1.2 Location	11
3.1.3 Sight Distance	11
3.2 Site / Car Park Layout	11
3.3 Car Parking Provision	12
3.3.1 Construction Stage	12
3.3.2 Operational Stage	12
3.4 Servicing	13
4. TRAFFIC ASSESSMENT - INPUTS	14
4.1 Overview	14
4.2 Background Traffic Volumes	14
4.2.1 Traffic Survey Data	14
4.2.2 Traffic Growth Rate	15
4.2.3 Cleveland Bay Industrial Park Traffic	15
4.3 Development Traffic	15
4.3.1 Traffic Generation	15
4.4 Assessed Traffic Volume Scenarios	17
5. TRAFFIC ANALYSIS - RESULTS	18
5.1 Intersection 1: Ron Maclean Drive / Heleen Downs Road / Colinta Road	18
5.2 Intersection 2: Bruce Highway / Flinders Highway / Ron Maclean Drive	19
5.3 Delay Assessment	20
6. SAFETY RISK ASSESSMENT	21
6.1 Overview	21
6.1.1 Potential Risks	21
6.1.2 Risk 1: Increased Motorists Turning Right & Left from Ron Mclean Drive into Colinta Road (Intersection 1)	22
6.1.3 Risk 2: Increased Motorists Turning Right & Left from Colinta Road into Ron Mclean Drive (Intersection 1)	23
6.1.4 Risk 3: Increased Motorists Turning Right & Left from Ron Mclean Drive into The Bruce Highway (Intersection 2)	24
6.1.5 Risk 4: Increased Motorists Turning Right & Left from The Bruce Highway into Ron Mclean Drive (Intersection 2)	25
7. PAVEMENT IMPACT ASSESSMENT	26
7.1 Context	26
7.2 Impact Assessment Area	26

7.3	Background Traffic	27
7.4	Development Traffic	28
7.4.1	Heavy Vehicle Assumptions	28
7.4.2	Development SAR4 Generation	29
7.4.3	Development SAR5 Generation	29
7.4.4	Development Heavy Vehicle Distributions	29
7.5	Development Pavement Impacts & Contributions	30
8.	CODE RESPONSES	31
9.	CONCLUSIONS & RECOMMENDATIONS	32
10.	REFERENCES	33

Tables

Table 2.1:	Road Network
Table 2.2:	Key Intersections
Table 3.1:	Review – Subject Site Frontage Vs Driveway Crossover Width
Table 3.2:	Access Location Review -
Table 3.3:	Car Park Layout Review
Table 3.4:	Car Parking Provision Rate
Table 3.5:	Development Staffing Requirements & Visitor Demands
Table 4.1:	Study Intersections
Table 4.2:	Development Traffic Generation
Table 4.3:	Development Traffic Distribution – External
Table 5.1:	Intersection 1 – SIDRA Results
Table 5.2:	Intersection 2 – SIDRA Results
Table 5.3:	Network Delay Assessment
Table 6.1:	Safety Risk Assessment – Risk 1
Table 6.2:	Safety Risk Assessment – Risk 2
Table 6.3:	Safety Risk Assessment – Risk 3
Table 6.4:	Safety Risk Assessment – Risk 4
Table 7.1:	Background Traffic Volumes - 2023
Table 7.2:	Carriageway Level Directional Factor
Table 7.3:	Background SAR4s
Table 7.4:	Heavy Vehicle Traffic Assumptions
Table 7.5:	Design Vehicle SAR Generation Rate
Table 7.6:	Heavy Vehicle SAR4 Generation
Table 7.7:	Heavy Vehicle SAR5 Generation
Table 7.8:	Development Pavement Impacts

Figures

Figure 2.1:	Subject Site Location & Existing Road Network
Figure 3.1:	Site Access Overview
Figure 4.1:	Study Intersections
Figure 5.1:	Intersection 1 – Aerial & Modelled SIDRA Layout
Figure 5.2:	Intersection 2 – Aerial & Modelled SIDRA Layout
Figure 6.1:	Safety Risk Score Matrix
Figure 7.1:	Pavement Impact Assessment Area
Figure 7.2:	Development Heavy Vehicle Traffic Distributions



Appendices

Appendix A: Approved ROL Plan

Appendix B: Proposed Development Plans

Appendix C: Access Concept

Appendix D: Car Parking Provision Concept

Appendix E: Swept Path Diagrams

Appendix F: Traffic Survey Data

Appendix G: Traffic Volume Diagrams

Appendix H: Detailed SIDRA Outputs

Appendix I: Pavement Impact Assessment

Appendix J: SDAP Code Responses

1. INTRODUCTION

1.1 Overview

Bitzios Consulting (Bitzios) has been commissioned by Jet Zero Australia Pty Ltd (Jet Zero) to provide traffic engineering advice in relation to a proposed sustainable aviation fuel (SAF) facility development on part of what are currently identified as Lot 36 on SP341877 and Lot 31 on SP341877 (subject site).

The subject site was also identified as part of a reconfiguring a lot (ROL) application (Application Ref: AP2023/013). The subject site is identified as Lot 35 on the approved plans and is made up of two (2) separate land areas, including one (1) that is 25-35m wide and connects to Colinta . The subject site / Lot 35 totals 19.556 hectares (ha). A copy of the approved ROL plan is included at **Appendix A**.

The subject site is located within the Townsville State Development Area (SDA) which is under the jurisdiction of the Queensland Coordinator-General. The subject site is also located in the Townsville City Council (Council) local government area.

The development is within the Townsville SDA's Cleveland Bay Industrial Park stage 3 area. The SDA zoning of the subject site is High Impact Industry and Environmental Management.

1.2 Background

It is again noted that the subject site is currently identified as part of Lot 36 on SP341877 and Lot 31 on SP341877.

Importantly though, the subject site extents have also been identified as part of a reconfiguring a lot (ROL) application (Application Ref: AP2023/013). The subject site is identified as Lot 35 on the approved plans and is made up of two (2) separate land areas. The subject site / approved Lot 35 totals 19.556 hectares (ha). A copy of the approved ROL plan is included at **Appendix A**.

1.3 Development Overview

Key development details are summarised below:

- **Use:** Special Industry – Sustainable Aviation Fuel Facility
- **Yield:** 1x SAF facility
- **Operating Time:** 24 hours per day
- **Staff:** Assumed 100 employees per day across three (3) shifts
- **Access:** Via a private roadway / driveway partly within an access easement which links to a crossover on Colinta Road
- **Regular Servicing:** Up to B-Double sized vehicles.

A copy of the current development plans is included at **Appendix B**. However, it is understood that the project is currently at the pre-front end engineering design stage (pre-FEED) and is bridging to the front-end engineering design stage (FEED). Accordingly, the plans are could change somewhat in the future.

1.4 Scope of Works

The scope of this TIA included the following tasks:

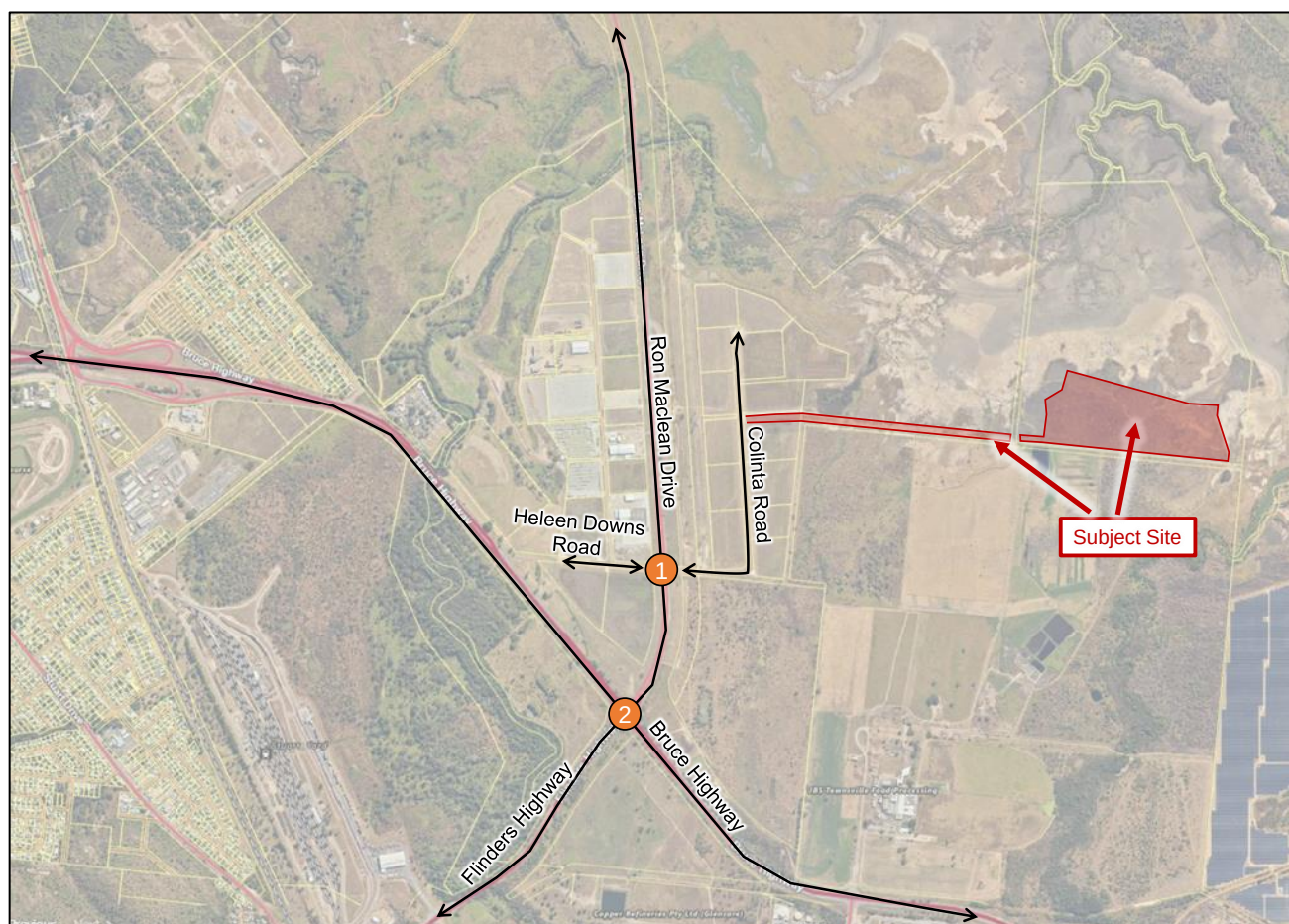
- Reviewing the proposed development site access arrangements (e.g. locations and configurations) for the construction and operational against the QLD Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP), SDA Development Scheme and/or relevant Australian Standard (AS2890.1) (Australian / New Zealand Standard Joint Technical Committee CE-001, Parking Facilities, 2004) requirements
- Reviewing the car parking provisions (e.g. general car spaces and People with Disability (PWD) car spaces) during the construction and operation phases considering SDA Development Scheme (DSDMIP, 2019) requirements and development information provided by Jet Zero

- Reviewing the internal car park layout arrangements (e.g. car parking bay dimensions and aisle widths) against Council planning scheme and/or AS2890.1 (Australian / New Zealand Standard Joint Technical Committee CE-001, Parking Facilities, 2004) requirements
- Reviewing the ability for design vehicles to access and manoeuvre within the site, including preparing swept paths using AutoTURN software
- Estimating future background traffic volumes at the study intersections
- Estimating potential peak hour traffic demands generated by the development during the construction and operation periods, based data provided by the project team
- Estimating development traffic volumes at the study intersections
- Estimating design (background + development traffic) volumes at the study intersections at the development's year of opening
- Undertaking analysis at the study intersections based on background and design scenario traffic volumes, using Signalised Intersection Design and Research Aid (SIDRA) software
- Undertaking a delay impact assessment at the study intersections in accordance with the Department of Transport and Main Roads' (TMR's) Guide to Traffic Impact Assessments (GTIA) (State of Queensland (Department of Transport and Main Roads), 2018)
- If required, identifying what upgrades are required at the study intersections to support the development.
- Estimating development traffic (daily and annual) based on information provided by client. This will include vehicle type, axle configuration and loading status (i.e. loaded or unloaded)
- Determining the existing Standard Axle Repetitions (SARs) for relevant sections of the State controlled network, based on data provided by TMR
- Determining the number and types of vehicles that will be generated by the development, and determine sections of the State controlled network where pavement assessment is required (i.e. based on the pavement loading 5% rule)
- Undertaking 'marginal cost analysis' for all impacted sections of the State controlled network to determine the required contributions as a result of the development.

2. EXISTING CONDITIONS

2.1 Road Network

Figure 2.1 illustrates the location of the subject site in the context of the surrounding road network.



Source: QLD Globe, 2025

Figure 2.1: Subject Site Location & Existing Road Network

Table 2.1 identifies key roads surrounding the subject site and their relevant characteristics.

Table 2.1: Road Network

Road Name	Jurisdiction	Hierarchy	Cross-Section	Speed Limit
Bruce Highway	State	Highway	4 lane / divided	90km/h
Colinta Road	Council	Industrial Access	2 lane / undivided	50km/h*
Flinders Highway	State	Highway	2 lane / undivided	80km/h
Heleen Downs Road	Council	Industrial Access	2 lane / undivided	50km/h*
Ron Maclean Drive	State	Highway	2 lane / undivided	80km/h

*Unposted speed limit – assumed default urban speed

Table 2.2 identifies key intersections surrounding the subject site and their relevant characteristics.

Table 2.2: Key Intersections

ID	Intersection Name	Jurisdiction	Configuration
1	Ron Maclean Drive / Heleen Downs Road / Colinta Road	State	Signalised
2	Bruce Highway / Flinders Highway / Ron Maclean Drive	State	Signalised

2.2 Transport Network Planning

A review of Council's Townsville City Plan, Local Government Infrastructure Plan (LGIP) (Council, 2024) indicated that there are no planned road network upgrades expected to impact the subject site.

A review of TMR's Queensland Transport and Roads Investment Program (QTRIP) 2024-25 to 2027-28 (TMR, 2024) indicated that there are no planned road network upgrades expected to impact the subject site.

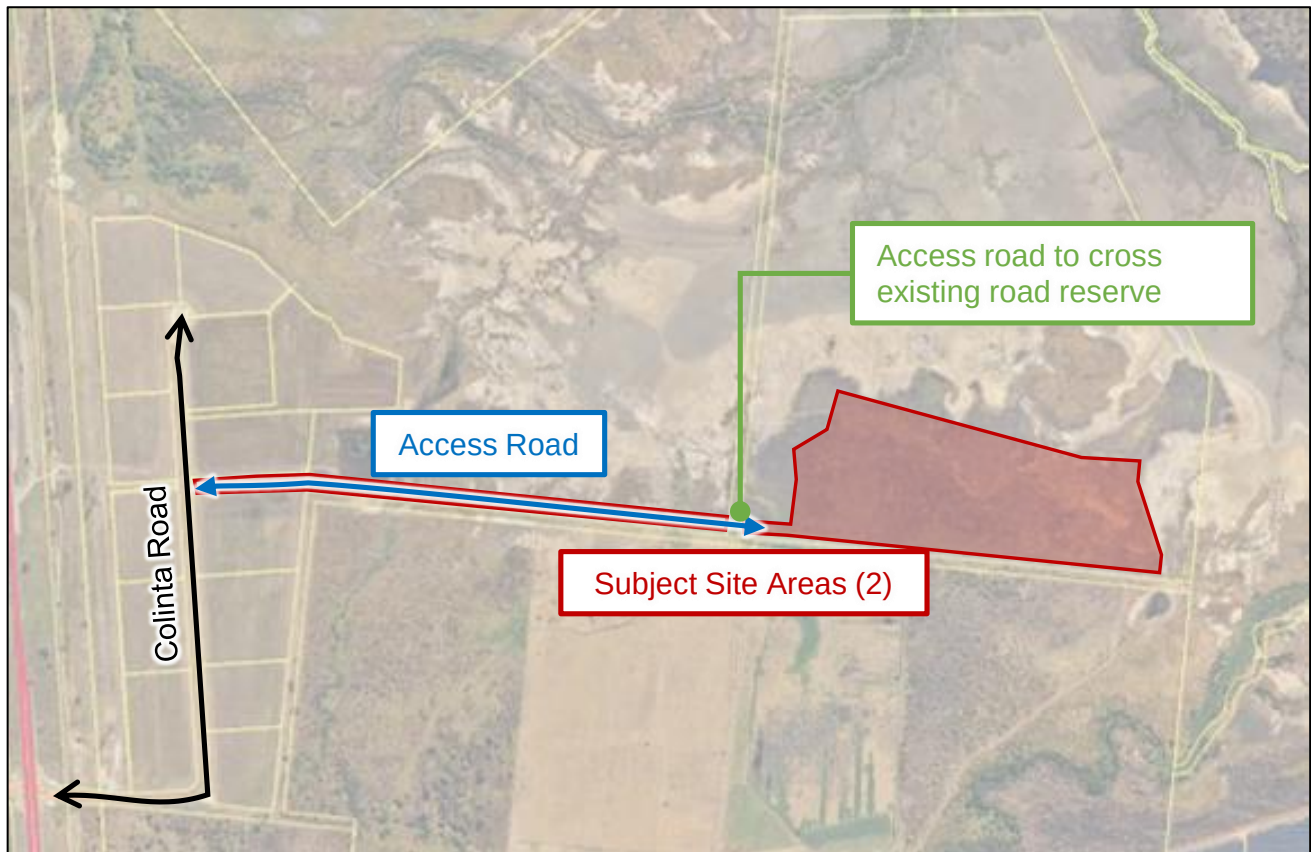
3. TRAFFIC DESIGN REVIEW

3.1 Site Access

3.1.1 Overview

Access to the development is proposed via a driveway crossover on Colinta Road. The driveway crossover will connect to a ~14m wide private access road. This road will traverse the area of the subject site closest to Colinta Road, before crossing an existing section of road reserve to provide access to the main area of the subject site.

Figure 3.1 provides an overview of the proposed site access.



Source: QLD Globe, 2025

Figure 3.1: Site Access Overview

A copy of plans illustrating the site access arrangement is included at **Appendix C**.

A review of the proposed driveway crossover has been undertaken as detailed herein.

3.1.1 Driveway Crossover Configuration

The SDA Development Scheme (DSDMIP, 2019) refers to Council's Townsville City Plan (Council, 2024) requirements in relation to site access.

It is noted that the current site access plans include limited details regarding the proposed driveway crossover configuration. Accordingly, the subject site frontage width has been reviewed against the crossover width required by Council.

Table 3.1 summarises our review of the subject site frontage width against the crossover width required by Council.

Table 3.1: Review – Subject Site Frontage Vs Driveway Crossover Width

Design Vehicle	Subject Site Width	Required Driveway Crossover Configuration
B-Double	~20m with a 14m wide access road within it	7-15m wide access at the property boundary (10-18m wide at the kerb) in accordance with Council Standard Drawing 'SD-031'

Based on the above, it is expected that a driveway crossover configured generally in accordance with Council requirements can be provided.

3.1.2 Location

Table 3.2 summarises our review of the proposed driveway crossover location against AS2890.1 (Australian / New Zealand Standard Joint Technical Committee CE-001, Parking Facilities, 2004), as referenced by Council's Planning Scheme.

Table 3.2: Access Location Review -

Adjacent Feature	Required Separation	Expected Separation	Expected to be Compliant (AS2890.1)?
Adjacent Intersection	6m along kerb	>6m	Yes

In summary, the proposed driveway crossover location is expected to comply with AS2890.1 requirements.

3.1.3 Sight Distance

Limited details of the topography near the proposed driveway crossover were available. However, it is understood that the topography is relatively flat.

Considering the above, a review of expected driveway sight distances has not been completed. However, it is considered likely that sufficient sight distances will be achieved at the driveway crossover.

It is recommended that as site planning progresses, driveway sight distances be reviewed to confirm that they will comply with AS2890.1 requirements.

3.2 Site / Car Park Layout

As previously identified, ongoing project planning could result in reasonably significant changes to the plans. Accordingly, a detailed review of the site / car park layout arrangements has not been undertaken.

It is recommended that site / car parking layout elements comply with AS2890 requirements. Importantly, it is expected that compliance with AS2890 will be easily achievable given the large size of the subject site.

Table 3.3 identifies AS2890.1 (Australian / New Zealand Standard Joint Technical Committee CE-001, Parking Facilities, 2004) and AS2890.2 (Australian Standard Technical Committee CE-001, Parking Facilities, 2018) requirements for key site / car parking layout elements.

Table 3.3: Car Park Layout Review

Design Element	Required
Visitor Parking Spaces (Class 2)	2.5m x 5.4m
Staff Parking Spaces (Class 2)	2.5m x 5.4m
Car Parking Spaces (PWD)	2.4m x 5.4m with 2.4m x 5.4m shared zone
Car Parking Aisle Width	5.8m min
Service Vehicle Aisle Width	6.5m min
HRV Service Bays	3.5m x 12.5m

3.3 Car Parking Provision

3.3.1 Construction Stage

Temporary on-site car parking is proposed to be provided during the construction phase. As the subject site is very large, it is expected that construction period car parking demands could be easily accommodated.

3.3.2 Operational Stage

3.3.2.1 Council Requirements

The number of on-site car parking spaces will be assessed as the development plans progress through FEED. Nonetheless a review has been undertaken on the currently proposed development concept.

Table 3.4 identifies Council's car parking provision rate for the proposed development land use.

Table 3.4: Car Parking Provision Rate

Land Use	Required Provision Rate
Industrial	One (1) space per 100m ² of GFA

The project site design will consider the GFA to determine the appropriate number of car parks based on the plant site requirements and considering the application of Council's car parking provision rate. The application of Council's car parking provision rate is not considered appropriate in this case due to the specialised nature of the proposed development. Therefore, development car parking requirements have been estimated based on a first principles assessment using information provided by Jet Zero. The level of staffing rates may be adjusted during FEED.

3.3.2.2 First Principles Assessment

The proposed development's car parking requirements have been estimated based on expected development staff and visitor numbers provided by the Jet Zero.

Table 3.5 summarises expected staff per shift and the expected number of daily visitors.

Table 3.5: Development Staffing Requirements & Visitor Demands

User Type	Timing	Yield
Staff	Morning Shift (6AM – 2 PM)	34 staff
	Afternoon Shift (2PM – 10PM)	34 staff
	Night Shift (10PM – 6AM)	34 staff
Visitors	Anytime During Operating Hours	1 – 2 visitors

Based on the above, car parking demands are expected to peak around the start and end of each shift.

Assuming all staff drive and do not carpool, there will be approximately 34 starting staff and 34 finishing staff parked on site at these times. Therefore, approximately 68 car parking spaces are expected to be required to accommodate staff demands. However, this will be further assessed during FEED.

At these times, it is expected that there may also be up to two (2) visitors parked on site.

Based on the above, the development is expected to generate demand for approximately 70 car parking spaces during peak periods.

3.3.2.3 Summary

In summary, at this stage it is recommended that 70 car parking spaces are provided on site to support development operations. However, this will be further assessed during FEED.

The current development plans identify 60 car parking spaces. A concept plan identifying how 70 car parking spaces could be provided on site has been prepared and is included at **Appendix D**.

3.4 Servicing

The proposed development proposes to import ethanol which will be transported to the facility via B-Double sized vehicles. Once the ethanol has been processed onsite / converted to SAF, it will be exported via B-Double sized vehicles to local airports or ports.

Given the above, provisions have been made to allow B-Double vehicles to manoeuvre and service the subject site where ethanol imports and SAF exports will be undertaken.

It is understood that the service vehicle requirements of all other areas are pending further investigations from the project team, which will confirm internal service vehicle flows and requirements throughout the other service areas.

Swept path diagrams have been prepared which demonstrate that the relevant service vehicles can enter the ethanol offloading and SAF loading area in a forward gear, access the weighbridge / loading area and exit the area in a forward gear via. Heavy Rigid Vehicle (HRV) swept paths for other servicing areas across the site have also been prepared.

A copy of the swept paths diagrams is provided at **Appendix E**.

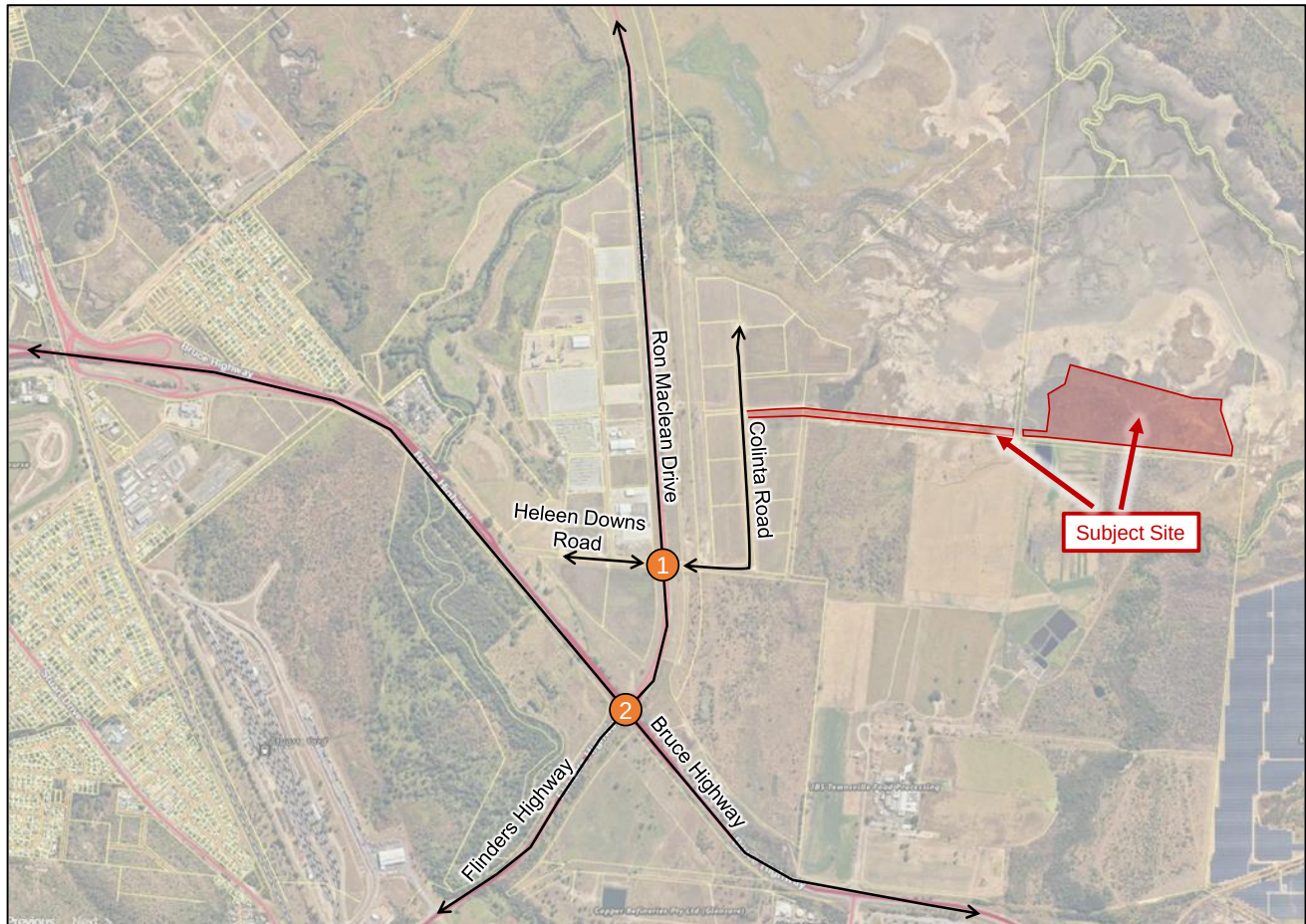
In summary, currently proposed ethanol / SAF loading areas are considered appropriate from traffic engineering perspective. However, it is recommended that additional swept path analysis be completed to confirm servicing arrangements are suitable as planning progresses. Servicing arrangements shall also comply with AS2890.2 (Australian Standard Technical Committee CE-001, Parking Facilities, 2018) requirements.

4. TRAFFIC ASSESSMENT - INPUTS

4.1 Overview

An assessment of potential development traffic impacts has been undertaken.

Figure 4.1 identifies the intersections (study intersections) that has been assessed herein.



Source: Google Maps

Figure 4.1: Study Intersections

Table 4.1 identifies the study intersections that have been assessed herein.

Table 4.1: Study Intersections

Intersection ID	Intersection Name
1	Ron Maclean Drive / Heleen Downs Road
2	Bruce Highway / Flinders Highway / Ron Maclean Drive

4.2 Background Traffic Volumes

4.2.1 Traffic Survey Data

The surveys were completed at the study intersections on Wednesday 23rd October 2024. The following peak hour periods were recorded across the network:

- Weekday AM Peak Period: 7:30am – 8:30am
- Weekday PM Peak Period: 3:30pm – 4:30pm.

A copy of the traffic survey data is included at **Appendix F**.

4.2.2 Traffic Growth Rate

A 2.5% p.a. linear growth rate has been applied to survey volumes on Ron Mclean Drive and a 3.5% growth rate has been applied to the Bruce Highway to estimate future background traffic volumes. Importantly, these adopted growth rates are consistent with 5-year growth rates informed by TMR traffic census data.

4.2.3 Cleveland Bay Industrial Park Traffic

The subject site is within the Cleveland Bay Industrial Park area. As part of the planning for this industrial area, a traffic impact assessment was prepared by Langtree Consulting (Langtree TIA), dated 23rd October 2020 (Ngoo, 2020).

The report estimated the traffic demands likely to be generated by development within the industrial area. The reporting split the area into two (2) precincts being the 'eastern precinct' and the 'western precinct', split based on the respective side of Ron Maclean Drive.

The subject site was considered as part of the 'eastern precinct'. We have adopted the traffic identified within the report for each precinct to be considered as background traffic. To appropriately reflect the changes proposed at the subject site we have removed the trips that were attributed to the subject site (~83 trips) from the background scenario using the traffic generation rates and distributions adopted in the Langtree TIA (Ngoo, 2020).

Adopted background traffic volume diagrams are included at **Appendix G**.

4.3 Development Traffic

4.3.1 Traffic Generation

Due to the relatively unique nature of the proposed development, no 'typical' / 'reference' trip generation rates are considered applicable. Accordingly, a 'first principles' approach has been adopted to estimate development traffic demands.

Based on input from the project team, the following key details informed our first principles traffic generation assumptions and estimates for the development's construction phase:

- Staff Related Vehicle Movements:
 - Staff per shift (1 x 12hr shift per day): 1,000 persons maximum, shifts are expected to start at 6am and end at 6pm. The shift start and finish times are outside of road peak hours therefore, we have assumed that 50% of staff will arrive/depart within the road peak time which is expected to be conservative.
 - Journey to Work Mode Share:
 - 90% of staff via 53 seat coaches and 20 seat minibuses, assuming a 50/50 split between the modes results in an average capacity of 36.5. Resulting in 12.5 coaches carrying ~650 staff and 12.5 minibuses transporting ~250 staff
 - 10% of staff (100 staff) via private vehicle with an average vehicle occupancy of 1.5 persons per vehicle
 - Staff trips
 - 13 buses (25 x 50% peak factor)
 - 34 cars (67 x 50% peak factor)
 - Total: 47 vehicles
 - Arrival / departure arrangements: Staff arrive during the hour of the start of their shift and depart during the hour at the end of their shift. Since the shifts start and finish outside of surrounding road peaks, we have conservatively assumed that 50% of peak staff trips will occur during the road peak periods. Minibuses and cars are parked on-site for the duration of the shift while coaches will depart site once dropping staff off at site
 - AM peak hour movements: 47 vehicles arrive (i.e. 47 trips in) 7 vehicles depart (i.e. 7 trips out)
 - PM peak hour movements: 7 vehicles arrive (i.e. 7 trips in) 47 vehicles depart (i.e. 47 trips out)
 - It is expected that construction staff will be staying in accommodation camps or on ships at the port, therefore a traffic distribution of 70% north and 30% south has been adopted.
- Servicing / Delivery Vehicle Movements:

- Daily: Not expected to exceed 30 vehicles per day on average (or 60 trips, 30 in and 30 out)
- Hourly: It is expected that deliveries will primarily occur within the first nine (9) hours of a shift (which is 12 hours long). It has been assumed that 90% of deliveries or 3 deliveries per hour will occur within the nine (9) hour period. In the remaining three (3) hours there will be 1 delivery per hour.
- AM peak hour movements: Three (3) deliveries (3 trips in and 3 trips out)
- PM peak hour movements: One (1) delivery (1 trip in and 1 trip out)

Based on input from the project team, the following key details informed our first principles traffic generation assumptions and estimates for the development's operational phase:

- **Staff Related Vehicle Movements:**
 - Staff per shift (3 shifts per day): 34 persons
 - Journey to Work Mode Share: 100% of staff via private vehicle with vehicle occupancy of 1 person per vehicle.
 - Staff trips: 34 cars per shift
 - Arrival / departure arrangements: Staff arrive during the AM peak and depart during the PM peak. Staff park on-site for the duration of their shift
 - AM peak hour movements: 34 vehicles arrive for start of morning shift (i.e. 34 trips in) and 34 vehicles depart (i.e. 34 trips out) for end of night shift
 - PM peak hour movements: 34 vehicles depart (i.e. 34 trips out) at the end of the morning shift and 34 vehicles arrive for start of the evening shift (i.e. 34 trips in)
 - It is expected that operational staff will live in nearby suburbs, therefore the majority of staff will access the site via the Bruce Highway. Subsequently a traffic distribution of 60% south and 40% north has been adopted.
- **Servicing / Delivery Vehicle Movements:**
 - Daily: Typically, 16 vehicles per day delivering to Townsville Airport, Townsville Port or to Cairns. It is understood that there will be 10 deliveries per day from the Port and six (6) deliveries per day to Townsville / Cairns Airport. It has been assumed that there is an equal split between the delivery to Townsville Airport and Cairns Airport.
 - AM peak hour movements: On average 1 delivery per hour is expected. However, for the purposes of assessment it has been assumed that four (4) deliveries will occur (i.e. 4 trips in and 4 trips out) during the AM peak
 - PM peak hour movements: On average 1 delivery per hour is expected. However, for the purposes of assessment it has been assumed that four (4) deliveries will occur (i.e. 4 trips in and 4 trips out) during the PM peak

Table 4.2 summarises the construction and operational phase traffic demand estimates detailed above.

Table 4.2: Development Traffic Generation

Trip Type	AM Peak (Trips)			PM Peak (Trips)		
	Inbound	Outbound	Total	Inbound	Outbound	Total
Construction Phase						
Staff	47	7	54	7	47	54
Servicing / Deliveries	3	3	6	1	1	2
Total	50	10	60	8	48	56
Operational Phase						
Staff	34	34	68	34	34	68
Servicing / Deliveries	4	4	8	4	4	8
Total	38	38	76	38	38	76

As identified above, the proposed development is typically expected to generate up to 60 peak hour trips during the construction phase and 76 peak hour trips during the operational phase.

Table 4.3 summarises the adopted external development traffic distribution based on a review of surrounding development, trip attractors / generators etc.

Table 4.3: Development Traffic Distribution – External

Phase	Direction	Via	Distribution
Construction	North	Ron Mclean Drive	40%
	South	Ron Mclean Drive	60%
	Total	-	100%
Operational	North	Ron Mclean Drive	70%
	South	Ron Mclean Drive	30%
	Total	-	100%

4.4 Assessed Traffic Volume Scenarios

For the purposes of the traffic assessment, we have assumed the following:

- Development year of construction commencement: 2025
- Development year of opening: 2027

Traffic volumes have been derived and assessed for the following scenarios:

- **2024 Survey:** 2024 surveyed volumes
- **2025 Background:** 2024 Survey factored up by 2% per annum through to 2025 construction commencement year
- **2025 With Development:** 2025 Background + Development construction traffic volumes
- **2027 Background:** 2024 Survey factored up by 2% per annum through to 2027 development year of opening
- **2027 With Development:** 2027 Background + Development operation traffic volumes

It is noted that traffic volume scenarios have been assessed as applicable, noting that TMR's GTIA only requires consideration of 10 year post opening design horizon impacts at accesses, and year of opening impacts at external (non-access) intersections.

Figures identifying traffic volume calculations and assessed traffic volumes are included at **Appendix G**.

5. TRAFFIC ANALYSIS - RESULTS

5.1 Intersection 1: Ron Maclean Drive / Heleen Downs Road / Colinta Road

Figure 5.1 includes an aerial image of Intersection 1 and the intersection layout as assessed in SIDRA.

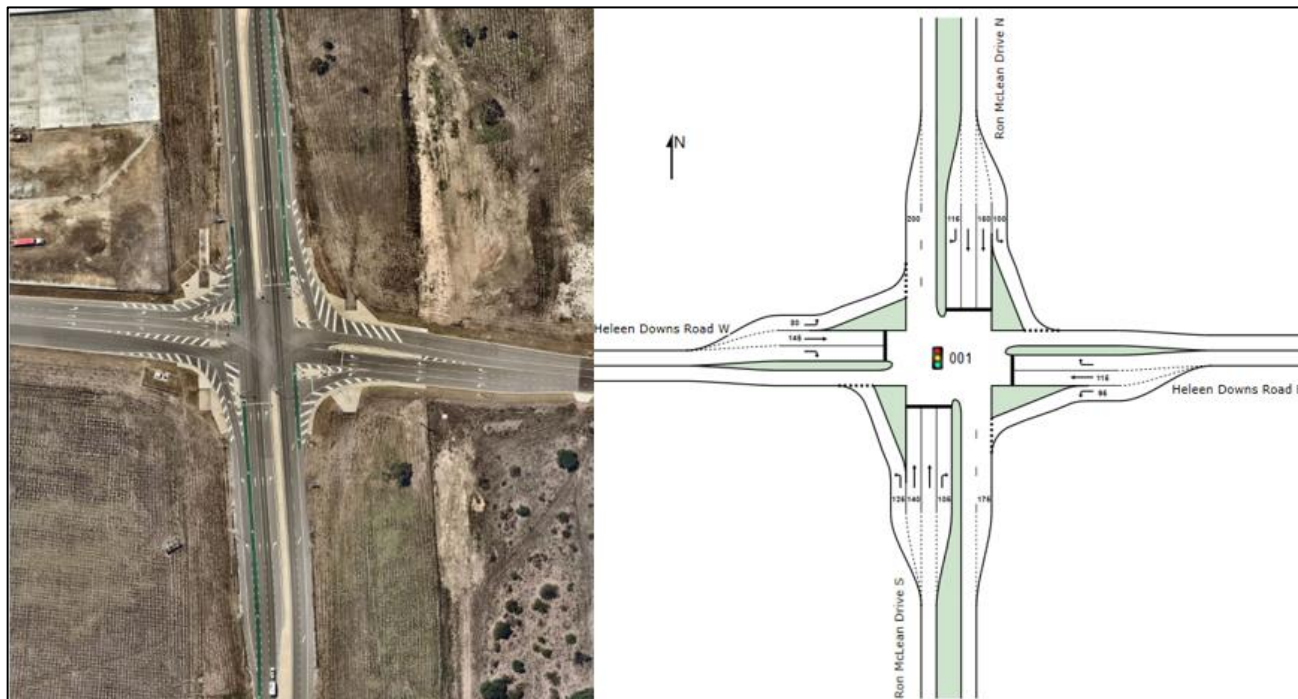


Figure 5.1: Intersection 1 – Aerial & Modelled SIDRA Layout

The SIDRA results are summarised in Table 5.1 with detailed outputs provided at **Appendix H**.

Table 5.1: Intersection 1 – SIDRA Results

Year	Peak	Scenario	Total Vehicles	Degree of Saturation (DOS)	Average Delay (s)	Level of Service	95th Percentile Queue (m)
2024	AM	Survey	466	0.14	13.1	A	24
	PM		353	0.12	17.4	B	19
2025 (Construction)	AM	BG	916	0.28	23.5	B	38
	PM		801	0.22	24.4	B	33
	AM	BG + DEV	982	0.28	23.8	B	39
	PM		863	0.26	24.8	B	41
2027 (Operations)	AM	BG	938	0.29	23.5	B	40
	PM		805	0.23	24.0	B	33
	AM	BG + DEV	1,019	0.30	24.4	B	41
	PM		898	0.26	24.9	B	38

As identified above, Intersection 1 will operate within the typically adopted operational threshold for a signalised intersection (DOS < 0.9) in all assessed scenarios.

5.2 Intersection 2: Bruce Highway / Flinders Highway / Ron Maclean Drive

Figure 5.2 includes an aerial image of Intersection 2 and the intersection layout as assessed in SIDRA.

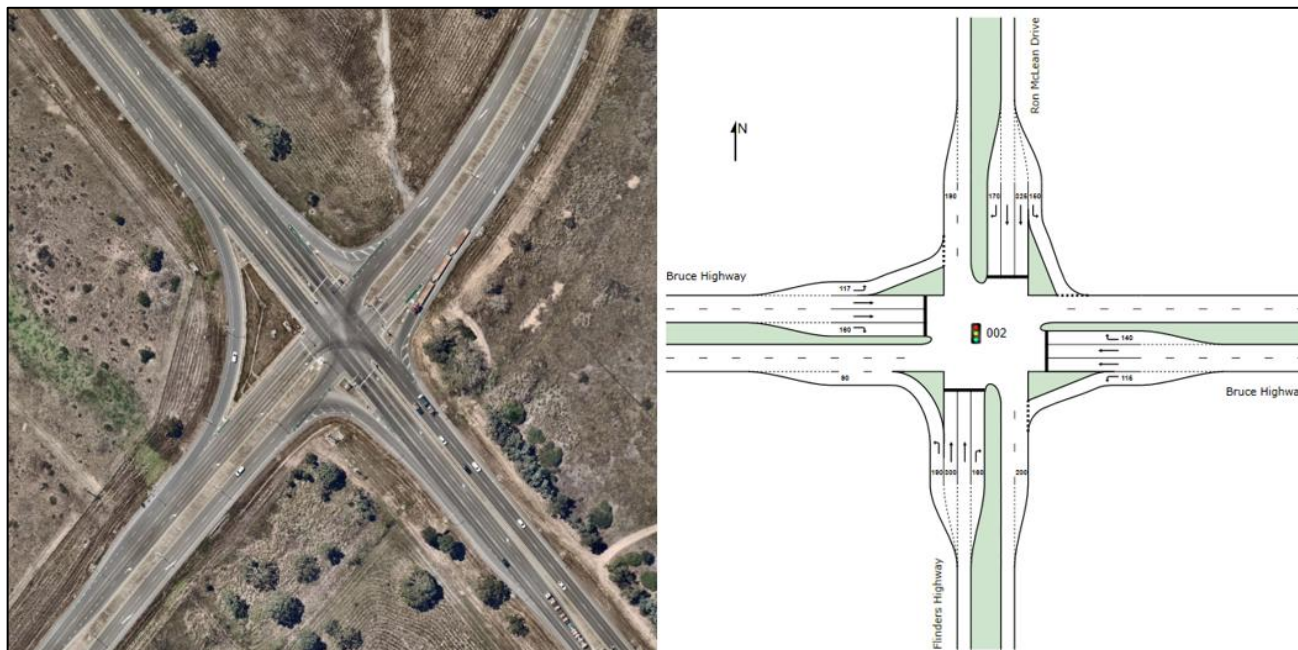


Figure 5.2: Intersection 2 – Aerial & Modelled SIDRA Layout

The SIDRA results are summarised in Table 5.2 with detailed outputs provided at **Appendix H**.

Table 5.2: Intersection 2 – SIDRA Results

Year	Peak	Scenario	Total Vehicles	Degree of Saturation (DOS)	Average Delay (s)	Level of Service	95th Percentile Queue (m)
2024	AM	Survey	2,322	0.52	19.2	B	84
	PM		1,772	0.37	20.1	B	69
2025 (Construction)	AM	BG	2,535	0.57	22.3	B	97
	PM		1,978	0.40	22.0	B	72
	AM	BG + DEV	2,557	0.58	22.5	B	99
	PM		1,997	0.41	22.5	B	74
2027 (Operations)	AM	BG	2,699	0.61	22.8	B	104
	PM		2,101	0.42	22.2	B	78
	AM	BG + DEV	2,746	0.63	23.1	B	104
	PM		2,146	0.45	23.1	B	82

As identified above, Intersection 2 will operate within the typically adopted operational threshold for a signalised intersection ($DOS < 0.9$) in all assessed scenarios.

5.3 Delay Assessment

Based on the above individual intersection assessments of the operational stage, a net delay assessment has been undertaken in accordance with TMR's GTIA to determine the expected impacts across the impacted assessment area. Table 5.3 summarises the delay assessment.

Table 5.3: Network Delay Assessment

Intersection ID	Background			Background + Development		Impact	
	Demand	Delay (sec/veh)	Delay (veh-mins)	Delay (sec/veh)	Delay (veh-mins)	Delay (veh-mins)	%
AM Peak							
1	916	23.5	358.4	24.1	367.7	9.3	2.59%
2	2,535	22.3	940.9	22.4	947.8	6.9	0.74%
Subtotal	3,451	22.6	1,299	22.9	1,315.5	16.2	1.25%
PM Peak							
1	801	24.4	326.0	25.2	336.1	10.1	3.09%
2	1,978	22.0	725.3	22.4	738.1	12.8	1.77%
Subtotal	2,779	22.7	1,051.3	23.2	1,074.2	22.9	2.18%
Total	6,230	22.6	2,350.6	23.0	2,389.7	39.1	1.66%

The network delay assessment indicates that background delay impacts resulting from development traffic will not exceed 5%. Accordingly, no intersection upgrades are required by TMR's GTIA to offset development traffic impacts.

6. SAFETY RISK ASSESSMENT

6.1 Overview

A review of the proposed expansion's potential safety impacts on the State-controlled transport network near the subject site has been undertaken in accordance with TMR's GTIA.

In terms of road safety, TMR's GTIA states that:

“Development should ensure that a road's safety is not significantly worsened as a result of development and that any pre-existing or development-introduced unacceptable safety risk is addressed. ‘Significantly worsened’ is defined in terms of the change in the safety risk rating (for example, from low to medium or from medium to high).”

Figure 6.1 illustrates the safety risk score matrix included in the GTIA.

		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 6.1: Safety Risk Score Matrix

6.1.1 Potential Risks

The following potential risks which could result from the development have been identified:

- **Risk 1:** The development will result in a greater number of motorists turning at Intersection 1. More specifically from Ron Mclean Drive into Colinta Road. This will increase the potential for vehicles from opposing direction type crashes (e.g. T-bone crashes), vehicles from one direction type crashes (e.g. rear-end crashes) etc.
- **Risk 2:** The development will result in a greater number of motorists turning at Intersection 1. More specifically from Colinta into Ron Mclean Drive. This will increase the potential for vehicles from opposing direction type crashes (e.g. T-bone crashes), vehicles from one direction type crashes (e.g. rear-end crashes) etc.
- **Risk 3:** The development will result in a greater number of motorists turning at Intersection 2. More specifically from Ron Mclean Drive into the Bruce Highway. This will increase the potential for vehicles from opposing direction type crashes (e.g. T-bone crashes), vehicles from one direction type crashes (e.g. rear-end crashes) etc.
- **Risk 4:** The development will result in a greater number of motorists turning at Intersection 2. More specifically from the Bruce Highway into Ron Mclean Drive. This will increase the potential for vehicles from opposing direction type crashes (e.g. T-bone crashes), vehicles from one direction type crashes (e.g. rear-end crashes) etc.

The above risks have been assessed below in accordance with TMR's GTIA.

6.1.2 Risk 1: Increased Motorists Turning Right & Left from Ron Mclean Drive into Colinta Road (Intersection 1)

An assessment of Risk 1 has been undertaken in accordance with TMR's GTIA. The results are summarised in Table 6.1.

Table 6.1: Safety Risk Assessment – Risk 1

Risk Item	Without Development			With Development			Comments
	Likelihood	Consequence	Risk Score	Likelihood	Consequence	Risk Score	
1	2	4	M	3	4	M	The likelihood of the risk <u>without the development</u> has been identified as 'unlikely' for the following key reasons: ▪ A review of publicly available crash data indicates that there have been no crashes recorded at the intersection in the last five (5) years. ▪ The assessed intersection operates well with low average delays, queues and DOS ▪ Sight distances are good. The likelihood of the risk <u>with the development</u> is expected to increase slightly and has therefore been identified as 'moderate'. The key reasons for this are as follows: ▪ The development is expected to minorly increase traffic volumes at the intersection ▪ Notwithstanding traffic increases resulting from the development, the intersection is still expected to operate with a low DOS. Average delays and queues are also expected to be low. The severity of the risk has been identified as 'Hospitalisation' for the following key reasons: ▪ Ron Mclean Drive has a speed limit of 80km/h and Colinta Road has a 50km/h speed limit ▪ T-bone crashes may result in impacts close to where motorists are sitting. It is worth noting that we expect rear-end crashes to be less severe than T-bone crashes. Further, as sight distances are good, it is likely that approaching motorists would be able to brake / slow prior to colliding with another vehicle. This could result in lower crash severity.

In summary, the Risk 1 score has been determined to be 'medium' both with and without the development. Accordingly, no works are required at Intersection 1 to offset development induced safety impacts related to Risk 1.

6.1.3 Risk 2: Increased Motorists Turning Right & Left from Colinta Road into Ron Mclean Drive (Intersection 1)

An assessment of Risk 2 has been undertaken in accordance with TMR's GTIA. The results are summarised in Table 6.2.

Table 6.2: Safety Risk Assessment – Risk 2

Risk Item	Without Development			With Development			Comments
	Likelihood	Consequence	Risk Score	Likelihood	Consequence	Risk Score	
2	2	4	M	3	4	M	The likelihood of the risk <u>without the development</u> has been identified as 'unlikely' for the following key reasons: ▪ A review of publicly available crash data indicates that there have been no crashes recorded at the intersection in the last five (5) years. ▪ The assessed intersection operates well with low average delays, queues and DOS ▪ Sight distances are good. The likelihood of the risk <u>with the development</u> is expected to increase slightly and has therefore been identified as 'moderate'. The key reasons for this are as follows: ▪ The development is expected to minorly increase traffic volumes at the intersection ▪ Notwithstanding traffic increases resulting from the development, the intersection is still expected to operate with a low DOS. Average delays and queues are also expected to be low. The severity of the risk has been identified as 'Hospitalisation' for the following key reasons: ▪ Ron Mclean Drive has a speed limit of 80km/h and Colinta Road has a 50km/h speed limit ▪ T-bone crashes may result in impacts close to where motorists are sitting. It is worth noting that we expect rear-end crashes to be less severe than T-bone crashes. Further, as sight distances are good, it is likely that approaching motorists would be able to brake / slow prior to colliding with another vehicle. This could result in lower crash severity.

In summary, the Risk 2 score has been determined to be 'medium' both with and without the development. Accordingly, no works are required at Intersection 1 to offset development induced safety impacts related to Risk 2.

6.1.4 Risk 3: Increased Motorists Turning Right & Left from Ron Mclean Drive into The Bruce Highway (Intersection 2)

An assessment of Risk 3 has been undertaken in accordance with TMR's GTIA. The results are summarised in Table 6.3.

Table 6.3: Safety Risk Assessment – Risk 3

Risk Item	Without Development			With Development			Comments
	Likelihood	Consequence	Risk Score	Likelihood	Consequence	Risk Score	
3	2	4	M	3	4	M	The likelihood of the risk <u>without the development</u> has been identified as 'unlikely' for the following key reasons: ▪ A review of publicly available crash data indicates that there has been one (1) crash recorded at the intersection in the last five (5) years. It is noted that this crash was a rear end crash. ▪ The assessed intersection operates well with low average delays, queues and DOS ▪ Sight distances are good. The likelihood of the risk <u>with the development</u> is expected to increase slightly and has therefore been identified as 'moderate'. The key reasons for this are as follows: ▪ The development is expected to minorly increase traffic volumes at the intersection ▪ Notwithstanding traffic increases resulting from the development, the intersection is still expected to operate with a low DOS. Average delays and queues are also expected to be low. The severity of the risk has been identified as 'Hospitalisation' for the following key reasons: ▪ Ron Maclean Drive and the Bruce Highway have 80km/h speed limits ▪ T-bone crashes may result in impacts close to where motorists are sitting. It is worth noting that we expect rear-end crashes to be less severe than T-bone crashes. Further, as sight distances are good, it is likely that approaching motorists would be able to brake / slow prior to colliding with another vehicle. This could result in lower crash severity.

In summary, the Risk 3 score has been determined to be 'medium' both with and without the development. Accordingly, no works are required at Intersection 2 to offset development induced safety impacts related to Risk 3.

6.1.5 Risk 4: Increased Motorists Turning Right & Left from The Bruce Highway into Ron Mclean Drive (Intersection 2)

An assessment of Risk 4 has been undertaken in accordance with TMR's GTIA. The results are summarised in Table 6.4.

Table 6.4: Safety Risk Assessment – Risk 4

Risk Item	Without Development			With Development			Comments
	Likelihood	Consequence	Risk Score	Likelihood	Consequence	Risk Score	
4	2	4	M	3	4	M	The likelihood of the risk <u>without the development</u> has been identified as 'unlikely' for the following key reasons: ▪ A review of publicly available crash data indicates that there has been one (1) crash recorded at the intersection in the last five (5) years. It is noted that this crash was a rear end crash. ▪ The assessed intersection operates well with low average delays, queues and DOS ▪ Sight distances are good. The likelihood of the risk <u>with the development</u> is expected to increase slightly and has therefore been identified as 'moderate'. The key reasons for this are as follows: ▪ The development is expected to minorly increase traffic volumes at the intersection ▪ Notwithstanding traffic increases resulting from the development, the intersection is still expected to operate with a low DOS. Average delays and queues are also expected to be low. The severity of the risk has been identified as 'Hospitalisation' for the following key reasons: ▪ Ron Maclean Drive and the Bruce Highway have 80km/h speed limits ▪ T-bone crashes may result in impacts close to where motorists are sitting. It is worth noting that we expect rear-end crashes to be less severe than T-bone crashes. Further, as sight distances are good, it is likely that approaching motorists would be able to brake / slow prior to colliding with another vehicle. This could result in lower crash severity.

In summary, the Risk 4 score has been determined to be 'medium' both with and without the development. Accordingly, no works are required at Intersection 2 to offset development induced safety impacts related to Risk 4.

7. PAVEMENT IMPACT ASSESSMENT

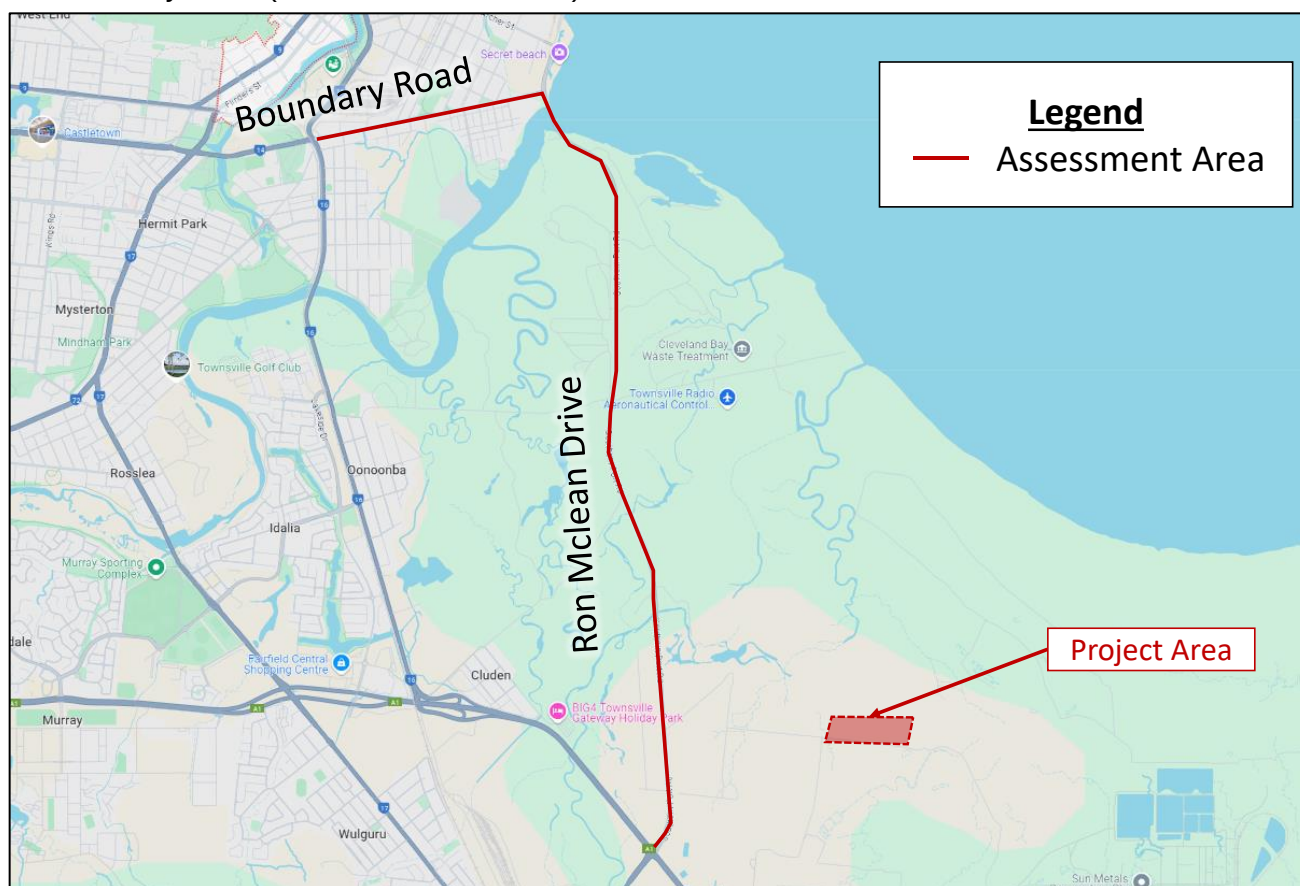
7.1 Context

In December 2017, TMR released the 'Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment' (Practice Note). The Practice Note provides a step-by-step guide on how to prepare a PIA in accordance with the GTIA. The Practice Note was prepared by Bitzios Consulting.

7.2 Impact Assessment Area

The adopted impact assessment area is illustrated below in Figure 7.1 and includes:

- Ron Mclean Drive (Southern Port Road) Road ID: 841 TDIST:0.00-7.36.
- Boundary Road (North Townsville Road) Road ID: 832 TDIST:16.51-18.84



Source: Google Maps

Figure 7.1: Pavement Impact Assessment Area

7.3 Background Traffic

Table 7.1 provides a summary of background heavy vehicle volumes and SAR4s along the subject road. SAR4s have been estimated utilising the standard conversion rate of 3.2 SAR4's / HV.

Table 7.1: Background Traffic Volumes - 2023

Road	Section	Direction	AADT	%HV	AADT_HV	SAR4s / HV
Ron Mclean Drive	0.00-0.77	Against	1,311	26.19	263	3.2
		Gazettal	1,436	18.29	343	3.2
	0.77-7.36	Against	1,311	26.19	263	3.2
		Gazettal	1,436	18.29	343	3.2
Boundary Road	16.51-16.63	Against	8,362	14.79	1237	3.2
		Gazettal	8,482	14.64	1242	3.2
	16.63-16.76	Against	1381	22.15	306	3.2
		Gazettal	1528	21.36	326	3.2
	16.76-18.84	Against	1381	22.15	306	3.2
		Gazettal	1528	21.36	326	3.2

SAR4s volumes are applied at a carriageway level based on a directional factor as per Table 7.2.

Table 7.2: Carriageway Level Directional Factor

Road	Section	Direction	Carriageway Description	Carriageway Code	Directional Factor
Ron Mclean Drive	0.00-0.77	Against (Northbound)	Divided	3	100%
		Gazettal (Southbound)	Divided	2	100%
	0.77-7.36	Against (Northbound)	Undivided	1	100%
		Gazettal (Southbound)	Undivided	1	100%
Boundary Road	16.51-16.63	Against (Westbound)	Divided	3	100%
		Gazettal (Eastbound)	Divided	2	100%
	16.63-16.76	Against (Westbound)	Undivided	1	100%
		Gazettal (Eastbound)	Undivided	1	100%
	16.76-18.84	Against (Westbound)	Undivided	1	100%
		Gazettal (Eastbound)	Undivided	1	100%

Table 7.3 calculates the background SAR4 volumes for the Warrego Highway.

Table 7.3: Background SAR4s

Road	Section	Direction	SAR4 / HV	SAR4 / Day (2023)	SAR4 / Year (2023)	Growth Rate (p.a.)	SAR4 / Year (2027)
Ron Mclean Drive	0.00-0.77	Against	3.2	1,099	401,034	0.48%	408,734
		Gazettal		841	306,769	0.00%	306,769
	0.77-7.36	Against		767	401,034	0.48%	408,734
		Gazettal		1,203	306,769	0.00%	306,769
Boundary Road	16.51-16.63	Against		3,974	1,450,381	5.18%	1,750,900
		Gazettal		3,958	1,444,512	7.02%	1,850,131
	16.63-16.76	Against		1,044	381,213	1.51%	404,238
		Gazettal		979	357,281	1.14%	373,573
	16.76-18.84	Against		1,044	381,213	1.51%	404,238
		Gazettal		979	357,281	1.14%	373,573

7.4 Development Traffic

7.4.1 Heavy Vehicle Assumptions

As per the traffic generation assumptions, 16 vehicles per day deliver to Townsville Airport, Townsville Port or to Cairns. It is understood that there will be 10 deliveries per day from the Port and six (6) deliveries per day to Townsville / Cairns Airport. It has been assumed that there is an equal split between the delivery to Townsville Airport and Cairns Airport.

Importantly, it has been assumed that each delivery will return to the point of origin with an inversed loading status. For example, if a delivery of ethanol comes from the port of Townsville to the site, then the empty truck will return to the port.

Table 7.4 summarises the key operational information for the proposed development.

Table 7.4: Heavy Vehicle Traffic Assumptions

Vehicle	Inbound Trips (Daily)		Outbound Trips (Daily)	
	Loaded	Unloaded	Loaded	Unloaded
Class 10 (B-Double)	10	6	6	10

Table 7.5 presents the SAR values for the relevant vehicle classes.

Table 7.5: Design Vehicle SAR Generation Rate

Vehicle Class	Load	SAR4	SAR5	SAR12
Class 10 (B-Double)	Loaded	6.30	7.09	17.17
	Unloaded	0.53	0.42	0.11

7.4.2 Development SAR4 Generation

Table 7.6 summarises development generated SAR4s.

Table 7.6: Heavy Vehicle SAR4 Generation

Vehicle Class	Loaded			Unloaded			Total	
	Demand	SAR4 / Veh	SAR4 / Day	Demand	SAR4 / Veh	SAR4 / Day	SAR4 / Day	SAR4 / Year
10	16	6.30	108	16	0.53	8.48	109.28	36,390

7.4.3 Development SAR5 Generation

Table 7.7 summarises development generated SAR5s.

Table 7.7: Heavy Vehicle SAR5 Generation

Vehicle Class	Loaded			Unloaded			Total	
	Demand	SAR5 / Veh	SAR5 / Day	Demand	SAR5 / Veh	SAR5 / Day	SAR5 / Day	SAR5 / Year
10	16	7.09	113.44	16	0.42	6.72	12016	40,013

7.4.4 Development Heavy Vehicle Distributions

Figure 7.2 shows assumed development heavy vehicle traffic distributions.

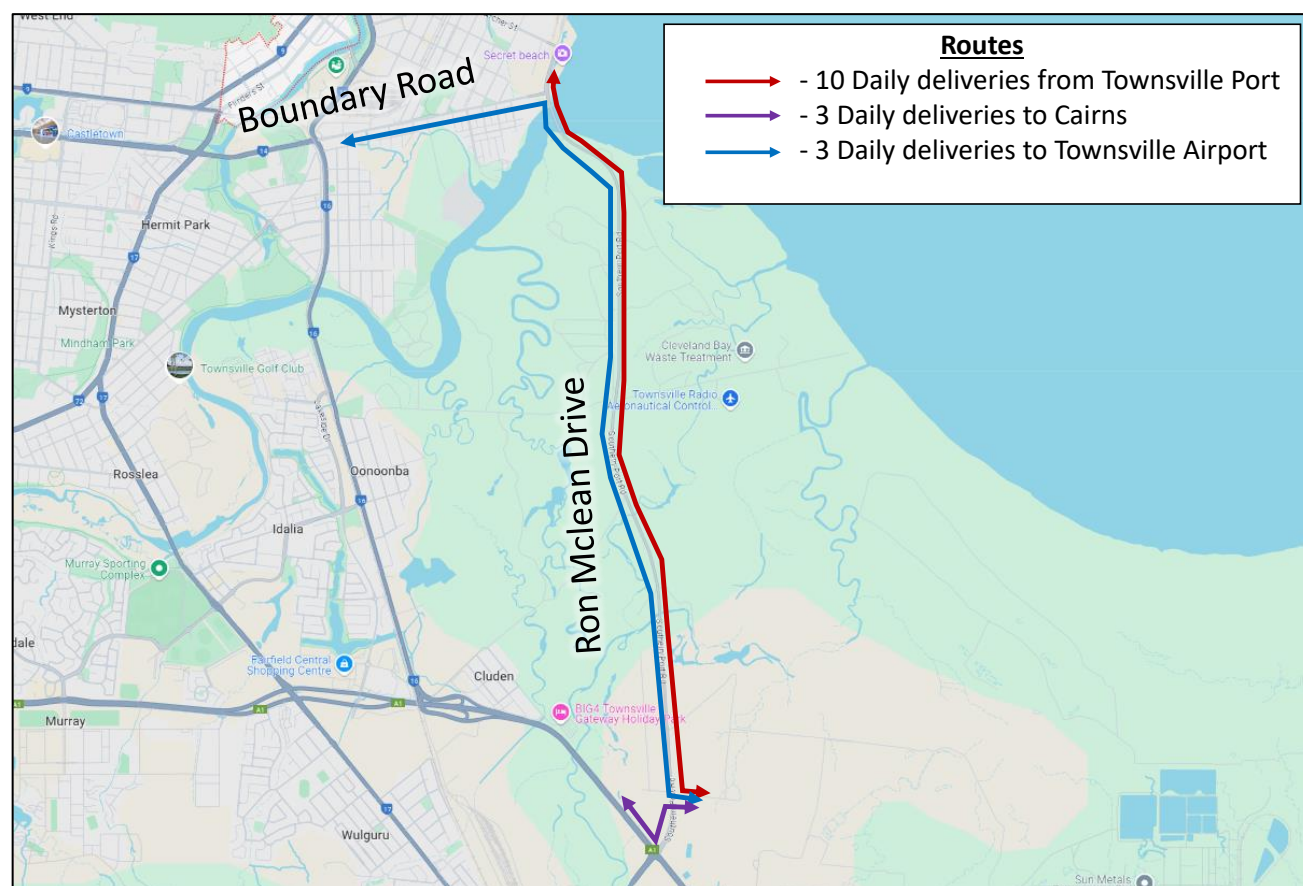


Figure 7.2: Development Heavy Vehicle Traffic Distributions

7.5 Development Pavement Impacts & Contributions

Table 7.8 summarises the pavement impacts on each segment of the impact assessment area

A detailed scoping assessment is included at **Appendix H**.

Table 7.8: Development Pavement Impacts

Road Name	Section	Direction	Background SAR4 / Year	Development SAR4 / Year	Development SAR5 / Year	Impact
Ron Mclean Drive	0.00-0.77	Against	401,034	6,294	7,083	1.54%
		Gazettal	306,769	529	420	0.17%
	0.77-7.36	Against	401,034	21,508	24,029	5.26%
		Gazettal	306,769	8,059	8,482	2.63%
Boundary Road	16.51-16.63	Against	1,850,131	6,294	7,083	0.34%
		Gazettal	1,750,900	529	420	0.03%
	16.63-16.76	Against	373,573	6,294	7,083	1.68%
		Gazettal	404,238	529	420	0.13%
	16.76-18.84	Against	373,573	6,294	7,083	1.68%
		Gazettal	404,238	529	420	0.13%

As shown above, one (1) road link has been identified where development volumes will have significant impacts (i.e. >5%). Based on the marginal costs provided, the required pavement contribution is estimated to be \$10,271.76 per year.

A copy of the pavement impact assessment outputs is included at **Appendix I**.

8. CODE RESPONSES

Responses have been prepared to State Code 6: Protection of State Transport Networks. A copy of our responses is included at **Appendix J**.

9. CONCLUSIONS & RECOMMENDATIONS

Key findings and recommendations are summarised below:

- Access to the development is proposed via a driveway crossover on Colinta Road. The driveway crossover will connect to a ~14m wide private access road
- it is expected that a driveway crossover configured generally in accordance with Council requirements can be provided
- The proposed driveway crossover location is expected to comply with AS2890.1 requirements
- It is recommended that as site planning progresses, driveway sight distances be reviewed to confirm that they will comply with AS2890.1 requirements. However, it is considered likely that sufficient sight distances will be achieved.
- It is recommended that site / car parking layout elements comply with AS2890 requirements. Importantly, it is expected that compliance with AS2890 will be easily achievable given the large size of the subject site
- The current development plans identify potentially 60 car parking spaces being provided. This will be further assessed during FEED. At this stage it is recommended that 70 car parking spaces are provided on site to support development operations. However, car parking requirements could change during FEED
- Currently proposed ethanol / SAF loading areas are considered appropriate from traffic engineering perspective. However, it is recommended that additional swept path analysis be completed to confirm servicing arrangements are suitable as planning progresses. Servicing arrangements shall also comply with AS2890 requirements.
- No upgrade works are required at the Ron Maclean Drive / Heleen Drive intersection (Intersection 1) or Bruce Highway / Flinders Highway / Ron Maclean Drive intersection (Intersection 2) to offset development related operational or safety impacts.
- A pavement impact assessment has determined that road links on Ron Maclean Drive will be significantly impacted by development traffic. Accordingly, contributions to offset pavement impacts are required.

Based on the above, there are no traffic engineering related matters to preclude approval of the development subject to reasonable and relevant conditions.

10. REFERENCES

State of Queensland, The Department of State Development, Manufacturing, Infrastructure and Planning (2019). *Townsville State Development Area Development Scheme*. [online] Available at: https://www.statedevelopment.qld.gov.au/__data/assets/pdf_file/0024/33684/townsville-development-scheme-2019.pdf.

Australian / New Zealand Standard Joint Technical Committee CE-001, Parking Facilities (2004). *AS2890.1:2004 Parking Facilities Part 1: Off-street car parking*. Standards Australia and Standards New Zealand.

Australian Standard Technical Committee CE-001, Parking Facilities (2018). *AS2890.2:2018 Parking Facilities Part 2: Off-street commercial vehicle facilities*. SAI Global Pty Limited under licence from Standards Australia Limited.

Department of Transport and Main Roads (2024). *Queensland Transport and Roads Investment Program (QTRIP) 2024-25 to 2027-28 - Queensland Transport and Roads Investment Program (QTRIP) 2024-25 to 2027-28 - Publications | Queensland Government*. [online] Available at: <https://www.tmr.qld.gov.au/qtriponline>.
<https://www.publications.qld.gov.au/dataset/queensland-transport-and-roads-investment-program-qtrip-2024-25-to-2027-28/resource/e2f11e9c-f59c-4292-a5cf-f35716d083dc>.

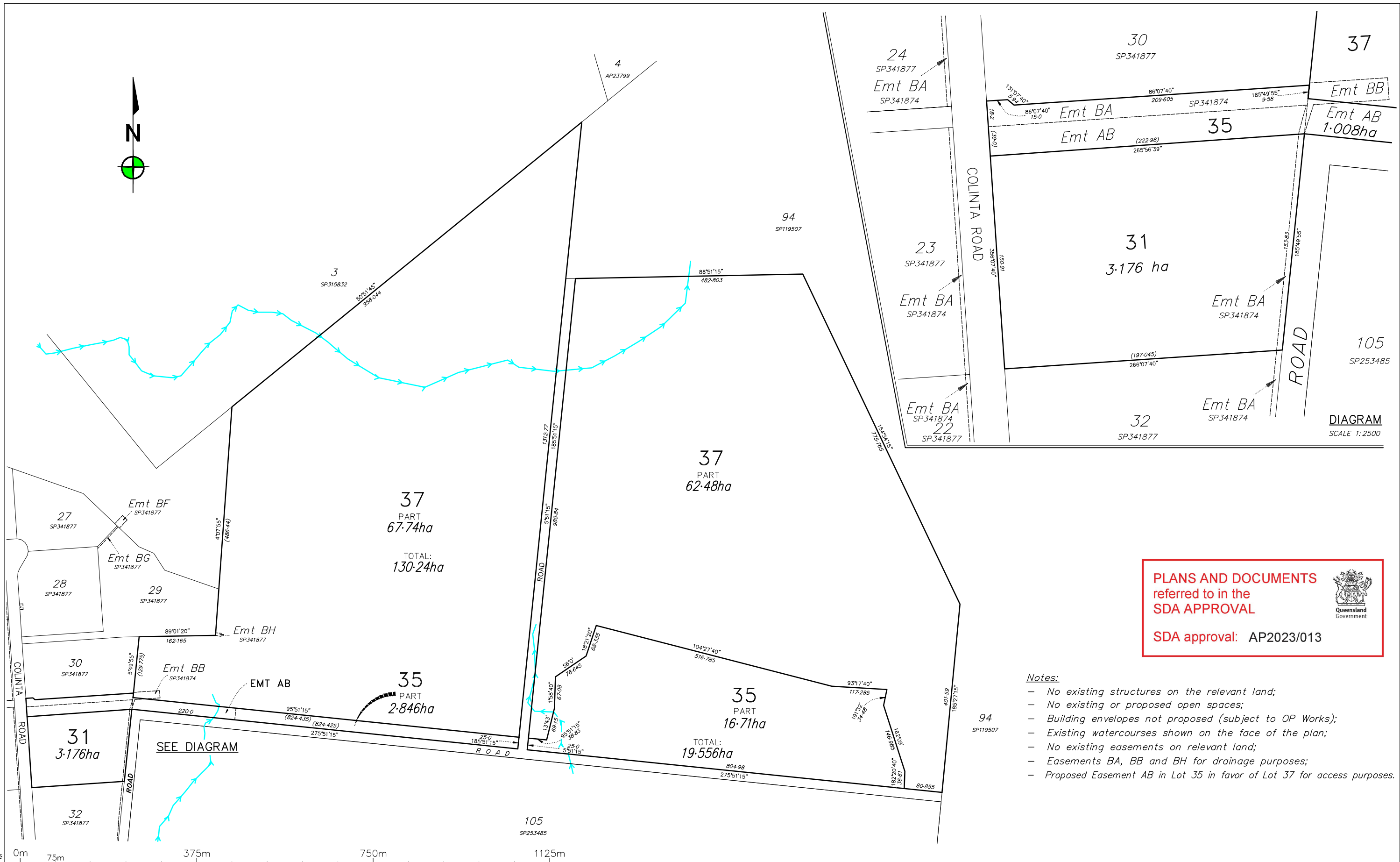
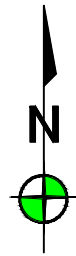
Ngoo, F. (2020). *Cleveland Bay Industrial Park Proposed Industrial Development, Traffic Impact Assessment*. Langtree Consulting.

State of Queensland (Department of Transport and Main Roads) (2018). *Guide to Traffic Impact Assessment*. [online] Available at: https://www.tmr.qld.gov.au/_/media/722c75d8ec464fd8a2e187361a9e853f.pdf?rev=b4e12e626a364a8eaf0afc0d427c268b&sc_lang=en&extension=pdf&size=1275326&hash=6F61A933244FEB46E729A57CEFC4A259.

Townsville City Council (2024). *Townsville City Plan - Version 2024/01*. [online] Available at: <https://planningscheme.townsville.qld.gov.au/planningscheme/current>.

Appendix A: Approved ROL Plan





PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL

SDA approval: AP2023/013


Queensland
Government

- Notes:
- No existing structures on the relevant land;
 - No existing or proposed open spaces;
 - Building envelopes not proposed (subject to OP Works);
 - Existing watercourses shown on the face of the plan;
 - No existing easements on relevant land;
 - Easements BA, BB and BH for drainage purposes;
 - Proposed Easement AB in Lot 35 in favor of Lot 37 for access purposes.

Plotted 19/12/2023 2:22 PM			
REVISIONS			
B	BC	19/12/2023	Amendments after registration of St 2
A	RG	21/08/2023	Easement AB added.
O	RG	17/08/2023	Original Issue
REV	BY	DATE	DESCRIPTION

NOTES
Property boundaries, areas and dimensions are approximate only and are subject to survey.

ACAD REF F:\43800\43811\Cd90\43811_83B.dwg



LEVEL DATUM: AHD(Der)
REF BM No: PM53476
REDUCED LEVEL: 7.945
LOCATION: Lot 5 on SP273456

AZIMUTH: MGA°94
SURVEYOR: RSPL
DRAWN: Romy Chebosu
SIGNED BY: Ben Cook


22 Gordon Street Garbutt, Townsville.
Ph:(07) 47755077 surveyors@rowlands.net.au

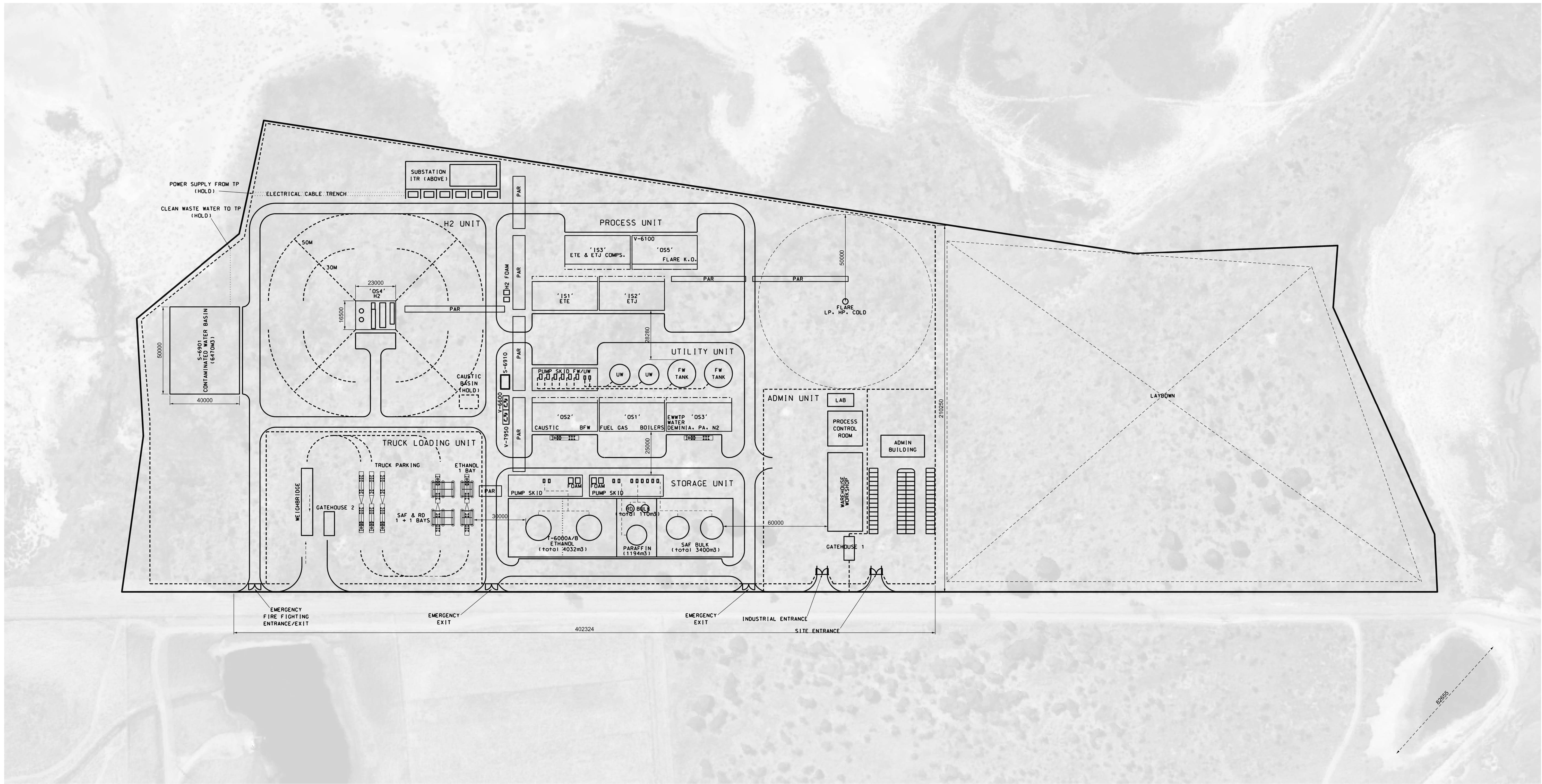
Cleveland Bay Industrial Park Pty Ltd
Colinta Road, Stuart
Proposed Reconfiguration Lots 31, 35 and 37
cancelling future Lots 31 and 35

SCALE 1:7500@A3
PASSED 
DATE 19/12/2023
SHEET 1 OF 1

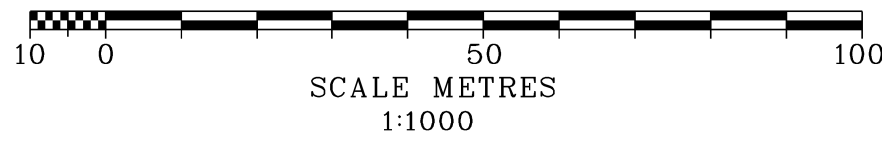
43811/83
B

Appendix B: Proposed Development Plans



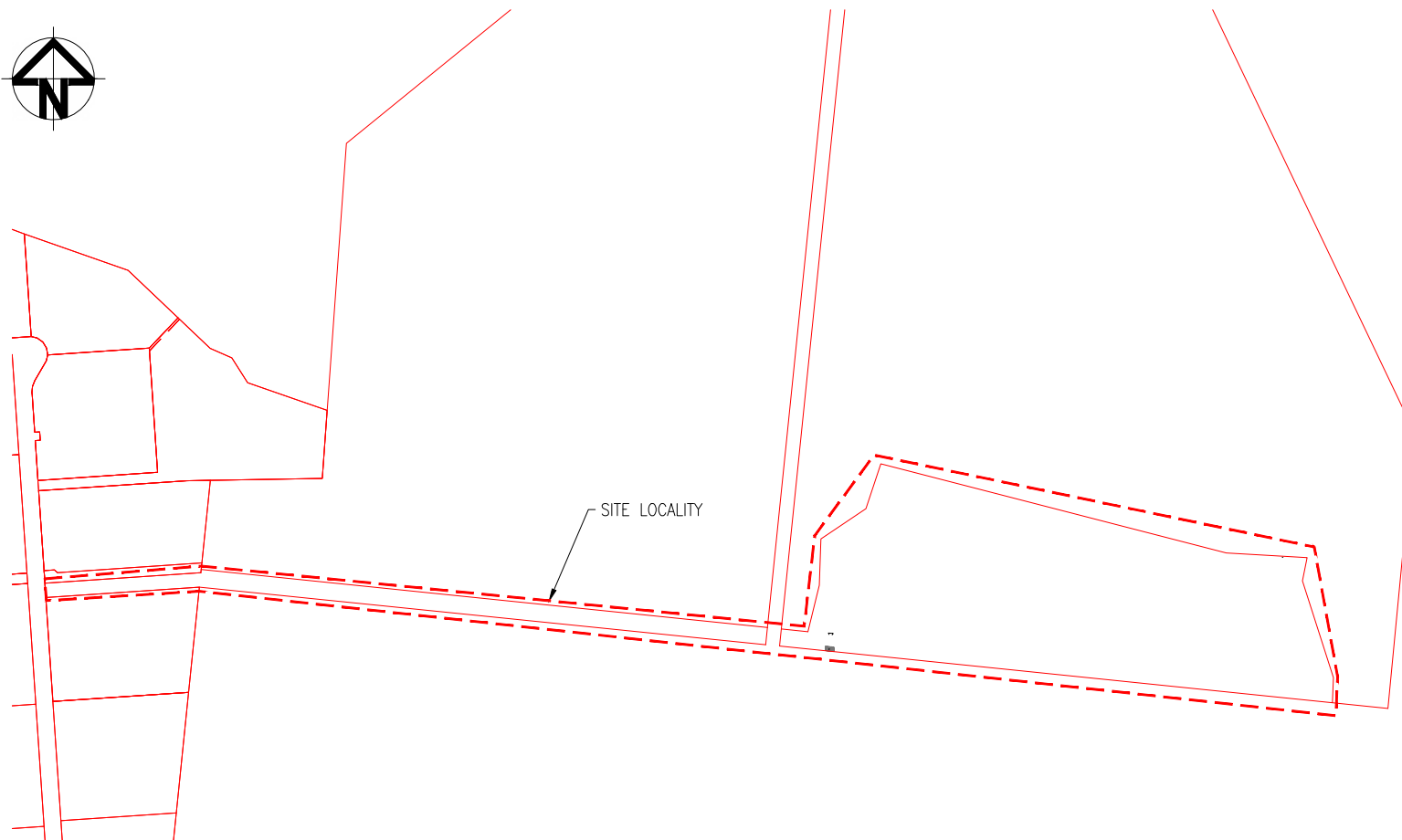


CLIENT Doc. Ref.		REVISION	FO
T.EN. Doc. Ref.			A



Appendix C: Access Concept





DRAWING INDEX		
DRAWING NUMBER	DRAWING NAME	REVISION
1241-001	TITLE PAGE, DRAWING SCHEDULE AND LOCALITY PLAN	2
1241-002	NOTES AND TYPICAL CROSS SECTION PLAN	1
1241-010	ROAD LAYOUT AND LONG SECTION – SHEET 1 OF 4	1
1241-011	ROAD LAYOUT AND LONG SECTION – SHEET 2 OF 4	1
1241-012	ROAD LAYOUT AND LONG SECTION – SHEET 3 OF 4	1
1241-013	ROAD LAYOUT AND LONG SECTION – SHEET 4 OF 4	2
1241-014	CROSS SECTION – SHEET 1 OF 6	1
1241-015	CROSS SECTION – SHEET 2 OF 6	1
1241-016	CROSS SECTION – SHEET 3 OF 6	1
1241-017	CROSS SECTION – SHEET 4 OF 6	1
1241-018	CROSS SECTION – SHEET 5 OF 6	1
1241-019	CROSS SECTION – SHEET 6 OF 6	1
1241-020	ROAD CUT/FILL PLAN	1
1241-021	EARTHWORKS LAYOUT PLAN	1
1241-022	PIPE OUTLET – SHEET 1 OF 2	1
1241-023	PIPE OUTLET – SHEET 2 OF 2	1
1241-024	EARTHWORKS CUT/FILL PLAN	1
1241-025	STORMWATER PIT DETAILS	0
1241-030	SESC PLAN – SHEET 1 OF 2	0
1241-031	SESC PLAN – SHEET 2 OF 2	0
1241-032	SESC NOTES PLAN	0

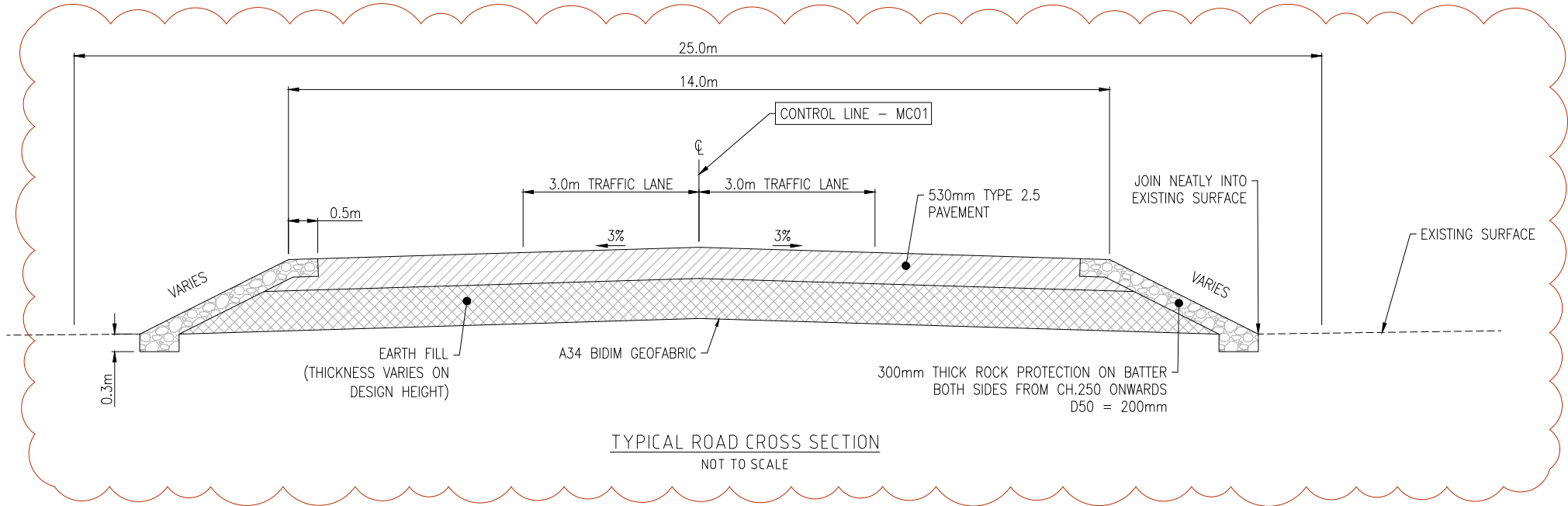
REVISIONS					HORIZ. DATUM		MGA		CERTIFICATION		 m 0400 699 979 e brett@langtreeconsulting.com.au	CLEVELAND BAY INDUSTRIAL PARK						SCALE	AS SHOWN					
					VERT. DATUM		AHD		 B. LANGTREE RPEQ 11932									TOWNSVILLE PORT ROAD, STUART FAR EAST DEVELOPMENT						SHEET
	2	A.R.	19.09.24	RESPONSE TO CONDITIONS		DRG. FILE				DATE		COPYRIGHT © These designs and drawings are copyright and are not to be used or reproduced without the written permission of LANGTREE CONSULTING PTY LTD (ACN 29 611 368 024). The contents of this drawing are electronically generated, are confidential and may only be used for the purpose for which they were intended. This is an uncontrolled document issued for information purposes only, unless the checked sections are signed and approved. Figured dimensions take precedence over scale. Do not scale from this drawing.												REVISION
	0	A.R.	27.08.24	DRAWINGS AMENDED		DESIGN		A.REINAUDO		28.05.24								TITLE PAGE, DRAWING SCHEDULE AND LOCALITY PLAN						DRG No.
	1	A.R.	28.05.24	FOR OPW APPLICATION		DRAWN		A.REINAUDO		28.05.24														
No.	BY	DATE	DESCRIPTION																					

CONSTRUCTION NOTES:
GENERAL:

1.
- ALL WORKS AND MATERIALS MUST BE IN ACCORDANCE WITH CURRENT LOCAL AUTHORITY POLICIES, SPECIFICATIONS, STANDARD DRAWINGS AND AUSTRALIAN STANDARDS.
2.
- THE CONTRACTOR MUST TAKE ALL NECESSARY MEASURES TO PROTECT NEARBY PROPERTY OWNERS FROM DUST POLLUTION DURING ALL PHASES OF WORKS. FINISHED AREAS OF EARTHWORKS MUST BE KEPT WATERED WHERE NECESSARY UNTIL A SATISFACTORY GRASS COVER IS ACHIEVED.
3.
- ALL CONSTRUCTION WORKS ARE TO BE JOINED NEATLY TO EXISTING SURFACE.
4.
- PUBLIC UTILITIES – DESPITE THE POSITION OF PUBLIC UTILITIES, FITTINGS, PIPES, POLES, MANHOLES, ETC MAY BE INDICATED ON THE DRAWINGS, NO RESPONSIBILITY WILL BE ACCEPTED BY THE PRINCIPLE FOR THE ACCURACY OF HE REPRESENTATION OR THE OMISSION THEREOF.
5.
- LOCATION AND LEVEL OF EXISTING SERVICES AND STRUCTURES HAS BEEN PLOTTED FROM AVAILABLE RECORDS AND IS TO BE CONSIDERED INDICATIVE ONLY. THE CONTRACTOR MUST ACCURATELY LOCATE THESE ON SITE PRIOR TO COMMENCING WORKS AND MUST PROTECT ALL EXISTING SERVICES DURING CONSTRUCTION. ANY DAMAGE TO EXISTING SERVICES MUST BE REPAIRED AT THE CONTRACTORS EXPENSE.
6.
- VEGETATION OUTSIDE WORKS AREAS MUST NOT BE DISTURBED UNLESS SPECIFICALLY AUTHORISED BY THE SUPERINTENDENT.
7.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN THE STABILITY OF ANY TEMPORARY WORKS ON THE SITE.
8.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN THE STABILITY OF ANY TEMPORARY WORKS ON THE SITE.
9.
- THE CONTRACTOR MUST CONFIRM THE ACCURACY OF ALL SET OUT AND CONFIRM ALL LEVELS WITH THE SUPERINTENDENT PRIOR TO COMMENCING CONSTRUCTION.
10.
- THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE LOCAL AUTHORITY SPECIFICATIONS AND THE PROJECT SPECIFICATIONS. IN THE EVENT OF A DISCREPANCY, REFER TO THE SUPERINTENDENTS FOR CLARIFICATION.
11.
- THESE DRAWINGS MUST BE READ IN CONJUNCTION WITH DRAWINGS PREPARED BY OTHER RELATED CONSULTANTS, ALL PROJECT SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE WORK. ALL THE DISCREPANCIES MUST BE REFERRED TO THE SUPERINTENDENT FOR HE DECISION BEFORE PROCEEDING WITH THE WORKS.
12.
- ALL DIMENSIONS RELEVANT TO THE SETTING OUT AND OFF-SITE WORK MUST BE AS INDICATED ON THESE DRAWINGS AND MUST BE VERIFIED BY THE CONTRACTOR BEFORE CONSTRUCTION AND/OR FABRICATION IS COMMENCED. THE ENGINEERS DRAWINGS MUST NOT BE SCALED, UNLESS SPECIFICALLY NOTED OTHERWISE.
13.
- DURING CONSTRUCTION THE CONTRACTOR MUST BE RESPONSIBLE FOR MAINTAINING PROPOSED AND EXISTING WORKS IN A STABLE CONDITION AND ENSURING NO PART MUST BE OVER STRESSED UNDER CONSTRUCTION ACTIVITIES.
14.
- SAFETY REQUIREMENTS MUST BE IN ACCORDANCE WITH WITH THE REQUIREMENTS OF THE WORKPLACE, HEALTH AND SAFETY ACT.
15.
- THE APPROVAL FOR SUBSTITUTION MAY BE SOUGHT FROM THE SUPERINTENDENT BUT IS NOT AN AUTHORISATION FOR A VARIATION. ANY VARIATION MUST BE APPROVED BY THE SUPERINTENDENT BEFORE WORK COMMENCES.
16.
- THE ACCESS FOR THE SITE MUST BE AS INDICATED ON THE CONTRACT OR AS APPROVED BY THE SUPERINTENDENT AND THE LOCAL AUTHORITIES. THE CONTRACTOR MUST OBTAIN ALL NECESSARY AND RELEVANT PERMITS. IT IS THE CONTRACTORS RESPONSIBILITY TO CONSTRUCT AND MAINTAIN THE ACCESS AS REQUIRED TO ALL PARTS OF THE CONTRACTORS WORK AREA.
17.
- THE CONTRACTORS COMPOUND MUST BE LOCATED AS APPROVED BY THE SUPERINTENDENT.
18.
- ANY WORKS WITHIN A STATE CONTROLLED ROAD RESERVE MUST BE CARRIED OUT IN ACCORDANCE WITH DTMR CURRENT SPECIFICATIONS AND STANDARD DRAWINGS.
19.
- THE CONTRACTOR MUST UNDERTAKE ALL WORKS IN PROXIMITY TO EXISTING SERVICES AND INFRASTRUCTURE IN ACCORDANCE WITH THE RELEVANT UTILITY / AUTHORITY POLICIES AND PROCEDURES.

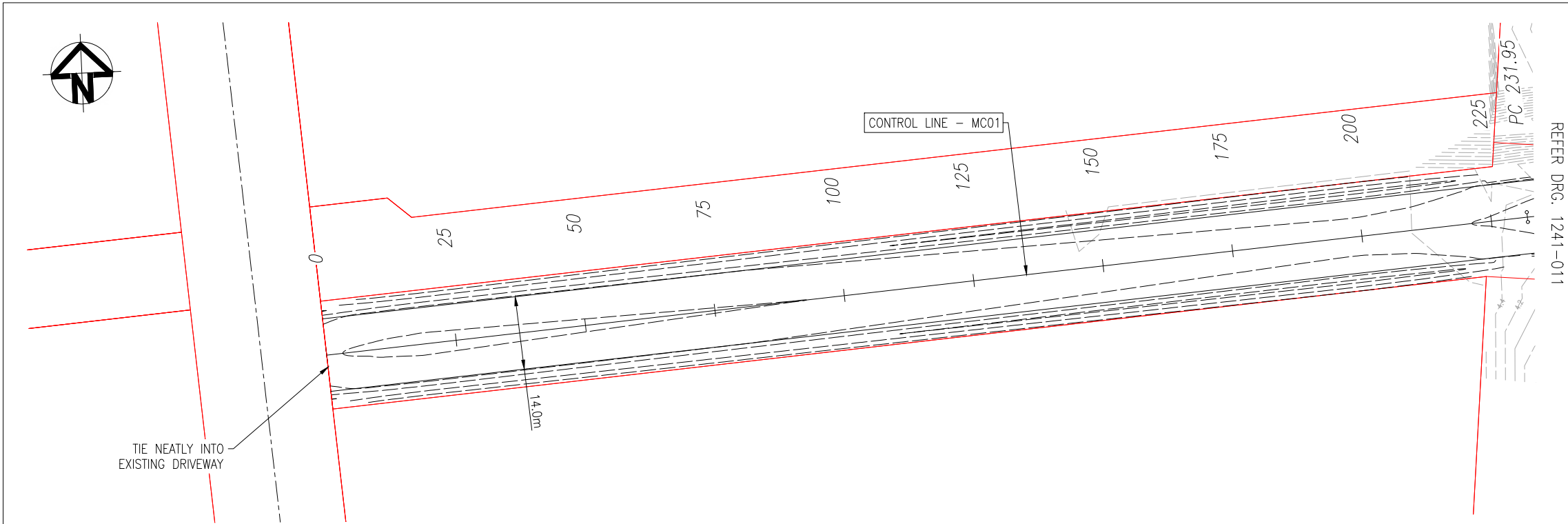
VEGETATION PROTECTION:

1.
- PRIOR TO CLEARANCE WORKS COMMENCING ON SITE. A JOINT INSPECTION MUST BE UNDERTAKEN TO IDENTIFY SELECTED TREES AND / OR SHRUBS WHICH ARE TO REMAIN UNDISTURBED. THESE MUST BE MARKED BY THE SUPERINTENDENT WITH COLOURED TAPE OR SIMILAR MARKS. THE CONTRACTOR MUST TAKE CARE NOT TO DAMAGE OR REMOVE ANY OF THESE TREES AND SHRUBS IN CARRYING OUT THE WORKS OF THE CONTRACT.
2.
- UNLESS DIRECTED BY A PROJECT ARBORIST / ECOLOGIST, WHEN WORKING WITHIN 4m OF TREES, RUBBER OR HARDWOOD GIRDLES SHOULD BE CONSTRUCTED WITH 18m BATTENS CLOSELY SPACED AND ARRANGED VERTICALLY FROM GROUND LEVEL. GIRDLES MUST BE STRAPPED TO TREES PRIOR TO CONSTRUCTION AND REMAIN UNTIL COMPLETION.
3.
- ANY TREE LOPPING REQUIRED SHOULD BE UNDERTAKEN BY A PROFESSIONAL ARBORIST.
4.
- THE CONTRACTOR IS NOT TO DISTURB OR CUT VEGETATION WITHOUT THE SUPERINTENDENTS APPROVAL.
5.
- THE CONTRACTOR MUST EMPLOY A PROFESSIONAL ARBORIST WHO MUST ASSIST WITH THE WORK TO PROTECT TREES (IF NECESSARY).



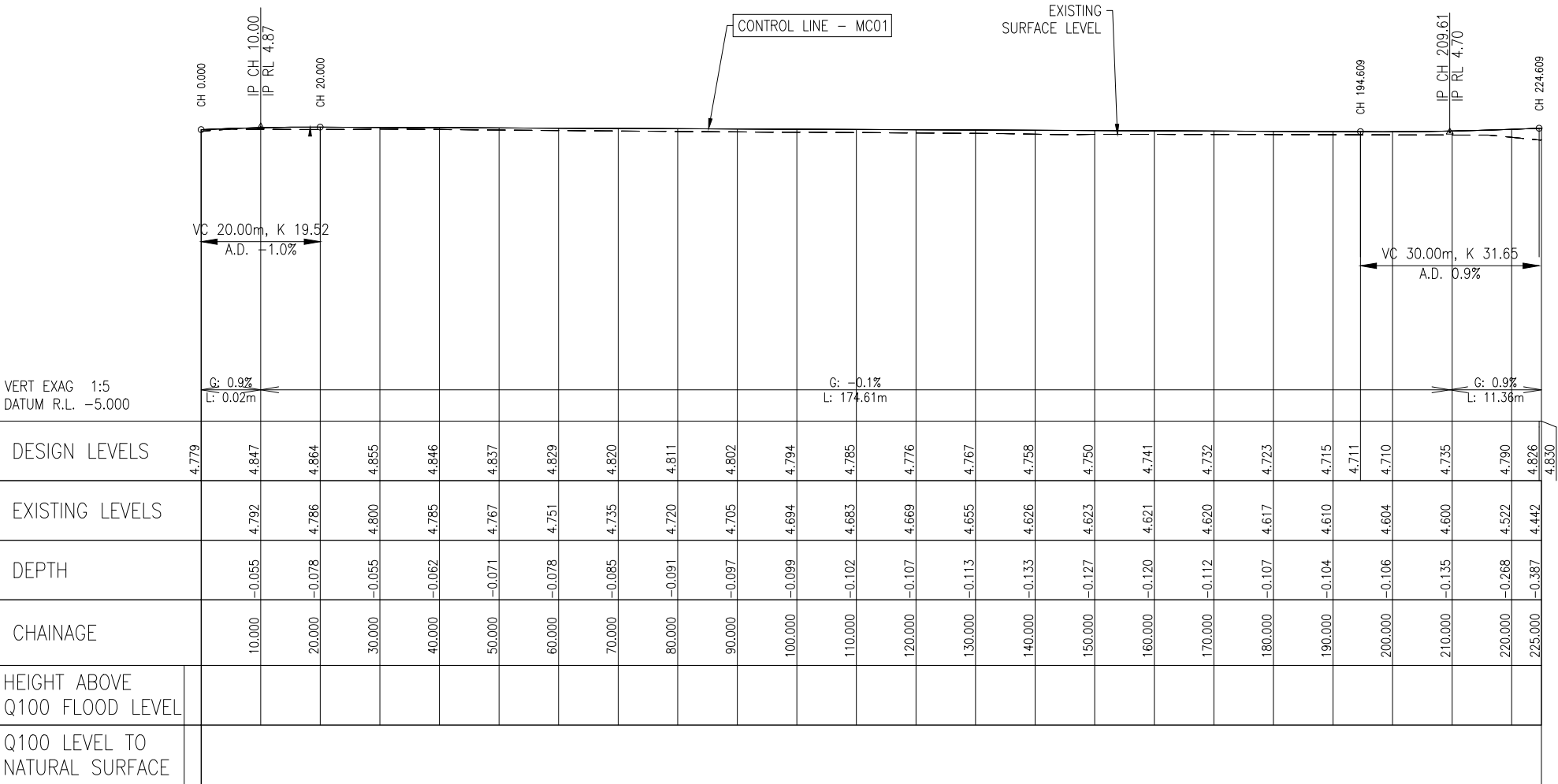
Set Out Table for Road Alignment							
TAG		CHAINAGE	EASTING	NORTHING	LENGTH	RADIUS	BEARING
L26	BP EP	0.000 231.952	84119.896 84351.318	863761.688 863777.352	231.952		086° 07' 40"
C5	TP IP TP	231.952 240.462 248.931	84351.318 84359.809 84368.275	863777.352 863777.927 863777.059	16.979	100.0	090° 59' 30.91"
L27	BP EP	248.931 1184.467	84368.275 85298.928	863777.059 863681.607	935.535		095° 51' 22"

REVISIONS					HORIZ. DATUM	MGA	CERTIFICATION  B. LANGTREE RPEQ 11932	 m 0400 699 979 e brett@langtreeconsulting.com.au	CLEVELAND BAY INDUSTRIAL PARK TOWNSVILLE PORT ROAD, STUART FAR EAST DEVELOPMENT NOTES AND TYPICAL CROSS SECTION PLAN	SCALE	AS SHOWN			
					VERT. DATUM	AHD				SHEET	2 OF 21			
	1	A.R	27.08.24	UPDATED SETOUT TABLE	DRG. FILE		DATE			REVISION	0	1		
	0	A.R	28.05.24	FOR OPW APPLICATION	DESIGN	A.REINAUDO	28.05.24							
	No.	BY	DATE	DESCRIPTION	DRAWN	A.REINAUDO	28.05.24			DRG No.	1241-002			



ROAD LAYOUT PLAN
SCALE: 1:500

- NOTES
1. REFER TO DRG. 1241-002 FOR THE TYPICAL CROSS SECTION.

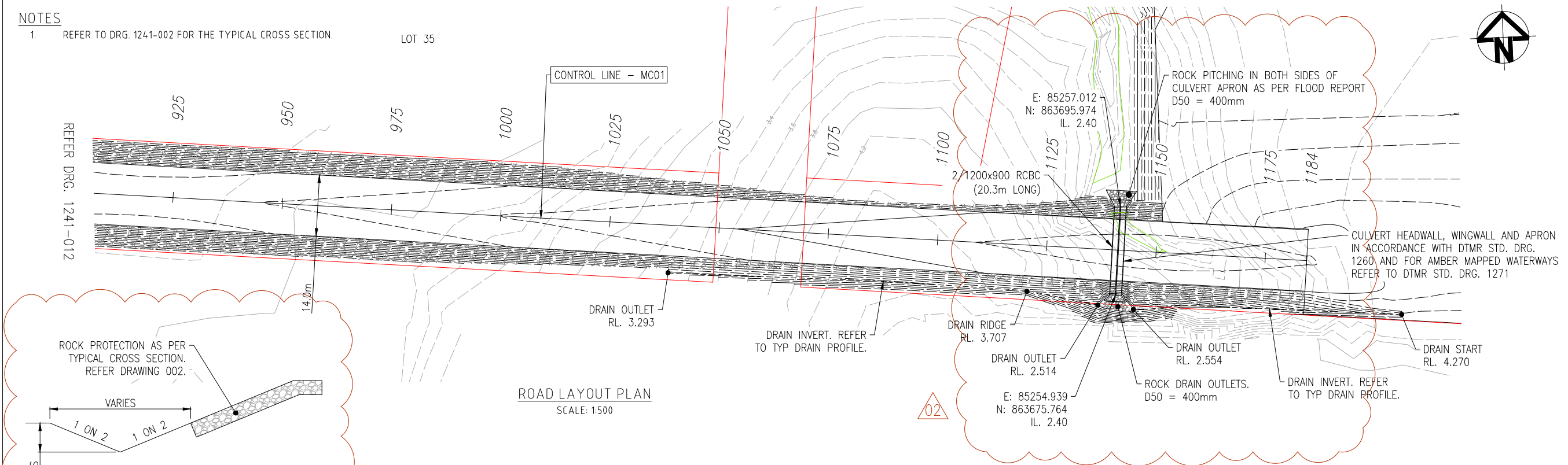
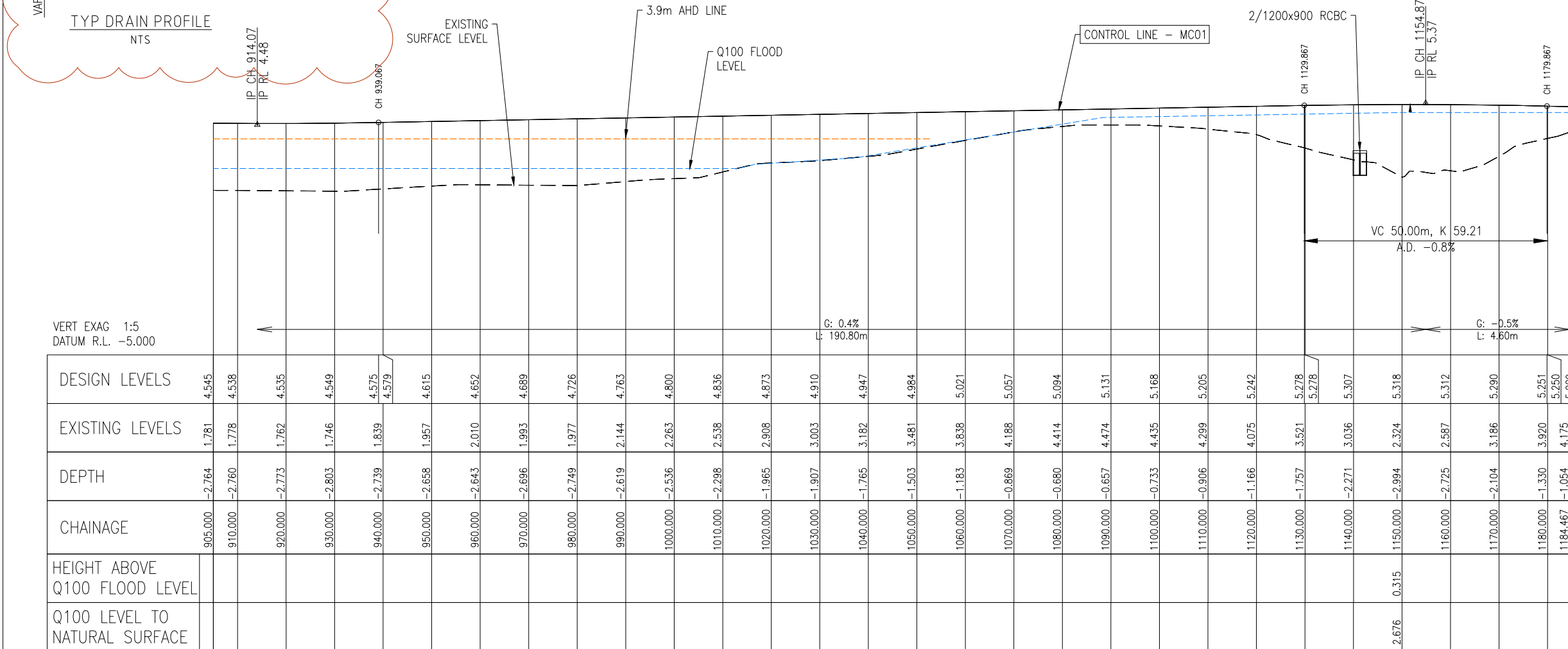


REVISED					HORIZ. DATUM		MGA		CERTIFICATION		 m 0400 699 979 e brett@langtreeconsulting.com.au	CLEVELAND BAY INDUSTRIAL PARK						SCALE	AS SHOWN				
					VERT. DATUM		AHD		 B. LANGTREE RPEQ 11932									SHEET	3 OF 21				
	1	A.R.	27.08.24	LAYOUT AND LONGSECTION AMENDMENTS		DRG. FILE				DATE		COPYRIGHT ©		REVISION		0 1							
	0	A.R.	28.05.24	FOR OPW APPLICATION		DESIGN		A.REINAUDO		28.05.24		These designs and drawings are copyright and are not to be used or reproduced without the written permission of LANGTREE CONSULTING PTY LTD (ACN 29 611 368 024). The contents of this drawing are electronically generated, are confidential and may only be used for the purpose for which they were intended. This is an uncontrolled document issued for information purposes only, unless the checked sections are signed and approved. Figured dimensions take precedence over scale. Do not scale from this drawing.		DRG No.		1241-010							
	No. REVISED	BY	DATE	DESCRIPTION		DRAWN		A.REINAUDO		28.05.24				TOWNSVILLE PORT ROAD, STUART FAR EAST DEVELOPMENT ROAD LAYOUT AND LONG SECTION – SHEET 1 OF 3									

NOTES

1. REFER TO DRG. 1241-002 FOR THE TYPICAL CROSS SECTION.

LOT 35

ROAD LAYOUT PLAN
SCALE: 1:500VERT EXAG 1:5
DATUM R.L. -5.000

DESIGN LEVELS	4.545	4.538		4.535		4.549	4.575	4.579		4.615		4.652		4.689		4.726		4.763		4.800		4.836		4.873		4.910		4.947		4.984		5.021		5.057		5.094		5.131		5.168		5.205		5.242		5.278	5.278		5.307		5.318		5.312		5.290		5.251	5.250
EXISTING LEVELS	1.781	1.778		1.762		1.746	1.839		1.957		2.010		1.993		1.977		2.144		2.263		2.538		2.908		3.003		3.182		3.481		3.838		4.188		4.414		4.474		4.435		4.299		4.075		3.521		3.036		2.324		2.587		3.186		3.920	4.175		
DEPTH	-2.764	-2.760		-2.773		-2.803	-2.739		-2.658		-2.643		-2.696		-2.749		-2.619		-2.536		-2.298		-1.965		-1.907		-1.765		-1.503		-1.183		-0.869		-0.680		-0.657		-0.733		-0.906		-1.166		-1.757		-2.271		-2.994		-2.725		-2.104		-1.330	-1.054		
CHAINAGE	905.000	910.000		920.000		930.000	940.000		950.000		960.000		970.000		980.000		990.000		1000.000		1010.000		1020.000		1030.000		1040.000		1050.000		1060.000		1070.000		1080.000		1090.000		1100.000		1110.000		1120.000		1130.000		1140.000		1150.000		1160.000		1170.000		1180.000	1184.467		
HEIGHT ABOVE Q100 FLOOD LEVEL																																																										
Q100 LEVEL TO NATURAL SURFACE																																																										

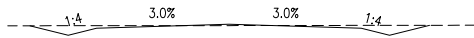
REVISIONS	No.	BY	DATE	DESCRIPTION	HORIZ. DATUM	MCA	CERTIFICATION
	2	A.R.	19.09.24	RESPONSE TO CONDITIONS	VERT. DATUM	AHD	B. LANGTREE RPEQ 11932
	1	A.R.	27.08.24	LAYOUT AND LONGSECTION AMENDMENTS	DRG. FILE	DATE	COPYRIGHT ©
	0	A.R.	28.05.24	FOR OPW APPLICATION	DESIGN	A.REINAUDO	28.05.24
					DRAWN	A.REINAUDO	28.05.24

m 0400 699 979
e brett@langtreeconsulting.com.au

CLEVELAND BAY INDUSTRIAL PARK

TOWNSVILLE PORT ROAD, STUART
FAR EAST DEVELOPMENT
ROAD LAYOUT AND LONG SECTION - SHEET 3 OF 3

SCALE	AS SHOWN
SHEET	6 OF 21
REVISION	0 1 2
DRG No.	1241 - 013



DATUM: 0.000									
PROPOSED LEVELS		4.758		4.752		4.627			
EXISTING LEVELS		4.757				4.765		4.786	
LEVEL DIFFERENCE		0.000		-0.507		-0.133		0.071	
OFFSETS		-10.523		-8.500		-7.000		0.000	

CHAINAGE 50.000



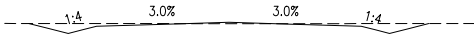
DATUM: 0.000									
PROPOSED LEVELS		4.633		4.408		4.187		4.627	
EXISTING LEVELS		4.630		4.638		4.696		4.700	
LEVEL DIFFERENCE		0.000		-0.227		-0.450		-0.002	
OFFSETS		-10.284		-9.385		-8.500		-7.000	

CHAINAGE 125.000



DATUM: 0.000									
PROPOSED LEVELS		4.601		4.125		4.500		4.624	
EXISTING LEVELS		4.600		4.603		4.602		4.627	
LEVEL DIFFERENCE		0.000		-0.477		-0.102		0.000	
OFFSETS		-10.403		-8.500		-7.000		0.000	

CHAINAGE 200.000



DATUM: 0.000									
PROPOSED LEVELS		4.796		4.534		4.462		4.792	
EXISTING LEVELS		4.800		4.799		4.788		4.794	
LEVEL DIFFERENCE		-0.002		-0.263		-0.326		-0.002	
OFFSETS		-10.588		-9.538		-8.500		-7.000	

CHAINAGE 25.000



DATUM: 0.000									
PROPOSED LEVELS		4.672		4.209		4.584		4.719	
EXISTING LEVELS		4.670		4.688		4.694		4.724	
LEVEL DIFFERENCE		0.000		-0.467		-0.095		-0.005	
OFFSETS		-10.355		-8.500		-7.000		0.000	

CHAINAGE 100.000



DATUM: 0.000									
PROPOSED LEVELS		4.601		4.143		4.518		4.652	
EXISTING LEVELS		4.600		4.606		4.607		4.657	
LEVEL DIFFERENCE		0.000		-0.461		-0.087		-0.005	
OFFSETS		-10.333		-9.408		-8.500		-7.000	

CHAINAGE 175.000



DATUM: 0.000									
PROPOSED LEVELS		4.194		4.569		4.779		4.569	
EXISTING LEVELS				4.700		4.718		4.700	
LEVEL DIFFERENCE				0.050					
OFFSETS		-8.500		-7.000		0.000		7.000	

CHAINAGE 00.000



DATUM: 0.000									
PROPOSED LEVELS		4.712		4.469		4.231		4.745	
EXISTING LEVELS		4.711		4.713		4.717		4.744	
LEVEL DIFFERENCE		0.000		-0.244		-0.484		0.001	
OFFSETS		-10.427		-9.455		-8.500		-7.000	

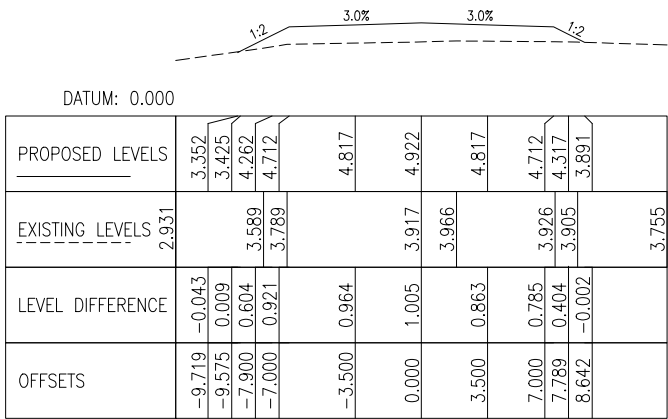
CHAINAGE 75.000



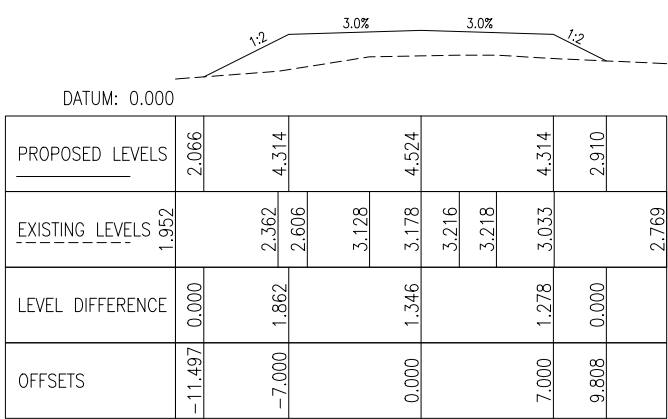
DATUM: 0.000									
PROPOSED LEVELS		4.600		4.165		4.540		4.663	
EXISTING LEVELS		4.600		4.600		4.623		4.672	
LEVEL DIFFERENCE		0.000		-0.435		-0.060		0.000	
OFFSETS		-10.241		-8.500		-7.000		0.000	

CHAINAGE 150.000

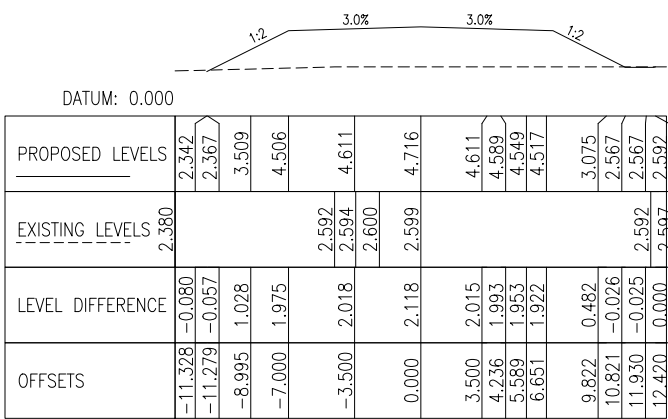
REVISIONS					HORIZ. DATUM	MCA	CERTIFICATION <i>B. Langtree</i> B.LANGTREE RPEQ 11932	Langtree Consulting m 0400 699 979 e brett@langtreeconsulting.com.au	CLEVELAND BAY INDUSTRIAL PARK	SCALE	AS SHOWN				
					VERT. DATUM	AHD				SHEET	7 OF 21				
	1	A.R	27.08.24	CROSS SECTIONS ADDED	DRG. FILE		DATE			TOWNSVILLE PORT ROAD, STUART FAR EAST DEVELOPMENT CROSS SECTION – SHEET 1 OF 6	REVISION	0	1		
	0	A.R	28.05.24	FOR OPW APPLICATION	DESIGN	A.REINAUDO	28.05.24								
	No.	BY	DATE	DESCRIPTION	DRAWN	A.REINAUDO	28.05.24					DRG No.	1241 – 014		



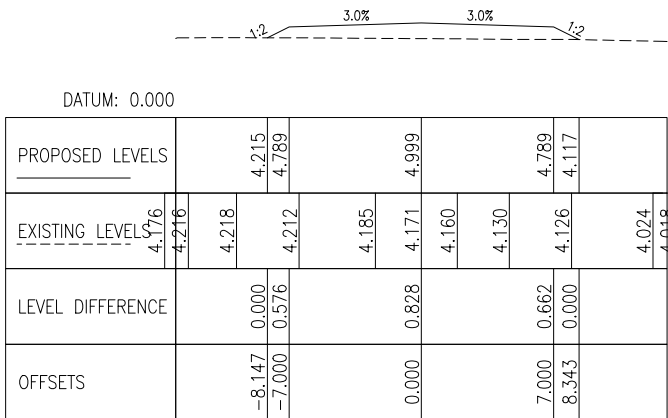
CHAINAGE 275.000



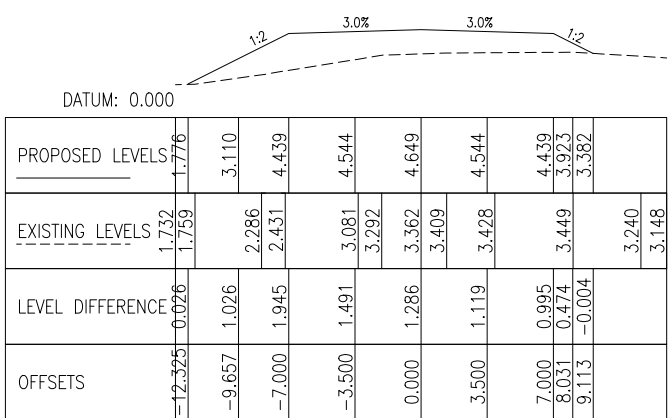
CHAINAGE 350.000



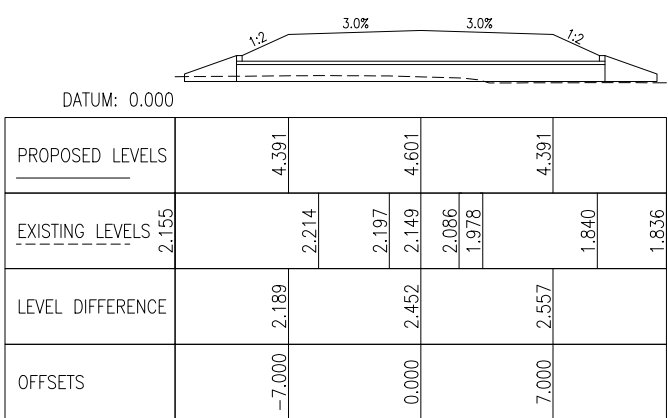
CHAINAGE 425.000



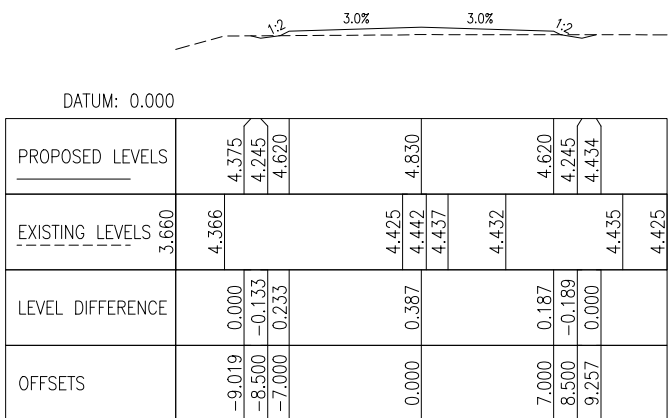
CHAINAGE 250.000



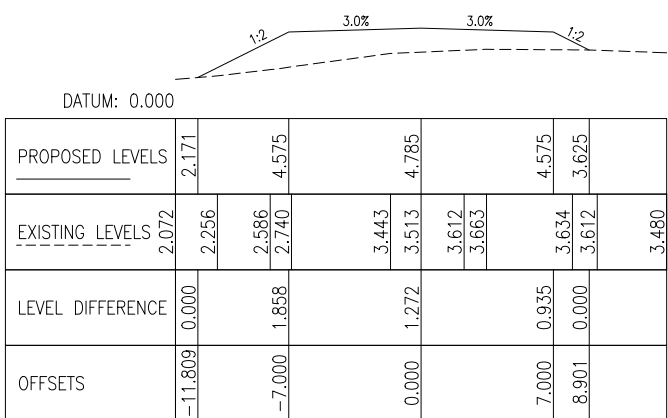
CHAINAGE 325.000



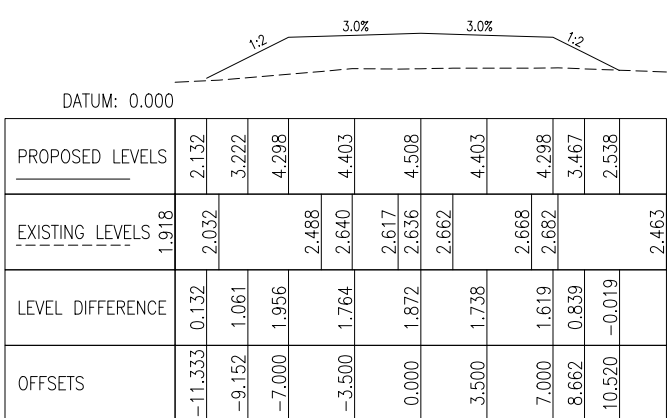
CHAINAGE 400.000



CHAINAGE 225.000

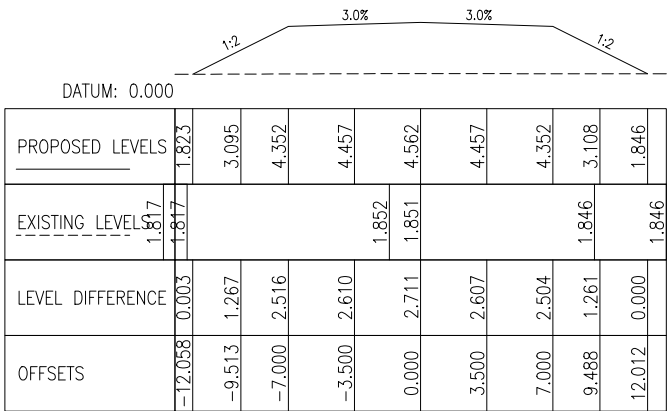


CHAINAGE 300.000

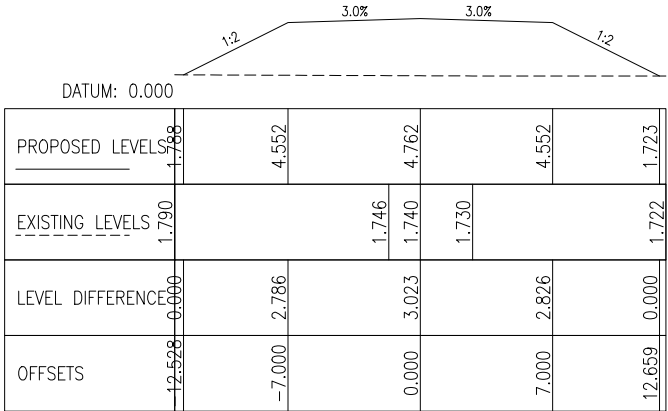


CHAINAGE 375.000

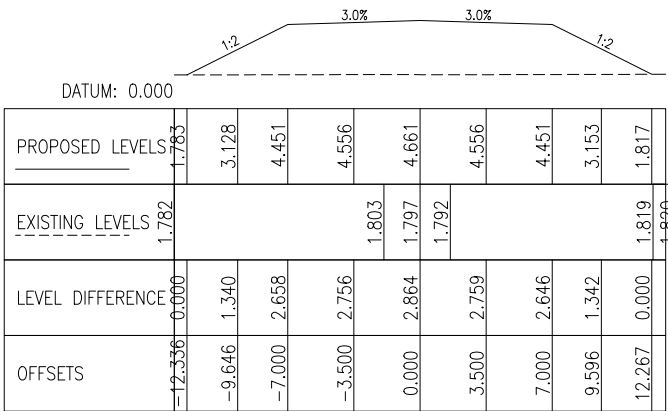
REVISIONS					HORIZ. DATUM	MGA	CERTIFICATION  B.LANGTREE RPEQ 11932 COPYRIGHT © These designs and drawings are copyright and are not to be used or reproduced without the written permission of LANGTREE CONSULTING PTY LTD (ACN 28 611 368 024). The contents of this drawing are electronically generated, are confidential and may only be used for the purpose for which they were intended. This is an uncontrolled document issued for information purposes only, unless the checked sections are signed and approved. Figured dimensions take precedence over scale. Do not scale from this drawing.	 m 0400 699 979 e brett@langtreeconsulting.com.au	CLEVELAND BAY INDUSTRIAL PARK	SCALE	AS SHOWN					
					VERT. DATUM	AHD				SHEET	9 OF 21					
	1	A.R	27.08.24	CROSS SECTIONS ADDED	DRG. FILE					DATE	REVISION	0	1			
	0	A.R	28.05.24	FOR OPW APPLICATION	DESIGN	A.REINAUDO				28.05.24						
	No. CHG	BY	DATE	DESCRIPTION	DRAWN	A.REINAUDO				28.05.24	DRG No.	1241 – 016				



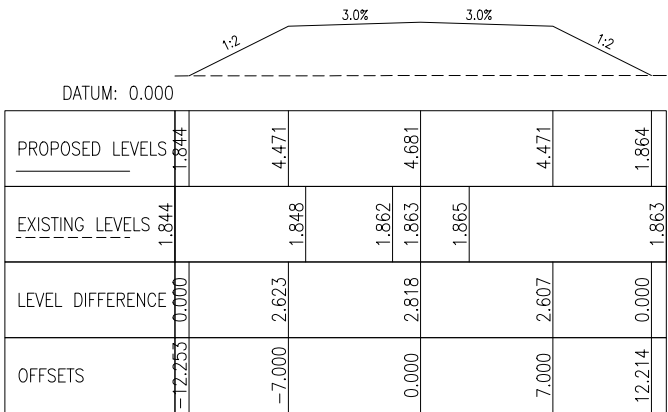
CHAINAGE 725.000



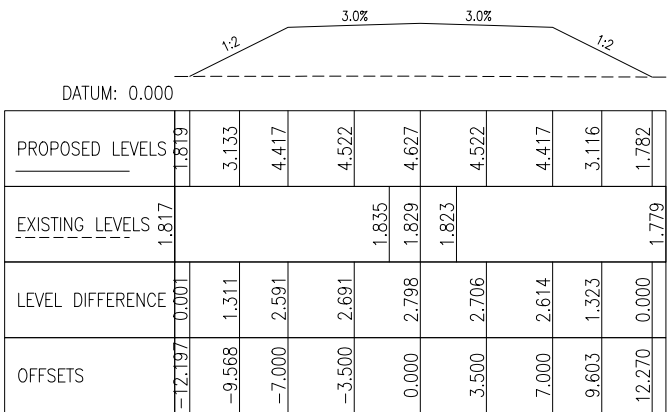
CHAINAGE 800.000



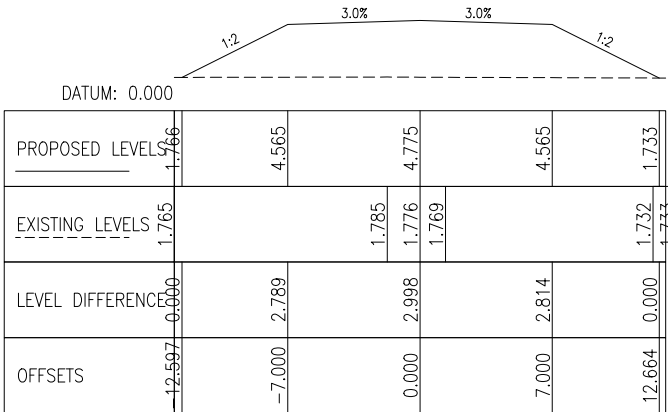
CHAINAGE 875.000



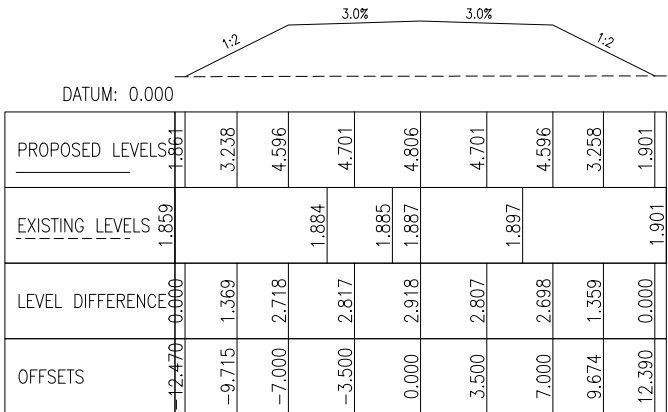
CHAINAGE 700.000



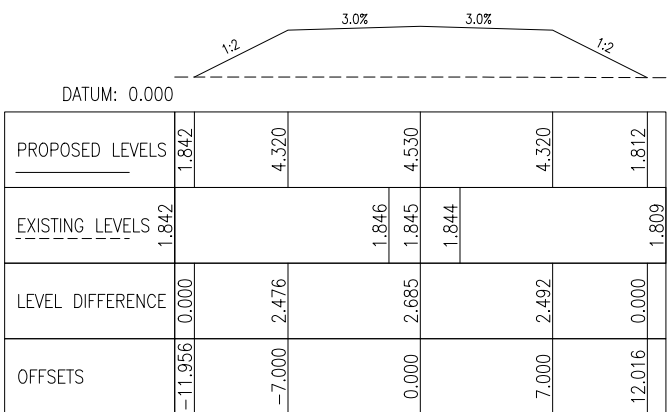
CHAINAGE 775.000



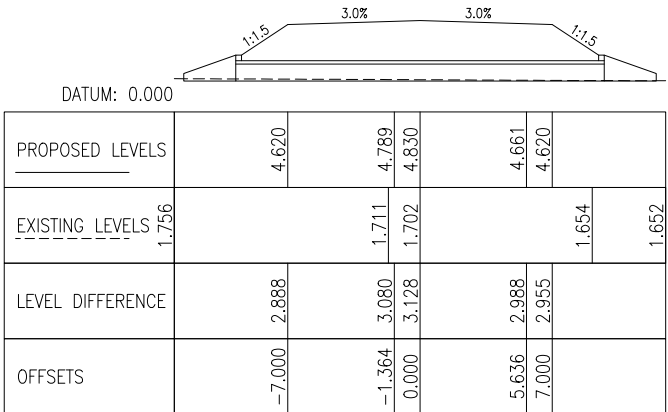
CHAINAGE 850.000



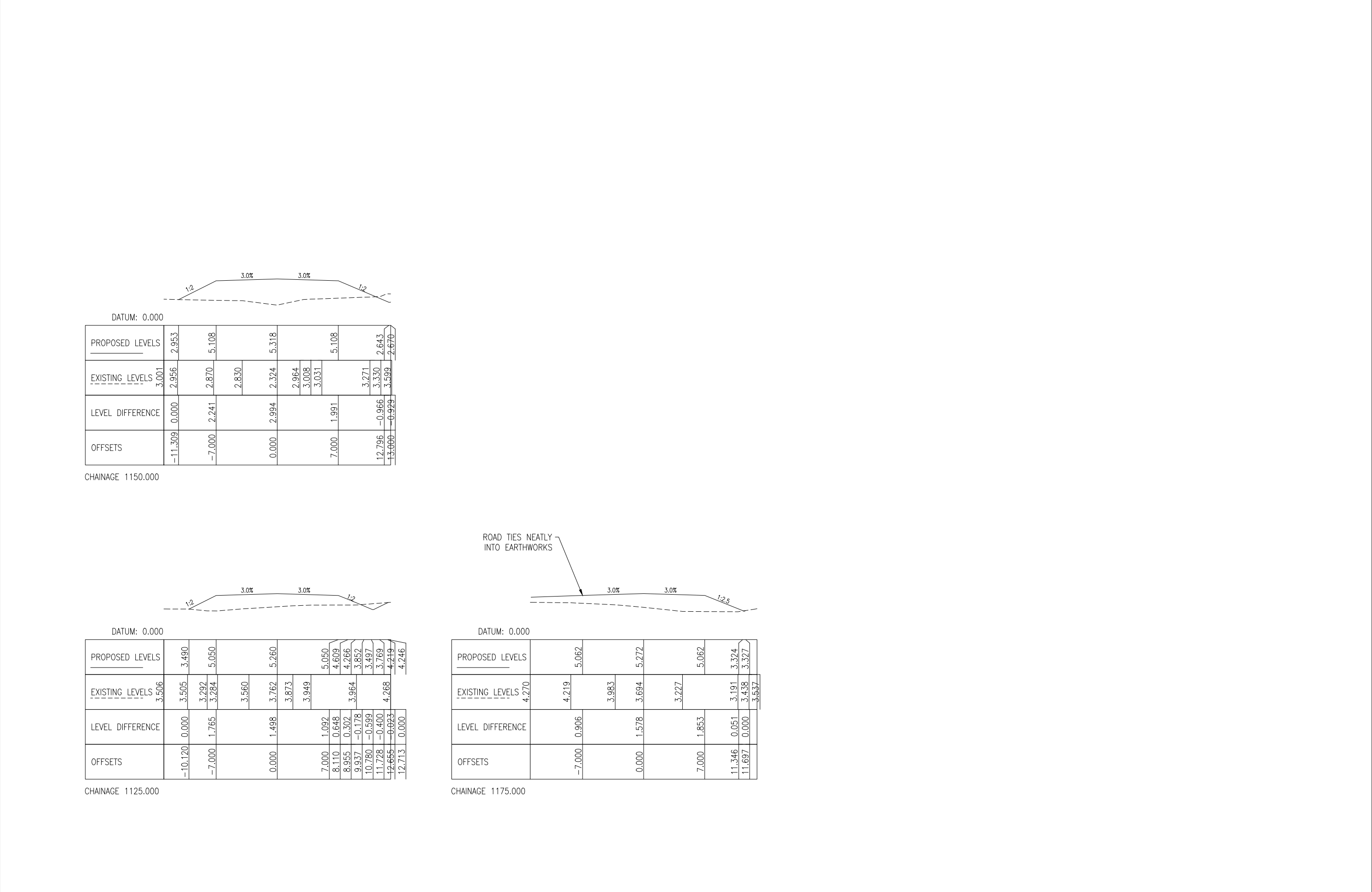
CHAINAGE 675.000



CHAINAGE 750.000



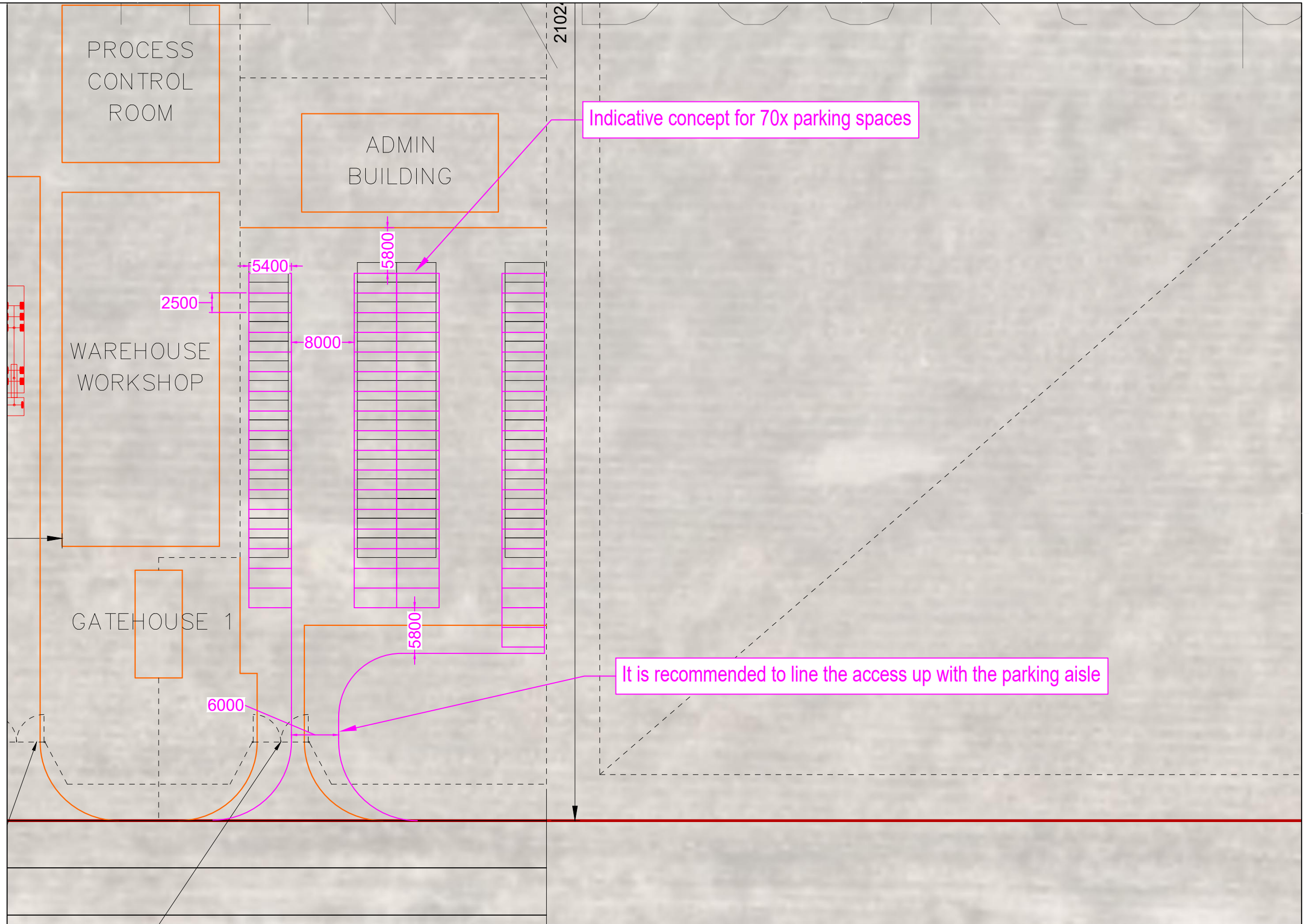
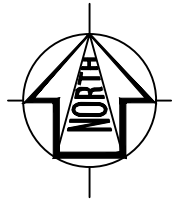
CHAINAGE 825.000



REVISIONS					HORIZ. DATUM		MGA		CERTIFICATION		 m 0400 699 979 e brett@langtreeconsulting.com.au	CLEVELAND BAY INDUSTRIAL PARK						SCALE	AS SHOWN						
					VERT. DATUM		AHD		 B. LANGTREE RPEQ 11932									SHEET	12 OF 21						
	1	A.R	27.08.24	CROSS SECTIONS ADDED	DRG. FILE				DATE			COPYRIGHT © These designs and drawings are copyright and are not to be used or reproduced without the written permission of LANGTREE CONSULTING PTY LTD (ACN 29 611 368 024). The contents of this drawing are electronically generated, are confidential and may only be used for the purpose for which they were intended. This is an uncontrolled document issued for information purposes only, unless the checked sections are signed and approved. Figured dimensions take precedence over scale. Do not scale from this drawing.		TOWNSVILLE PORT ROAD, STUART FAR EAST DEVELOPMENT CROSS SECTION – SHEET 6 OF 6						REVISION	0	1			
	0	A.R	28.05.24	FOR OPW APPLICATION	DESIGN		A.REINAUDO		28.05.24																
	No.	BY	DATE	DESCRIPTION	DRAWN		A.REINAUDO		28.05.24											DRG No.		1241 – 019			

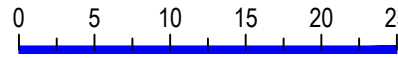
Appendix D: Car Parking Provision Concept





Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

REVISIONS		Drawn	Date
Issue	Revisions/Descriptions		
001	Review	M.E	16.12.2024

Scale @ A3  1:500

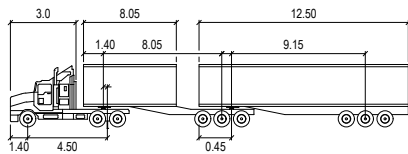
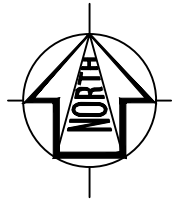
ENGINEERING CERTIFICATION (RPEQ)

Name	Signature	No.	Date

Project Jet Zero SAF Facility Townsville	Design M.E	Drawn M.E	Checked M.E
	CONCEPT ONLY		
	Date 16.12.2024		
Title Parking Concept	Project Number P6680	Sheet Number 1	Issue 001

Appendix E: Swept Path Diagrams





B-DOUBLE (26.0m) meters

Tractor Width	: 2.5	Lock to Lock Time	: 6.0
Trailer Width	: 2.5	Steering Angle	: 23.4
Tractor Track	: 2.5	Articulating Angle	: 70.0
Trailer Track	: 2.5		

DESIGN VEHICLE

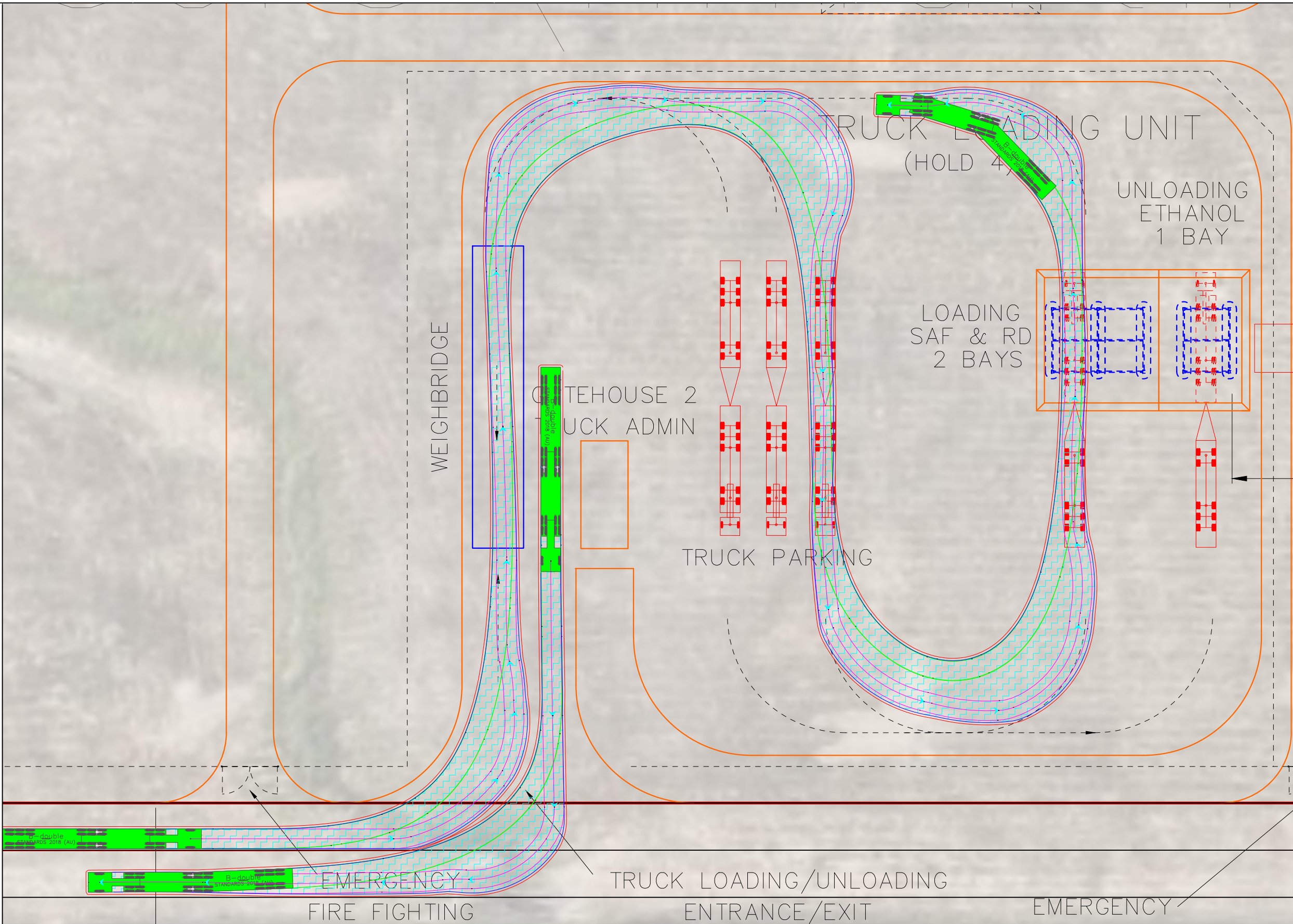


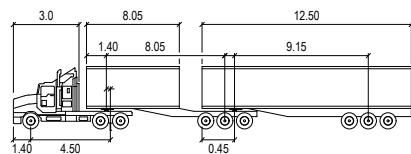
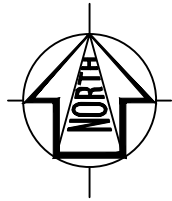
Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

REVISIONS		Drawn	Date
Issue	Revisions/Descriptions		
001	Review	M.E	16.12.2024

Scale @ A3				0	5	10	15	20	25	1:500
ENGINEERING CERTIFICATION (RPEQ)										
Name	Signature	No.	Date							

Project Jet Zero SAF Facility Townsville	Design M.E	Drawn M.E	Checked N.E
	CONCEPT ONLY		
	Project Number P6680	Sheet Number 1	Date 16.12.2024
Title Servicing Swept Paths - Sheet 1		Issue 001	





B-DOUBLE (26.0m)			
Tractor Width	: 2.5	Lock to Lock Time	: 6.0
Trailer Width	: 2.5	Steering Angle	: 23.4
Tractor Track	: 2.5	Articulating Angle	: 70.0
Trailer Track	: 2.5		

DESIGN VEHICLE



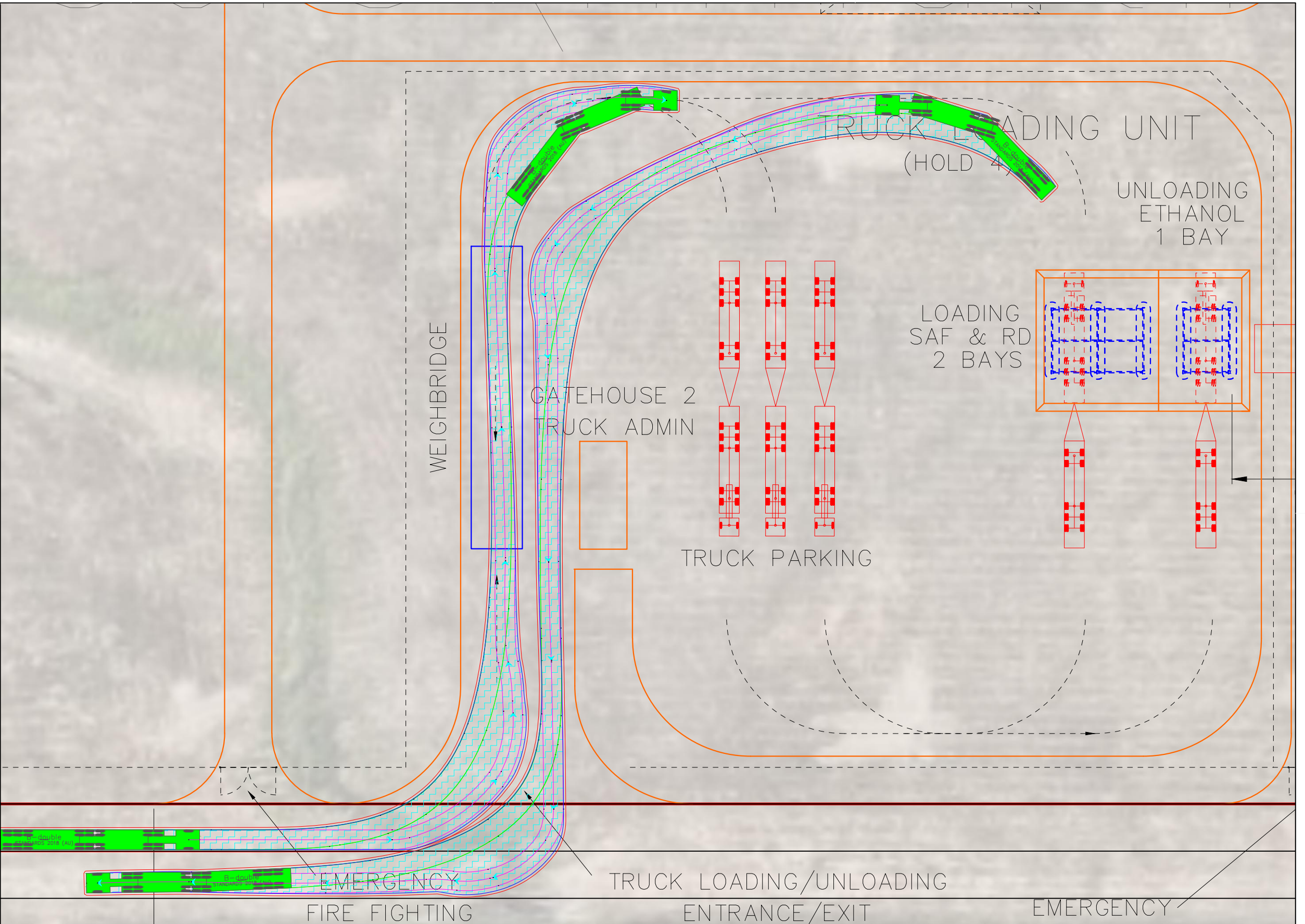
Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

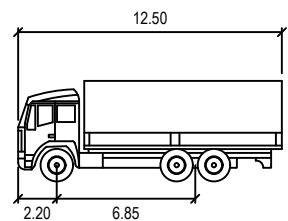
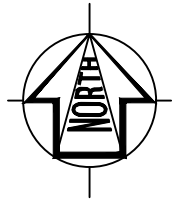
Issue	REVISIONS			Drawn	Date
	Revisions/Descriptions				
001	Review			M.E	16.12.2024

Scale @ A3 0 5 10 15 20 25 1:500

ENGINEERING CERTIFICATION (RPEQ)			
Name	Signature	No.	Date

Project Jet Zero SAF Facility Townsville	Design M.E	Drawn M.E	Checked N.E
	CONCEPT ONLY		
Title Servicing Swept Paths - Sheet 2	Project Number P6680	Sheet Number 2	Issue 001





HRV
Width : 2.50
Track : 2.50
Lock to Lock Time : 6.0
Steering Angle : 36.6

DESIGN VEHICLE

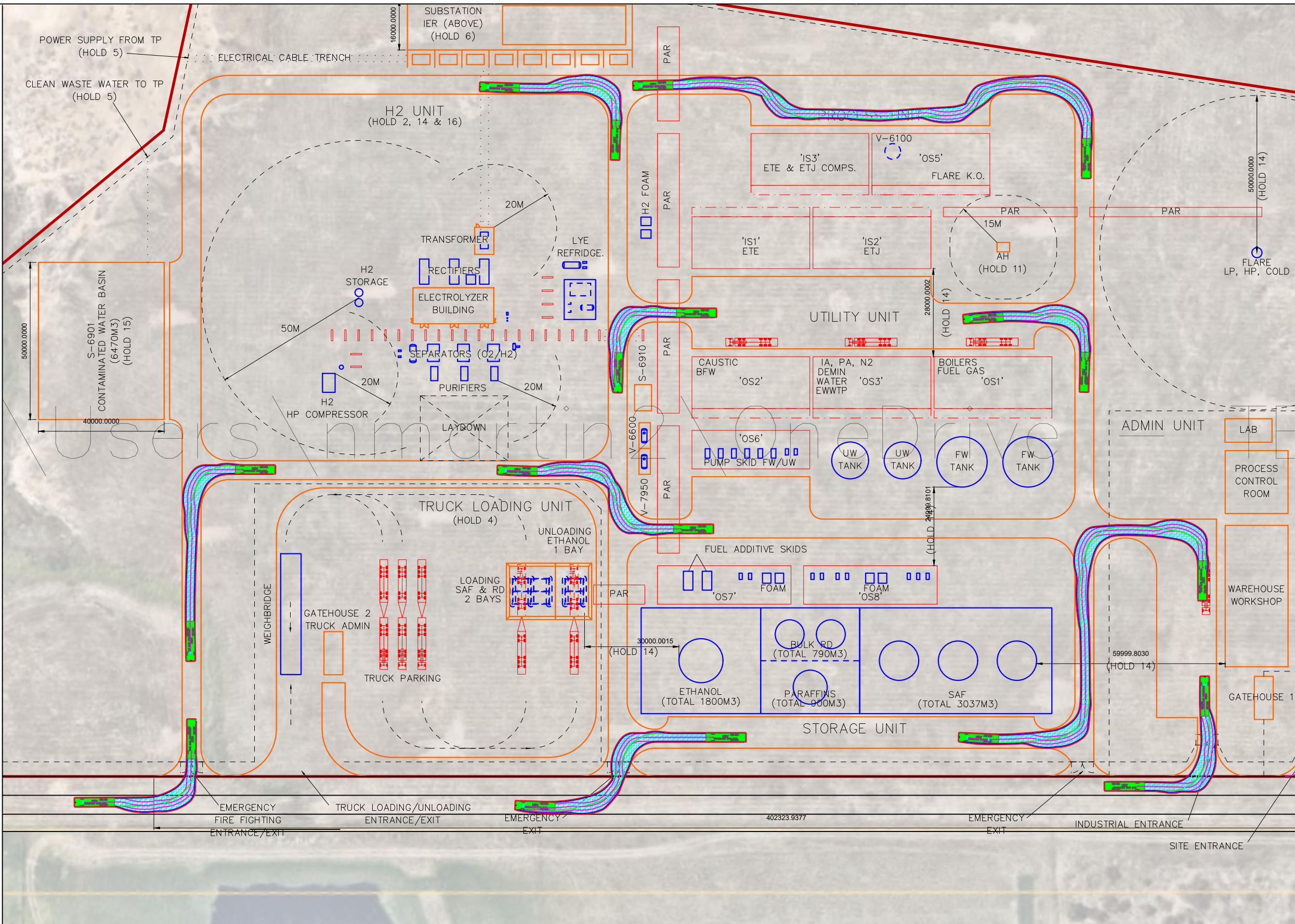


Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

REVISIONS		Drawn	Date
Issue	Revisions/Descriptions		
001	Review	M.E	16.12.2024

Scale @ A3				1:1250
ENGINEERING CERTIFICATION (RPEQ)				
Name	Signature	No.	Date	

Project Jet Zero SAF Facility Townsville	Design M.E	Drawn M.E	Checked N.E
	CONCEPT ONLY		
	Project Number P6680	Sheet Number 3	Date 16.12.2024
Title Servicing Swept Paths - Sheet 3		Issue 001	



Appendix F: Traffic Survey Data



T2389.01 Bruce Hwy & Flinders Hwy Intersection Repor

T2389.02 Ron Mclean Dr & Heleen Downs Rd Intersection Repor

Appendix G: Traffic Volume Diagrams



Project Information	
Project Name:	Jst Zero Townsville TIA
Project Number:	P6680
Prepared By:	John Kirkham
Reviewed By:	Nathan Edwards
Prepared Date:	4/03/2025
Reviewed Date:	4/03/2025

Table 1: Development Traffic Generation Assumptions - Refer TIA for Details

Land Use	IN	AM Peak OUT	TOTAL	IN	PM Peak OUT	TOTAL
Construction Phase						
Staff	47.0	7.0	54.0	7.0	47.0	54.0
Servicing / Deliverables	3.0	3.0	6.0	1.0	1.0	2.0
Total	50	10	60	8	48	56
Operational Phase						
Staff	34.0	34.0	68.0	34.0	34.0	68.0
Servicing / Deliverables	4.0	4.0	8.0	4.0	4.0	8.0
Total	38	38	76	38	38	76

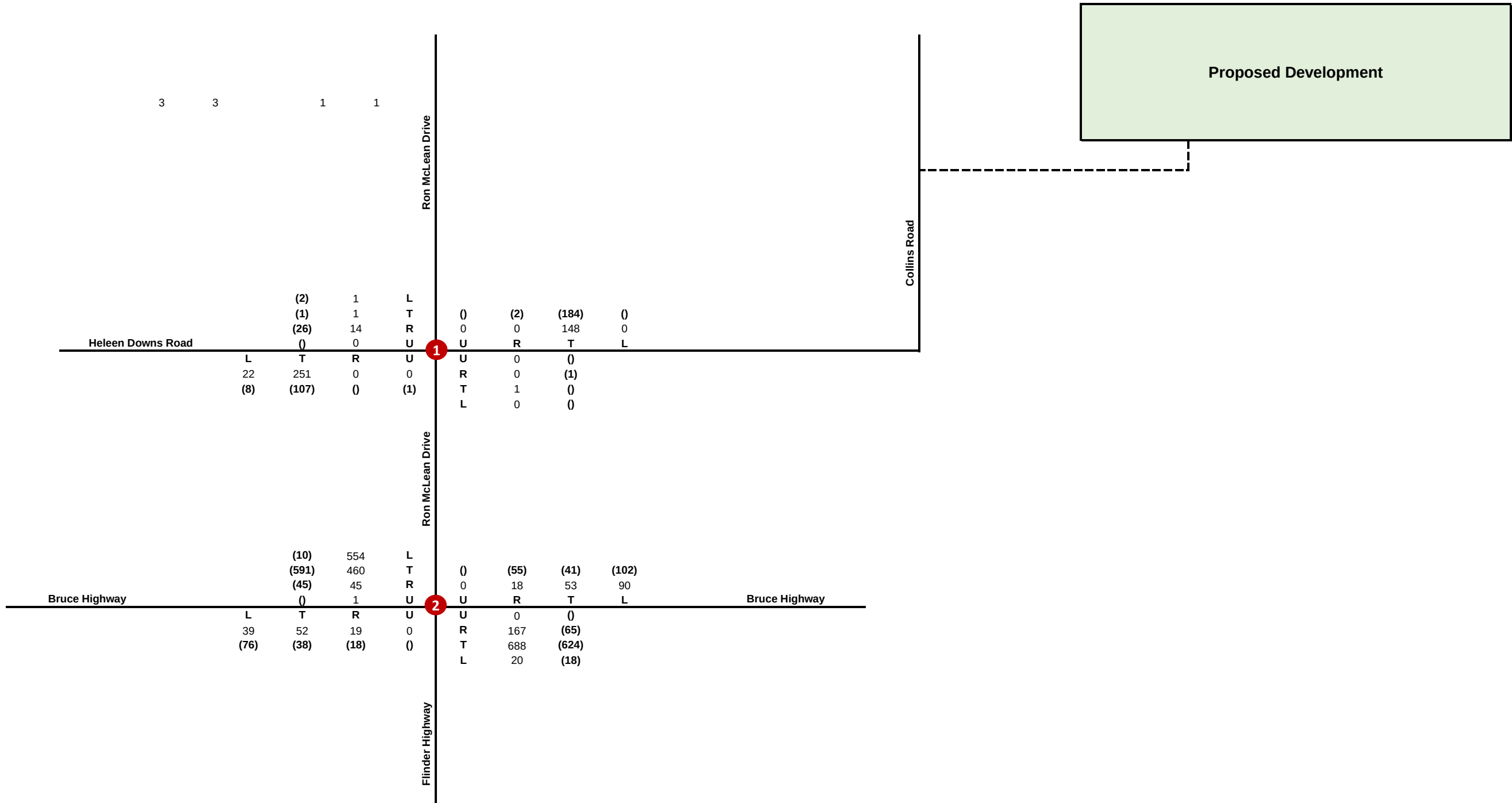
Table 2: External Traffic Distribution

To / From	Construction %	Operational %
North via Ron Mclean Drive	70%	40%
South via Ron Mclean Drive	30%	60%
Total	100%	100%

Table 3: Background Traffic Growth

Road	Growth Rate	Survey Year	Future Year	Factor
Ron Mclean Drive	2.50%	2024	2025	1.03
Bruce Highway	3.50%	2024	2025	1.04
Ron Mclean Drive	2.50%	2024	2027	1.08
Bruce Highway	3.50%	2024	2027	1.11

RAW Traffic Survey Volumes



DOCUMENT CONTROL

Job Number: P6680
Job Name: Jet Zero Townsville TIA
File Path: \\BITZIOS-FS1.bitzios.local\Projects\IP6680 Jet Zero Townsville TIA\Technical\Traffic Generation\

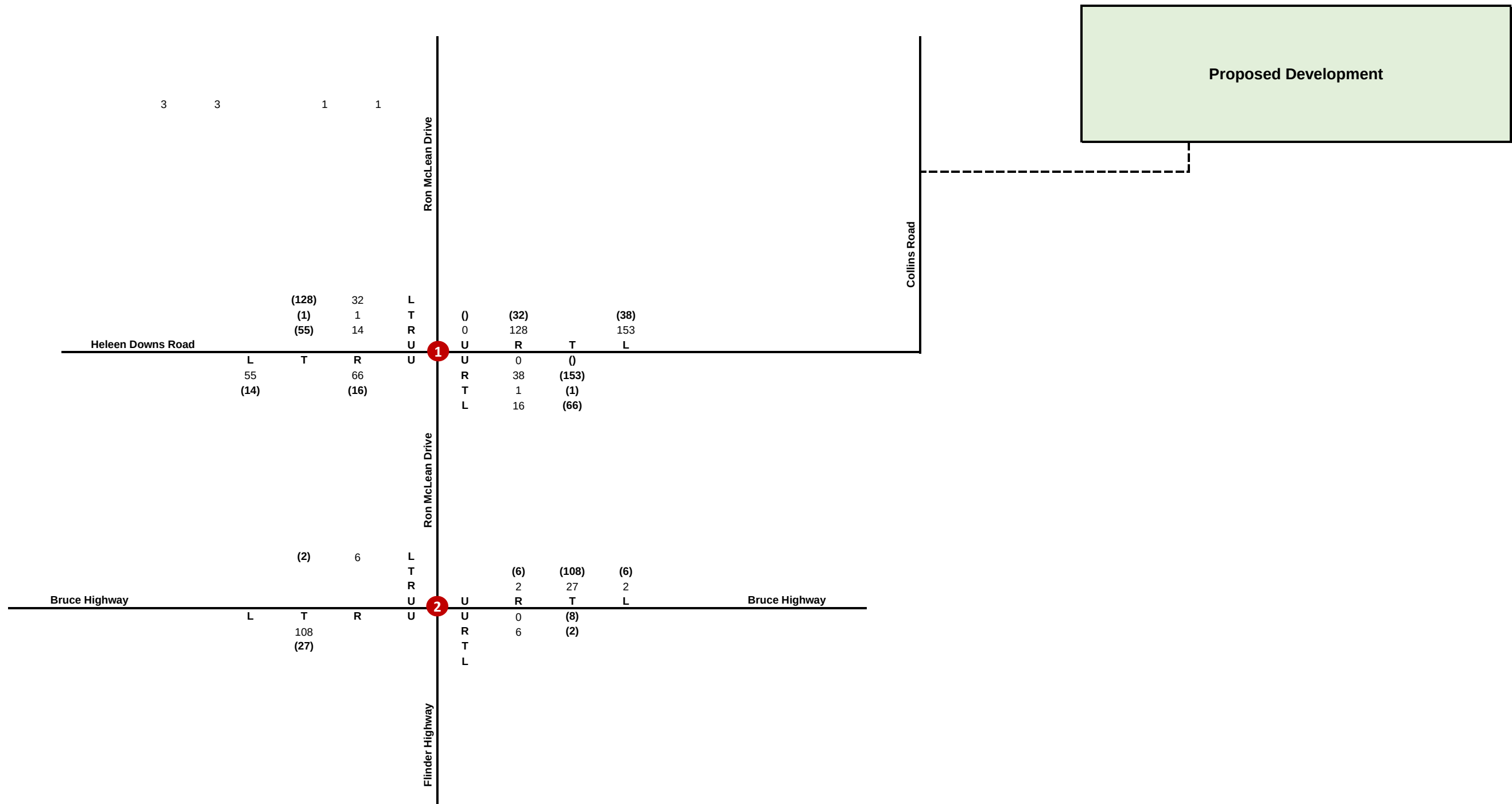
Prepared By: John Kirkham
Reviewed By: Nathan Edwards

Prepared Date: 4/03/2025
Reviewed Date: 4/03/2025

LEGEND

##	Weekday AM Peak Hour Volumes	T	Through Movement	L	Left Turn Movement
(##)	Weekday PM Peak Hour Volumes	R	Right Turn Movement	U	U-Turn Movement
1	Intersection ID				

BG Cleveland Industrial Area Eastern + West Precinct Volumes



DOCUMENT CONTROL

LEGEND

Job Number: P6680
Job Name: Jet Zero Townsville TIA
File Path: \\BITZIOS-FS1.bitzios.local\Projects\IP6680 Jet Zero Townsville TIA\Technical\Traffic Generation\

Prepared By: John Kirkham
Reviewed By: Nathan Edwards

Prepared Date: 4/03/2025
Reviewed Date: 4/03/2025

##	Weekday AM Peak Hour Volumes	T	Through Movement	L	Left Turn Movement
(##)	Weekday PM Peak Hour Volumes	R	Right Turn Movement	U	U-Turn Movement
1	Intersection ID				

BG Cleveland Industrial Area Subject Site Trip Reduction

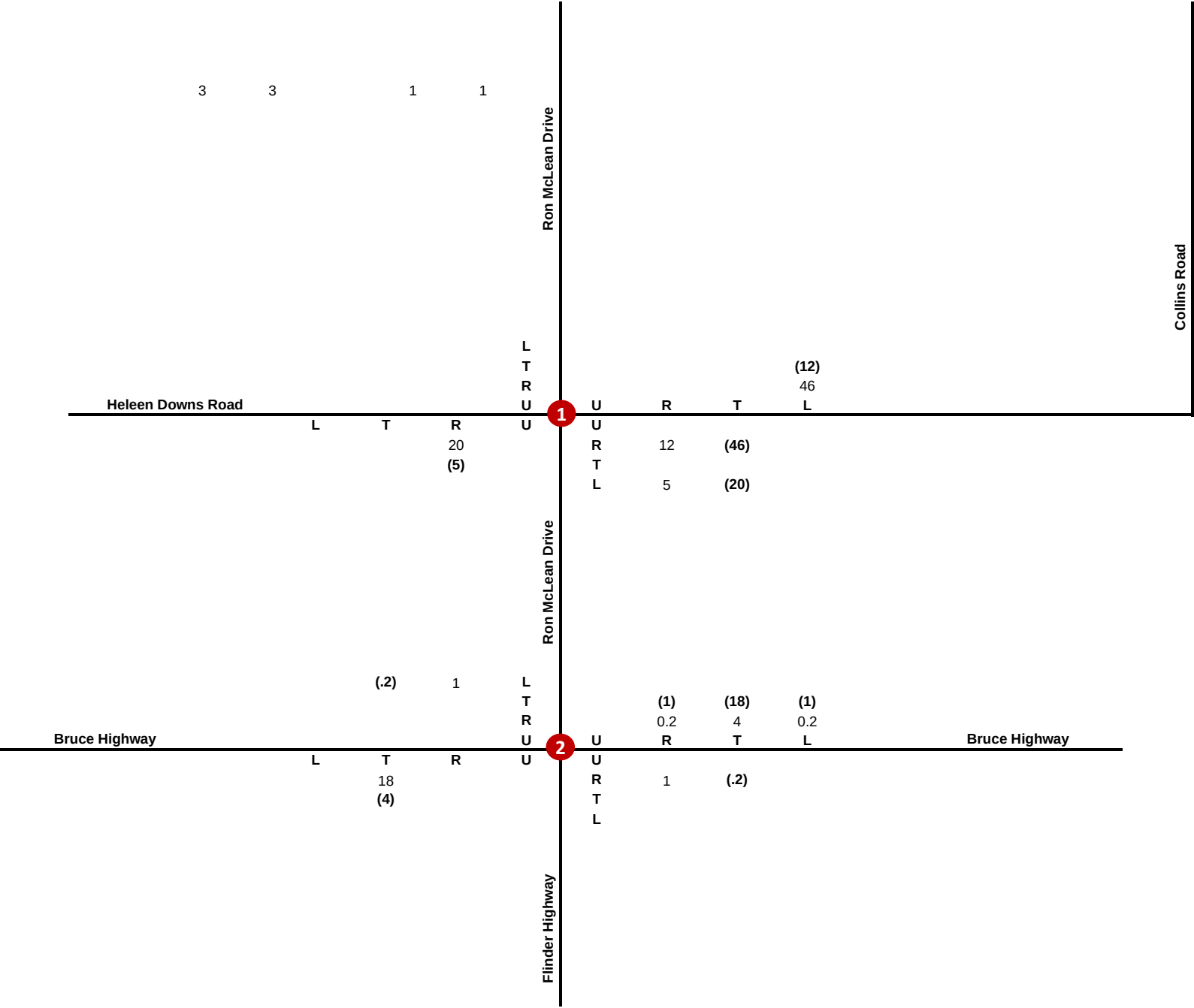


Table 1: Developable Area of Subject Site Within Previous Report

Land Use	Yield	Unit
Industrial	165,000	m2

Table 2: Plot Ratio Adopted from Previous Report

Plot Ratio	Yield	Unit
10%	16,500	m2 GFA

Table 3: Adopted Trip Genreation Rates

Land Use	Peak Rate	Unit	Peak Hour Trips
Industrial	0.5	Trips /100m2 GFA	82.5

Table 4: Directional Traffic Distribution

Land Use	AM PEAK			PM PEAK		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Industrial	80%	20%	100%	20%	80%	100%

Table 5: Traffic Generation

Land Use	AM PEAK			PM PEAK		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Industrial	66	17	83	17	66	83

Table 6: External Traffic Distribution From Previous Report

To / From	Construction %
North via Ron Mclean Drive	70%
South via Ron Mclean Drive	30%
Total	100%

DOCUMENT CONTROL

Job Number: P6680
Job Name: Jet Zero Townsville TIA
File Path: \\BITZIOS-FS1.bitzios.local\Projects\IP6680 Jet Zero Townsville TIA\Technical\Traffic Generation\

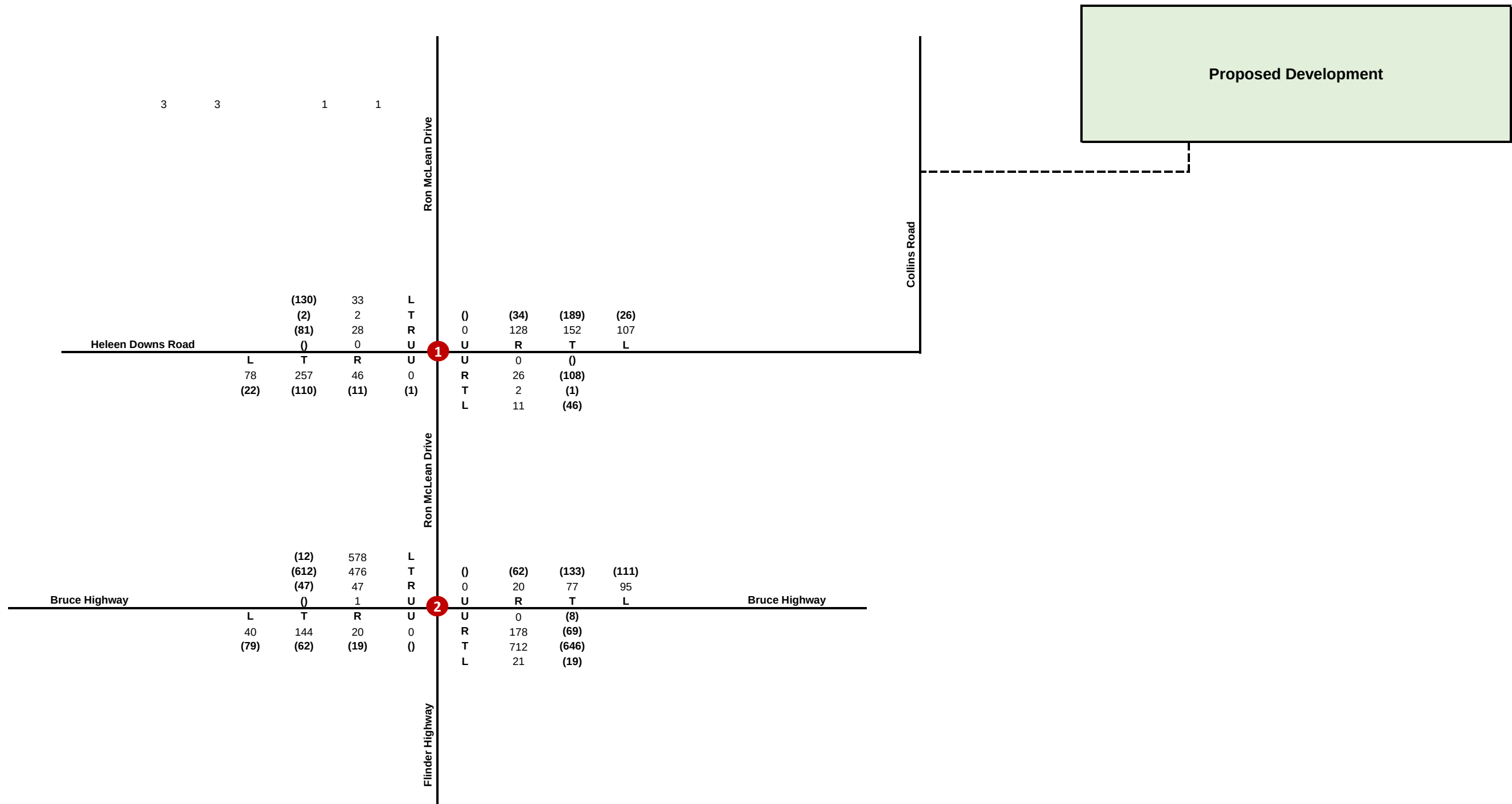
Prepared By: John Kirkham
Reviewed By: Nathan Edwards

Prepared Date: 4/03/2025
Reviewed Date: 4/03/2025

LEGEND

Weekday AM Peak Hour Volumes
(##) Weekday PM Peak Hour Volumes
1 Intersection ID
T Through Movement
R Right Turn Movement
L Left Turn Movement
U U-Turn Movement

2025 Background Volumes - Construction



DOCUMENT CONTROL

Job Number: P6680
Job Name: Jet Zero Townsville TIA
File Path: \\BITZIOS-FS1.bitzios.local\Projects\IP6680 Jet Zero Townsville TIA\Technical\Traffic Generation\

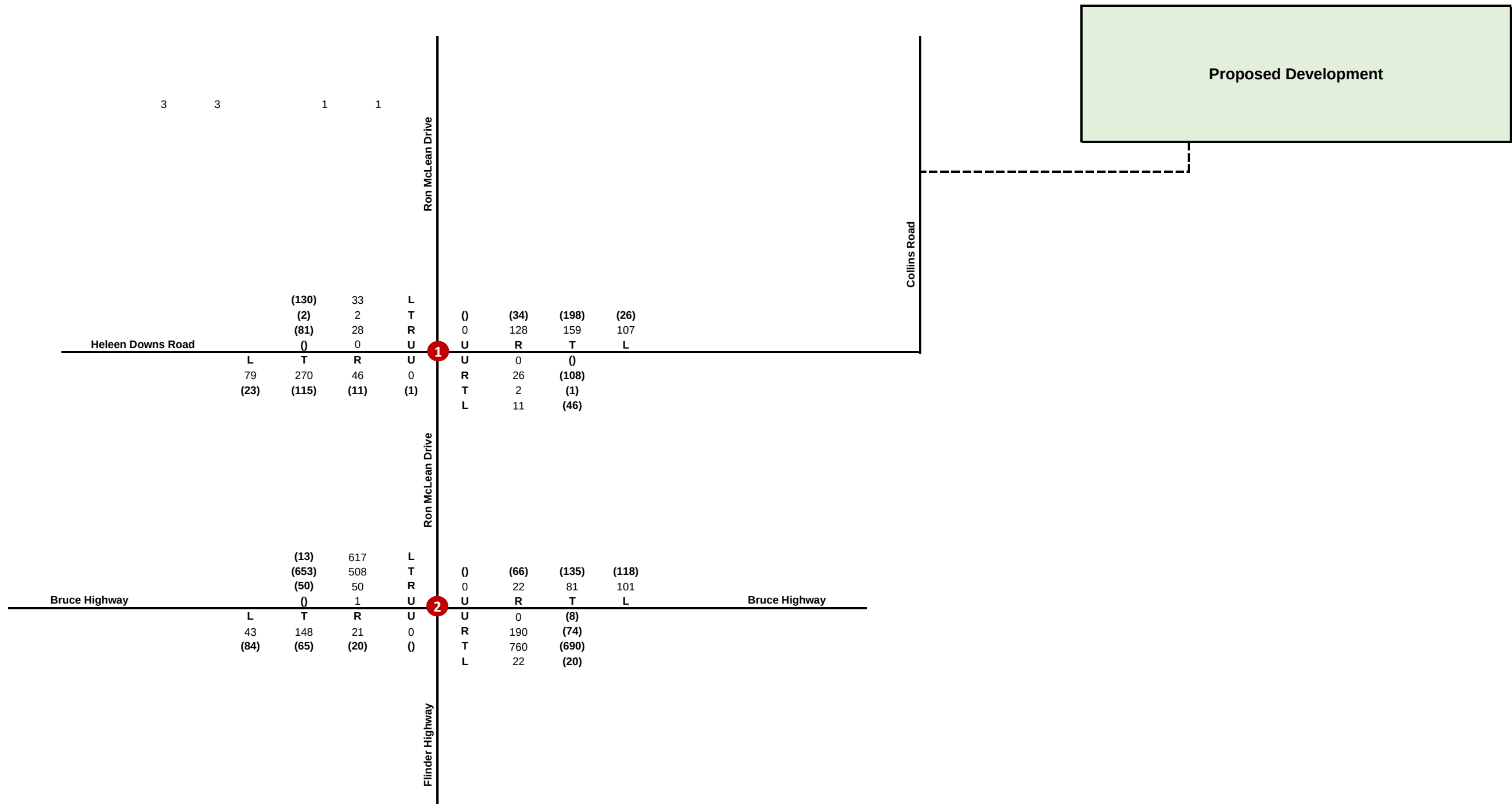
Prepared By: John Kirkham
Reviewed By: Nathan Edwards

Prepared Date: 4/03/2025
Reviewed Date: 4/03/2025

LEGEND

- | | | | | | |
|------|------------------------------|---|---------------------|---|--------------------|
| ## | Weekday AM Peak Hour Volumes | T | Through Movement | L | Left Turn Movement |
| (##) | Weekday PM Peak Hour Volumes | R | Right Turn Movement | U | U-Turn Movement |
| 1 | Intersection ID | | | | |

2027 Background Volumes - Operations



DOCUMENT CONTROL

Job Number: P6680
Job Name: Jet Zero Townsville TIA
File Path: \\BITZIOS-FS1.bitzios.local\Projects\IP6680 Jet Zero Townsville TIA\Technical\Traffic Generation\

Prepared By: John Kirkham
Reviewed By: Nathan Edwards

Prepared Date: 4/03/2025
Reviewed Date: 4/03/2025

LEGEND

- ##

Weekday AM Peak Hour Volumes
- T

Through Movement
- L

Left Turn Movement
- (##)

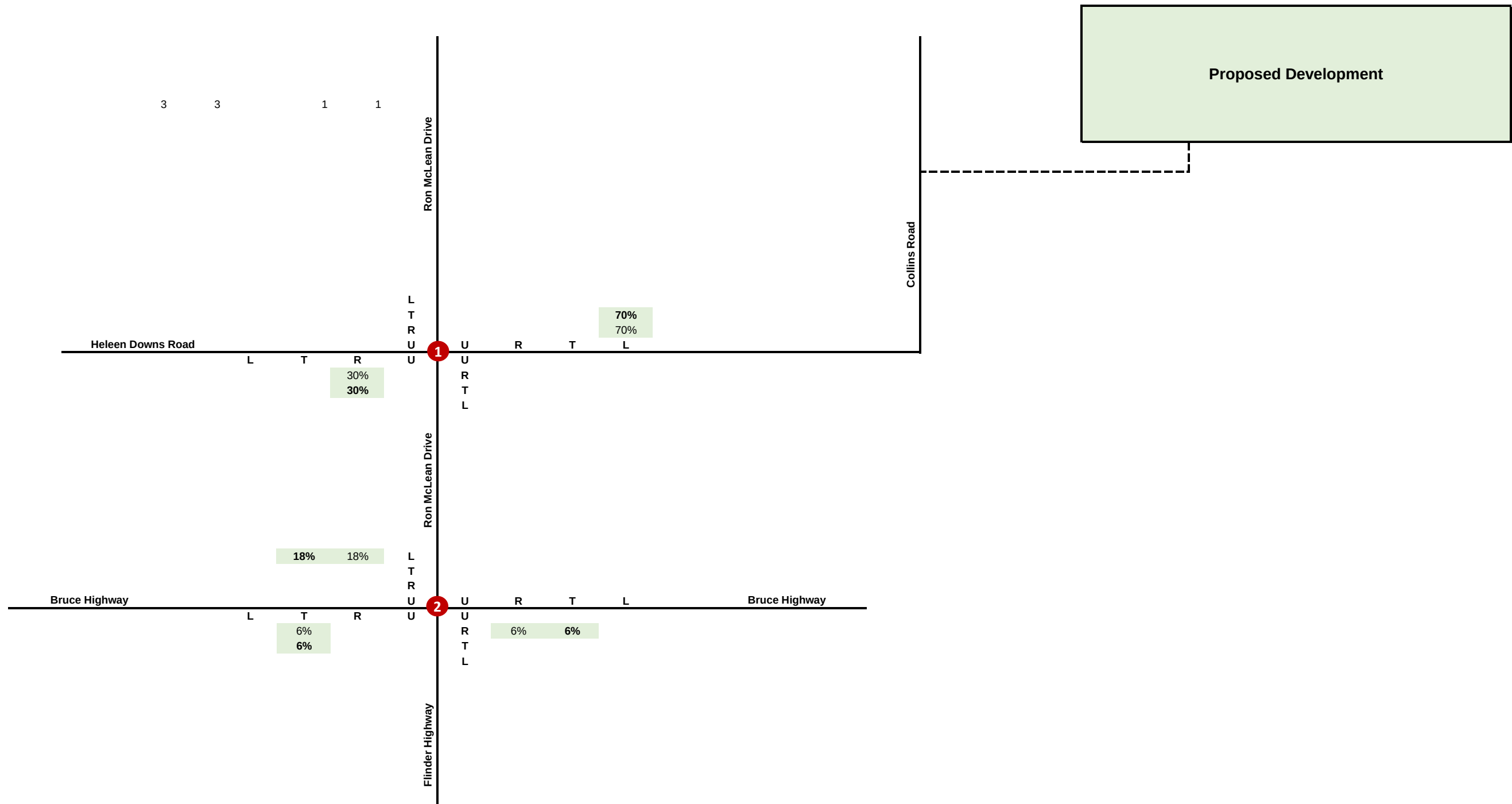
Weekday PM Peak Hour Volumes
- R

Right Turn Movement
- U

U-Turn Movement
- 1

Intersection ID

Development Traffic Distribution | Inbound | Construction

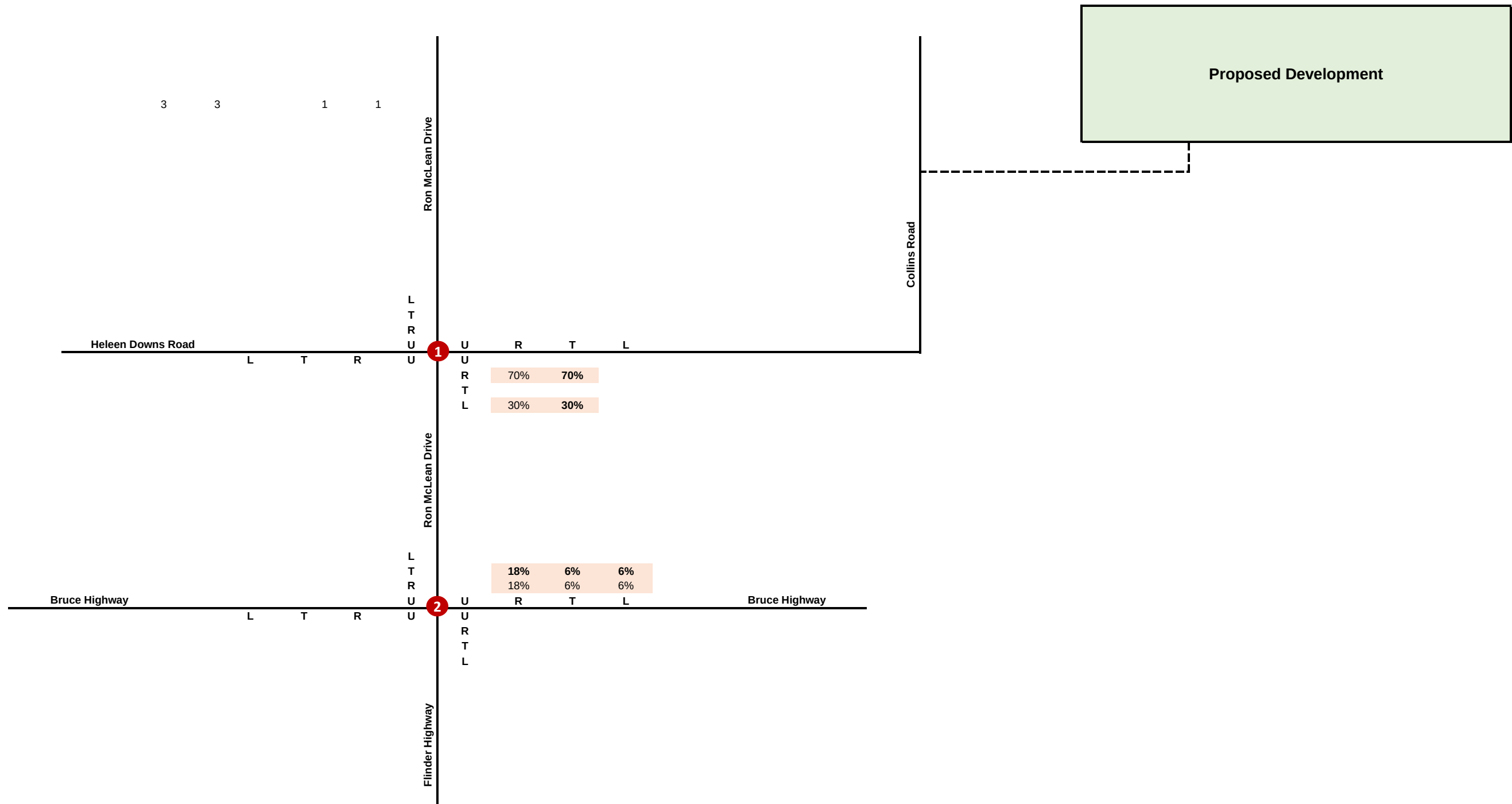


DOCUMENT CONTROL

LEGEND

Job Number: P6680 Job Name: Jet Zero Townsville TIA File Path: \\BITZIOS-FS1.bitzios.local\Projects\IP6680 Jet Zero Townsville TIA\Technical\Traffic Generation\	Prepared By: John Kirkham Reviewed By: Nathan Edwards	Prepared Date: 4/03/2025 Reviewed Date: 4/03/2025	##	Weekday AM Peak Hour Volumes	T	Through Movement	L	Left Turn Movement
			(##)	Weekday PM Peak Hour Volumes	R	Right Turn Movement	U	U-Turn Movement
			1	Intersection ID				

Development Traffic Distribution | Outbound | Construction

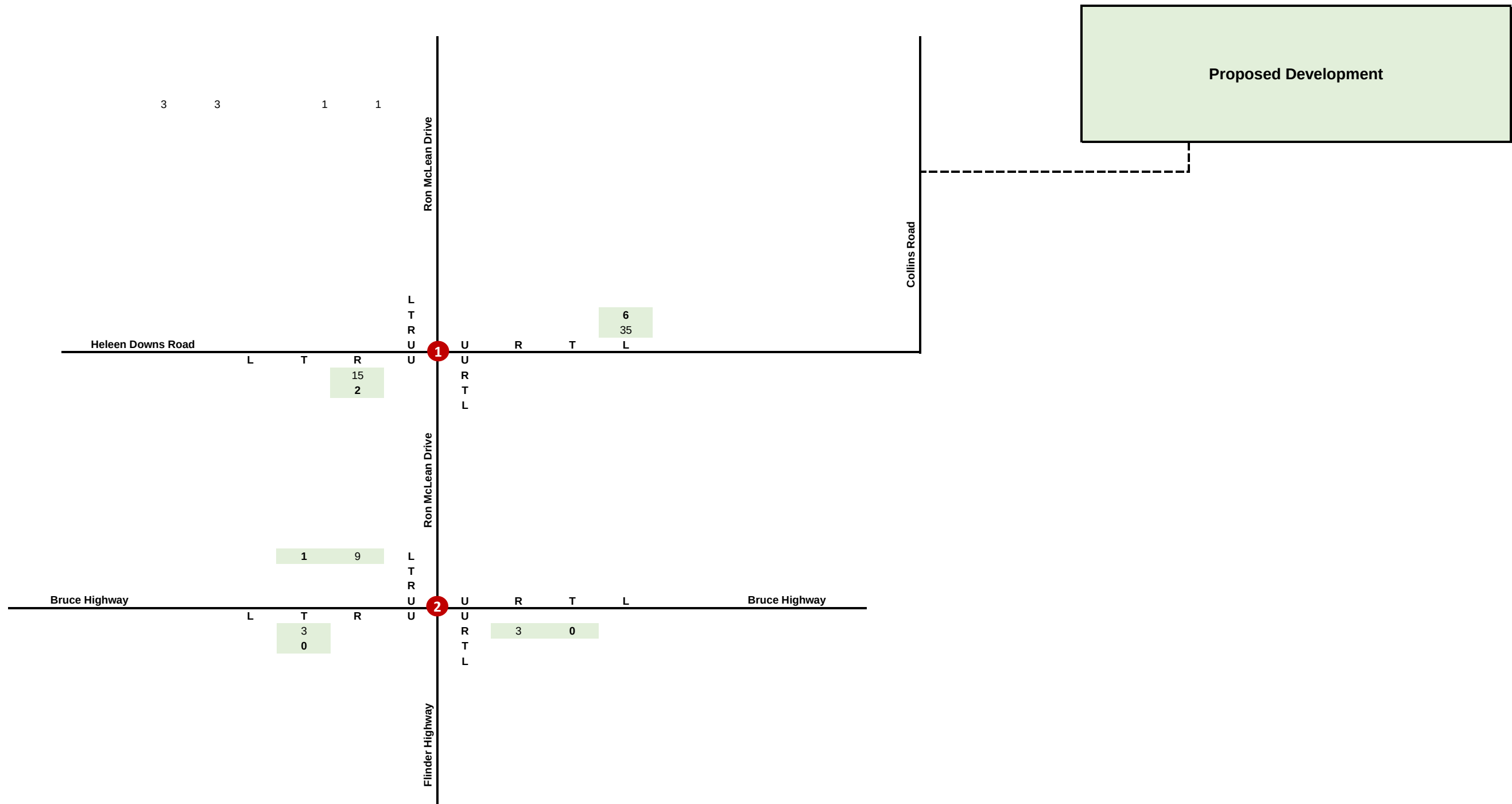


DOCUMENT CONTROL

LEGEND

Job Number: P6680 Job Name: Jet Zero Townsville TIA File Path: \\BITZIOS-FS1.bitzios.local\Projects\IP6680 Jet Zero Townsville TIA\Technical\Traffic Generation\	Prepared By: John Kirkham Reviewed By: Nathan Edwards	Prepared Date: 4/03/2025 Reviewed Date: 4/03/2025	##	Weekday AM Peak Hour Volumes	T	Through Movement	L	Left Turn Movement
			(##)	Weekday PM Peak Hour Volumes	R	Right Turn Movement	U	U-Turn Movement
			1	Intersection ID				

Development Traffic Volumes | Inbound | Construction



DOCUMENT CONTROL

LEGEND

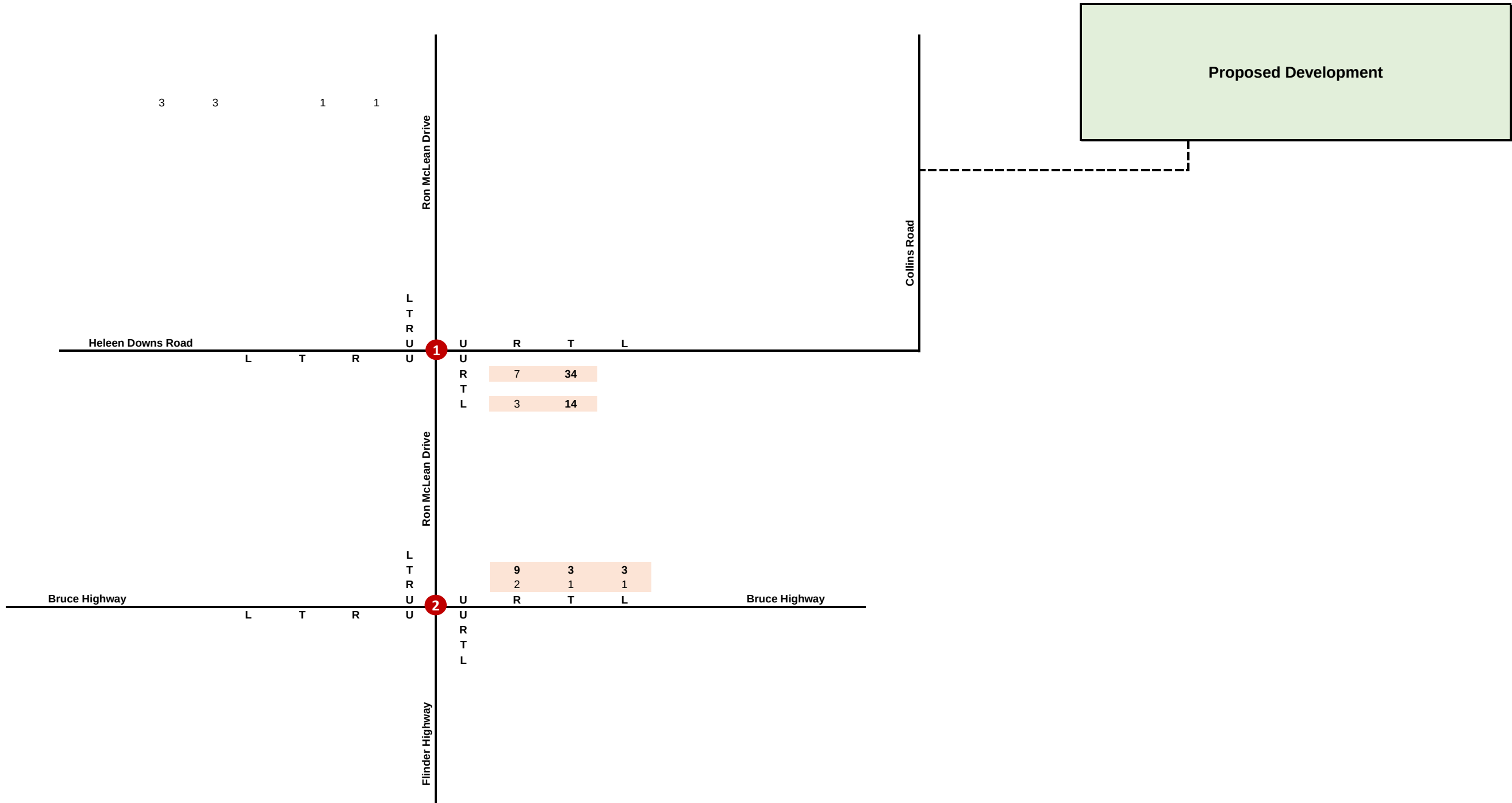
Job Number: P6680
Job Name: Jet Zero Townsville TIA
File Path: \\BITZIOS-FS1.bitzios.local\Projects\IP6680 Jet Zero Townsville TIA\Technical\Traffic Generation\

Prepared By: John Kirkham
Reviewed By: Nathan Edwards

Prepared Date: 4/03/2025
Reviewed Date: 4/03/2025

##	Weekday AM Peak Hour Volumes	T	Through Movement	L	Left Turn Movement
(##)	Weekday PM Peak Hour Volumes	R	Right Turn Movement	U	U-Turn Movement
1	Intersection ID				

Development Traffic Volumes | Outbound | Construction



DOCUMENT CONTROL

Job Number: P6680
Job Name: Jet Zero Townsville TIA
File Path: \\BITZIOS-FS1.bitzios.local\Projects\IP6680 Jet Zero Townsville TIA\Technical\Traffic Generation\

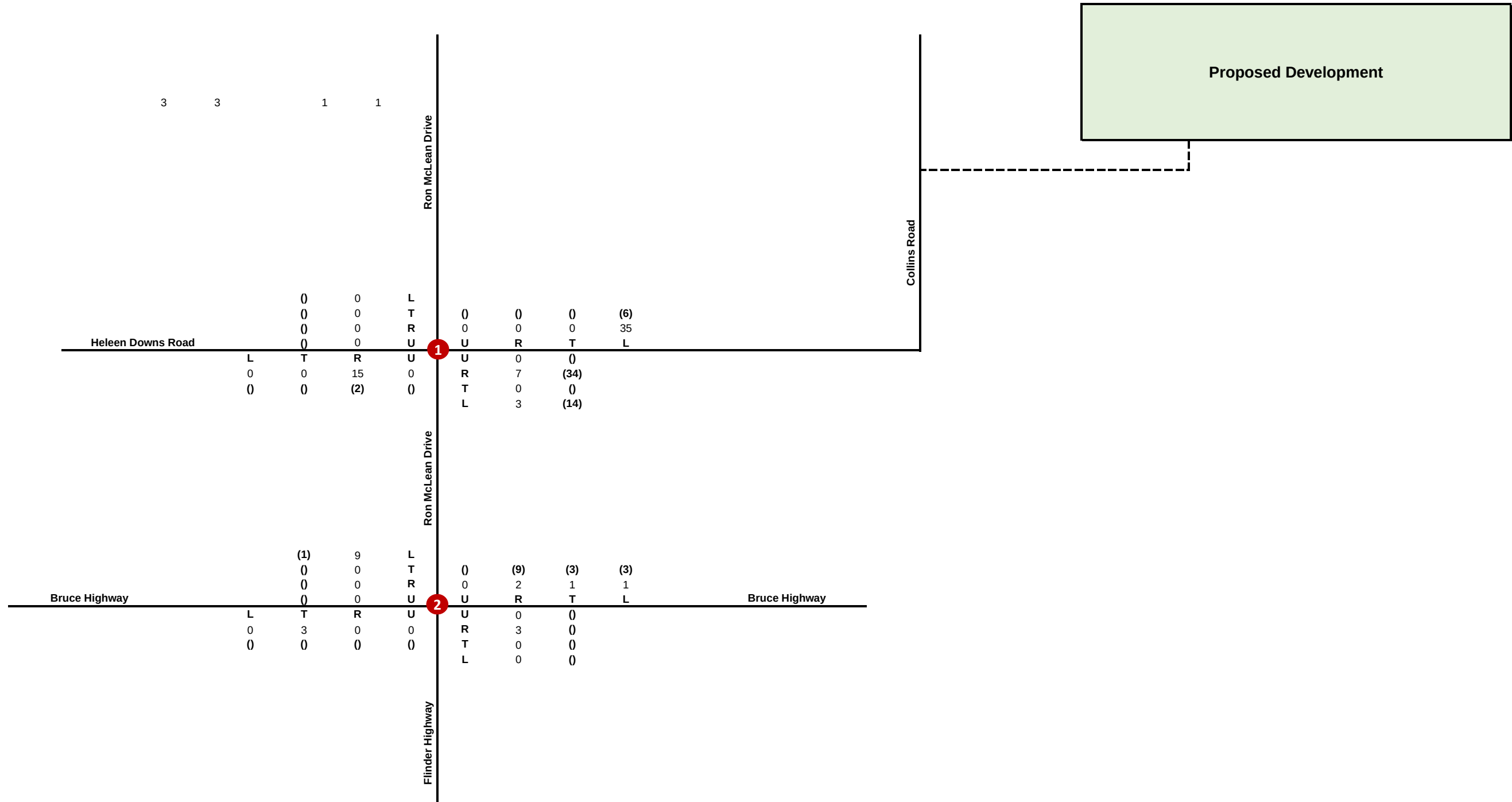
Prepared By: John Kirkham
Reviewed By: Nathan Edwards

Prepared Date: 4/03/2025
Reviewed Date: 4/03/2025

LEGEND

- | | | | | | |
|------|------------------------------|---|---------------------|---|--------------------|
| ## | Weekday AM Peak Hour Volumes | T | Through Movement | L | Left Turn Movement |
| (##) | Weekday PM Peak Hour Volumes | R | Right Turn Movement | U | U-Turn Movement |
| 1 | Intersection ID | | | | |

Development Traffic Volumes | Total | Construction



DOCUMENT CONTROL

Job Number: P6680
Job Name: Jet Zero Townsville TIA
File Path: \\BITZIOS-FS1.bitzios.local\Projects\IP6680 Jet Zero Townsville TIA\Technical\Traffic Generation\

Prepared By: John Kirkham
Reviewed By: Nathan Edwards

Prepared Date: 4/03/2025
Reviewed Date: 4/03/2025

LEGEND

- ##

Weekday AM Peak Hour Volumes
- T

Through Movement
- L

Left Turn Movement
- (##)

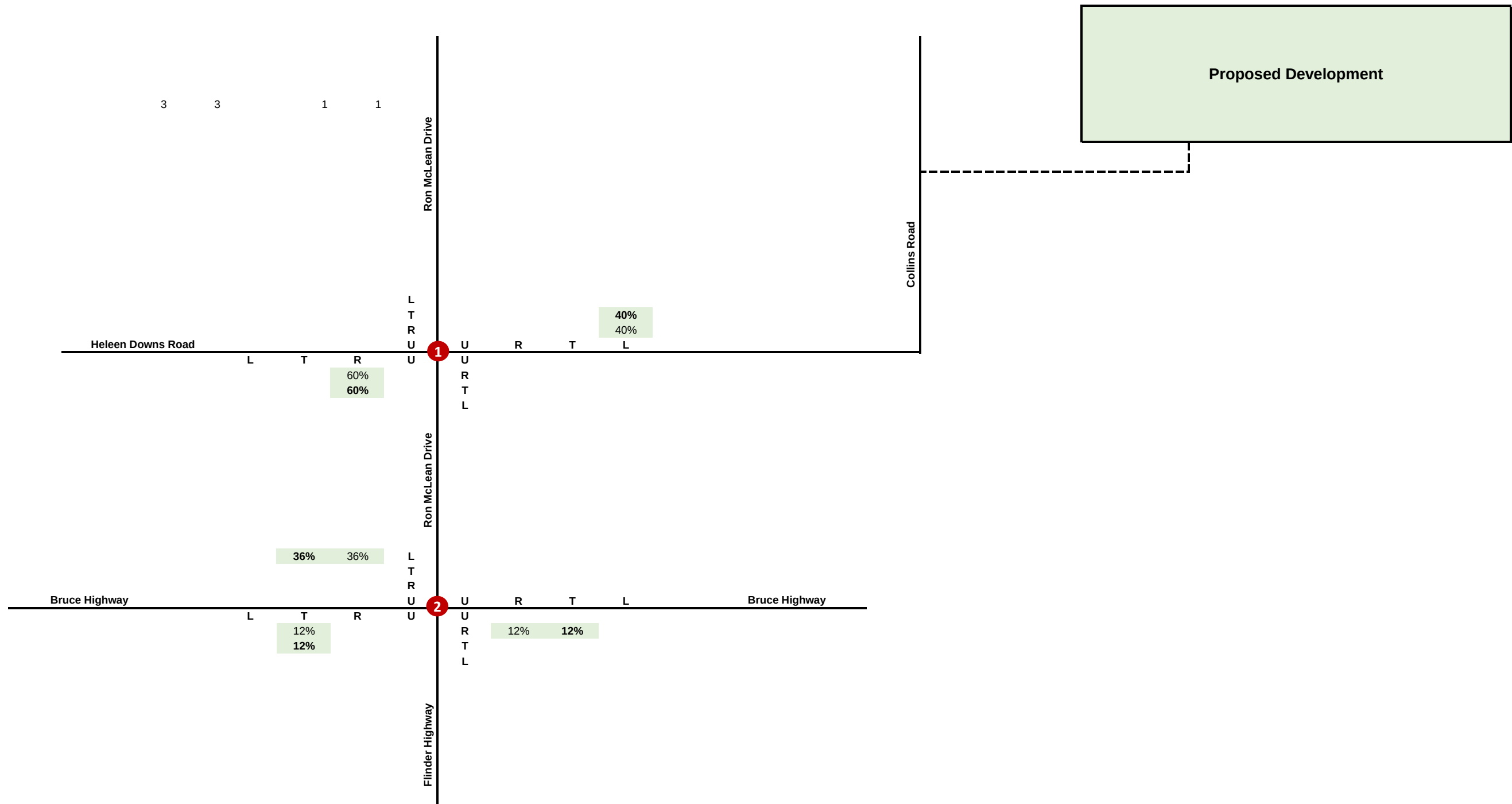
Weekday PM Peak Hour Volumes
- R

Right Turn Movement
- U

U-Turn Movement
- 1

Intersection ID

Development Traffic Distribution | Inbound | Operation



DOCUMENT CONTROL

LEGEND

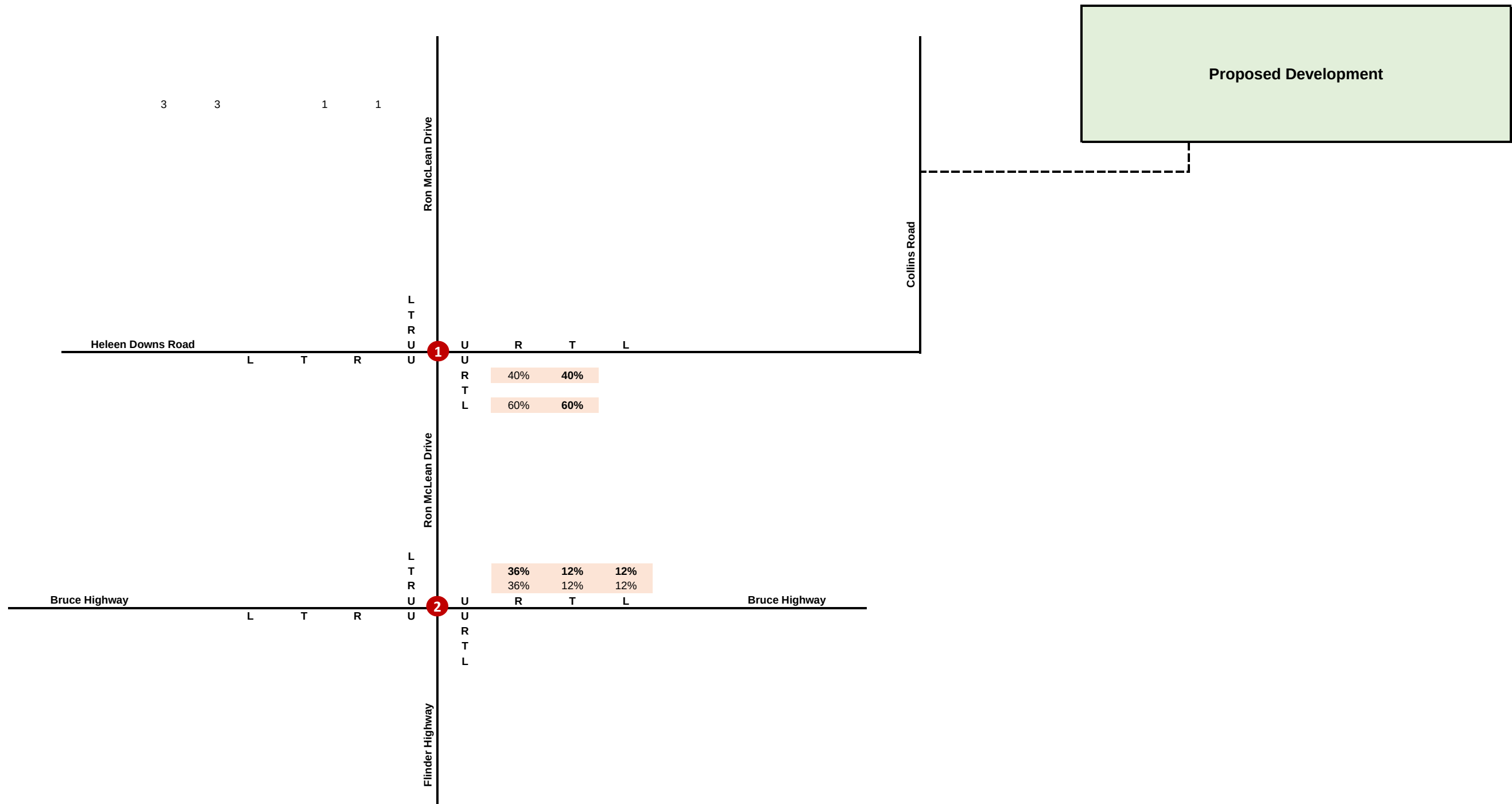
Job Number: P6680
Job Name: Jet Zero Townsville TIA
File Path: \\BITZIOS-FS1.bitzios.local\Projects\IP6680 Jet Zero Townsville TIA\Technical\Traffic Generation\

Prepared By: John Kirkham
Reviewed By: Nathan Edwards

Prepared Date: 4/03/2025
Reviewed Date: 4/03/2025

##	Weekday AM Peak Hour Volumes	T	Through Movement	L	Left Turn Movement
(##)	Weekday PM Peak Hour Volumes	R	Right Turn Movement	U	U-Turn Movement
1	Intersection ID				

Development Traffic Distribution | Outbound | Operation



DOCUMENT CONTROL

LEGEND

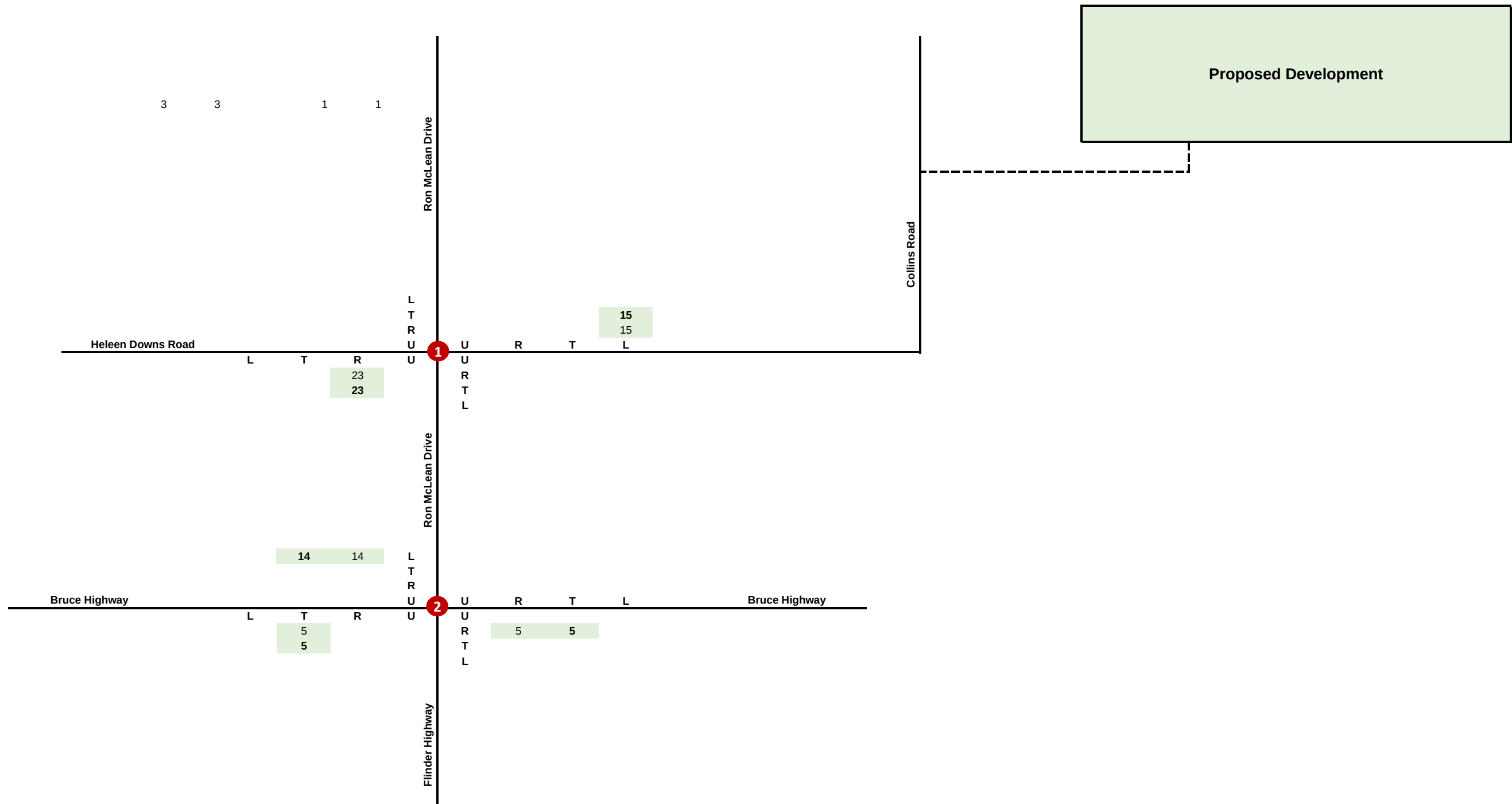
Job Number: P6680
Job Name: Jet Zero Townsville TIA
File Path: \\BITZIOS-FS1.bitzios.local\Projects\IP6680 Jet Zero Townsville TIA\Technical\Traffic Generation\

Prepared By: John Kirkham
Reviewed By: Nathan Edwards

Prepared Date: 4/03/2025
Reviewed Date: 4/03/2025

##	Weekday AM Peak Hour Volumes	T	Through Movement	L	Left Turn Movement
(##)	Weekday PM Peak Hour Volumes	R	Right Turn Movement	U	U-Turn Movement
1	Intersection ID				

Development Traffic Volumes | Inbound | Operation

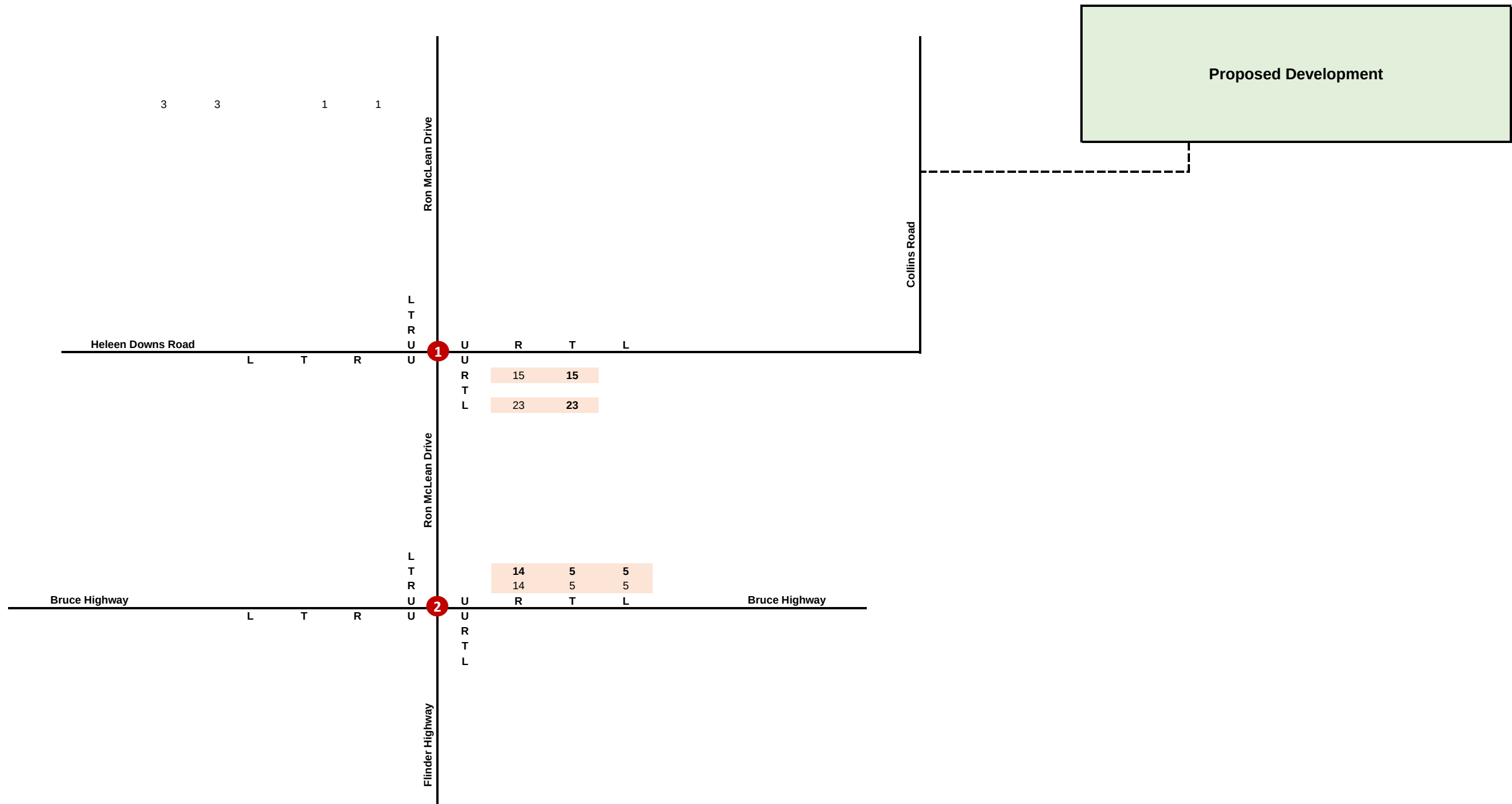


DOCUMENT CONTROL

LEGEND

Job Number: P6680	Prepared By: John Kirkham	Prepared Date: 4/03/2025	## Weekday AM Peak Hour Volumes	T Through Movement	L Left Turn Movement
Job Name: Jet Zero Townsville TIA	Reviewed By: Nathan Edwards	Reviewed Date: 4/03/2025	(##) Weekday PM Peak Hour Volumes	R Right Turn Movement	U U-Turn Movement
File Path: \\BITZIOS-FS1.bitzios.local\Projects\IP6680 Jet Zero Townsville TIA\Technical\Traffic Generation\			1 Intersection ID		

Development Traffic Volumes | Outbound | Operation



DOCUMENT CONTROL

Job Number: P6680
Job Name: Jet Zero Townsville TIA
File Path: \\BITZIOS-FS1.bitzios.local\Projects\IP6680 Jet Zero Townsville TIA\Technical\Traffic Generation\

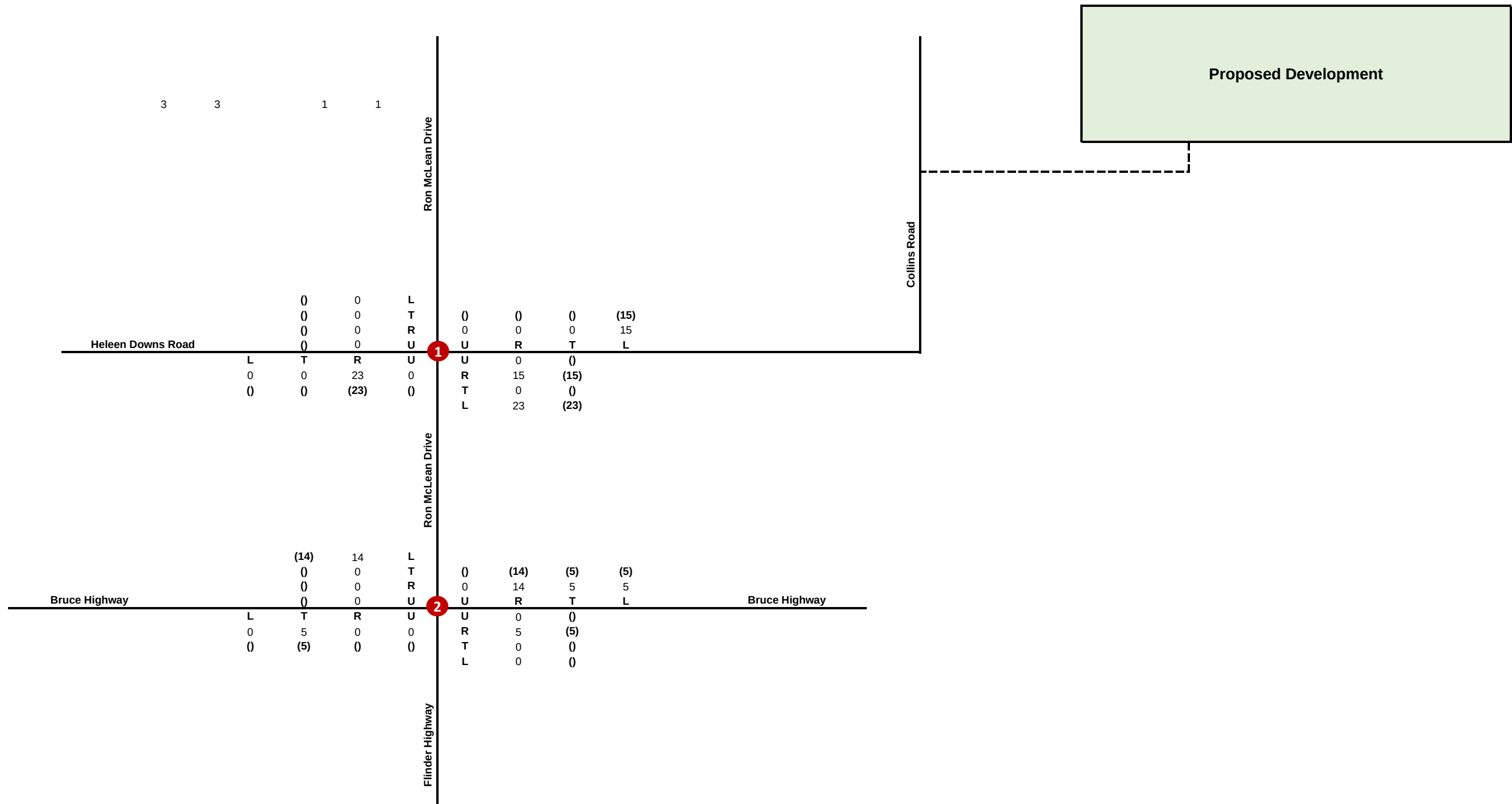
Prepared By: John Kirkham
Reviewed By: Nathan Edwards

Prepared Date: 4/03/2025
Reviewed Date: 4/03/2025

LEGEND

- | | | | | | |
|------|------------------------------|---|---------------------|---|--------------------|
| ## | Weekday AM Peak Hour Volumes | T | Through Movement | L | Left Turn Movement |
| (##) | Weekday PM Peak Hour Volumes | R | Right Turn Movement | U | U-Turn Movement |
| 1 | Intersection ID | | | | |

Development Traffic Volumes | Total | Operation



DOCUMENT CONTROL

Job Number: P6680
Job Name: Jet Zero Townsville TIA
File Path: \\BITZIOS-FS1.bitzios.local\Projects\IP6680 Jet Zero Townsville TIA\Technical\Traffic Generation\

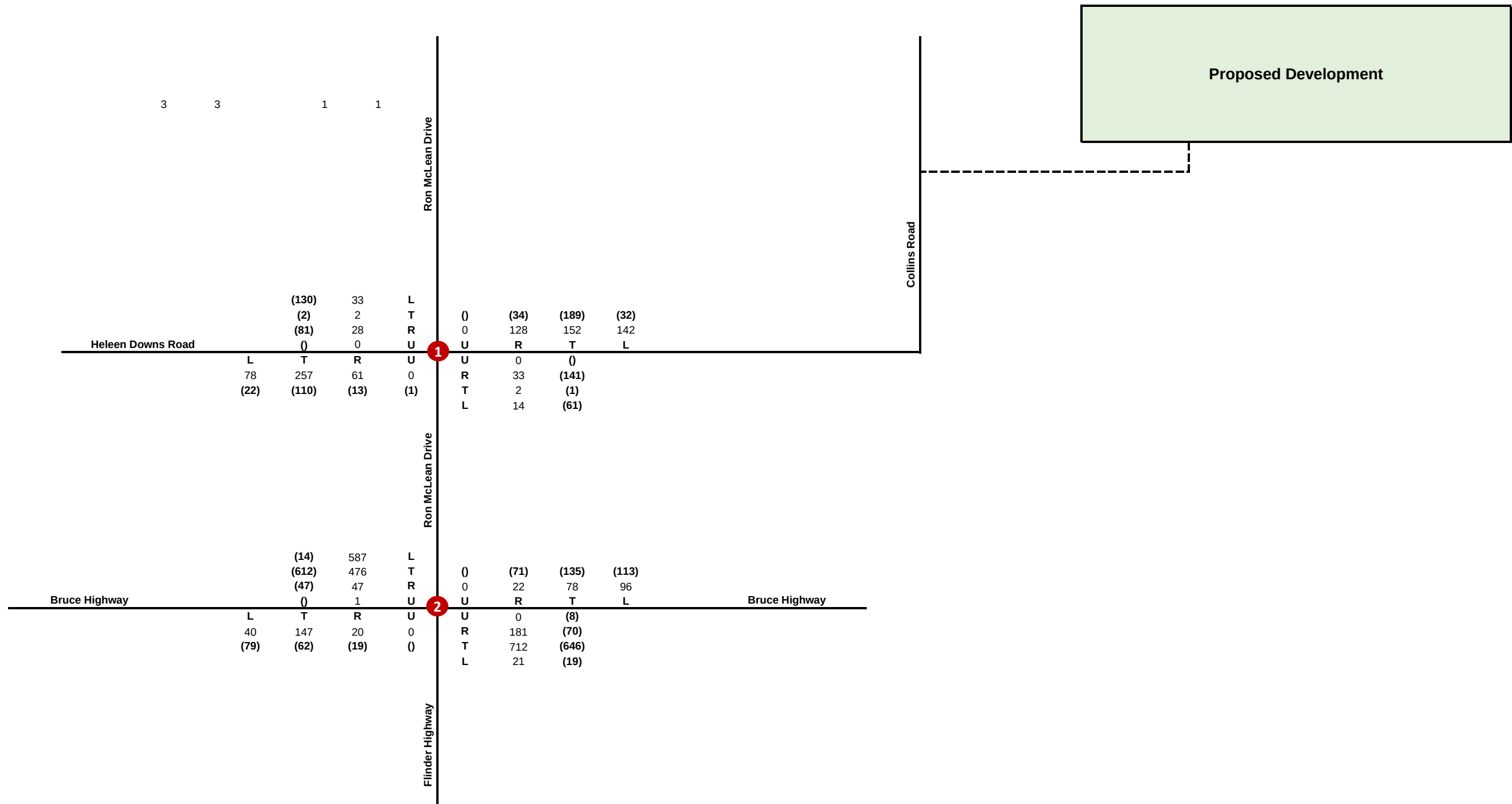
Prepared By: John Kirkham
Reviewed By: Nathan Edwards

Prepared Date: 4/03/2025
Reviewed Date: 4/03/2025

LEGEND

- | | | | | | |
|------|------------------------------|---|---------------------|---|--------------------|
| ## | Weekday AM Peak Hour Volumes | T | Through Movement | L | Left Turn Movement |
| (##) | Weekday PM Peak Hour Volumes | R | Right Turn Movement | U | U-Turn Movement |
| 1 | Intersection ID | | | | |

2025 Background Volumes + Development Volumes



DOCUMENT CONTROL

Job Number: P6680
Job Name: Jet Zero Townsville TIA
File Path: \\BITZIOS-FS1.bitzios.local\\Projects\\P6680 Jet Zero Townsville TIA\\Technical\\Traffic Generation\\

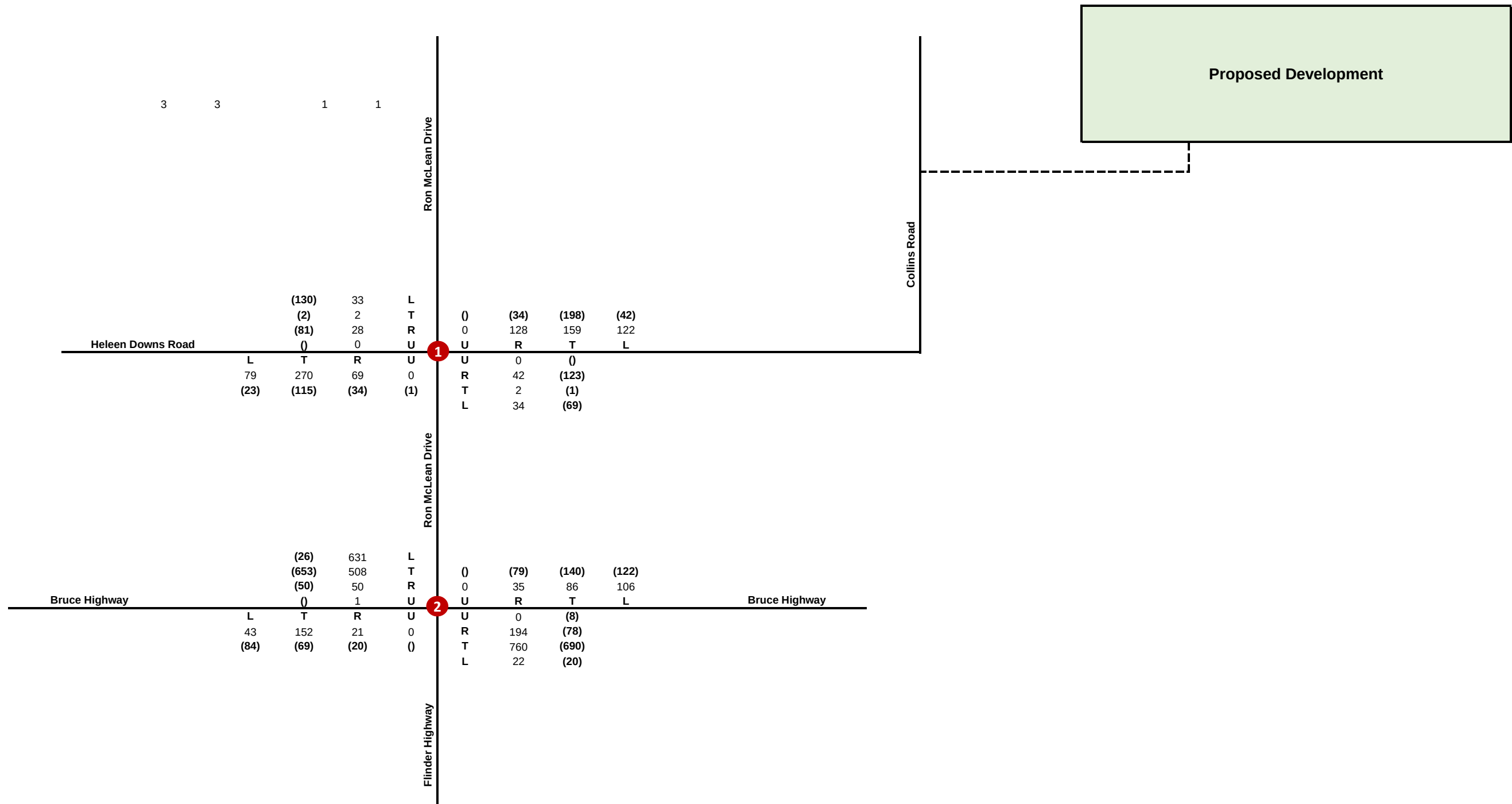
Prepared By: John Kirkham
Reviewed By: Nathan Edwards

Prepared Date: 4/03/2025
Reviewed Date: 4/03/2025

LEGEND

- ## Weekday AM Peak Hour Volumes
- (##) Weekday PM Peak Hour Volumes
- 1 Intersection ID
- T Through Movement
- R Right Turn Movement
- L Left Turn Movement
- U U-Turn Movement

2035 Background Volumes + Development Volumes



DOCUMENT CONTROL

Job Number: P6680
Job Name: Jet Zero Townsville TIA
File Path: \\BITZIOS-FS1.bitzios.local\Projects\IP6680 Jet Zero Townsville TIA\Technical\Traffic Generation\

Prepared By: John Kirkham
Reviewed By: Nathan Edwards

Prepared Date: 4/03/2025
Reviewed Date: 4/03/2025

LEGEND

##	Weekday AM Peak Hour Volumes	T	Through Movement	L	Left Turn Movement
(##)	Weekday PM Peak Hour Volumes	R	Right Turn Movement	U	U-Turn Movement
1	Intersection ID				

Appendix H: Detailed SIDRA Outputs



SITE LAYOUT

 **Site: 001 [2024 AM_Survey (Site Folder: General)]**

Project No.: P6680

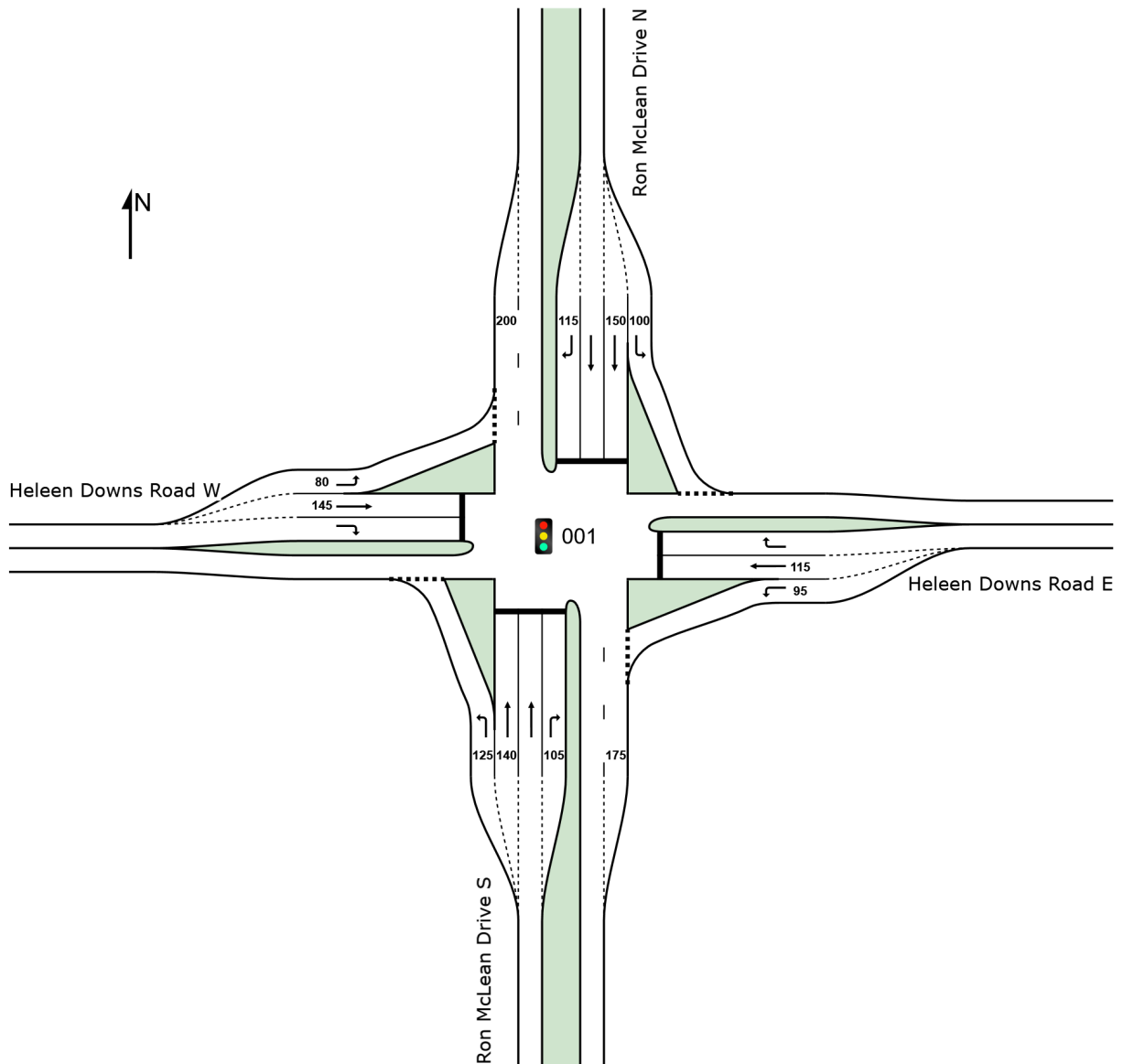
Project: Jet Zero Townsville TIA

Intersection: Ron McLean Drive / Heleen Downs Road

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



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

Organisation: BITZIOS CONSULTING | Licence: PLUS / FLOATING | Created: Monday, 16 December 2024 3:21:53 PM

Project: P:\P6680 Jet Zero Townsville TIA\Technical\SIDRA\P6680.001_Int 01 Ron McLean Dr_Heleen Downs Rd.sip9

MOVEMENT SUMMARY

 Site: 001 [2024 AM_Survey (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Ron McLean Drive / Heleen Downs Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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] m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Ron McLean Drive S															
1	L2	All MCs	23	16.0	23	16.0	0.016	6.2	LOS A	0.1	0.6	0.14	0.57	0.14	52.1
2	T1	All MCs	264	16.0	264	16.0	* 0.143	12.0	LOS A	3.0	23.6	0.55	0.45	0.55	50.3
3	R2	All MCs	1	16.0	1	16.0	0.009	49.5	LOS D	0.0	0.4	0.95	0.59	0.95	32.3
Approach			288	16.0	288	16.0	0.143	11.6	LOS A	3.0	23.6	0.51	0.46	0.51	50.3
East: Heleen Downs Road E															
4	L2	All MCs	1	0.0	1	0.0	0.001	7.2	LOS A	0.0	0.0	0.23	0.56	0.23	52.1
5	T1	All MCs	1	0.0	1	0.0	* 0.008	43.3	LOS D	0.0	0.3	0.95	0.56	0.95	35.2
6	R2	All MCs	1	0.0	1	0.0	0.009	49.0	LOS D	0.0	0.3	0.95	0.59	0.95	32.7
Approach			3	0.0	3	0.0	0.009	33.2	LOS C	0.0	0.3	0.71	0.57	0.71	38.4
North: Ron McLean Drive N															
7	L2	All MCs	1	23.0	1	23.0	0.001	6.3	LOS A	0.0	0.0	0.14	0.55	0.14	51.9
8	T1	All MCs	156	23.0	156	23.0	0.090	11.5	LOS A	1.7	14.4	0.53	0.42	0.53	50.5
9	R2	All MCs	1	23.0	1	23.0	* 0.010	49.7	LOS D	0.0	0.4	0.95	0.59	0.95	32.2
Approach			158	23.0	158	23.0	0.090	11.8	LOS A	1.7	14.4	0.53	0.42	0.53	50.4
West: Heleen Downs Road W															
10	L2	All MCs	1	50.0	1	50.0	0.001	8.0	LOS A	0.0	0.1	0.24	0.55	0.24	50.2
11	T1	All MCs	1	50.0	1	50.0	0.009	42.7	LOS D	0.0	0.4	0.94	0.56	0.94	35.4
12	R2	All MCs	15	50.0	15	50.0	* 0.138	50.9	LOS D	0.6	6.5	0.96	0.69	0.96	31.6
Approach			17	50.0	17	50.0	0.138	47.7	LOS D	0.6	6.5	0.91	0.68	0.91	32.6
All Vehicles			466	19.5	466	19.5	0.143	13.1	LOS A	3.0	23.6	0.53	0.45	0.53	49.3

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

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

Organisation: BITZIOS CONSULTING | Licence: PLUS / FLOATING | Processed: Monday, 16 December 2024 3:21:59 PM

Project: P:\P6680 Jet Zero Townsville TIA\Technical\SIDRA\P6680.001_Int 01 Ron McLean Dr_Heleen Downs Rd.sip9

MOVEMENT SUMMARY

 Site: 001 [2024 PM_Survey (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Ron McLean Drive / Heleen Downs Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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. Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Ron McLean Drive S															
1	L2	All MCs	8	20.0	8	20.0	0.006	6.2	LOS A	0.0	0.2	0.14	0.56	0.14	52.0
2	T1	All MCs	113	20.0	113	20.0	0.072	14.7	LOS B	1.4	11.3	0.59	0.46	0.59	48.4
3	R2	All MCs	1	20.0	1	20.0	0.010	49.6	LOS D	0.0	0.4	0.95	0.59	0.95	32.2
Approach			122	20.0	122	20.0	0.072	14.4	LOS A	1.4	11.3	0.56	0.47	0.56	48.4
East: Heleen Downs Road E															
4	L2	All MCs	1	35.0	1	35.0	0.001	7.9	LOS A	0.0	0.1	0.25	0.56	0.25	50.6
5	T1	All MCs	1	35.0	1	35.0	* 0.010	43.9	LOS D	0.0	0.4	0.95	0.56	0.95	35.0
6	R2	All MCs	1	35.0	1	35.0	0.006	45.0	LOS D	0.0	0.4	0.91	0.59	0.91	33.5
Approach			3	35.0	3	35.0	0.010	32.3	LOS C	0.0	0.4	0.70	0.57	0.70	38.4
North: Ron McLean Drive N															
7	L2	All MCs	1	11.0	1	11.0	0.001	6.1	LOS A	0.0	0.0	0.14	0.55	0.14	52.3
8	T1	All MCs	194	11.0	194	11.0	* 0.119	15.1	LOS B	2.5	18.9	0.61	0.49	0.61	48.2
9	R2	All MCs	2	11.0	2	11.0	* 0.018	49.7	LOS D	0.1	0.7	0.95	0.61	0.95	32.3
Approach			197	11.0	197	11.0	0.119	15.5	LOS B	2.5	18.9	0.61	0.49	0.61	47.9
West: Heleen Downs Road W															
10	L2	All MCs	2	24.0	2	24.0	0.002	7.2	LOS A	0.0	0.1	0.22	0.56	0.22	51.3
11	T1	All MCs	1	24.0	1	24.0	0.006	39.9	LOS C	0.0	0.4	0.92	0.55	0.92	36.4
12	R2	All MCs	27	24.0	27	24.0	* 0.119	43.1	LOS D	1.1	9.1	0.90	0.71	0.90	34.2
Approach			31	24.0	31	24.0	0.119	40.5	LOS C	1.1	9.1	0.86	0.70	0.86	35.1
All Vehicles			353	15.5	353	15.5	0.119	17.4	LOS B	2.5	18.9	0.61	0.50	0.61	46.5

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

MOVEMENT SUMMARY

 Site: 001 [2025 AM_BG_CON (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Ron McLean Drive / Heleen Downs Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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.]	Dist]				
			veh/h		veh/h		v/c	sec		veh	m				km/h
South: Ron McLean Drive S															
1	L2	All MCs	82	20.0	82	20.0	0.066	6.8	LOS A	0.5	3.9	0.21	0.60	0.21	51.6
2	T1	All MCs	271	20.0	271	20.0	* 0.271	27.1	LOS B	4.6	38.0	0.81	0.66	0.81	41.7
3	R2	All MCs	48	20.0	48	20.0	0.128	35.6	LOS C	1.7	14.0	0.82	0.72	0.82	36.8
Approach			401	20.0	401	20.0	0.271	24.0	LOS B	4.6	38.0	0.69	0.66	0.69	42.7
East: Heleen Downs Road E															
4	L2	All MCs	12	35.0	12	35.0	0.011	8.0	LOS A	0.1	0.8	0.26	0.58	0.26	50.6
5	T1	All MCs	2	35.0	2	35.0	* 0.020	44.2	LOS D	0.1	0.8	0.95	0.59	0.95	34.9
6	R2	All MCs	27	35.0	27	35.0	0.237	51.1	LOS D	1.2	11.1	0.97	0.72	0.97	31.7
Approach			41	35.0	41	35.0	0.237	38.6	LOS C	1.2	11.1	0.77	0.67	0.77	35.6
North: Ron McLean Drive N															
7	L2	All MCs	113	20.0	113	20.0	0.085	6.5	LOS A	0.5	3.9	0.18	0.59	0.18	51.8
8	T1	All MCs	160	20.0	160	20.0	0.133	21.2	LOS B	2.4	19.8	0.71	0.56	0.71	44.6
9	R2	All MCs	135	20.0	135	20.0	* 0.276	32.0	LOS C	4.6	37.5	0.80	0.76	0.80	38.1
Approach			407	20.0	407	20.0	0.276	20.7	LOS B	4.6	37.5	0.59	0.64	0.59	43.8
West: Heleen Downs Road W															
10	L2	All MCs	35	35.0	35	35.0	0.034	8.9	LOS A	0.3	3.0	0.30	0.60	0.30	50.1
11	T1	All MCs	2	35.0	2	35.0	0.020	44.2	LOS D	0.1	0.8	0.95	0.59	0.95	34.9
12	R2	All MCs	29	35.0	29	35.0	* 0.255	51.2	LOS D	1.3	11.9	0.97	0.72	0.97	31.7
Approach			66	35.0	66	35.0	0.255	28.8	LOS C	1.3	11.9	0.62	0.65	0.62	39.4
All Vehicles			916	21.8	916	21.8	0.276	23.5	LOS B	4.6	38.0	0.65	0.65	0.65	42.5

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

MOVEMENT SUMMARY

 Site: 001 [2025 PM_BG_CON (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Ron McLean Drive / Heleen Downs Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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: Ron McLean Drive S															
1	L2	All MCs	23	20.0	23	20.0	0.017	6.3	LOS A	0.1	0.7	0.15	0.57	0.15	51.9
2	T1	All MCs	116	20.0	116	20.0	* 0.159	32.0	LOS C	2.1	17.3	0.85	0.65	0.85	39.5
3	R2	All MCs	13	20.0	13	20.0	0.117	51.2	LOS D	0.6	4.6	0.97	0.68	0.97	31.8
Approach			152	20.0	152	20.0	0.159	29.6	LOS C	2.1	17.3	0.76	0.64	0.76	40.2
East: Heleen Downs Road E															
4	L2	All MCs	48	35.0	48	35.0	0.051	8.9	LOS A	0.5	4.2	0.30	0.61	0.30	50.1
5	T1	All MCs	1	35.0	1	35.0	0.010	43.9	LOS D	0.0	0.4	0.95	0.56	0.95	35.0
6	R2	All MCs	114	35.0	114	35.0	* 0.222	28.7	LOS C	3.6	32.6	0.75	0.74	0.75	39.3
Approach			163	35.0	163	35.0	0.222	22.9	LOS B	3.6	32.6	0.62	0.70	0.62	41.9
North: Ron McLean Drive N															
7	L2	All MCs	27	11.0	27	11.0	0.018	6.2	LOS A	0.1	0.6	0.14	0.57	0.14	52.3
8	T1	All MCs	199	11.0	199	11.0	0.218	28.9	LOS C	3.5	27.2	0.83	0.66	0.83	40.8
9	R2	All MCs	36	11.0	36	11.0	* 0.187	46.5	LOS D	1.5	11.4	0.94	0.73	0.94	33.2
Approach			262	11.0	262	11.0	0.218	28.9	LOS C	3.5	27.2	0.77	0.66	0.77	40.5
West: Heleen Downs Road W															
10	L2	All MCs	137	24.0	137	24.0	0.135	9.0	LOS A	1.4	12.0	0.33	0.63	0.33	50.3
11	T1	All MCs	2	24.0	2	24.0	* 0.019	44.0	LOS D	0.1	0.8	0.95	0.59	0.95	35.0
12	R2	All MCs	85	24.0	85	24.0	0.156	28.0	LOS B	2.6	22.0	0.73	0.73	0.73	39.8
Approach			224	24.0	224	24.0	0.156	16.5	LOS B	2.6	22.0	0.48	0.67	0.48	45.5
All Vehicles			801	21.2	801	21.2	0.222	24.4	LOS B	3.6	32.6	0.66	0.67	0.66	42.0

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

MOVEMENT SUMMARY

 Site: 001 [2027 AM_BG_OP (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Ron McLean Drive / Heleen Downs Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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: Ron McLean Drive S															
1	L2	All MCs	83	20.0	83	20.0	0.067	6.8	LOS A	0.5	3.9	0.21	0.60	0.21	51.6
2	T1	All MCs	284	20.0	284	20.0	* 0.285	27.2	LOS B	4.9	40.1	0.82	0.67	0.82	41.6
3	R2	All MCs	48	20.0	48	20.0	0.134	36.5	LOS C	1.7	14.2	0.84	0.73	0.84	36.4
Approach			416	20.0	416	20.0	0.285	24.2	LOS B	4.9	40.1	0.70	0.66	0.70	42.6
East: Heleen Downs Road E															
4	L2	All MCs	12	35.0	12	35.0	0.011	8.0	LOS A	0.1	0.8	0.26	0.58	0.26	50.6
5	T1	All MCs	2	35.0	2	35.0	* 0.020	44.2	LOS D	0.1	0.8	0.95	0.59	0.95	34.9
6	R2	All MCs	27	35.0	27	35.0	0.237	51.1	LOS D	1.2	11.1	0.97	0.72	0.97	31.7
Approach			41	35.0	41	35.0	0.237	38.6	LOS C	1.2	11.1	0.77	0.67	0.77	35.6
North: Ron McLean Drive N															
7	L2	All MCs	113	20.0	113	20.0	0.084	6.5	LOS A	0.5	3.9	0.18	0.59	0.18	51.8
8	T1	All MCs	167	20.0	167	20.0	0.135	20.5	LOS B	2.5	20.4	0.70	0.55	0.70	45.0
9	R2	All MCs	135	20.0	135	20.0	* 0.276	32.0	LOS C	4.6	37.5	0.80	0.76	0.80	38.1
Approach			415	20.0	415	20.0	0.276	20.4	LOS B	4.6	37.5	0.59	0.63	0.59	44.0
West: Heleen Downs Road W															
10	L2	All MCs	35	35.0	35	35.0	0.034	8.9	LOS A	0.3	3.1	0.30	0.60	0.30	50.1
11	T1	All MCs	2	35.0	2	35.0	0.020	44.2	LOS D	0.1	0.8	0.95	0.59	0.95	34.9
12	R2	All MCs	29	35.0	29	35.0	* 0.255	51.2	LOS D	1.3	11.9	0.97	0.72	0.97	31.7
Approach			66	35.0	66	35.0	0.255	28.8	LOS C	1.3	11.9	0.62	0.65	0.62	39.4
All Vehicles			938	21.7	938	21.7	0.285	23.5	LOS B	4.9	40.1	0.65	0.65	0.65	42.6

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

MOVEMENT SUMMARY

 Site: 001 [2027 PM_BG_OP (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Ron McLean Drive / Heleen Downs Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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	km/h				
South: Ron McLean Drive S															
1	L2	All MCs	24	20.0	24	20.0	0.017	6.3	LOS A	0.1	0.7	0.15	0.57	0.15	51.9
2	T1	All MCs	121	20.0	121	20.0	* 0.158	31.1	LOS C	2.2	17.8	0.84	0.65	0.84	39.9
3	R2	All MCs	1	20.0	1	20.0	0.010	49.6	LOS D	0.0	0.4	0.95	0.59	0.95	32.2
Approach			146	20.0	146	20.0	0.158	27.1	LOS B	2.2	17.8	0.73	0.64	0.73	41.4
East: Heleen Downs Road E															
4	L2	All MCs	48	35.0	48	35.0	0.051	8.9	LOS A	0.5	4.2	0.30	0.61	0.30	50.1
5	T1	All MCs	1	35.0	1	35.0	0.010	43.9	LOS D	0.0	0.4	0.95	0.56	0.95	35.0
6	R2	All MCs	114	35.0	114	35.0	* 0.222	28.7	LOS C	3.6	32.6	0.75	0.74	0.75	39.3
Approach			163	35.0	163	35.0	0.222	22.9	LOS B	3.6	32.6	0.62	0.70	0.62	41.9
North: Ron McLean Drive N															
7	L2	All MCs	27	11.0	27	11.0	0.018	6.2	LOS A	0.1	0.6	0.14	0.57	0.14	52.3
8	T1	All MCs	208	11.0	208	11.0	0.228	29.0	LOS C	3.7	28.5	0.83	0.66	0.83	40.8
9	R2	All MCs	36	11.0	36	11.0	* 0.208	47.8	LOS D	1.5	11.6	0.95	0.73	0.95	32.9
Approach			272	11.0	272	11.0	0.228	29.2	LOS C	3.7	28.5	0.78	0.66	0.78	40.4
West: Heleen Downs Road W															
10	L2	All MCs	137	24.0	137	24.0	0.135	9.0	LOS A	1.4	12.0	0.33	0.63	0.33	50.3
11	T1	All MCs	2	24.0	2	24.0	* 0.019	44.0	LOS D	0.1	0.8	0.95	0.59	0.95	35.0
12	R2	All MCs	85	24.0	85	24.0	0.156	28.0	LOS B	2.6	22.0	0.73	0.73	0.73	39.8
Approach			224	24.0	224	24.0	0.156	16.5	LOS B	2.6	22.0	0.49	0.67	0.49	45.5
All Vehicles			805	21.1	805	21.1	0.228	24.0	LOS B	3.7	32.6	0.65	0.67	0.65	42.2

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

MOVEMENT SUMMARY

 Site: 001 [2025 AM_BG+DEV_CON (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Ron McLean Drive / Heleen Downs Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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] m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Ron McLean Drive S															
1	L2	All MCs	82	20.0	82	20.0	0.066	6.8	LOS A	0.5	3.9	0.21	0.60	0.21	51.6
2	T1	All MCs	271	20.0	271	20.0	* 0.282	28.0	LOS B	4.7	38.6	0.83	0.67	0.83	41.3
3	R2	All MCs	65	20.0	65	20.0	0.151	33.2	LOS C	2.2	18.2	0.80	0.73	0.80	37.6
Approach			418	20.0	418	20.0	0.282	24.6	LOS B	4.7	38.6	0.70	0.67	0.70	42.3
East: Heleen Downs Road E															
4	L2	All MCs	15	35.0	15	35.0	0.014	8.0	LOS A	0.1	1.1	0.26	0.58	0.26	50.6
5	T1	All MCs	2	35.0	2	35.0	* 0.020	44.2	LOS D	0.1	0.8	0.95	0.59	0.95	34.9
6	R2	All MCs	36	35.0	36	35.0	* 0.271	50.1	LOS D	1.6	14.3	0.97	0.73	0.97	32.0
Approach			53	35.0	53	35.0	0.271	38.1	LOS C	1.6	14.3	0.77	0.68	0.77	35.8
North: Ron McLean Drive N															
7	L2	All MCs	151	20.0	151	20.0	0.115	6.5	LOS A	0.7	5.4	0.18	0.59	0.18	51.8
8	T1	All MCs	160	20.0	160	20.0	0.152	24.3	LOS B	2.6	21.3	0.76	0.60	0.76	43.0
9	R2	All MCs	135	20.0	135	20.0	* 0.276	32.0	LOS C	4.6	37.5	0.80	0.76	0.80	38.1
Approach			445	20.0	445	20.0	0.276	20.6	LOS B	4.6	37.5	0.58	0.65	0.58	43.8
West: Heleen Downs Road W															
10	L2	All MCs	35	35.0	35	35.0	0.034	8.9	LOS A	0.3	3.1	0.30	0.60	0.30	50.1
11	T1	All MCs	2	35.0	2	35.0	0.020	44.2	LOS D	0.1	0.8	0.95	0.59	0.95	34.9
12	R2	All MCs	29	35.0	29	35.0	0.223	49.8	LOS D	1.3	11.7	0.96	0.72	0.96	32.1
Approach			66	35.0	66	35.0	0.223	28.2	LOS B	1.3	11.7	0.61	0.65	0.61	39.6
All Vehicles			982	21.8	982	21.8	0.282	23.8	LOS B	4.7	38.6	0.64	0.66	0.64	42.4

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

MOVEMENT SUMMARY

 Site: 001 [2025 PM_BG+DEV_CON (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Ron McLean Drive / Heleen Downs Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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. Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Ron McLean Drive S															
1	L2	All MCs	23	20.0	23	20.0	0.017	6.3	LOS A	0.1	0.7	0.15	0.57	0.15	51.9
2	T1	All MCs	116	20.0	116	20.0	* 0.178	34.0	LOS C	2.2	17.9	0.88	0.67	0.88	38.7
3	R2	All MCs	16	20.0	16	20.0	0.146	51.5	LOS D	0.7	5.7	0.97	0.69	0.97	31.7
Approach			155	20.0	155	20.0	0.178	31.6	LOS C	2.2	17.9	0.78	0.66	0.78	39.3
East: Heleen Downs Road E															
4	L2	All MCs	64	35.0	64	35.0	0.067	8.9	LOS A	0.6	5.7	0.31	0.61	0.31	50.1
5	T1	All MCs	1	35.0	1	35.0	0.010	43.9	LOS D	0.0	0.4	0.95	0.56	0.95	35.0
6	R2	All MCs	149	35.0	149	35.0	* 0.259	26.2	LOS B	4.5	40.9	0.72	0.75	0.72	40.3
Approach			215	35.0	215	35.0	0.259	21.1	LOS B	4.5	40.9	0.60	0.71	0.60	42.8
North: Ron McLean Drive N															
7	L2	All MCs	35	11.0	35	11.0	0.023	6.2	LOS A	0.1	0.8	0.14	0.57	0.14	52.3
8	T1	All MCs	199	11.0	199	11.0	0.264	32.7	LOS C	3.8	29.0	0.88	0.69	0.88	39.2
9	R2	All MCs	36	11.0	36	11.0	* 0.234	49.2	LOS D	1.5	11.9	0.96	0.73	0.96	32.5
Approach			269	11.0	269	11.0	0.264	31.5	LOS C	3.8	29.0	0.79	0.68	0.79	39.4
West: Heleen Downs Road W															
10	L2	All MCs	137	24.0	137	24.0	0.141	9.4	LOS A	1.5	12.7	0.34	0.64	0.34	50.1
11	T1	All MCs	2	24.0	2	24.0	* 0.019	44.0	LOS D	0.1	0.8	0.95	0.59	0.95	35.0
12	R2	All MCs	85	24.0	85	24.0	0.138	25.0	LOS B	2.4	20.4	0.68	0.72	0.68	41.1
Approach			224	24.0	224	24.0	0.141	15.6	LOS B	2.4	20.4	0.48	0.67	0.48	46.1
All Vehicles			863	22.0	863	22.0	0.264	24.8	LOS B	4.5	40.9	0.66	0.68	0.66	41.8

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

MOVEMENT SUMMARY

 Site: 001 [2027 AM_BG+DEV_OP (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Ron McLean Drive / Heleen Downs Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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. Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Ron McLean Drive S															
1	L2	All MCs	83	20.0	83	20.0	0.067	6.8	LOS A	0.5	3.9	0.21	0.60	0.21	51.6
2	T1	All MCs	284	20.0	284	20.0	* 0.296	28.1	LOS B	5.0	40.8	0.83	0.68	0.83	41.2
3	R2	All MCs	73	20.0	73	20.0	0.168	33.4	LOS C	2.5	20.3	0.80	0.74	0.80	37.6
Approach			440	20.0	440	20.0	0.296	25.0	LOS B	5.0	40.8	0.71	0.67	0.71	42.1
East: Heleen Downs Road E															
4	L2	All MCs	36	35.0	36	35.0	0.034	8.1	LOS A	0.3	2.6	0.26	0.59	0.26	50.5
5	T1	All MCs	2	35.0	2	35.0	* 0.020	44.2	LOS D	0.1	0.8	0.95	0.59	0.95	34.9
6	R2	All MCs	44	35.0	44	35.0	* 0.297	49.0	LOS D	1.9	17.4	0.96	0.74	0.96	32.3
Approach			82	35.0	82	35.0	0.297	31.1	LOS C	1.9	17.4	0.66	0.67	0.66	38.4
North: Ron McLean Drive N															
7	L2	All MCs	128	20.0	128	20.0	0.099	6.6	LOS A	0.6	5.1	0.19	0.59	0.19	51.8
8	T1	All MCs	167	20.0	167	20.0	0.165	25.2	LOS B	2.8	22.7	0.77	0.61	0.77	42.5
9	R2	All MCs	135	20.0	135	20.0	* 0.287	32.9	LOS C	4.7	38.1	0.82	0.77	0.82	37.8
Approach			431	20.0	431	20.0	0.287	22.1	LOS B	4.7	38.1	0.61	0.65	0.61	43.1
West: Heleen Downs Road W															
10	L2	All MCs	35	35.0	35	35.0	0.035	9.2	LOS A	0.4	3.2	0.31	0.60	0.31	49.9
11	T1	All MCs	2	35.0	2	35.0	0.020	44.2	LOS D	0.1	0.8	0.95	0.59	0.95	34.9
12	R2	All MCs	29	35.0	29	35.0	0.198	48.4	LOS D	1.3	11.5	0.95	0.72	0.95	32.5
Approach			66	35.0	66	35.0	0.198	27.7	LOS B	1.3	11.5	0.62	0.66	0.62	39.8
All Vehicles			1019	22.2	1019	22.2	0.297	24.4	LOS B	5.0	40.8	0.66	0.66	0.66	42.1

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

MOVEMENT SUMMARY

 Site: 001 [2027 PM_BG+DEV_OP (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Ron McLean Drive / Heleen Downs Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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] m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Ron McLean Drive S															
1	L2	All MCs	24	20.0	24	20.0	0.017	6.3	LOS A	0.1	0.7	0.15	0.57	0.15	51.9
2	T1	All MCs	121	20.0	121	20.0	0.150	30.2	LOS C	2.1	17.5	0.83	0.64	0.83	40.3
3	R2	All MCs	37	20.0	37	20.0	* 0.255	49.5	LOS D	1.6	13.1	0.97	0.73	0.97	32.3
Approach			182	20.0	182	20.0	0.255	30.9	LOS C	2.1	17.5	0.77	0.65	0.77	39.5
East: Heleen Downs Road E															
4	L2	All MCs	73	35.0	73	35.0	0.076	9.0	LOS A	0.7	6.5	0.31	0.62	0.31	50.0
5	T1	All MCs	1	35.0	1	35.0	0.010	43.9	LOS D	0.0	0.4	0.95	0.56	0.95	35.0
6	R2	All MCs	129	35.0	129	35.0	* 0.253	29.0	LOS C	4.1	37.5	0.76	0.75	0.76	39.1
Approach			203	35.0	203	35.0	0.253	21.9	LOS B	4.1	37.5	0.60	0.70	0.60	42.4
North: Ron McLean Drive N															
7	L2	All MCs	44	11.0	44	11.0	0.030	6.3	LOS A	0.2	1.4	0.17	0.58	0.17	52.2
8	T1	All MCs	208	11.0	208	11.0	* 0.250	30.9	LOS C	3.9	29.5	0.85	0.68	0.85	40.0
9	R2	All MCs	36	11.0	36	11.0	0.234	49.2	LOS D	1.5	11.9	0.96	0.73	0.96	32.5
Approach			288	11.0	288	11.0	0.250	29.4	LOS C	3.9	29.5	0.76	0.67	0.76	40.3
West: Heleen Downs Road W															
10	L2	All MCs	137	24.0	137	24.0	0.138	9.3	LOS A	1.5	12.6	0.34	0.64	0.34	50.1
11	T1	All MCs	2	24.0	2	24.0	* 0.019	44.0	LOS D	0.1	0.8	0.95	0.59	0.95	35.0
12	R2	All MCs	85	24.0	85	24.0	0.156	28.0	LOS B	2.6	22.0	0.73	0.73	0.73	39.8
Approach			224	24.0	224	24.0	0.156	16.7	LOS B	2.6	22.0	0.49	0.67	0.49	45.4
All Vehicles			898	21.5	898	21.5	0.255	24.9	LOS B	4.1	37.5	0.66	0.67	0.66	41.8

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

SITE LAYOUT

 **Site: 002 [2024 AM_Survey (Site Folder: General)]**

Project No.: P6680

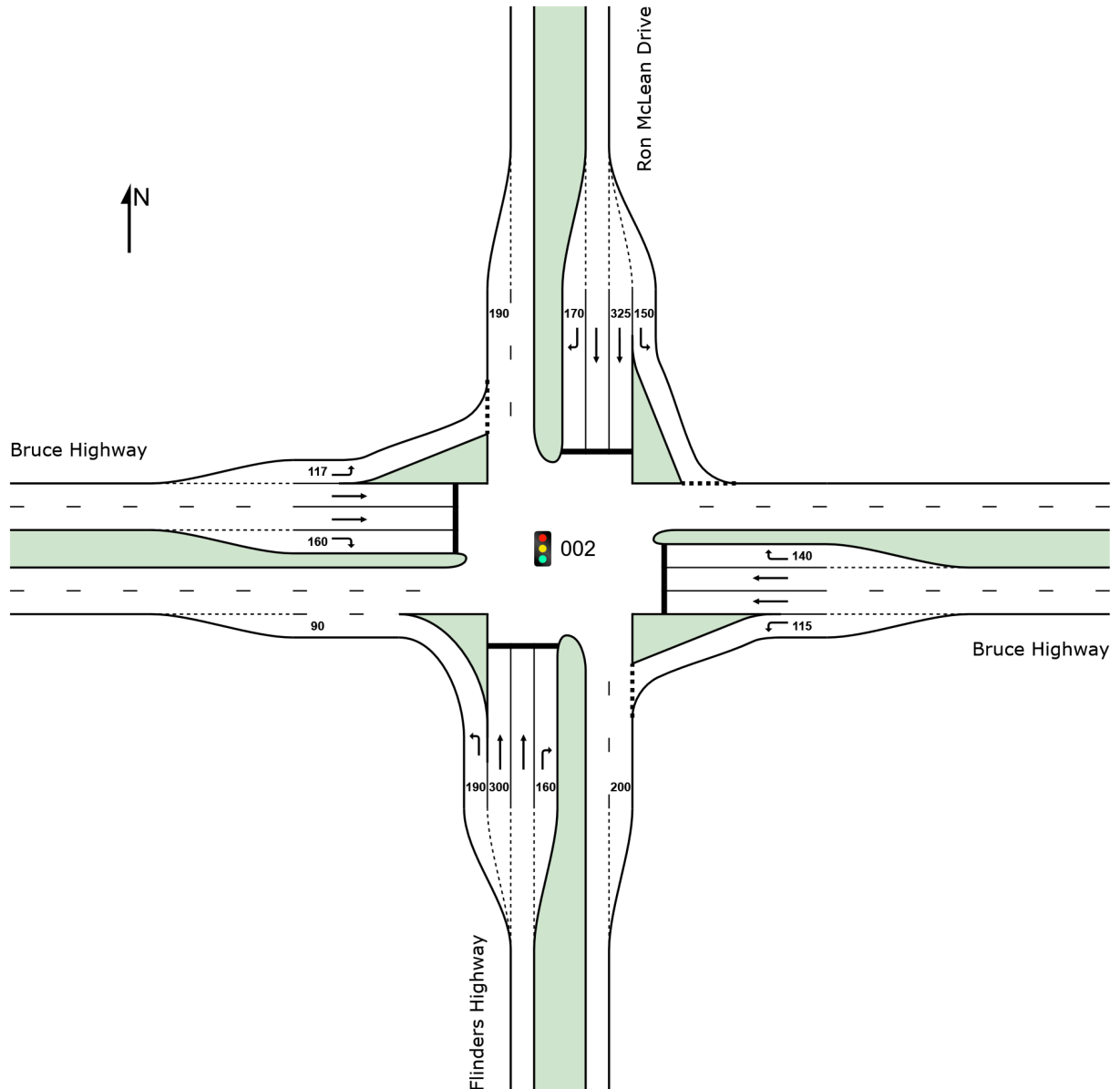
Project: Jet Zero Townsville TIA

Intersection: Bruce Highway / Flinders Highway / Ron McLean Drive

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



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

Organisation: BITZIOS CONSULTING | Licence: PLUS / FLOATING | Created: Tuesday, 17 December 2024 6:54:30 AM

Project: P:\P6680 Jet Zero Townsville TIA\Technical\SIDRA\P6680.001_Int 02 Bruce Hwy_Flinders Hwy_Ron McLean Dr.sip9

MOVEMENT SUMMARY

 Site: 002 [2024 AM_Survey (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Bruce Highway / Flinders Highway / Ron McLean Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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] m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flinders Highway															
1	L2	All MCs	41	37.0	41	37.0	0.028	7.0	LOS A	0.0	0.0	0.00	0.51	0.00	52.2
2	T1	All MCs	55	37.0	55	37.0	* 0.261	46.8	LOS D	1.2	11.4	0.98	0.71	0.98	34.2
3	R2	All MCs	20	37.0	20	37.0	* 0.204	52.4	LOS D	0.9	8.3	0.98	0.70	0.98	31.4
Approach			116	37.0	116	37.0	0.261	33.7	LOS C	1.2	11.4	0.63	0.64	0.63	38.3
East: Bruce Highway															
4	L2	All MCs	21	11.0	21	11.0	0.016	7.5	LOS A	0.2	1.2	0.24	0.59	0.24	51.5
5	T1	All MCs	724	11.0	724	11.0	* 0.381	13.7	LOS A	9.4	72.2	0.64	0.56	0.64	49.1
6	R2	All MCs	176	11.0	176	11.0	0.510	41.3	LOS C	7.1	54.3	0.94	0.80	0.94	35.0
Approach			921	11.0	921	11.0	0.510	18.8	LOS B	9.4	72.2	0.69	0.60	0.69	45.6
North: Ron McLean Drive															
7	L2	All MCs	95	27.0	95	27.0	0.096	7.6	LOS A	0.8	6.6	0.27	0.61	0.27	50.9
8	T1	All MCs	56	27.0	56	27.0	0.252	46.3	LOS D	1.3	10.8	0.98	0.71	0.98	34.3
9	R2	All MCs	19	27.0	19	27.0	0.182	51.9	LOS D	0.8	7.3	0.97	0.70	0.97	31.7
Approach			169	27.0	169	27.0	0.252	25.3	LOS B	1.3	10.8	0.58	0.65	0.58	41.4
West: Bruce Highway															
10	L2	All MCs	583	17.0	583	17.0	0.515	11.5	LOS A	10.5	83.9	0.52	0.72	0.52	49.0
11	T1	All MCs	484	17.0	484	17.0	0.345	20.3	LOS B	7.4	59.4	0.74	0.63	0.74	45.2
12	R2	All MCs	48	17.0	48	17.0	* 0.376	51.4	LOS D	2.2	17.4	0.99	0.74	0.99	32.0
Approach			1116	17.0	1116	17.0	0.515	17.0	LOS B	10.5	83.9	0.64	0.68	0.64	46.2
All Vehicles			2322	16.3	2322	16.3	0.515	19.2	LOS B	10.5	83.9	0.65	0.64	0.65	45.1

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

MOVEMENT SUMMARY

 Site: 002 [2024 PM_Survey (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Bruce Highway / Flinders Highway / Ron McLean Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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] m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flinders Highway															
1	L2	All MCs	80	20.0	80	20.0	0.049	6.6	LOS A	0.0	0.0	0.00	0.52	0.00	52.8
2	T1	All MCs	40	20.0	40	20.0	* 0.174	45.7	LOS D	0.9	7.3	0.97	0.69	0.97	34.5
3	R2	All MCs	19	20.0	19	20.0	0.131	48.7	LOS D	0.8	6.6	0.95	0.70	0.95	32.6
Approach			139	20.0	139	20.0	0.174	23.6	LOS B	0.9	7.3	0.41	0.59	0.41	42.7
East: Bruce Highway															
4	L2	All MCs	19	11.0	19	11.0	0.014	7.5	LOS A	0.1	1.1	0.24	0.59	0.24	51.5
5	T1	All MCs	657	11.0	657	11.0	* 0.369	15.4	LOS B	9.0	68.6	0.67	0.58	0.67	48.0
6	R2	All MCs	68	11.0	68	11.0	0.358	47.7	LOS D	2.9	22.4	0.97	0.76	0.97	33.0
Approach			744	11.0	744	11.0	0.369	18.1	LOS B	9.0	68.6	0.68	0.59	0.68	46.2
North: Ron McLean Drive															
7	L2	All MCs	107	13.0	107	13.0	0.111	7.7	LOS A	0.9	7.3	0.28	0.62	0.28	51.2
8	T1	All MCs	43	13.0	43	13.0	0.154	44.1	LOS D	0.9	7.3	0.96	0.68	0.96	35.0
9	R2	All MCs	58	13.0	58	13.0	* 0.341	48.7	LOS D	2.5	19.5	0.97	0.75	0.97	32.7
Approach			208	13.0	208	13.0	0.341	26.6	LOS B	2.5	19.5	0.62	0.67	0.62	40.8
West: Bruce Highway															
10	L2	All MCs	11	10.0	11	10.0	0.008	7.7	LOS A	0.1	0.6	0.25	0.58	0.25	51.4
11	T1	All MCs	622	10.0	622	10.0	0.373	17.2	LOS B	8.9	67.9	0.70	0.60	0.70	46.9
12	R2	All MCs	47	10.0	47	10.0	* 0.351	51.0	LOS D	2.1	16.0	0.98	0.74	0.98	32.1
Approach			680	10.0	680	10.0	0.373	19.5	LOS B	8.9	67.9	0.71	0.61	0.71	45.5
All Vehicles			1772	11.6	1772	11.6	0.373	20.1	LOS B	9.0	68.6	0.66	0.61	0.66	44.9

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

MOVEMENT SUMMARY

 Site: 002 [2025 AM_BG_CON (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Bruce Highway / Flinders Highway / Ron McLean Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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] m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flinders Highway															
1	L2	All MCs	42	37.0	42	37.0	0.029	7.1	LOS A	0.0	0.0	0.00	0.51	0.00	52.2
2	T1	All MCs	152	37.0	152	37.0	* 0.542	46.3	LOS D	3.4	31.7	1.00	0.78	1.02	34.5
3	R2	All MCs	21	37.0	21	37.0	* 0.184	50.8	LOS D	0.9	8.6	0.97	0.71	0.97	31.8
Approach			215	37.0	215	37.0	0.542	39.1	LOS C	3.4	31.7	0.80	0.72	0.82	36.7
East: Bruce Highway															
4	L2	All MCs	22	11.0	22	11.0	0.017	7.7	LOS A	0.2	1.4	0.26	0.59	0.26	51.4
5	T1	All MCs	749	11.0	749	11.0	* 0.421	15.9	LOS B	10.6	80.8	0.69	0.60	0.69	47.7
6	R2	All MCs	187	11.0	187	11.0	0.544	41.6	LOS C	7.6	58.3	0.95	0.81	0.95	35.0
Approach			959	11.0	959	11.0	0.544	20.7	LOS B	10.6	80.8	0.73	0.64	0.73	44.6
North: Ron McLean Drive															
7	L2	All MCs	99	27.0	99	27.0	0.099	7.8	LOS A	0.9	7.4	0.28	0.62	0.28	50.7
8	T1	All MCs	81	27.0	81	27.0	0.275	43.9	LOS D	1.8	15.2	0.97	0.72	0.97	35.1
9	R2	All MCs	21	27.0	21	27.0	0.174	50.5	LOS D	0.9	8.0	0.97	0.70	0.97	32.0
Approach			201	27.0	201	27.0	0.275	26.8	LOS B	1.8	15.2	0.63	0.67	0.63	40.9
West: Bruce Highway															
10	L2	All MCs	608	17.0	608	17.0	0.567	14.4	LOS A	12.1	97.0	0.60	0.77	0.60	47.7
11	T1	All MCs	501	17.0	501	17.0	0.389	22.8	LOS B	8.2	65.5	0.78	0.66	0.78	43.8
12	R2	All MCs	51	17.0	51	17.0	* 0.392	51.5	LOS D	2.3	18.2	0.99	0.74	0.99	32.0
Approach			1160	17.0	1160	17.0	0.567	19.7	LOS B	12.1	97.0	0.69	0.72	0.69	45.0
All Vehicles			2535	17.2	2535	17.2	0.567	22.3	LOS B	12.1	97.0	0.71	0.69	0.71	43.7

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

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

Organisation: BITZIOS CONSULTING | Licence: PLUS / FLOATING | Processed: Monday, 16 December 2024 3:34:35 PM

Project: P:\P6680 Jet Zero Townsville TIA\Technical\SIDRA\P6680.001_Int 02 Bruce Hwy_Flinders Hwy_Ron McLean Dr.sip9

MOVEMENT SUMMARY

 Site: 002 [2025 PM_BG_CON (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Bruce Highway / Flinders Highway / Ron McLean Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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] m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flinders Highway															
1	L2	All MCs	83	20.0	83	20.0	0.051	6.7	LOS A	0.0	0.0	0.00	0.52	0.00	52.8
2	T1	All MCs	65	20.0	65	20.0	* 0.284	46.4	LOS D	1.5	12.0	0.98	0.71	0.98	34.3
3	R2	All MCs	20	20.0	20	20.0	0.185	51.7	LOS D	0.9	7.3	0.98	0.70	0.98	31.8
Approach			168	20.0	168	20.0	0.284	27.4	LOS B	1.5	12.0	0.50	0.61	0.50	41.0
East: Bruce Highway															
4	L2	All MCs	20	11.0	20	11.0	0.016	8.0	LOS A	0.2	1.3	0.27	0.59	0.27	51.2
5	T1	All MCs	680	11.0	680	11.0	* 0.382	15.5	LOS B	9.3	71.6	0.67	0.58	0.67	47.9
6	R2	All MCs	81	11.0	81	11.0	0.385	46.8	LOS D	3.4	26.3	0.96	0.77	0.96	33.3
Approach			781	11.0	781	11.0	0.385	18.5	LOS B	9.3	71.6	0.69	0.60	0.69	45.9
North: Ron McLean Drive															
7	L2	All MCs	117	13.0	117	13.0	0.120	7.9	LOS A	1.1	8.6	0.30	0.63	0.30	51.0
8	T1	All MCs	140	13.0	140	13.0	0.389	43.2	LOS D	3.0	23.6	0.98	0.75	0.98	35.3
9	R2	All MCs	65	13.0	65	13.0	* 0.384	49.0	LOS D	2.8	22.1	0.98	0.76	0.98	32.6
Approach			322	13.0	322	13.0	0.389	31.6	LOS C	3.0	23.6	0.73	0.70	0.73	39.0
West: Bruce Highway															
10	L2	All MCs	13	10.0	13	10.0	0.010	7.9	LOS A	0.1	0.8	0.27	0.59	0.27	51.3
11	T1	All MCs	644	10.0	644	10.0	0.396	18.1	LOS B	9.5	72.4	0.72	0.62	0.72	46.4
12	R2	All MCs	49	10.0	49	10.0	* 0.367	51.1	LOS D	2.2	16.8	0.99	0.74	0.99	32.1
Approach			706	10.0	706	10.0	0.396	20.2	LOS B	9.5	72.4	0.73	0.63	0.73	45.0
All Vehicles			1978	11.7	1978	11.7	0.396	22.0	LOS B	9.5	72.4	0.69	0.63	0.69	43.9

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

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

Organisation: BITZIOS CONSULTING | Licence: PLUS / FLOATING | Processed: Monday, 16 December 2024 3:34:36 PM

Project: P:\P6680 Jet Zero Townsville TIA\Technical\SIDRA\P6680.001_Int 02 Bruce Hwy_Flinders Hwy_Ron McLean Dr.sip9

MOVEMENT SUMMARY

 Site: 002 [2027 AM_BG_OP (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Bruce Highway / Flinders Highway / Ron McLean Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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] m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flinders Highway															
1	L2	All MCs	45	37.0	45	37.0	0.031	7.2	LOS A	0.0	0.0	0.00	0.51	0.00	52.2
2	T1	All MCs	156	37.0	156	37.0	* 0.557	46.6	LOS D	3.5	32.7	1.00	0.79	1.03	34.5
3	R2	All MCs	22	37.0	22	37.0	* 0.193	50.9	LOS D	1.0	9.0	0.97	0.71	0.97	31.8
Approach			223	37.0	223	37.0	0.557	39.0	LOS C	3.5	32.7	0.79	0.72	0.82	36.7
East: Bruce Highway															
4	L2	All MCs	23	11.0	23	11.0	0.018	7.8	LOS A	0.2	1.5	0.26	0.59	0.26	51.4
5	T1	All MCs	800	11.0	800	11.0	* 0.450	16.2	LOS B	11.5	87.9	0.70	0.61	0.70	47.5
6	R2	All MCs	200	11.0	200	11.0	0.581	41.9	LOS C	8.2	62.8	0.96	0.81	0.96	34.8
Approach			1023	11.0	1023	11.0	0.581	21.0	LOS B	11.5	87.9	0.74	0.65	0.74	44.4
North: Ron McLean Drive															
7	L2	All MCs	106	27.0	106	27.0	0.108	8.1	LOS A	1.0	8.6	0.30	0.62	0.30	50.5
8	T1	All MCs	85	27.0	85	27.0	0.289	44.0	LOS D	1.9	16.0	0.97	0.72	0.97	35.1
9	R2	All MCs	23	27.0	23	27.0	0.191	50.6	LOS D	1.0	8.8	0.97	0.71	0.97	32.0
Approach			215	27.0	215	27.0	0.289	26.9	LOS B	1.9	16.0	0.64	0.67	0.64	40.8
West: Bruce Highway															
10	L2	All MCs	649	17.0	649	17.0	0.611	15.9	LOS B	13.0	104.0	0.63	0.81	0.63	46.9
11	T1	All MCs	535	17.0	535	17.0	0.415	23.1	LOS B	8.8	70.8	0.79	0.68	0.79	43.7
12	R2	All MCs	54	17.0	54	17.0	* 0.417	51.6	LOS D	2.4	19.4	0.99	0.75	0.99	31.9
Approach			1238	17.0	1238	17.0	0.611	20.6	LOS B	13.0	104.0	0.72	0.75	0.72	44.6
All Vehicles			2699	17.2	2699	17.2	0.611	22.8	LOS B	13.0	104.0	0.73	0.70	0.73	43.4

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

MOVEMENT SUMMARY

 Site: 002 [2027 PM_BG_OP (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Bruce Highway / Flinders Highway / Ron McLean Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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] m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flinders Highway															
1	L2	All MCs	88	20.0	88	20.0	0.054	6.8	LOS A	0.0	0.0	0.00	0.52	0.00	52.8
2	T1	All MCs	68	20.0	68	20.0	* 0.297	46.5	LOS D	1.5	12.6	0.99	0.72	0.99	34.3
3	R2	All MCs	21	20.0	21	20.0	0.194	51.8	LOS D	0.9	7.7	0.98	0.70	0.98	31.8
Approach			178	20.0	178	20.0	0.297	27.4	LOS B	1.5	12.6	0.49	0.62	0.49	41.0
East: Bruce Highway															
4	L2	All MCs	21	11.0	21	11.0	0.017	8.0	LOS A	0.2	1.4	0.27	0.59	0.27	51.2
5	T1	All MCs	726	11.0	726	11.0	* 0.408	15.7	LOS B	10.1	77.7	0.68	0.59	0.68	47.8
6	R2	All MCs	86	11.0	86	11.0	0.410	46.9	LOS D	3.7	28.2	0.97	0.77	0.97	33.3
Approach			834	11.0	834	11.0	0.410	18.8	LOS B	10.1	77.7	0.70	0.61	0.70	45.8
North: Ron McLean Drive															
7	L2	All MCs	124	13.0	124	13.0	0.130	8.2	LOS A	1.3	9.8	0.32	0.63	0.32	50.8
8	T1	All MCs	142	13.0	142	13.0	0.395	43.3	LOS D	3.1	24.0	0.98	0.75	0.98	35.3
9	R2	All MCs	69	13.0	69	13.0	* 0.409	49.1	LOS D	3.0	23.6	0.98	0.76	0.98	32.6
Approach			336	13.0	336	13.0	0.409	31.5	LOS C	3.1	24.0	0.73	0.71	0.73	39.0
West: Bruce Highway															
10	L2	All MCs	14	10.0	14	10.0	0.011	8.0	LOS A	0.1	0.9	0.27	0.59	0.27	51.3
11	T1	All MCs	687	10.0	687	10.0	0.422	18.4	LOS B	10.3	78.4	0.73	0.63	0.73	46.2
12	R2	All MCs	53	10.0	53	10.0	* 0.390	51.3	LOS D	2.4	17.9	0.99	0.75	0.99	32.1
Approach			754	10.0	754	10.0	0.422	20.5	LOS B	10.3	78.4	0.74	0.64	0.74	44.9
All Vehicles			2101	11.7	2101	11.7	0.422	22.2	LOS B	10.3	78.4	0.70	0.64	0.70	43.8

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

MOVEMENT SUMMARY

 Site: 002 [2025 AM_BG+DEV_CON (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Bruce Highway / Flinders Highway / Ron McLean Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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] m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flinders Highway															
1	L2	All MCs	42	37.0	42	37.0	0.029	7.1	LOS A	0.0	0.0	0.00	0.51	0.00	52.2
2	T1	All MCs	155	37.0	155	37.0	* 0.554	46.5	LOS D	3.5	32.4	1.00	0.78	1.03	34.5
3	R2	All MCs	21	37.0	21	37.0	0.184	50.8	LOS D	0.9	8.6	0.97	0.71	0.97	31.8
Approach			218	37.0	218	37.0	0.554	39.3	LOS C	3.5	32.4	0.80	0.72	0.83	36.6
East: Bruce Highway															
4	L2	All MCs	22	11.0	22	11.0	0.017	7.7	LOS A	0.2	1.4	0.26	0.59	0.26	51.4
5	T1	All MCs	749	11.0	749	11.0	* 0.421	15.9	LOS B	10.6	80.8	0.69	0.60	0.69	47.7
6	R2	All MCs	191	11.0	191	11.0	0.553	41.7	LOS C	7.8	59.4	0.95	0.81	0.95	34.9
Approach			962	11.0	962	11.0	0.553	20.8	LOS B	10.6	80.8	0.73	0.64	0.73	44.6
North: Ron McLean Drive															
7	L2	All MCs	101	27.0	101	27.0	0.101	7.8	LOS A	0.9	7.6	0.28	0.62	0.28	50.7
8	T1	All MCs	82	27.0	82	27.0	0.278	43.9	LOS D	1.8	15.4	0.97	0.72	0.97	35.1
9	R2	All MCs	23	27.0	23	27.0	* 0.191	50.6	LOS D	1.0	8.8	0.97	0.71	0.97	32.0
Approach			206	27.0	206	27.0	0.278	27.0	LOS B	1.8	15.4	0.63	0.67	0.63	40.8
West: Bruce Highway															
10	L2	All MCs	619	17.0	619	17.0	0.579	15.0	LOS B	12.3	98.7	0.61	0.78	0.61	47.4
11	T1	All MCs	501	17.0	501	17.0	0.389	22.8	LOS B	8.2	65.5	0.78	0.66	0.78	43.8
12	R2	All MCs	51	17.0	51	17.0	* 0.392	51.5	LOS D	2.3	18.2	0.99	0.74	0.99	32.0
Approach			1171	17.0	1171	17.0	0.579	19.9	LOS B	12.3	98.7	0.70	0.73	0.70	44.9
All Vehicles			2557	17.3	2557	17.3	0.579	22.5	LOS B	12.3	98.7	0.71	0.69	0.72	43.6

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

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

Organisation: BITZIOS CONSULTING | Licence: PLUS / FLOATING | Processed: Monday, 16 December 2024 3:34:40 PM

Project: P:\P6680 Jet Zero Townsville TIA\Technical\SIDRA\P6680.001_Int 02 Bruce Hwy_Flinders Hwy_Ron McLean Dr.sip9

MOVEMENT SUMMARY

 Site: 002 [2025 PM_BG+DEV_CON (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Bruce Highway / Flinders Highway / Ron McLean Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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] m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flinders Highway															
1	L2	All MCs	83	20.0	83	20.0	0.051	6.7	LOS A	0.0	0.0	0.00	0.52	0.00	52.8
2	T1	All MCs	65	20.0	65	20.0	* 0.284	46.4	LOS D	1.5	12.0	0.98	0.71	0.98	34.3
3	R2	All MCs	20	20.0	20	20.0	0.185	51.7	LOS D	0.9	7.3	0.98	0.70	0.98	31.8
Approach			168	20.0	168	20.0	0.284	27.4	LOS B	1.5	12.0	0.50	0.61	0.50	41.0
East: Bruce Highway															
4	L2	All MCs	20	11.0	20	11.0	0.016	8.0	LOS A	0.2	1.3	0.27	0.59	0.27	51.2
5	T1	All MCs	680	11.0	680	11.0	* 0.391	16.2	LOS B	9.6	73.2	0.69	0.59	0.69	47.5
6	R2	All MCs	82	11.0	82	11.0	0.390	46.8	LOS D	3.5	26.7	0.96	0.77	0.96	33.3
Approach			782	11.0	782	11.0	0.391	19.2	LOS B	9.6	73.2	0.70	0.61	0.70	45.6
North: Ron McLean Drive															
7	L2	All MCs	120	13.0	120	13.0	0.122	8.0	LOS A	1.1	8.9	0.30	0.63	0.30	51.0
8	T1	All MCs	143	13.0	143	13.0	0.358	42.0	LOS C	3.1	23.8	0.97	0.74	0.97	35.8
9	R2	All MCs	75	13.0	75	13.0	* 0.396	48.0	LOS D	3.2	25.0	0.97	0.76	0.97	32.9
Approach			338	13.0	338	13.0	0.396	31.2	LOS C	3.2	25.0	0.73	0.71	0.73	39.2
West: Bruce Highway															
10	L2	All MCs	15	10.0	15	10.0	0.011	7.9	LOS A	0.1	1.0	0.27	0.59	0.27	51.3
11	T1	All MCs	644	10.0	644	10.0	0.406	18.9	LOS B	9.7	73.9	0.73	0.63	0.73	45.9
12	R2	All MCs	49	10.0	49	10.0	* 0.367	51.1	LOS D	2.2	16.8	0.99	0.74	0.99	32.1
Approach			708	10.0	708	10.0	0.406	20.9	LOS B	9.7	73.9	0.74	0.64	0.74	44.7
All Vehicles			1997	11.7	1997	11.7	0.406	22.5	LOS B	9.7	73.9	0.70	0.64	0.70	43.6

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

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

Organisation: BITZIOS CONSULTING | Licence: PLUS / FLOATING | Processed: Monday, 16 December 2024 3:34:42 PM

Project: P:\P6680 Jet Zero Townsville TIA\Technical\SIDRA\P6680.001_Int 02 Bruce Hwy_Flinders Hwy_Ron McLean Dr.sip9

MOVEMENT SUMMARY

 Site: 002 [2027 AM_BG+DEV_OP (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Bruce Highway / Flinders Highway / Ron McLean Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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: Flinders Highway															
1	L2	All MCs	45	37.0	45	37.0	0.031	7.2	LOS A	0.0	0.0	0.00	0.51	0.00	52.2
2	T1	All MCs	160	37.0	160	37.0	* 0.573	46.8	LOS D	3.7	33.7	1.00	0.79	1.05	34.4
3	R2	All MCs	22	37.0	22	37.0	0.193	50.9	LOS D	1.0	9.0	0.97	0.71	0.97	31.8
Approach			227	37.0	227	37.0	0.573	39.3	LOS C	3.7	33.7	0.80	0.73	0.83	36.6
East: Bruce Highway															
4	L2	All MCs	23	11.0	23	11.0	0.018	8.0	LOS A	0.2	1.5	0.27	0.59	0.27	51.2
5	T1	All MCs	800	11.0	800	11.0	* 0.450	16.2	LOS B	11.5	87.9	0.70	0.61	0.70	47.5
6	R2	All MCs	204	11.0	204	11.0	0.628	43.3	LOS D	8.6	65.7	0.97	0.82	0.99	34.4
Approach			1027	11.0	1027	11.0	0.628	21.4	LOS B	11.5	87.9	0.75	0.65	0.75	44.2
North: Ron McLean Drive															
7	L2	All MCs	112	27.0	112	27.0	0.115	8.1	LOS A	1.0	9.1	0.30	0.62	0.30	50.5
8	T1	All MCs	91	27.0	91	27.0	0.307	44.1	LOS D	2.0	17.1	0.97	0.72	0.97	35.0
9	R2	All MCs	37	27.0	37	27.0	* 0.304	51.3	LOS D	1.6	14.2	0.98	0.73	0.98	31.8
Approach			239	27.0	239	27.0	0.307	28.4	LOS B	2.0	17.1	0.66	0.68	0.66	40.1
West: Bruce Highway															
10	L2	All MCs	664	17.0	664	17.0	0.626	16.7	LOS B	13.0	104.1	0.64	0.82	0.64	46.6
11	T1	All MCs	535	17.0	535	17.0	0.403	22.2	LOS B	8.7	69.4	0.78	0.66	0.78	44.1
12	R2	All MCs	54	17.0	54	17.0	* 0.417	51.6	LOS D	2.4	19.4	0.99	0.75	0.99	31.9
Approach			1253	17.0	1253	17.0	0.626	20.6	LOS B	13.0	104.1	0.72	0.75	0.72	44.6
All Vehicles			2746	17.3	2746	17.3	0.628	23.1	LOS B	13.0	104.1	0.73	0.71	0.73	43.3

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

MOVEMENT SUMMARY

 Site: 002 [2027 PM_BG+DEV_OP (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Project No.: P6680
Project: Jet Zero Townsville TIA
Intersection: Bruce Highway / Flinders Highway / Ron McLean Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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] m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flinders Highway															
1	L2	All MCs	88	20.0	88	20.0	0.054	6.8	LOS A	0.0	0.0	0.00	0.52	0.00	52.8
2	T1	All MCs	73	20.0	73	20.0	* 0.316	46.6	LOS D	1.6	13.4	0.99	0.72	0.99	34.2
3	R2	All MCs	21	20.0	21	20.0	0.194	51.8	LOS D	0.9	7.7	0.98	0.70	0.98	31.8
Approach			182	20.0	182	20.0	0.316	27.8	LOS B	1.6	13.4	0.51	0.62	0.51	40.8
East: Bruce Highway															
4	L2	All MCs	21	11.0	21	11.0	0.017	8.0	LOS A	0.2	1.4	0.27	0.59	0.27	51.2
5	T1	All MCs	726	11.0	726	11.0	* 0.428	17.2	LOS B	10.6	81.2	0.71	0.62	0.71	46.9
6	R2	All MCs	91	11.0	91	11.0	0.430	47.1	LOS D	3.9	29.6	0.97	0.77	0.97	33.2
Approach			838	11.0	838	11.0	0.430	20.2	LOS B	10.6	81.2	0.73	0.63	0.73	45.0
North: Ron McLean Drive															
7	L2	All MCs	128	13.0	128	13.0	0.132	8.5	LOS A	1.4	10.7	0.33	0.64	0.33	50.6
8	T1	All MCs	147	13.0	147	13.0	0.335	40.8	LOS C	3.1	24.1	0.96	0.73	0.96	36.2
9	R2	All MCs	83	13.0	83	13.0	* 0.400	46.9	LOS D	3.5	27.5	0.96	0.77	0.96	33.2
Approach			359	13.0	359	13.0	0.400	30.6	LOS C	3.5	27.5	0.73	0.71	0.73	39.4
West: Bruce Highway															
10	L2	All MCs	27	10.0	27	10.0	0.022	8.2	LOS A	0.3	1.9	0.28	0.60	0.28	51.1
11	T1	All MCs	687	10.0	687	10.0	0.445	19.9	LOS B	10.7	81.6	0.76	0.66	0.76	45.3
12	R2	All MCs	53	10.0	53	10.0	* 0.390	51.3	LOS D	2.4	17.9	0.99	0.75	0.99	32.1
Approach			767	10.0	767	10.0	0.445	21.6	LOS B	10.7	81.6	0.76	0.66	0.76	44.3
All Vehicles			2146	11.7	2146	11.7	0.445	23.1	LOS B	10.7	81.6	0.72	0.65	0.72	43.3

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

Appendix I: Pavement Impact Assessment



Extracted data details and disclaimer

The extracted data in the adjacent worksheets contains the following information:

- **Marginal Cost** - Marginal Cost for the selected sections of road 832 (SOUTH TOWNSVILLE ROAD) and road 841 (TOWNSVILLE PORT ROAD)).
The details of the selected road sections are provided in the worksheet **Road sections**.
- **AADT** - Annual Average Daily Traffic along the selected sections.

Additional notes:

AADT - Annual Average Daily Traffic

PERCENT_LV - The percentage of the Annual Average Daily Traffic represented by Light Vehicles

PERCENT_HV - The percentage of the Annual Average Daily Traffic represented by Heavy Vehicles

AADT_LV - The Annual Average Daily Traffic vehicles of Light Vehicles

AADT_HV - The Annual Average Daily Traffic of Heavy Vehicles

- The data extracted from the Roadlink on 11 November 2024 and were current at that date.
- Data request reference number: DR3355.

Disclaimer: While every care is taken to ensure the accuracy of this data, Transport Systems Asset Management (TSAM), Department of Transport and Main Roads makes no representation or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses (including indirect or consequential damage) and costs which you might incur as a result of the data being inaccurate or incomplete in any way and for any reason.

ROAD_SECTION_ID	CARRIAGE	ThroughDistance	ROAD_SECTION_ID	RPDescription	TO RP IDENTIFIER	TDIST	END	RP FULL DESCRIPTION
841	2	0	841/1	Start 841 Townsville Port Road (Cwy 2) Int with 106 Bruce Hwy (Ary - Tsv) 10M Bruce Hwy	(Tsv - Inq) & 14A Flinders Hwy (Tsv - Chrs Tws)			
841	2	0	841/1O	Start 841 Townsville Port Road (Cwy 2) Int with 106 Bruce Hwy (Ary - Tsv) 10M Bruce Hwy	(Tsv - Inq) & 14A Flinders Hwy (Tsv - Chrs Tws)			
841	1	4.249	841/2	Int 841 Townsville Port Road with Racecourse Road (Local)				
841	1	7.338	841/2	Int 841 Townsville Port Road with 832 North Townsville Road				
832	1	16.635	832/1O	Int 832 with South Townsville Road also North Ward Road (833), Cwy 3				
832	2	16.635	832/1	Int 832 with South Townsville Road (833) also North Ward Road (833), Cwy 2				
832	1	18.841	832/12	End of 832 North Townsville Road. Int. with 841 Townsville Port Road.				

ROAD_SECTION_ID	CARRIAGE	ThroughDistance	ROAD_SECTION_ID	RPDescription	TO RP IDENTIFIER	TDIST	END	RP_FULL_DESCRIPTION
841	2	0	841/1	Start 841 Townsville Port Road (Cwy 2) Int with 106 Bruce Hwy (Ary - Tsv) 10M Bruce Hwy	(Tsv - Inq) & 14A Flinders Hwy (Tsv - Chrs Tws)			
841	2	0	841/1O	Start 841 Townsville Port Road (Cwy 2) Int with 106 Bruce Hwy (Ary - Tsv) 10M Bruce Hwy	(Tsv - Inq) & 14A Flinders Hwy (Tsv - Chrs Tws)			
841	1	4.249	841/2	Int 841 Townsville Port Road with Racecourse Road (Local)				
841	1	7.338	841/2	Int 841 Townsville Port Road with 832 North Townsville Road				
832	1	16.635	832/1O	Int 832 with South Townsville Road also North Ward Road (833), Cwy 3				
832	2	16.635	832/1	Int 832 with South Townsville Road (833) also North Ward Road (833), Cwy 2				
832	1	18.841	832/12	End of 832 North Townsville Road. Int. with 841 Townsville Port Road.				

Marginal Cost along the selected sections of roads 841

LINE	ROADNAME	ROAD SECTION	DIRECTION	SUPERSET CWAY	INAGEWAY	CTDIST	STATDIST	EL	LENGTH	MC COSTING	PAYMENT TYPE	MARGINAL COST
1	TOWNSVILLE PORT ROAD	841	G	1	2	0	0.1		0.1	GN		7.57
2	TOWNSVILLE PORT ROAD	841	AG	1	2	0.1	0.2		0.1	GN		7.57
3	TOWNSVILLE PORT ROAD	841	G	1	2	0.1	0.2		0.1	GN		5.18
4	TOWNSVILLE PORT ROAD	841	AG	3	3	0.1	0.2		0.1	GN		5.18
5	TOWNSVILLE PORT ROAD	841	G	1	2	0.2	0.3		0.1	GN		4.95
6	TOWNSVILLE PORT ROAD	841	AG	3	3	0.2	0.3		0.1	GN		4.95
7	TOWNSVILLE PORT ROAD	841	G	1	2	0.3	0.4		0.1	GN		4.95
8	TOWNSVILLE PORT ROAD	841	AG	3	3	0.3	0.4		0.1	GN		3.22
9	TOWNSVILLE PORT ROAD	841	G	1	2	0.4	0.014		0.1	GN		6.89
10	TOWNSVILLE PORT ROAD	841	AG	3	3	0.4	0.027		0.027	GN		6.89
11	TOWNSVILLE PORT ROAD	841	AG	3	3	0.044	0.3		0.086	GN		6.89
12	TOWNSVILLE PORT ROAD	841	G	1	2	0.5	0.6		0.1	GN		6.89
13	TOWNSVILLE PORT ROAD	841	G	1	2	0.6	0.7		0.1	GN		7.64
14	TOWNSVILLE PORT ROAD	841	G	1	2	0.7	0.772		0.072	GN		6.89
15	TOWNSVILLE PORT ROAD	841	G	1	1	0.772	0.8		0.028	GN		6.89
16	TOWNSVILLE PORT ROAD	841	G	1	1	0.8	0.9		0.1	GN		6.45
17	TOWNSVILLE PORT ROAD	841	G	1	1	0.9	1		0.1	GN		6.48
18	TOWNSVILLE PORT ROAD	841	G	1	1	1	1		0.1	AC		5.95
19	TOWNSVILLE PORT ROAD	841	G	1	1	1.1	1.2		0.1	AC		10.1
20	TOWNSVILLE PORT ROAD	841	G	1	1	1.2	1.3		0.1	AC		14.48
21	TOWNSVILLE PORT ROAD	841	G	1	1	1.3	1.4		0.1	AC		15.31
22	TOWNSVILLE PORT ROAD	841	G	1	1	1.4	1.5		0.1	AC		18.06
23	TOWNSVILLE PORT ROAD	841	G	1	1	1.5	1.6		0.1	AC		11.71
24	TOWNSVILLE PORT ROAD	841	G	1	1	1.6	1.7		0.1	GN		9.27
25	TOWNSVILLE PORT ROAD	841	G	1	1	1.7	1.8		0.1	GN		6.48
26	TOWNSVILLE PORT ROAD	841	G	1	1	1.8	1.9		0.1	GN		6.67
27	TOWNSVILLE PORT ROAD	841	G	1	1	1.9	2		0.1	GN		6.2
28	TOWNSVILLE PORT ROAD	841	G	1	1	2	2.1		0.1	GN		7.33
29	TOWNSVILLE PORT ROAD	841	G	1	1	2.1	2.2		0.1	GN		7.8
30	TOWNSVILLE PORT ROAD	841	G	1	1	2.2	2.3		0.1	GN		7.7
31	TOWNSVILLE PORT ROAD	841	G	1	1	2.3	2.4		0.1	MC		
32	TOWNSVILLE PORT ROAD	841	G	1	1	2.4	2.5		0.1	GN		6.59
33	TOWNSVILLE PORT ROAD	841	G	1	1	2.5	2.6		0.1	GN		6.84
34	TOWNSVILLE PORT ROAD	841	G	1	1	2.6	2.7		0.1	GN		6.84
35	TOWNSVILLE PORT ROAD	841	G	1	1	2.7	2.8		0.1	GN		6.8
36	TOWNSVILLE PORT ROAD	841	G	1	1	2.8	2.9		0.1	GN		6.84
37	TOWNSVILLE PORT ROAD	841	G	1	1	2.9	3		0.1	GN		6.41
38	TOWNSVILLE PORT ROAD	841	G	1	1	3	3.1		0.1	GN		7.14
39	TOWNSVILLE PORT ROAD	841	G	1	1	3.1	3.2		0.1	MC		
40	TOWNSVILLE PORT ROAD	841	G	1	1	3.2	3.3		0.1	AC		5.14
41	TOWNSVILLE PORT ROAD	841	G	1	1	3.3	3.4		0.1	AC		4.95
42	TOWNSVILLE PORT ROAD	841	G	1	1	3.4	3.5		0.1	AC		4.49
43	TOWNSVILLE PORT ROAD	841	G	1	1	3.5	3.6		0.1	GN		6.41
44	TOWNSVILLE PORT ROAD	841	G	1	1	3.6	3.7		0.1	GN		7.12
45	TOWNSVILLE PORT ROAD	841	G	1	1	3.7	3.8		0.1	GN		6.8
46	TOWNSVILLE PORT ROAD	841	G	1	1	3.8	3.9		0.1	GN		6.87
47	TOWNSVILLE PORT ROAD	841	G	1	1	3.9	4		0.1	GN		6.4
48	TOWNSVILLE PORT ROAD	841	G	1	1	4	4.1		0.1	GN		7.26
49	TOWNSVILLE PORT ROAD	841	G	1	1	4.1	4.2		0.1	GN		7.09
50	TOWNSVILLE PORT ROAD	841	G	1	1	4.2	4.3		0.1	GN		7.1
51	TOWNSVILLE PORT ROAD	841	G	1	1	4.3	4.4		0.1	GN		6.9
52	TOWNSVILLE PORT ROAD	841	G	1	1	4.4	4.5		0.1	GN		6.77
53	TOWNSVILLE PORT ROAD	841	G	1	1	4.5	4.6		0.1	GN		6.07
54	TOWNSVILLE PORT ROAD	841	G	1	1	4.6	4.7		0.1	GN		6.08
55	TOWNSVILLE PORT ROAD	841	G	1	1	4.7	4.8		0.1	GN		6.84
56	TOWNSVILLE PORT ROAD	841	G	1	1	4.8	4.9		0.1	GN		6.8
57	TOWNSVILLE PORT ROAD	841	G	1	1	4.9	5		0.1	GN		6.87
58	TOWNSVILLE PORT ROAD	841	G	1	1	5	5.1		0.1	GN		6.89
59	TOWNSVILLE PORT ROAD	841	G	1	1	5.1	5.2		0.1	GN		6.72
60	TOWNSVILLE PORT ROAD	841	G	1	1	5.2	5.3		0.1	AC		4.48
61	TOWNSVILLE PORT ROAD	841	G	1	1	5.3	5.4		0.1	AC		4.28
62	TOWNSVILLE PORT ROAD	841	G	1	1	5.4	5.5		0.1	AC		4.41
63	TOWNSVILLE PORT ROAD	841	G	1	1	5.5	5.6		0.1	GN		6.88
64	TOWNSVILLE PORT ROAD	841	G	1	1	5.6	5.7		0.1	GN		6.88
65	TOWNSVILLE PORT ROAD	841	G	1	1	5.7	5.8		0.1	GN		6.47
66	TOWNSVILLE PORT ROAD	841	G	1	1	5.8	5.9		0.1	GN		7.01
67	TOWNSVILLE PORT ROAD	841	G	1	1	5.9	6		0.1	GN		6.61
68	TOWNSVILLE PORT ROAD	841	G	1	1	6	6.1		0.1	GN		7.07
69	TOWNSVILLE PORT ROAD	841	G	1	1	6.1	6.2		0.1	GN		6.98
70	TOWNSVILLE PORT ROAD	841	G	1	1	6.2	6.3		0.1	GN		6.99
71	TOWNSVILLE PORT ROAD	841	G	1	1	6.3	6.4		0.1	GN		6.59
72	TOWNSVILLE PORT ROAD	841	G	1	1	6.4	6.5		0.1	GN		6.83
73	TOWNSVILLE PORT ROAD	841	G	1	1	6.5	6.6		0.1	GN		6.83
74	TOWNSVILLE PORT ROAD	841	G	1	1	6.6	6.7		0.1	GN		6.4
75	TOWNSVILLE PORT ROAD	841	G	1	1	6.7	6.8		0.1	GN		6.35
76	TOWNSVILLE PORT ROAD	841	G	1	1	6.8	6.9		0.1	GN		6.32
77	TOWNSVILLE PORT ROAD	841	G	1	1	6.9	7		0.1	GN		6.83
78	TOWNSVILLE PORT ROAD	841	G	1	1	7	7.1		0.1	MC		
79	TOWNSVILLE PORT ROAD	841	G	1	1	7.1	7.2		0.1	MC		
80	TOWNSVILLE PORT ROAD	841	G	1	1	7.2	7.3		0.1	AC		4.94
81	TOWNSVILLE PORT ROAD	841	G	1	1	7.3	7.4		0.1	AC		6.83
82	TOWNSVILLE PORT ROAD	841	AG	1	2	0.044	0.5		0.086	GN		6.89
83	TOWNSVILLE PORT ROAD	841	AG	1	2	0.5	0.6		0.1	GN		6.88
84	TOWNSVILLE PORT ROAD	841	AG	1	2	0.6	0.7		0.1	GN		7.04
85	TOWNSVILLE PORT ROAD	841	AG	1	2	0.7	0.772		0.072	GN		6.89
86	TOWNSVILLE PORT ROAD	841	AG	1	2	0.772	0.8		0.028	GN		6.89
87	TOWNSVILLE PORT ROAD	841	AG	1	2	0.8	0.9		0.1	GN		6.49
88	TOWNSVILLE PORT ROAD	841	AG	1	1	0.9	1		0.1	GN		6.49
89	TOWNSVILLE PORT ROAD	841	AG	1	1	1	1		0.1	AC		6.89
90	TOWNSVILLE PORT ROAD	841	AG	1	1	1.1	1.2		0.1	AC		10.1
91	TOWNSVILLE PORT ROAD	841	AG	1	1	1.2	1.3		0.1	AC		14.48
92	TOWNSVILLE PORT ROAD	841	AG	1	1	1.3	1.4		0.1	AC		21.31
93	TOWNSVILLE PORT ROAD	841	AG	1	1	1.4	1.5		0.1	AC		16.04
94	TOWNSVILLE PORT ROAD	841	AG	1	1	1.5	1.6		0.1	AC		14.74
95	TOWNSVILLE PORT ROAD	841	AG	1	1	1.6	1.7		0.1	GN		9.27
96	TOWNSVILLE PORT ROAD	841	AG	1	1	1.7	1.8		0.1	GN		6.49
97	TOWNSVILLE PORT ROAD	841	AG	1	1	1.8	1.9		0.1	GN		6.87
98	TOWNSVILLE PORT ROAD	841	AG	1	1	1.9	2		0.1	GN		6.93
99	TOWNSVILLE PORT ROAD	841	AG	1	1	2	2.1		0.1	GN		7.33
100	TOWNSVILLE PORT ROAD	841	AG	1	1	2.1	2.2		0.1	GN		7.8
101	TOWNSVILLE PORT ROAD	841	AG	1	1	2.2	2.3		0.1	GN		7.7
102	TOWNSVILLE PORT ROAD	841	AG	1	1	2.3	2.4		0.1	MC		
103	TOWNSVILLE PORT ROAD	841	AG	1	1	2.4	2.5		0.1	GN		6.59
104	TOWNSVILLE PORT ROAD	841	AG	1	1	2.5	2.6		0.1	GN		6.84
105	TOWNSVILLE PORT ROAD	841	AG	1	1	2.6	2.7		0.1	GN		6.84
106	TOWNSVILLE PORT ROAD	841	AG	1	1	2.7	2.8		0.1	GN		6.4
107	TOWNSVILLE PORT ROAD	841	AG	1	1	2.8	2.9		0.1	GN		6.88
108	TOWNSVILLE PORT ROAD	841	AG	1	1	2.9	3		0.1	GN		6.41
109	TOWNSVILLE PORT ROAD	841	AG	1	1	3	3.1		0.1	GN		7.15
110	TOWNSVILLE PORT ROAD	841	AG	1	1	3.1	3.2		0.1	MC		
111	TOWNSVILLE PORT ROAD	841	AG	1	1	3.2	3.3		0.1	AC		5.11
112	TOWNSVILLE PORT ROAD	841	AG	1	1	3.3	3.4		0.1	AC		4.59
113	TOWNSVILLE PORT ROAD	841	AG	1	1	3.4	3.5		0.1	AC		4.49
114	TOWNSVILLE PORT ROAD	841	AG	1	1	3.5	3.6		0.1	GN		6.41
115	TOWNSVILLE PORT ROAD	841	AG	1	1	3.6	3.7		0.1	GN		7.12
116	TOWNSVILLE PORT ROAD	841	AG	1	1	3.7	3.8		0.1	GN		6.8
117	TOWNSVILLE PORT ROAD	841	AG	1	1	3.8	3.9		0.1	GN		6.87

	Sum of MC	count	Length (KI AVE \$/KM
CS	0	0	0.0000
AC	108.19	12	1.013 \$ 1.068
GN	370.97	86	5.314 \$ 0.688
MC	0	4	0.2 \$
	479.16	71	6.527 \$ 0.734

Annual Average Daily Traffic along the selected sections of roads 18A and 3042

[illegible]

SARAH	SARADAY		
3.2	840	306769.2	
3.2	1099	401033.9	
3.2	840	306769.2	
3.2	1099	401033.9	
3.2	3958		
3.2	3974		
3.2	979		
3.2	1044		
4.2	1285		
5.2	1697		

Pavement type description

ARMIS-derived TMR pavement type	FAMLIT pavement type	Load damage exponent
Sprayed seal over flexible pavement, including cement modified and lime stabilised layer types C4 and C5	GN	4
Sprayed seal or Asphalt over flexible pavement with bitumen stabilised pavement	AC	5
Asphalt over flexible pavement, including cement modified and lime stabilised layer types C4 and C5	AC	5
Sprayed seal over semi rigid/semi rigid composite pavement	CS	12
Asphalt over semi rigid/semi rigid composite pavement	CS	12

Carriageway code description

The following table lists the codes used to describe the position of carriageways on the road section.
All carriageways are labelled based on the gazettal direction.

CARRIAGEWAY_CODE	SUPERSET_CWAY	CARRIAGEWAY_CODE_LABEL
1	1	Primary through undivided
2	1	Primary through divided in gazettal
3	3	Primary through divided against gazettal

Truck Details								
Truck Type	Austroads	Payload	SAR4 / Trip (ESAs)		SAR5 / Trip		SAR12 / Trip	
			Loaded	Unloaded	Loaded	Unloaded	Loaded	Unloaded
Two Axle Truck	3	6.5	2.98	0.54	3.29	0.43	6.60	0.11
Three Axle Truck	4	13	3.57	0.50	4.14	0.41	12.08	0.11
Four Axle Truck	5	15	4.09	0.46	4.89	0.37	17.07	0.09
Three Axle Articulated	6	11.5	4.43	0.60	4.88	0.46	9.65	0.11
Four Axle Articulated	7	18	5.02	0.56	5.73	0.44	15.13	0.11
Five Axle Articulated	8	24.5	5.61	0.52	6.58	0.41	20.61	0.11
Six Axle Articulated	9	26.5	4.93	0.51	5.61	0.41	14.63	0.11
B Double	10	40	6.30	0.53	7.09	0.42	17.17	0.11
Double Road Train	11	51.5	8.34	0.55	9.53	0.43	25.71	0.11
Triple Road Train	12	76.5	11.75	0.58	13.45	0.44	36.79	0.11
Truck and Dog	13	29.5	7.06	0.57	8.17	0.44	23.67	0.11

Table 1: Operational Details

Peak Year Production:		
Number of Days	333	Days
Life of Project	20	Years

Table 2: Site Traffic Generation

ID	Vehicle	Inbound Trips (veh/day)	% Loaded	Outbound Trips (veh/day)	% Loaded	Daily Trips	Quantity Per Year
1	AV	0.00	0%	0.00	100%	0.00	0
2	B-Double (Ethanol)	10.00	100%	10.00	0%	20.00	6660
3	B-Double (SAF)	6.00	0%	6.00	100%	12.00	3996
4							
5							
6							
TOTAL						32.00	10656.0

Table 3: Development Generated Truck Details

Table 3: Development Generated Truck Details			Trips					
Truck Details			INBOUND (PER DAY)		OUTBOUND (PER DAY)		TOTAL	North
ID	Vehicle	Truck Type	LOADED	UNLOADED	LOADED	UNLOADED		IB
1	AV	9	0.00	0.00	0.00	0.00	0.00	
2	B-Double (Ethanol)	10	10.00	0.00	0.00	10.00	20.00	100%
3	B-Double (SAF)	10	0.00	6.00	6.00	0.00	12.00	0%
4	0							
5	0							
6	0							

Table 4: Development Generated ESA/DAY Details

Truck Details			North		East		South	
ID	Vehicle	Truck Type	INBOUND	OUTBOUND	INBOUND	OUTBOUND	INBOUND	OUTBOUND
1	AV	9	0.0	0.0	0.0	0.0	0.0	0.0
2	B-Double (Ethanol)	10	63.0	5.3	0.0	0.0	0.0	0.0
3	B-Double (SAF)	10	0.0	0.0	0.0	0.0	1.6	18.9
4	0							
5	0							
6	0							
TOTAL			63.0	5.3	0.0	0.0	1.6	18.9
TOTAL			68.3		0.0		20.5	

Table 5: Section Distributions

Section	Direction	Gazettle	ESA/Day
North	Outbound	G	5.30
	Inbound	A	63.00
East	Outbound	G	0.00
	Inbound	A	0.00
South	Outbound	A	18.90
	Inbound	G	1.59
West	Outbound	G	18.90
	Inbound	A	1.59

If new row, add in SAR5 / SAR12 as well.

DISTRIBUTION						
TV Port	East		South to Cairns		West to TV Airport	
OB	IB	OB	IB	OB	IB	OB
100%			0%	0%	0%	0%
0%			50%	50%	50%	50%

If new row, add

West		TOTAL			
INBOUND	OUTBOUND	INBOUND	OUTBOUND	TOTAL	Yearly
0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	63.0	5.3	68.3	22,743.9
1.6	18.9	3.2	37.8	41.0	13,646.3
1.6	18.9	66.2	43.1	109.3	36,390.2
20.5		109.3			

If new row, add in SAR5 / SAR12 as well.

Table 1: Operational Details

Peak Year Production:		
Number of Days	333	Days
Life of Project	20	Years

Table 2: Site Traffic Generation

ID	Vehicle	ound Trips (veh/d)	% Loaded	ound Trips (veh	% Loaded	Daily Trips	Quantity Per Year
1	AV	0.00	0%	0.00	100%	0.00	0
2	B-Double (Ethanol)	10.00	100%	10.00	0%	20.00	6660
3	B-Double (SAF)	6.00	0%	6.00	100%	12.00	3996
4	0	0.00	0%	0.00	0%	0.00	0
5	0	0.00	0%	0.00	0%	0.00	0
6	0	0.00	0%	0.00	0%	0.00	0
TOTAL	0	0	0	0	0	32.00	10656.0

Table 3: Development Generated Truck Details

			Trips					
Truck Details			INBOUND (PER DAY)		OUTBOUND (PER DAY)		TOTAL	N
ID	Vehicle	Truck Type	LOADED	UNLOADED	LOADED	UNLOADED		
1	AV	9	0.00	0.00	0.00	0.00	0.00	0%
2	B-Double (Ethanol)	10	10.00	0.00	0.00	10.00	20.00	100%
3	B-Double (SAF)	10	0.00	6.00	6.00	0.00	12.00	0%
4	0	0	0.00	0.00	0.00	0.00	0.00	0%
5	0	0	0.00	0.00	0.00	0.00	0.00	0%
6	0	0	0.00	0.00	0.00	0.00	0.00	0%

Table 4: Development Generated ESA/DAY Details

Truck Details			North		East		South	
ID	Vehicle	Truck Type	INBOUND	OUTBOUND	INBOUND	OUTBOUND	INBOUND	OUTBOUND
1	AV	9	0.0	0.0	0.0	0.0	0.0	0.0
2	B-Double (Ethanol)	10	70.9	4.2	0.0	0.0	0.0	0.0
3	B-Double (SAF)	10	0.0	0.0	0.0	0.0	1.3	21.3
4	0	0						
5	0	0						
6	0	0						
TOTAL			70.9	4.2	0.0	0.0	1.3	21.3
TOTAL			75.1		0.0		22.5	

Table 5: Section Distributions

Section	Direction	Gazettle	ESA/Day
North	Outbound	G	4.20
	Inbound	A	70.90
East	Outbound	G	0.00
	Inbound	A	0.00
South	Outbound	A	21.27
	Inbound	G	1.26
West	Outbound	G	21.27
	Inbound	A	1.26

DISTRIBUTION						
North	East		South		West	
OB	IB	OB	IB	OB	IB	OB
0%	0%	0%	0%	0%	0%	0%
100%	0%	0%	0%	0%	0%	0%
0%	0%	0%	50%	50%	50%	50%
0%	0%	0%	0%	0%	0%	0%
0%	0%	0%	0%	0%	0%	0%
0%	0%	0%	0%	0%	0%	0%

West		TOTAL			
INBOUND	OUTBOUND	INBOUND	OUTBOUND	TOTAL	Yearly
0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	70.9	4.2	75.1	25,008.3
1.3	21.3	0.0	0.0	0.0	0.0
1.3	21.3	70.9	4.2	75.1	25,008.3
22.5		75.1			

Segment ID		Road Section ID	Direction	Segment Description	Carriageway Code	Carriageway	No. of Lanes	Dist_Start	Dist_End	Length	Pavement Type	AC (cents/SAR-km)	Segment AADT (1-Way)	% HV	Directional Factor	Truck Mvts / Day	ESAs / HV (All Other Roads)	SAR4s / Day	Base Year	SAR4s / Base Year	Annual Growth Rate	Design Year	SAR4s / Design Year
1	841	G			2	Divided	2	0.0	0.1	0.1	GN	7.57	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
2	841	G	AG		3	Divided	2	0.0	0.1	0.1	GN	7.57	1,311	26%	100%	343	3.2	1,099	2023	401,034	0.48%	2027	408,734
3	841	G			2	Divided	2	0.1	0.2	0.1	GN	5.18	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
4	841	AG			3	Divided	2	0.1	0.2	0.1	GN	5.18	1,311	26%	100%	343	3.2	1,099	2023	401,034	0.48%	2027	408,734
5	841	G			2	Divided	2	0.2	0.3	0.1	GN	4.29	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
6	841	AG			3	Divided	2	0.2	0.3	0.1	GN	4.29	1,311	26%	100%	343	3.2	1,099	2023	401,034	0.48%	2027	408,734
7	841	G			2	Divided	2	0.3	0.4	0.1	GN	3.22	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
8	841	AG			3	Divided	2	0.3	0.4	0.1	GN	3.22	1,311	26%	100%	343	3.2	1,099	2023	401,034	0.48%	2027	408,734
9	841	G			2	Divided	2	0.4	0.4	0.0	GN	6.89	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
10	841	AG			3	Divided	2	0.4	0.4	0.0	GN	6.89	1,311	26%	100%	343	3.2	1,099	2023	401,034	0.48%	2027	408,734
11	841	G			2	Divided	2	0.4	0.5	0.1	GN	6.89	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
12	841	G			2	Divided	2	0.5	0.6	0.1	GN	6.88	1,311	26%	100%	343	3.2	1,099	2023	401,034	0.48%	2027	408,734
13	841	G			2	Divided	2	0.6	0.7	0.1	GN	7.04	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
14	841	G			2	Divided	2	0.7	0.8	0.1	GN	6.89	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
15	841	G			1	Divided	2	0.8	0.8	0.0	GN	6.89	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
16	841	G			1	Divided	2	0.8	0.9	0.1	GN	6.49	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
17	841	G			1	Divided	2	0.9	1.0	0.1	GN	6.49	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
18	841	G			1	Divided	2	1.0	1.1	0.1	AC	5.05	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
19	841	G			1	Divided	2	1.1	1.2	0.1	AC	10.1	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
20	841	G			1	Divided	2	1.2	1.3	0.1	AC	14.46	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
21	841	G			1	Divided	2	1.3	1.4	0.1	AC	21.31	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
22	841	G			1	Divided	2	1.4	1.5	0.1	AC	18.06	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
23	841	G			1	Divided	2	1.5	1.6	0.1	AC	11.74	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
24	841	G			1	Divided	2	1.6	1.7	0.1	GN	9.27	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
25	841	G			1	Divided	2	1.7	1.8	0.1	GN	6.49	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
26	841	G			1	Divided	2	1.8	1.9	0.1	GN	6.67	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
27	841	G			1	Divided	2	1.9	2.0	0.1	GN	6.9	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
28	841	G			1	Divided	2	2.0	2.1	0.1	GN	7.33	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
29	841	G			1	Divided	2	2.1	2.2	0.1	GN	7.8	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
30	841	G			1	Divided	2	2.2	2.3	0.1	GN	7.7	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
31	841	G			1	Divided	2	2.3	2.4	0.1	MC	0	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
32	841	G			1	Divided	2	2.4	2.5	0.1	GN	6.59	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
33	841	G			1	Divided	2	2.5	2.6	0.1	GN	6.84	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
34	841	G			1	Divided	2	2.6	2.7	0.1	GN	6.84	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
35	841	G			1	Divided	2	2.7	2.8	0.1	GN	6.6	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
36	841	G			1	Divided	2	2.8	2.9	0.1	GN	6.84	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
37	841	G			1	Divided	2	2.9	3.0	0.1	GN	6.41	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
38	841	G			1	Divided	2	3.0	3.1	0.1	GN	7.12	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
39	841	G			1	Divided	2	3.1	3.2	0.1	MC	0	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
40	841	G			1	Divided	2	3.2	3.3	0.1	AC	5.11	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
41	841	G			1	Divided	2	3.3	3.4	0.1	AC	4.59	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
42	841	G			1	Divided	2	3.4	3.5	0.1	AC	4.49	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
43	841	G			1	Divided	2	3.5	3.6	0.1	GN	6.41	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
44	841	G			1	Divided	2	3.6	3.7	0.1	GN	7.12	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
45	841	G			1	Divided	2	3.7	3.8	0.1	GN	7	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
46	841	G			1	Divided	2	3.8	3.9	0.1	GN	6.87	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
47	841	G			1	Divided	2	3.9	4.0	0.1	GN	6.6	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
48	841	G			1	Divided	2	4.0	4.1	0.1	GN	7.94	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
49	841	G			1	Divided	2	4.1	4.2	0.1	GN	7.09	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
50	841	G			1	Divided	2	4.2	4.3	0.1	GN	7.3	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
51	841	G			1	Divided	2	4.3	4.4	0.1	GN	6.9	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
52	841	G			1	Divided	2	4.4	4.5	0.1	GN	6.37	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
53	841	G			1	Divided	2	4.5	4.6	0.1	GN	6.07	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
54	841	G			1	Divided	2	4.6	4.7	0.1	GN	6.05	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
55	841	G			1	Divided	2	4.7	4.8	0.1	GN	6.84	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
56	841	G			1	Divided	2	4.8	4.9	0.1	GN	7	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
57	841	G			1	Divided	2	4.9	5.0	0.1	GN	6.89	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
58	841	G			1	Divided	2	5.0	5.1	0.1	GN	6.88	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
59	841	G			1	Divided	2	5.1	5.2	0.1	GN	6.72	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
60	841	G			1	Divided	2	5.2	5.3	0.1	AC	4.46	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
61	841	G			1	Divided	2	5.3	5.4	0.1	AC	4.36	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
62	841	G			1	Divided	2	5.4	5.5	0.1	AC	4.46	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
63	841	G			1	Divided	2	5.5	5.6	0.1	GN	6.68	1,436	18%	100%	263	3.2	840	2023	306,769	0.00%	2027	306,769
64	841	G			1	Divided	2	5.6	5.7	0.1	GN	6.69	1,436										

ROAD DATA																							20223 SITE DATA							SAR4		SAR5	
SEGMENT ID	ROAD SECTION ID	DIRECTION	SEGMENT DESCRIPTION	CARRIAGEWAY CODE	CARRIAGEWAY	NO. OF LANES	TDIST_START	TDIST_END	LENGTH	PAVEMENT TYPE	MC (cents/SAR-km)	SEGMENT AADT (1-WAY)	% HV	DIRECTIONAL FACTOR	TRUCK MVTs / DAY	ESAs / HV (ALL OTHER ROADS)	SAR4s / DAY	BASE YEAR	SAR4s / BASE YEAR	ANNUAL GROWTH RATE	DESIGN YEAR	SAR4s / DESIGN YEAR	SAR4s / DAY	SAR4s / YEAR	% IMPACT (YEAR)	>5% IMPACT (ESAs/YEAR)	SAR4s / YEAR	SAR4 DEVELOPMENT CONTRIBUTION (\$)	SAR5s / YEAR	SAR5 DEVELOPMENT CONTRIBUTION (\$)			
148	841	AG	Warrego Highway	1	Divided	2	6.9	7.0	0.1	GN	6.83	1,311	26%	100%	343	3.2	1,099	2023	401,034	0.48%	2027	408,734	65	21,508	5.26%	YES	21,508	\$146.90	24,029	\$0.00			
149	841	AG		1	Divided	2	7.0	7.1	0.1	MC	0	1,311	26%	100%	343	3.2	1,099	2023	401,034	0.48%	2027	408,734	65	21,508	5.26%	YES	21,508	\$0.00	24,029	\$0.00			
150	841	AG		1	Divided	2	7.1	7.2	0.1	MC	0	1,311	26%	100%	343	3.2	1,099	2023	401,034	0.48%	2027	408,734	65	21,508	5.26%	YES	21,508	\$0.00	24,029	\$0.00			
151	841	AG		1	Divided	2	7.2	7.3	0.1	AC	4.94	1,311	26%	100%	343	3.2	1,099	2023	401,034	0.48%	2027	408,734	65	21,508	5.26%	YES	21,508	\$0.00	24,029	\$118.70			
152	841	AG		1	Divided	2	7.3	7.4	0.1	AC	6.82	1,311	26%	100%	343	3.2	1,099	2023	401,034	0.48%	2027	408,734	65	21,508	5.26%	YES	21,508	\$0.00	24,029	\$163.88			
153	0	0																									0	\$0.00					
154	0	0																									0	\$0.00					
155	832	G		2	Divided	5	16.5	16.6	0.1	MC	0	8,482	15%	100%	1,242	3.2	3,974	2023	1,450,381	5.18%	2027	1,750,900	2	529	0.03%	NO	529	\$0.00	420	\$0.00			
156	832	AG		3	Divided	6	16.5	16.6	0.1	MC	0	8,362	15%	100%	1,237	3.2	3,958	2023	1,444,512	7.02%	2027	1,850,131	19	6,294	0.34%	NO	6,294	\$0.00	7,083	\$0.00			
157	832	G		2	Divided	7	16.6	16.7	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
158	832	AG		3	Divided	8	16.6	16.7	0.1	MC	0	1,381	22%	100%	306	3.2	979	2023	357,281	1.14%	2027	373,573	19	6,294	1.68%	NO	6,294	\$0.00	7,083	\$0.00			
159	832	G		2	Divided	9	16.7	16.8	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
160	832	AG		3	Divided	10	16.7	16.8	0.1	MC	0	1,381	22%	100%	306	3.2	979	2023	357,281	1.14%	2027	373,573	2	529	0.14%	NO	529	\$0.00	420	\$0.00			
161	832	G		1	Divided	11	16.8	16.8	0.0	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
162	832	G		1	Divided	12	16.8	16.9	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
163	832	G		1	Divided	13	16.9	17.0	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
164	832	G		1	Divided	14	17.0	17.1	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
165	832	G		1	Divided	15	17.1	17.2	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
166	832	G		1	Divided	16	17.2	17.3	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
167	832	G		1	Divided	17	17.3	17.4	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
168	832	G		1	Divided	18	17.4	17.5	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
169	832	G		1	Divided	19	17.5	17.6	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
170	832	G		1	Divided	20	17.6	17.7	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
171	832	G		1	Divided	21	17.7	17.8	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
172	832	G		1	Divided	22	17.8	17.9	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
173	832	G		1	Divided	23	17.9	18.0	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
174	832	G		1	Divided	24	18.0	18.1	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
175	832	G		1	Divided	25	18.1	18.2	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
176	832	G		1	Divided	26	18.2	18.3	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
177	832	G		1	Divided	27	18.3	18.4	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2	529	0.13%	NO	529	\$0.00	420	\$0.00			
178	832	G		1	Divided	28	18.4	18.5	0.1	MC	0	1,528	21%	100%	326	3.2	1,044	2023	381,213	1.51%	2027	404,238	2										

Appendix J: SDAP Code Responses



State code 6: Protection of state transport networks

Table 6.2 Development in general

Performance outcomes	Acceptable outcomes	Response
Network impacts		
PO1 Development does not compromise the safety of users of the state-controlled road network.	No acceptable outcome is prescribed.	Complies with PO1 The proposed development does not compromise the safety of users of the state-controlled road network. Refer to Section 6 of the TIA for further details.
PO2 Development does not adversely impact the structural integrity or physical condition of a state-controlled road or road transport infrastructure .	No acceptable outcome is prescribed.	Complies with PO2 The proposed development does not adversely impact the structural integrity or physical condition of a state-controlled road or road transport infrastructure.
PO3 Development ensures no net worsening of the operating performance the state-controlled road network.	No acceptable outcome is prescribed.	Complies with PO3 The proposed development does not significantly impact the operating performance of the state-controlled road network. Refer to Section 5 of the TIA for further details.
PO4 Traffic movements are not directed onto a state-controlled road where they can be accommodated on the local road network.	No acceptable outcome is prescribed.	Complies with PO4 The traffic movements are not directed onto the state-controlled network where possible.
PO5 Development involving haulage exceeding 10,000 tonnes per year does not damage the pavement of a state-controlled road .	No acceptable outcome is prescribed.	Complies with PO5 A pavement impact assessment has been undertaken in accordance with the GTIA. Contributions have been identified for road links that are impacted. Refer to Section 7 of the TIA for further details.
PO6 Development does not require a new railway level crossing.	No acceptable outcome is prescribed.	Complies with PO6 The proposed development does not require a new railway level crossing
PO7 Development does not adversely impact the operating performance of an existing railway crossing .	No acceptable outcome is prescribed.	Complies with PO7 The proposed development does not adversely impact the operating performance of an existing railway crossing.

Performance outcomes	Acceptable outcomes	Response
PO8 Development does not adversely impact on the safety of an existing railway crossing .	No acceptable outcome is prescribed.	Complies with PO8 The proposed development does not adversely impact the safety of an existing railway crossing.
PO9 Development is designed and constructed to allow for on-site circulation to ensure vehicles do not queue in a railway crossing .	No acceptable outcome is prescribed.	Complies with PO9 The proposed development is not expected to cause queuing at railway crossings
PO10 Development does not create a safety hazard within the railway corridor .	No acceptable outcome is prescribed.	Complies with PO10 The proposed development is not expected to create a safety hazard within the railway corridor.
PO11 Development does not adversely impact the operating performance of the railway corridor .	No acceptable outcome is prescribed.	Complies with PO11 The proposed development is not expected to adversely impact the operating performance of the railway corridor.
PO12 Development does not interfere with or obstruct the railway transport infrastructure or other rail infrastructure .	No acceptable outcome is prescribed.	Complies with PO12 The proposed development does not interfere with or obstruct the railway transport infrastructure or other rail infrastructure.
PO13 Development does not adversely impact the structural integrity or physical condition of a railway corridor or rail transport infrastructure .	No acceptable outcome is prescribed.	Complies with PO13 The proposed development does not adversely impact the structural integrity or physical condition of a railway corridor or rail transport infrastructure.
Stormwater and overland flow		
PO14 Stormwater run-off or overland flow from the development site does not create or exacerbate a safety hazard for users of a state transport corridor or state transport infrastructure .	No acceptable outcome is prescribed.	Not Traffic Engineering Related
PO15 Stormwater run-off or overland flow from the development site does not result in a material worsening of operating performance of a state transport corridor or state transport infrastructure .	No acceptable outcome is prescribed.	Not Traffic Engineering Related
PO16 Stormwater run-off or overland flow from the development site does not interfere with the structural integrity or physical condition of the	No acceptable outcome is prescribed.	Not Traffic Engineering Related

Performance outcomes	Acceptable outcomes	Response
state transport corridor or state transport infrastructure.		
PO17 Development associated with a state-controlled road or road transport infrastructure ensures that stormwater is lawfully discharged.	AO17.1 Development does not create any new points of discharge to a state transport corridor or state transport infrastructure. AND AO17.2 Development does not concentrate flows to a state transport corridor. AND AO17.3 Stormwater run-off is discharged to a lawful point of discharge. AND AO17.4 Development does not worsen the condition of an existing lawful point of discharge to a state transport corridor or state transport infrastructure.	Not Traffic Engineering Related
Flooding		
PO18 Development does not result in a material worsening of flooding impacts within a state transport corridor or state transport infrastructure	<i>For a state-controlled road or road transport infrastructure, all of the following apply:</i> AO18.1 For all flood events up to 1% annual exceedance probability, development ensures there are negligible impacts (within +/- 10mm) to existing flood levels within a state transport corridor. AND AO18.2 For all flood events up to 1% annual exceedance probability, development ensures there are negligible impacts (up to a 10% increase) to existing peak velocities within a state transport corridor.	Not Traffic Engineering Related

Performance outcomes	Acceptable outcomes	Response
	AND AO18.3 For all flood events up to 1% annual exceedance probability, development ensures there are negligible impacts (up to a 10% increase) to existing time of submergence of a state transport corridor. <i>No acceptable outcome is prescribed for a railway corridor or rail transport infrastructure.</i>	
Drainage infrastructure		
PO19 Drainage infrastructure does not create a safety hazard in a state transport corridor .	<i>For a state-controlled road environment, both of the following apply:</i> AO19.1 Drainage infrastructure associated with, or in a state-controlled road is wholly contained within the development site, except at the lawful point of discharge. AND AO19.2 Drainage infrastructure can be maintained without requiring access to a state transport corridor. <i>For a railway environment both of the following apply:</i> AO19.3 Drainage infrastructure associated with a railway corridor or rail transport infrastructure is wholly contained within the development site. AND	Not Traffic Engineering Related

Performance outcomes	Acceptable outcomes	Response
	AO19.4 Drainage infrastructure can be maintained without requiring access to a state transport corridor .	
PO20 Drainage infrastructure associated with, or in a state-controlled road or road transport infrastructure is constructed and designed to ensure the structural integrity and physical condition of existing drainage infrastructure and the surrounding drainage network is maintained.	No acceptable outcome is prescribed.	Not Traffic Engineering Related
Planned upgrades		
PO21 Development does not impede delivery of planned upgrades of state transport infrastructure .	No acceptable outcome is prescribed.	Complies with PO21 The proposed development is not expected to impede delivery of planned upgrades to state transport infrastructure

Table 6.3 Public passenger transport infrastructure and active transport

Performance outcomes	Acceptable outcomes	Response
PO22 Development does not damage or interfere with public passenger transport infrastructure, active transport infrastructure or public passenger services .	No acceptable outcome is prescribed.	Complies with PO22 The proposed development is not expected to damage or interfere with public passenger transport infrastructure, active transport infrastructure or public passenger services.
PO23 Development does not compromise the safety of public passenger transport infrastructure, public passenger services and active transport infrastructure .	No acceptable outcome is prescribed.	Complies with PO23 The proposed development is not expected to compromise the safety of public passenger transport infrastructure, public passenger services and active transport infrastructure.
PO24 Development does not adversely impact the operating performance of public passenger transport infrastructure, public passenger services and active transport infrastructure .	No acceptable outcome is prescribed.	Complies with PO24 The proposed development is not expected to adversely impact the operating performance of public passenger transport infrastructure, public passenger services and active transport infrastructure

Performance outcomes	Acceptable outcomes	Response
PO25 Development does not adversely impact the structural integrity or physical condition of public passenger transport infrastructure and active transport infrastructure .	No acceptable outcome is prescribed.	Complies with PO25 The proposed development is not expected to adversely impact the structural integrity or physical condition of public passenger transport infrastructure and active transport infrastructure.
PO26 Upgraded or new public passenger transport infrastructure and active transport infrastructure is provided to accommodate the demand for public passenger transport and active transport generated by the development.	No acceptable outcome is prescribed.	Complies with PO26 There is no upgraded or new public transport or active transport required to accommodate the demand for public passenger transport and active transport generated by the development.
PO27 Development is designed to ensure the location of public passenger transport infrastructure prioritises and enables efficient public passenger services .	No acceptable outcome is prescribed.	Complies with PO27 The proposed development is not expected to impact locations of future public transport or active transport infrastructure.
PO28 Development enables the provision or extension of public passenger services , public passenger transport infrastructure and active transport infrastructure to the development and avoids creating indirect or inefficient routes for public passenger services .	No acceptable outcome is prescribed.	Complies with PO28 The proposed development enables the provision or extension of public passenger services, public passenger transport infrastructure and active transport infrastructure to the development and avoids creating indirect or inefficient routes for public passenger services.
PO29 New or modified road networks are designed to enable development to be serviced by public passenger services .	AO29.1 Roads catering for buses are arterial or sub-arterial roads, collector or their equivalent. AND AO29.2 Roads intended to accommodate buses are designed and constructed in accordance with: 1. Road Planning and Design Manual, 2nd Edition, Volume 3 – Guide to Road Design; Department of Transport and Main Roads; 2. Supplement to Austroads Guide to Road Design (Parts 3, 4-4C and 6), Department of Transport and Main Roads; 3. Austroads Guide to Road Design (Parts 3, 4-4C and 6);	Complies with PO29 No road networks are proposed to be modified and the development is not expected to generate significant public transport demands.

Performance outcomes	Acceptable outcomes	Response
	4. Austroads Design Vehicles and Turning Path Templates; 5. Queensland Manual of Uniform Traffic Control Devices, Part 13: Local Area Traffic Management and AS 1742.13-2009 Manual of Uniform Traffic Control Devices – Local Area Traffic Management; AND AO29.3 Traffic calming devices are not installed on roads used for buses in accordance with section 2.3.2 Bus Route Infrastructure, Public Transport Infrastructure Manual, Department of Transport and Main Roads, 2015.	
PO30 Development provides safe, direct and convenient access to existing and future public passenger transport infrastructure and active transport infrastructure .	No acceptable outcome is prescribed.	Complies with PO30 The proposed development provides safe access to the wider road network and subsequently to existing and future public and active transport infrastructure.
PO31 On-site vehicular circulation ensures the safety of both public passenger transport services and pedestrians.	No acceptable outcome is prescribed.	N/A Public transport services are not required to access the site.
PO32 Taxi facilities are provided to accommodate the demand generated by the development.	No acceptable outcome is prescribed.	N/A The proposed development is not expected to generate taxi demands.
PO33 Facilities are provided to accommodate the demand generated by the development for community transport services, courtesy transport services, and booked hire services other than taxis.	No acceptable outcome is prescribed.	N/A The proposed development is not expected to generate taxi demands.

Performance outcomes	Acceptable outcomes	Response
PO34 Taxi facilities are located and designed to provide convenient, safe and equitable access for passengers.	AO34.1 A taxi facility is provided parallel to the kerb and adjacent to the main entrance. AND AO34.2 Taxi facilities are designed in accordance with: 1. AS2890.5–1993 Parking facilities – on-street parking and AS1428.1–2009 Design for access and mobility – general requirements for access – new building work; 2. AS1742.11–1999 Parking controls – manual of uniform traffic control devices 3. AS/NZS 2890.6–2009 Parking facilities –off street parking for people with disabilities; 4. Disability standards for accessible public 5. transport 2002 made under section 31(1) of the Disability Discrimination Act 1992; 6. AS/NZS 1158.3.1 – Lighting for roads and public spaces, Part 3.1: Pedestrian area (category P) lighting – Performance and design requirements; 7. Chapter 7 Taxi Facilities, Public Transport Infrastructure Manual, Department of Transport and Main Roads, 2015.	N/A The proposed development is not expected to generate taxi demands.
PO35 Educational establishments are designed to ensure the safe and efficient operation of public passenger services, pedestrian and cyclist access and active transport infrastructure.	AO35.1 Educational establishments are designed in accordance with the provisions of the Planning for Safe Transport Infrastructure at Schools, Department of Transport and Main Roads, 2011.	N/A The proposed development is not an educational establishment,

Gold Coast

Suite 26, 58 Riverwalk Avenue
Robina QLD 4226
P: (07) 5562 5377

Brisbane

Level 2, 428 Upper Edward Street
Spring Hill QLD 4000
P: (07) 3831 4442

Sydney

Studio 203, 3 Gladstone Street
Newtown NSW 2042
P: (02) 9557 6202



W: www.bitziosconsulting.com.au

E: admin@bitziosconsulting.com.au

