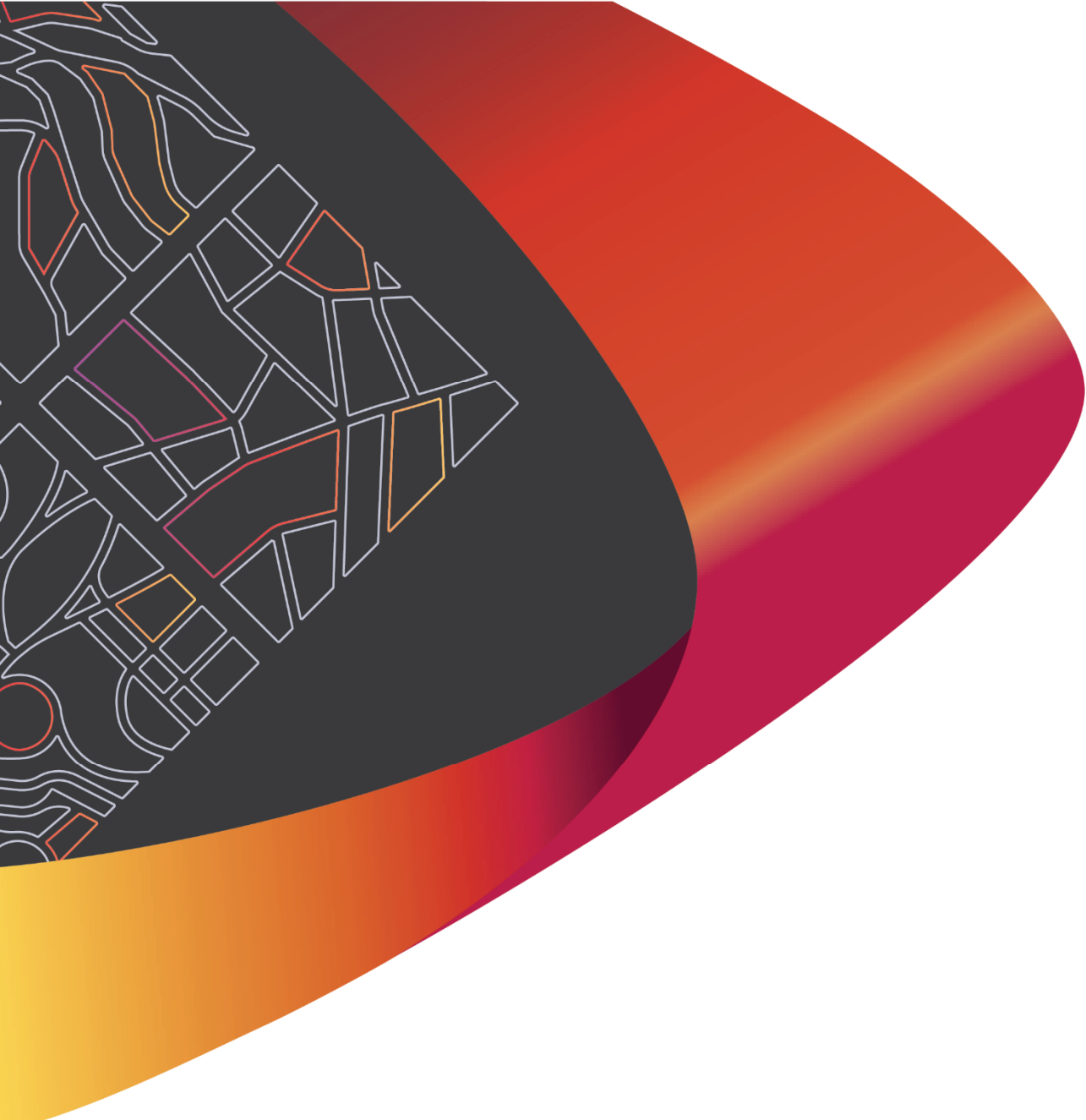


# APPENDIX F

Traffic Impact Assessment prepared by Premise

brazier motti





**Ross River Road Residential**  
Hurst Constructions Queensland Pty Ltd

**TRAFFIC IMPACT ASSESSMENT**

P003620 -R01 TIA

Rev: A

13 October 2025






**Premise**

PART OF THE  
Amey GROUP

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## EXECUTIVE SUMMARY

The Ross River Road Residential development proposed for the subject site comprises 81 residential units to offer affordable housing. The proposed access arrangement includes a left-in-left-out access on Ross River Road and a one-way egress only at the rear of the subject site via a 4m wide unnamed laneway to Albert Street.

In the normal design domain (NDD), an auxiliary left turn treatment with a short turn slot (AUL(S)) is warranted at the site entry on Ross River Road. Keeping the left turn deceleration lane clear of driveway at 340 Ross River Road requires limiting the length of the left turn deceleration lane to 32m which

- > Complies with minimum NDD requirements for a design speed of 67km/h (more than 10% above the posted speed limit); and
- > Exceeds minimum extended design domain (EDD) requirements for a design speed of 70km/h (10km/h above the posted speed limit).

Planning supplied by TMR proposed that westbound traffic on Ross River Road will merge from three (3) lanes to two (2) lanes on the development site frontage. To avoid the diverge associated with the development site access overlapping with the merge of westbound through traffic it is recommended that the existing arrangement of westbound lanes on the development site frontage is retained with the merge from three (3) lanes to two (2) lanes occurring west of Acheron Avenue.

During an inspection of the site on 17 September 2025 it was observed that the site complies with minimum requirements for approach sight distance (ASD) and minimum gap sight distance (MGSD). This exceeds minimum sight distance requirements for a property access.

Risk assessments were undertaken for the 1.2m wide path on Ross River Road at the proposed left-in-left-out access and the 1.5m wide path on Albert Street at the unnamed laneway. The recommended treatments to provide acceptable safety at both pathways are:

- > At the Ross River Road left-in-left-out:
  - Install a road hump across the exit driveway at the property boundary; and
  - Maximise the gradient of the entering driveway.
- > At the Unnamed Laneway exit to Albert Street:
  - Install road humps or cushions at both ends of the laneway, designed in accordance with relevant standards and with consideration for stormwater management and cyclist movement.
  - Install shared zone signage at the northern (entry) end of the laneway to formalise low-speed, mixed-use operation and clearly communicate pedestrian and cyclist priority.
  - Install 'No Entry' signage at the Albert Street end of the laneway to reinforce the one-way operation and prevent unauthorised access.

With the above recommendations and planned safety improvements by TMR, the development is not expected to worsen the risk score of any existing road safety issues.

Intersection analysis confirmed that development accesses and intersections which are expected to be significantly impacted by the development will continue operating well below their practical capacity with acceptable delays and queues.

## 1. INTRODUCTION

Premise Australia Pty Ltd (Premise) has been engaged by Hurst Constructions Queensland Pty Ltd to undertake a Traffic Impact Assessment (TIA) for the Ross River Road Residential development located at 344-350 Ross River Road, Cranbrook, QLD, in accordance with the Department of Transport and Main Roads' (TMR's) "Guide to Traffic Impact Assessment" (GTIA) and Townsville City Plan SC6.4.5.2 Traffic Impact Assessment.

### 1.1 Background

The Ross River Road Residential development proposed for the subject site comprises 81 residential units to offer affordable housing. The proposed access arrangement includes a left-in-left-out access on Ross River Road and a one-way egress only at the rear of the subject site via a 4m wide unnamed laneway to Albert Street.

The subject site was previously granted Development Approval MC09/0005, which has recently lapsed. The approved development under that application consisted of:

- > 100 motel rooms and 70 dwelling units.
- > left-in-left-out access at the eastern end of 348 Ross River Road and one-way egress via the 4m wide unnamed laneway to Albert Street.

The current proposal adopts the same access arrangements as the previously approved development but reflects a reduced development yield. This access configuration is considered suitable for the site context, noting:

- > The proposed left-in-left-out access on Ross River Road will consolidate and replace five (5) existing domestic driveways, including one located within the controlled area of the Acheron Avenue signalised intersection; and
- > The unnamed laneway, being 4 m wide, is not suitable for two-way traffic and is therefore proposed to operate as a one-way exit only.

## 1.2 Level of Assessment

The level of Traffic Impact Assessment is determined in accordance with Townsville City Plan SC6.4.5.2(2). Relevant development details are:

- > Location in an urban area;
- > Generation of 40.2 vph during the peak hour;
- > Direct access to an arterial road;
- > Residential development where the primary commercial vehicle generation is expected to be weekly refuse collection; and
- > Replacement of three (3) dwelling houses, nominally providing a total of six (6) onsite parking spaces, with 111 proposed on-site parking spaces.

**Table 1 – Townsville City Plan Table SC6.4.5.2 ‘Urban Area TIA Impact Level Assessment Criteria’**

Criteria	Impact		
	Low	Moderate	High
Trip Generation	New or additional trip generation in a peak hour of less than 20 trips directly accessing a street.	New or additional trip generation in a peak hour of 20 to 300 trips directly accessing a street. New or additional trip generation directly accessing a sub arterial, arterial, or highway.	New or additional trip generation in a peak hour of more than 300 trips.
Commercial Vehicles	5 or less new or additional commercial vehicles per day in a residential area. Less than 10 new or additional commercial vehicles per day in a non-residential area.	More than 5 and up to 300 new or additional commercial vehicles per day in a residential area.	More than 300 new or additional commercial vehicles per day.
Car Parking	An increase or decrease of 9 or less onsite car park spaces. Loss of 2 or less line marked on-street carparks or loading zones.	An increase or decrease of 10 or more on-site car park spaces. Loss of between 3 or more line-marked on street carparks or loading zones.	
Public Transport	Relocation of any bus zone or taxi rank.	Impacts on the bus interchange or bus routes.	
Transport System	No change to existing transport network operation.	Changes to the connectivity between local streets and collector roads.	Changes to the connectivity between arterial and sub-arterial roads.

Using the criteria of the Townsville City Plan provided in Table 1, it is determined that a MODERATE level traffic impact assessment is adequate for this proposed development.

### 1.3 Scope and Study Area

Figure 1 shows the impact assessment area which consists of Ross River Road between Nathan Street and Acheron Avenue, the unnamed laneway, and Albert Street between the unnamed laneway and Nathan Street.

Figure 1 - Impact Assessment Area



### 1.4 Pre-lodgement Meeting

A pre-lodgement meeting with Townsville City Council (TCC) was held on 25<sup>th</sup> June 2025, the minutes of this meeting are included in Appendix A.

## 2. EXISTING CONDITIONS

### 2.1 Land Use Zoning

The subject site forms part of an existing parcel of land described as Lots 1 -2/RP721729 and Lot 3/SP146326 which is currently zoned Medium Density Residential in the Townsville City Planning Scheme as shown by Figure 2. Each of the three (3) lots have most recently been occupied by a detached dwelling, but the dwelling was removed from lot 2 in 2017/2018 and lot 3 in 2020. Therefore Lot 2/RP721729 and Lot 3/SP146326 are currently vacant (undeveloped), and Lot 1 on RP721729 is most recently occupied by one (1) detached dwelling.

## 2.2 Adjacent land Uses / Approval

As shown in Figure 2, the land directly north and east of the subject site at 344–350 Ross River Road, Cranbrook is within the Aitkenvale Major Centre Precinct, which is designated for a mix of retail, commercial, community, and residential uses under the Townsville City Plan. This precinct is intended to function as a vibrant focal point for the community.

Surrounding the Major Centre is land zoned Medium Density Residential, which supports medium-rise residential development close to the Major Centre. The subject site is situated within this Medium Density Residential zone, which aims to:

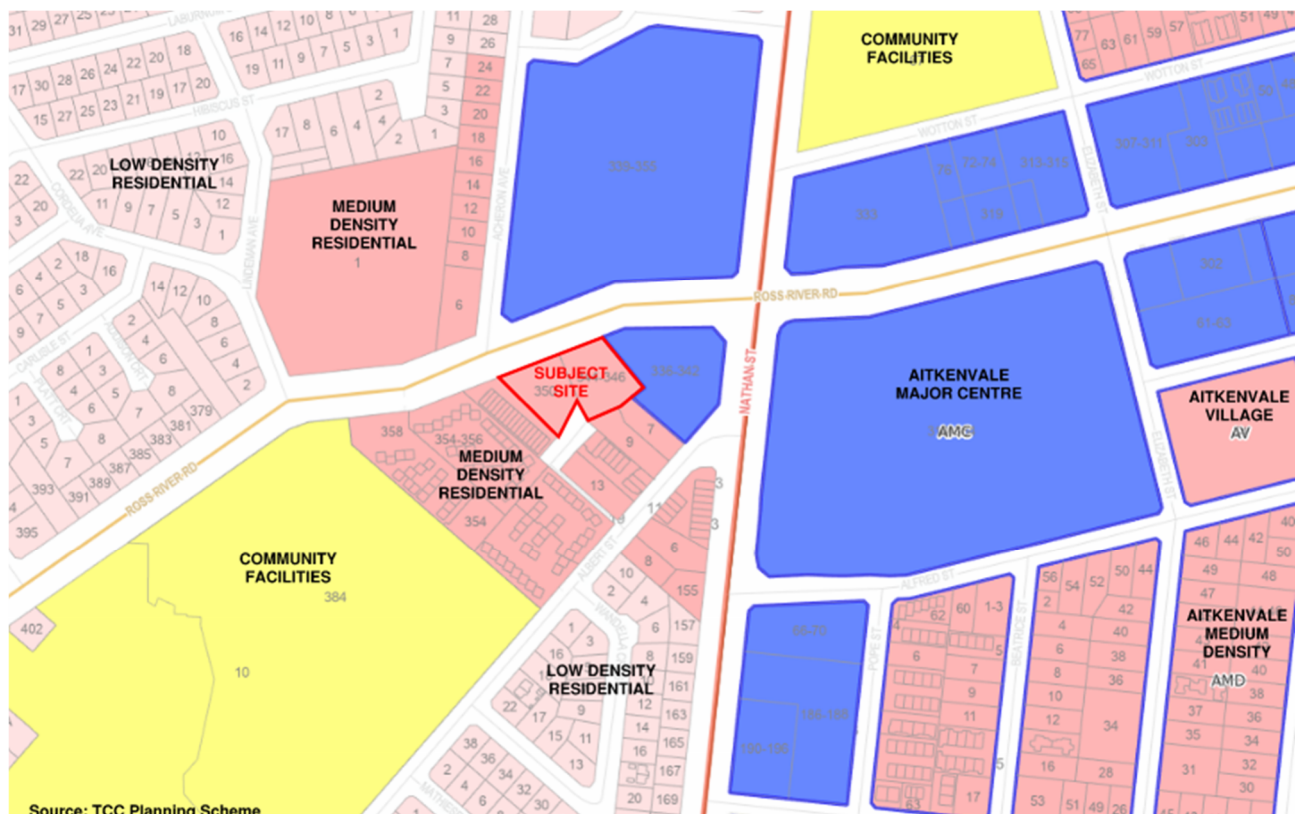
- > Provide opportunities for medium density living in proximity to key centres;
- > Support residential development that complements nearby commercial and community activities.

The site is also highly accessible to community infrastructure, being within a 15-minute walk of six parks, four schools, the local library, and three childcare centres (Source: [Healthy Active by Design – Interactive Map](#)). Community Facilities zones are shown in Figure 2, and include Ignatius Park College and Holy Spirit Catholic Primary School to the southwest, and Aitkenvale State Primary School to the northeast.

Beyond the Aitkenvale Medium Density Precinct lies Low Density Residential zoning, providing a gradual transition in land use intensity.

The subject site’s location within the Medium Density Residential zone adjacent to the Aitkenvale Major Centre aligns with the Townsville City Plan’s framework for land use and supports the ongoing development of the Major Centre as a key community hub.

**Figure 2 - Surrounding Area Land Use**



## 2.3 Surrounding Road Network Details

The surrounding road network is shown by Figure 1 and Figure 2.

### 2.3.1 ROAD LINKS

#### 2.3.1.1 Frontage Road

##### 2.3.1.1.1 Ross River Road

The subject site has frontage to Ross River Road. Ross River Road is under the jurisdiction of the Department of Transport and Main Roads (TMR) and is classified as an Arterial Road under the Townsville Road Hierarchy. The sign posted speed limit is 60km/h. As shown by Figure 3 below, Ross River Road on the subject site frontage has a five (5) lane, divided cross section (two (2) lanes eastbound and three (3) lanes westbound) with marked bicycle lanes. On the subject site frontage, the bicycle lane varies in width from 1.5m in the eastern site extent to 1.0m toward the west. The verge width increases from 6.4m in the east to 7.4m in the west. There is a 1.2m wide pedestrian footpath along the subject site frontage providing pedestrian connectivity to the Aitkenvale Major Centre.

**Figure 3 - Site Frontage to Ross River Road**



2.3.1.1.2 Unnamed Laneway

The subject site also has frontage to an unnamed laneway to the south which is under the jurisdiction of Townsville City Council (TCC). The laneway consists of an approximately 50m by 20m area at the rear of the subject site and surrounding lots which has a 4m wide, 65m long connection to Albert Street as shown in Figure 4. This 4m wide laneway passes between Cranbrae Village Retirement community on the western side of the laneway, and Precinct Apartments- a 19-unit apartment complex on the eastern side. No formal vehicle accesses are currently provided on the laneway.

**Figure 4 - Unnamed Laneway**



### 2.3.1.2 Other Roads

#### 2.3.1.2.1 Albert Street

Albert Street is a 7-metre-wide Access Street under the jurisdiction of TCC. Albert Street features a 1.5-metre-wide pedestrian footpath, ensuring safe pedestrian linkage to Nathan Street. Additionally, recessed street parking is provided along the northern side of Albert Street, immediately west of the subject site. The speed limit on Albert Street is 50km/h.

**Figure 5 - Albert Street facing west**



2.3.1.2.2 Nathan Street

Nathan Street is under the jurisdiction of TMR and is classified as an Arterial Road under the Townsville Road Hierarchy. The sign posted speed limit on Nathan Street is 60km/h. As shown by Figure 6 and Figure 7 below, at the intersection of Albert Street, Nathan Street has a seven (7) lane, divided cross section which provides four (4) lanes northbound, including two (2) right turn lanes into Ross River Road, and three (3) lanes southbound. Bicycle lanes are marked on Nathan Street.

**Figure 6 - Nathan Street facing South**



**Figure 7 - Nathan Street facing North**



## 2.3.2 INTERSECTIONS

The intersections relevant to this assessment include:

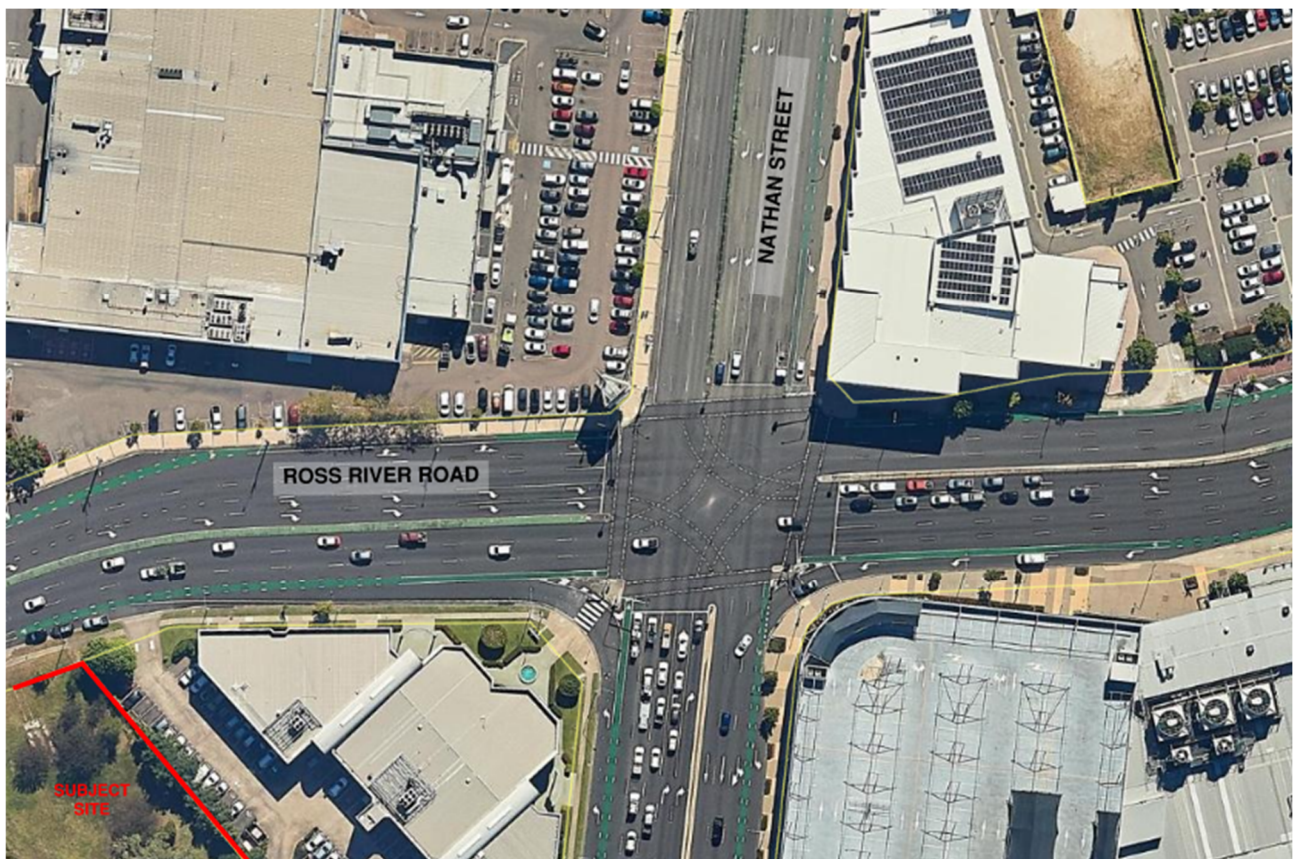
- > Ross River Road and Nathan Street
- > Ross River Road and Acheron Avenue
- > Albert Street and unnamed laneway
- > Albert Street and Nathan Street.

### 2.3.2.1 Ross River Road / Nathan Street Signalised Crossroad

The subject site is located approximately 200 metres west of the signalised, four-leg intersection of Nathan Street and Ross River Road shown in Figure 8 below. A detailed intersection layout plan, incorporating signal phasing diagrams, is included in Appendix B. All intersection approaches provide three (3) through lanes, double right turn lanes and un-staged pedestrian crossings. Left turn treatments are:

- > South approach (Nathan Street): Continuous (low angle) left turn slip lane with pedestrian (zebra) crossing and 100m long acceleration lane ending approximately 15m east of the subject site;
- > East approach (Ross River Road): High angle left turn slip lane with two (2) aspect signal control and signalised pedestrian crossing.
- > North approach (Nathan Street): Exclusive left turn lane through the primary signalised intersection area with expanded storage area for bicycles.
- > West approach (Ross River Road): Shared through-and-left lane.

**Figure 8 - Ross River Road / Nathan Street Signalised Crossroad**



### 2.3.2.2 Ross River Road / Acheron Avenue Signalised Intersection

Acheron Avenue forms a T-intersection with Ross River Road directly in front of Lot 1/RP721729 as shown by Figure 9. This is a signalised intersection with a 30m (excluding taper) channelised right turn lane from Ross River Road into Acheron Avenue. A detailed intersection layout plan, incorporating signal phasing diagrams, is included in Appendix B. A pedestrian crossing is provided on the Acheron Avenue leg of the intersection, but no pedestrian crossings are provided on Ross River Road.

**Figure 9 - Ross River Road / Acheron Avenue T-intersection**



### 2.3.2.3 Albert Street / Unnamed Laneway Intersection

The unnamed laneway intersects with Albert Street as a driveway crossover as shown by Figure 4

2.3.2.4 Albert Street / Nathan Street Priority Controlled Intersection

Albert Street forms a T-intersection with Nathan Street approximately 110m northwest of the laneway egress from the subject site. As shown by Figure 10, the T-intersection is controlled by a give-way sign on the Albert Street (terminating approach). On Nathan Street, a 60m long (including taper) channelised left (CHL) turn treatment is provided.

**Figure 10 - Albert Street / Nathan Street Priority Controlled Intersection**



### 2.3.3 FUTURE ROAD NETWORK PLANNING

TMR are current undertaking safety improvement works at various locations along Ross River Road to provide proactive safety treatments for all road users, including pedestrians, bicycle riders and motorists.

In particular, the project *Ross River Road, Mabin Street to Rolfe Street, improve safety* – includes the following works that will impact upon the study area for this Traffic Impact Assessment:

- > Removal of the left slip lanes from Nathan Street to Ross River Road, resulting in dedicated and signalised left turn lanes.
  - This intersection upgrade is currently in planning stage with TMR, who have provided design drawings which are included in Appendix E. The intersection modification involves:
    - > removing the left turn slip lane from Nathan Street to Ross River Road westbound and replacing with a signalised left turn lane.
    - > addition of a dedicated left turn lane into the driveway of the property at 340 Ross River Road, immediately to the east of the subject site.
    - > merging three lanes to two lanes, associated realignment of the bicycle lane, and installation of chevron markings immediately in front of the subject site.
- > Installation of pedestrian fencing near the Ross River Road and Nathan Street intersection.
- > Signalisation of Lindeman Avenue and associated works. This upgrade includes:
  - installation of 3 pedestrian crossings; and
  - removal of signalised midblock pedestrian crossing.

Replacing the existing mid-block crossing on Ross River Road with a pedestrian crossing at Lindeman Avenue will bring the crossing facility approximately 100m closer to the subject site.

## 2.4 Traffic Volumes

### 2.4.1 QUEENSLAND GOVERNMENT TRAFFIC CENSUS DATA

Traffic census data for Queensland State Declared Roads 2014-2024 was reviewed for the following locations:

- > Ross River Road – segment west of Nathan Street, traffic count site 90073, directly in front of Ignatius Park College
- > Ross River Road – segment east of Nathan Street traffic count at site 90025, directly in front of the Cathedral School.
- > Nathan Street – segment south of Ross River Road, traffic count site 92188, 150m south of Ross River
- > Nathan Street – segment north of Ross River Road, traffic count site 92202, 180m south of Pixley Crescent.

The traffic census data is summarised in Table 2 below.

**Table 2 - Traffic Volumes from 2024 QLD Government Census Data**

Road	AADT (vpd)	%HV
<b>Ross River Road</b> <i>(segment west of Nathan St)</i>	18,421	4.6%
<b>Ross River Road</b> <i>(segment east of Nathan St)</i>	22,467	6.3%
<b>Nathan Street</b> <i>(south of Ross River Road)</i>	32,617	9.4%
<b>Nathan Street</b> <i>(north of Ross River Road)</i>	26,793	12.0%

### 2.4.2 TOWNSVILLE AIMSUN INTEGRATED MODEL

Annual Average Daily Traffic (AADT) volumes and annual average peak hour traffic volumes from 2025 were obtained from the Townsville Aimsun Integrated Model (TAIMS) for all four road segments leading into the Ross River Road and Nathan Street intersection, in addition to Albert Street. These volumes are summarised in Table 3 below.

**Table 3 - Summary of Average AM and PM Traffic Volumes from 2025 TAIM Data**

Road	Period	Direction	Peak Hour Traffic Volumes (vph)	AADT (vpd)
Ross River Road (segment west of Nathan St)	AM	Eastbound	1,098	20,547
		Westbound	1,124	
	PM	Eastbound	554	
		Westbound	1,299	
Ross River Road (segment east of Nathan St)	AM	Eastbound	1,439	16,831
		Westbound	890	
	PM	Eastbound	668	
		Westbound	1,098	
Nathan Street (south of Ross River Road)	AM	Southbound	1,145	30,244
		Northbound	1,660 <sup>1</sup>	
	PM	Southbound	1,166	
		Northbound	1,601 <sup>2</sup>	
Nathan Street (north of Ross River Road)	AM	Southbound	1,024	21,578
		Northbound	963	
	PM	Southbound	892	
		Northbound	1,011	
Albert Street (east of Wandella Crescent)	AM	Eastbound	115	1,447
		Westbound	8	
	PM	Eastbound	97	
		Westbound	6	

<sup>1</sup>This number includes the AM peak hour volume for the left turn slip into Ross River Road of 336 vph.

<sup>2</sup>This number includes the PM peak hour volume for the left turn slip into Ross River Road of 524 vph.

## 2.5 Intersection and Network Performance

Based on STREAMS signal timing data provided by TMR on 25 August, the signalised intersections along Ross River Road, from Alice Street in the west to Charlotte Street in the east, are coordinated in one (1) intersection group, with a cycle time of 140 seconds during peak periods.

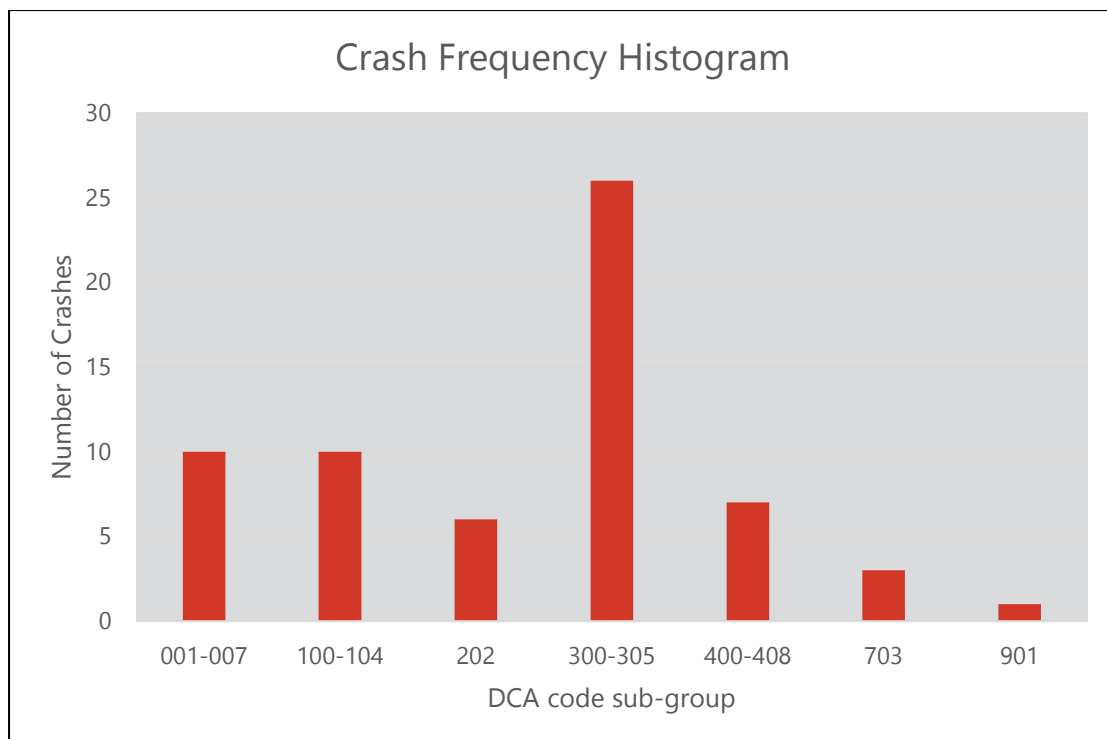
## 2.6 Road Safety Issues

Existing road safety issues in the study area were identified through crash rate analysis. The analysis was conducted on data supplied by TMR. The analysis was undertaken for Ross River Road from Acheron Avenue to Nathan Street including the functional area of associated intersections, from 2008 to 2024 inclusive. The information provided for each crash includes the crash type, location, year, number/type of vehicles involved, vehicle direction, and conditions. There was a total of sixty-three (63) crashes recorded in the study area for this period including fifty-two (52) crashes at the Ross River Road / Nathan Street signals, eleven (11) crashes at the Ross River Road / Acheron Avenue signals and no reported crashes on Albert Street.

Analysis of crash data was conducted through use of a crash factor matrix which can be found in Appendix C. The crash factor matrix groups data according to the TMR Definitions for Coding Accidents (DCAs) which can also be found in Appendix C.

As can be seen in Figure 11 below, the most frequent type of crashes occurs in the subgroup 300-305 which describes collisions between vehicles travelling in the same direction. The next most frequent DCA categories are 001-007 which describes collisions involving pedestrians, and 100-104 which are crashes at intersections involving vehicles from adjacent approaches.

**Figure 11 - Crash Frequency Histogram**



The most frequent type of crash occurred between vehicles travelling in the same direction. In the Ross River Road /Nathan Street intersection, most of these vehicles were travelling Southbound, and in the Ross River Road / Acheron Street intersection, the majority of these vehicles were travelling Eastbound.

Analysis of the crash factor matrix indicates:

- > The majority of crashes occurred between 7:00 am and 5:00 pm.
- > Approximately 80% of crashes took place in dry weather conditions.
- > Around 13% of crashes involved vulnerable road users, specifically cyclists and pedestrians. Of these:
  - Eight (8) pedestrian crashes involved road crossings by pedestrians (DCA 001 to 003) at the Ross River Road / Nathan Street intersection with six (6) resulting in hospitalisation and two (2) resulting in medical treatment.
  - Two (2) pedestrian crashes involved pedestrians being struck as they crossed a driveway (DCA 007), resulting in medical treatment. Based on the locations indicated in the TMR supplied crash data it appears that one (1) of these involved a vehicle exiting 340 Ross River Road and the other involved a vehicle reversing out of the eastern driveway of lot 1 on RP721729 (refer Section 2.7).
  - Seven (7) crashes involving bicycles were all manoeuvring crashes (DCA 400 series). Three (3) hospitalisation and one (1) medical treatment bicycle crash involved bicyclists exiting a footway (DCA 408). One (1) hospitalisation and two (2) medical treatment bicycle crashes were defined as other manoeuvring crashes (DCA 400).
- > One (1) crash involved a heavy vehicle.
- > There has been no discernible change in crash frequency over time.

There were no fatalities in the study area over the time interval analysed. Twenty-four (24) crashes required hospitalisation. Of these more severe crashes:

- > Eight (8) crashes involved vehicles travelling in the same direction (DCA 300 series).
- > Six (6) crashes involved collisions with pedestrians (DCA 000 series).
- > Five (5) crashes involving vehicles travelling from opposite directions with a through – right collision (DCA 202).
- > Three (3) crashes involving bicyclists exiting a footway (DCA 408). These crash locations were as follows:
  - Acheron Avenue mid-block - a cyclist entering the roadway collided with a stationary vehicle.
  - Ross River Road / Nathan Street intersection – between the vehicle travelling eastbound and the cyclist travelling northbound.
  - Ross River Road / Nathan Street intersection – between the vehicle travelling northbound and the cyclist travelling westbound.

## 2.7 Site Access

The subject site forms part of an existing parcel of land which currently contains three (3) lots. Access to these three (3) lots is currently provided by five (5) existing driveway crossovers. The western most crossover is located within the controlled area of the Acheron Avenue traffic signals, while the adjacent crossover is positioned at the intersection stop line. The locations of these five (5) crossovers are shown in Figure 12 below.

Figure 12 - Existing Site Access



## 2.8 Public Transport

The closest public transport stop for scheduled bus services is the Townsville Shopping Centre (SC) approximately 550m (8 minutes) walk to the east of the subject site. This is a major public transport interchange and is served by:

- > Route 200 Breakwater ferry terminal to Kelso via Townsville City bus hub, Townsville SC and Willows every 20 minutes.
- > Route 201 Breakwater ferry terminal to JCU via Townsville City bus hub Townsville SC and hospital every 25 minutes.
- > Route 202 Townsville City bus hub to Townsville University Hospital (TUH), James Cook University (JCU) every hour.
- > Route 203 Townsville City bus hub to Kirwan via Mater Hospital, Townsville SC and Willows every half hour.
- > Route 204 Townsville City bus hub to Townsville SC via Mt Louisa every hour.
- > Route 205 Townsville City bus hub to Townsville SC via Garbutt every hour.
- > Route 208 Townsville City bus hub to Willows via Railway Estate and TUH/JCU every hour.
- > Route 209 Townsville City bus hub to TUH/JCU/Townsville SC via Wulguru every hour.
- > Route 215 Townsville City bus hub to Townsville SC via Garbutt and Domain every hour.
- > Route 232 Townsville SC to Burdell every hour.
- > Route 233 Townsville SC to Bushland Beach via Deeragun and Jensen every hour.

## 2.9 Active Transport

A 1.2-metre-wide concrete footpath is provided along the subject site frontage on Ross River Road, extending eastward to connect with footpaths on Nathan Street and westward to Hatchett Street. This footpath links directly to a pedestrian crossing on the Nathan Street slip lane, which in turn connects to signalised pedestrian crossings in both directions at the Ross River Road / Nathan Street intersection approximately 200 metres east of the site. Additionally, a staggered (offset) signalised pedestrian crossing is located mid-block approximately 300 metres west of the subject site, enhancing pedestrian connectivity across Ross River Road.

Along Albert Street, a 1.5-metre-wide concrete footpath provides further pedestrian access, supporting safe and convenient movement within the local street network.

Complementing pedestrian infrastructure, a dedicated bicycle lane runs along Ross River Road in front of the subject site, facilitating safe and direct cycling access from the Aitkenvale Major Centre and surrounding community facilities. Both Ross River Road and Nathan Street are identified as Priority A routes in the Principal Cycle Network Plan, as shown on the North Queensland Priority Route Map (2021). This designation reflects their importance within the regional cycling network and indicates that these corridors are priorities for government investment in high-quality cycling infrastructure over the 10-year period following the 2021 plan.

These active transport facilities align with the objectives of the Medium Density Residential zone in the Townsville City Plan, which promotes walkability and cycling as key components of sustainable urban living and reduced car dependency.

## 3. PROPOSED DEVELOPMENT DETAILS

### 3.1 Development Site Plan

The proposed development is a five (5) storey residential development on Lots 1 – 2/RP721729 and Lot 3/SP146326. The proposed development includes two (2) buildings separated by an internal roadway. The development also includes provision for secured bicycle parking, a dedicated refuse collection area and wash bay. Development site plans are enclosed in Appendix D.

### 3.2 Operational Details

The proposed development is to consist of 81 residential units including:

- > 21 single bedroom units for the Department of Housing (DoH);
- > 42 two-bedroom units including three (3) for the DoH; and
- > 18 three-bedroom units.

### 3.3 Proposed Access and Parking

The development access is proposed to consist of left-in-left-out access on Ross River Road and one-way egress only via the 4m wide laneway to Albert Street.

The five (5) existing driveway crossovers will be removed as part of the proposed development.

Onsite parking is proposed to include:

- > 111 on-site parking spaces including:
  - Four (4) spaces for people with disabilities; and
  - Three (3) pairs of spaces in tandem configurations.
- > 16 off-site visitor parking spaces within the unnamed road reserve to the south of the development site.

## 4. DEVELOPMENT TRAFFIC

### 4.1 Traffic Generation

The “Guide to Traffic Generating Developments” (RTA 2002) reports traffic generation rates indicated in Table 4 for medium density residential flat buildings.

Table 4 – Medium Density Residential Flat Building Traffic Generation

Dwelling Type	Daily Vehicle Trips	Weekday Peak Hour Vehicle Trips
Smaller units and flats Up to two (2) bedrooms	4-5 per dwelling	0.4-0.5 per dwelling
Larger units and townhouses Three (3) or more bedrooms	5.0-6.5 per dwelling	0.5-0.65 per dwelling

Therefore, the proposed housing development is expected to generate 402 trips per day with 40.2 trips during weekday peak hours based on:

- > Single bedroom units generating 4 trips per day and 0.4 trips during weekday peak hours; and
- > Two-bedroom units will each generate 5 trips per day and 0.5 trips during weekday peak hours.
- > Three-bedroom units will each generate 6 trips per day and 0.6 trips during weekday peak hours

In accordance with the TCC TIA guidelines, the adopted directional splits for this development traffic are:

- > 80% outbound: 20% inbound during the morning (AM) peak hour (32 vehicles per hour outbound, 8 vehicles per hour inbound).
- > 30% outbound: 70% inbound during the evening (PM) peak hour (12 vehicles per hour outbound, 28 vehicles per hour inbound).

### 4.2 Trip Distribution

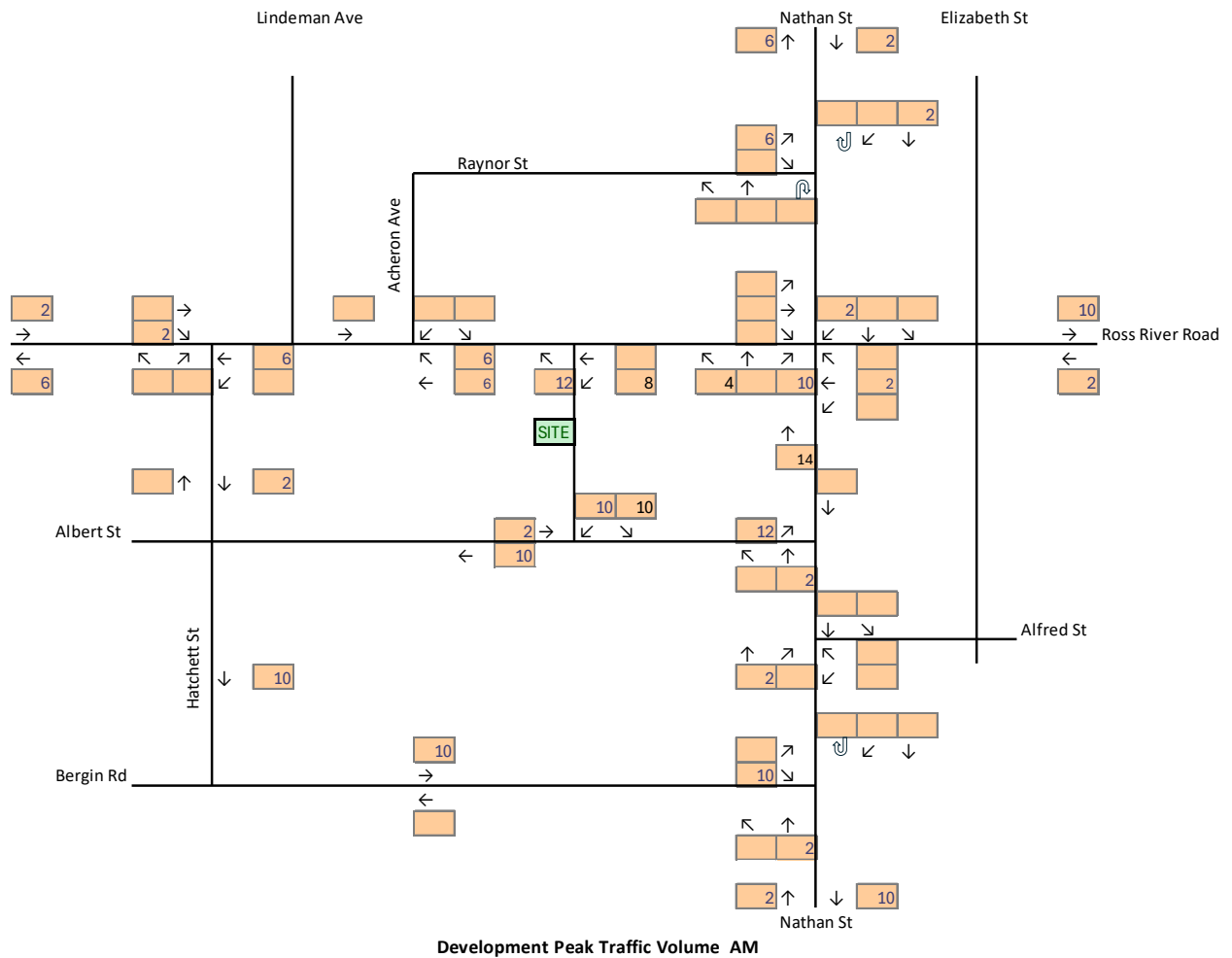
Based on the TCC TAIM Projected Traffic Flows using the *2036 Forecast Model (with LGIP Works)*, the adopted trip distribution is:

- > to/from South (JCU, TUH, Lavarack Barracks) = 30% (12 vph).
- > to/from East (Townsville Principal Centre) = 30% (12 vph)
- > to/from North (Garbutt, Mt St John, Bohle Industrial Precincts) = 20% (8 vph).
- > to/from West (Thuringowa Central) = 20% (8 vph).

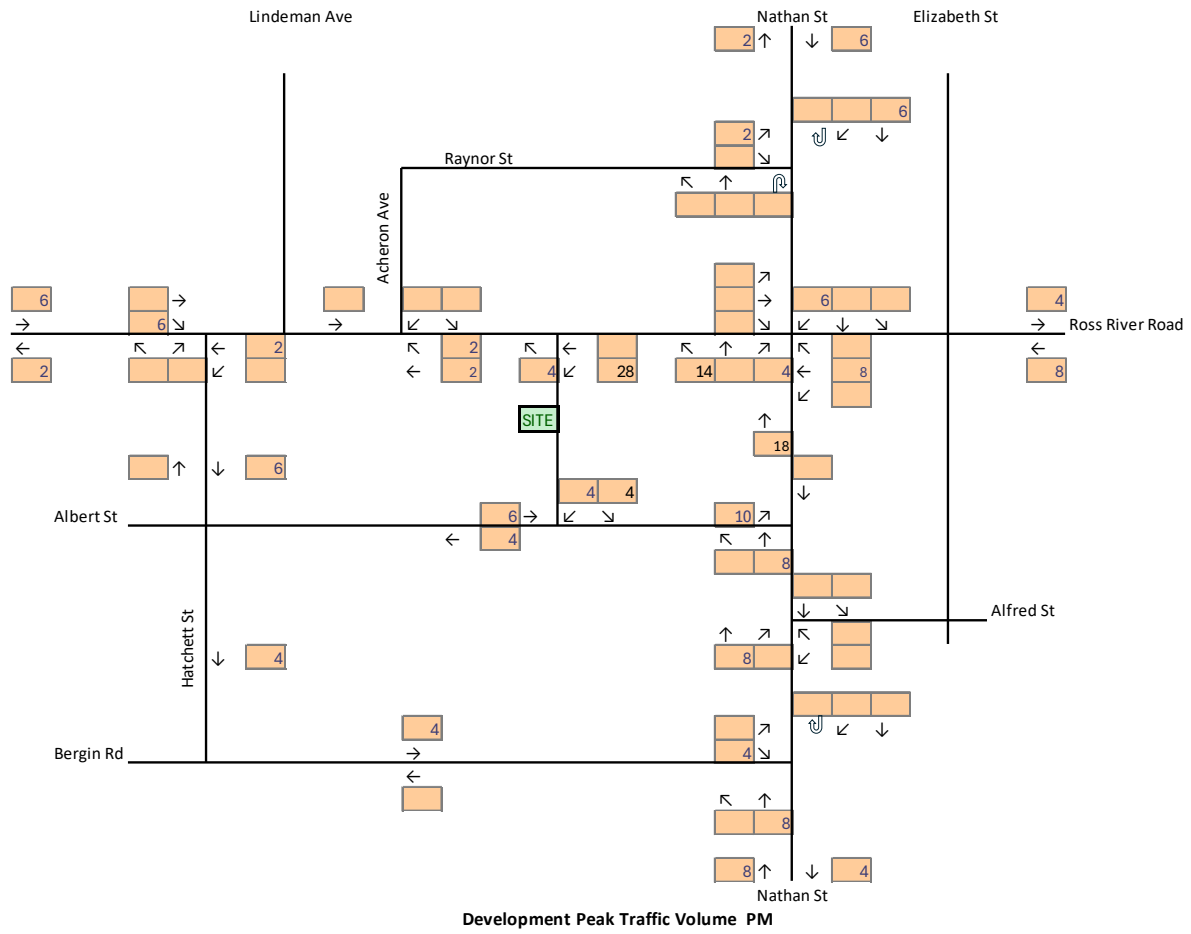
### 4.3 Development Traffic Volumes on the Network

As a result of the LILO access arrangements the development will generate the peak hour movements shown by Figure 13 and Figure 14.

**Figure 13 - Development AM Peak Hour Traffic Volume**

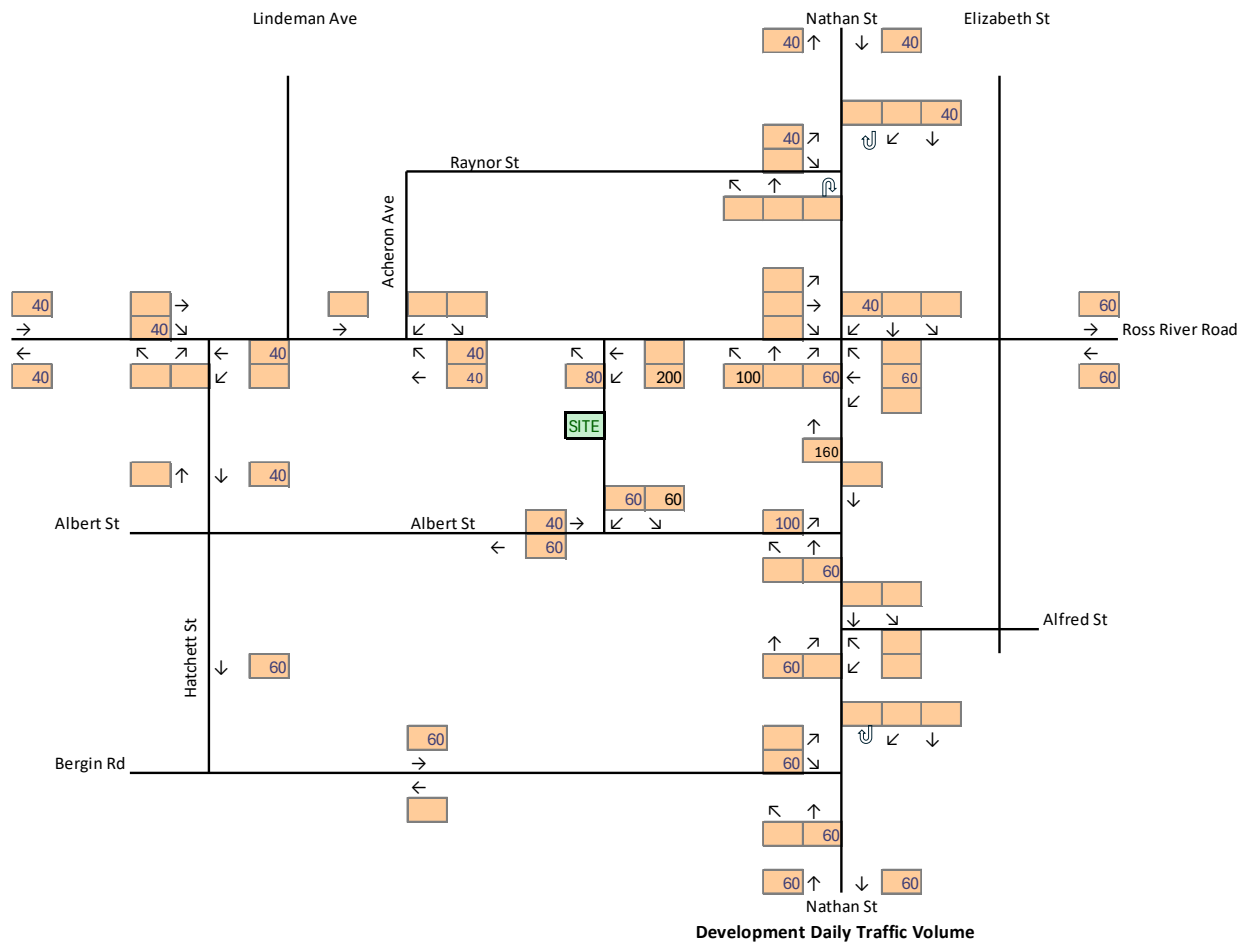


**Figure 14 - Development PM Peak Hour Traffic Volume**



The daily traffic is shown in Figure 15 below.

**Figure 15 - Development Daily Traffic**



## 5. IMPACT ASSESSMENT AND MITIGATION

### 5.1 With and Without Development Traffic Volumes

#### 5.1.1 WITHOUT DEVELOPMENT TRAFFIC

Figure 16 and Figure 17 below summarise the 'without development' traffic for AM and PM Peak hours for the year 2036 as forecast in the TAIMS 2036 Forecast Model (with LGIP works).

**Figure 16 - Without Development AM Peak Traffic Volume 2036**

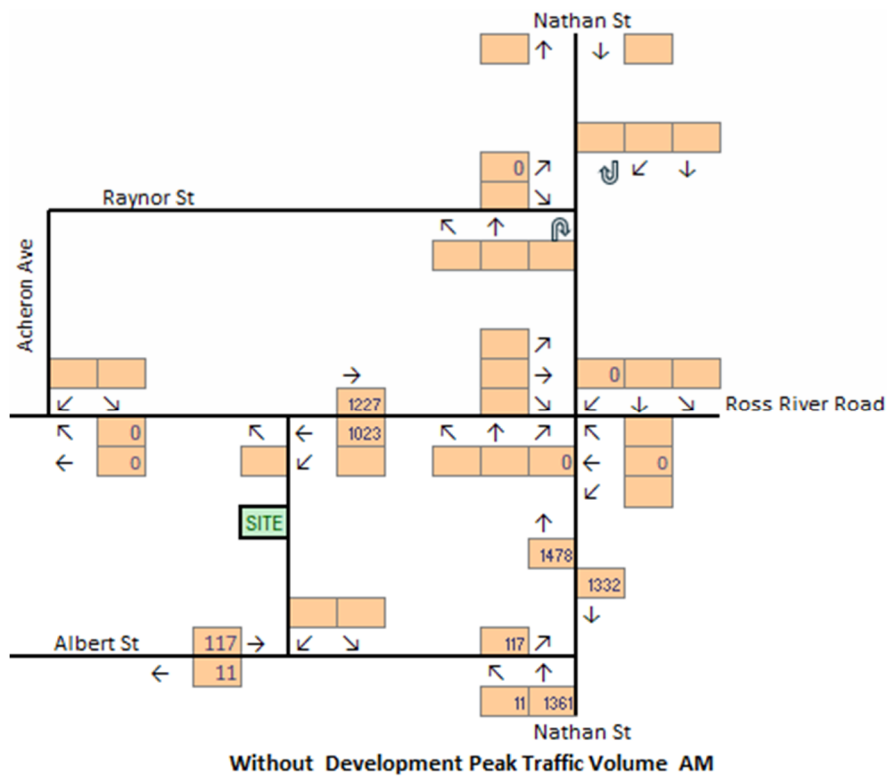
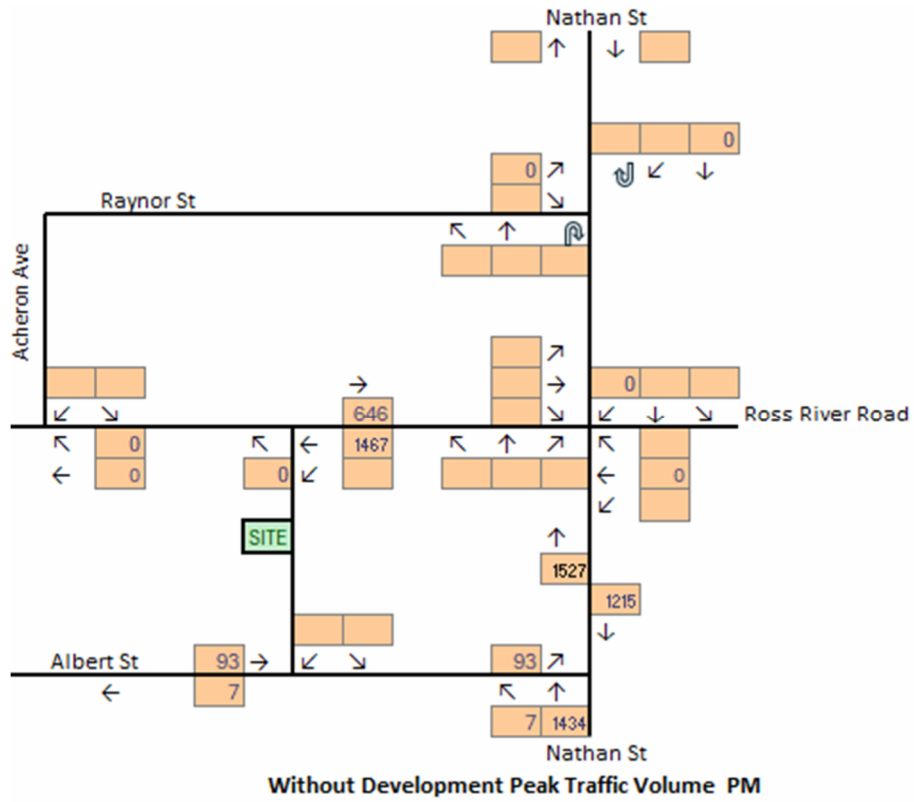


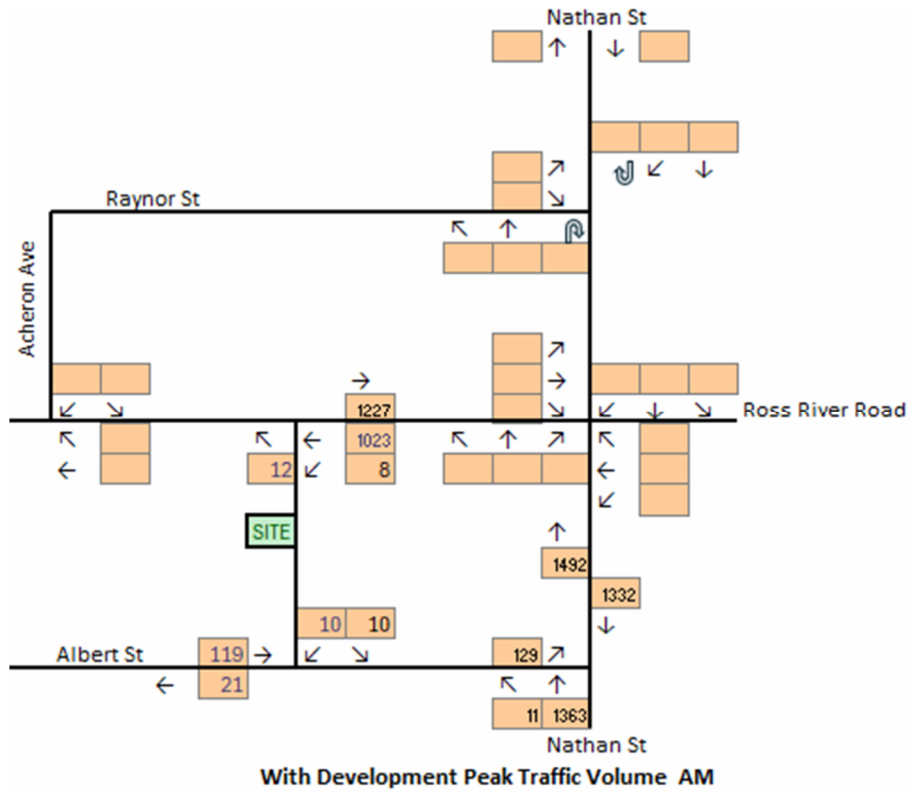
Figure 17 - Without Development PM Peak Traffic Volume 2036



5.1.2 WITH DEVELOPMENT

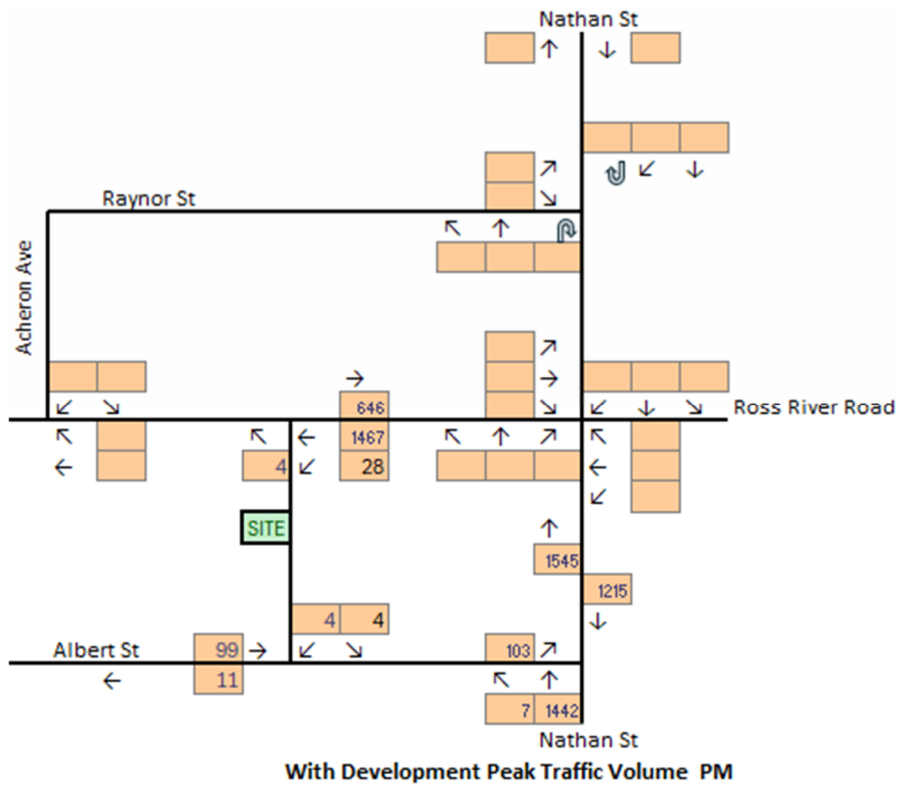
The 'with development' morning peak hour traffic is shown in Figure 18. It is the sum of the development traffic shown in Figure 13 and 'without development' traffic shown in Figure 16.

Figure 18 - With Development AM Peak Traffic Volume 2036



The 'with development' afternoon peak hour traffic is shown in Figure 18. It is the sum of the development traffic shown in Figure 14 and 'without development' traffic shown in Figure 17.

**Figure 19 - With Development PM Peak Traffic Volume 2036**



## 5.2 Road Safety Impact Assessment and Mitigation

The GTIA specifies the following two stage process for assessment of road safety impacts:

1. Road Safety Risk Assessment to determine the change in risk profile associated with existing road safety issues as a result of the development; and
2. Road Environment Safety Assessment to determine if changes to infrastructure require either a road safety audit by an accredited road safety auditor (RSA) or a road safety assessment by either an RSA or a Registered Professional Engineer of Queensland (RPEQ).

### 5.2.1 ROAD SAFETY RISK ASSESSMENT

A road safety risk assessment was conducted in accordance with the risk assessment process specified by the GTIA. The risk assessment process involves the following steps for each risk item:

- > Evaluate potential consequences based on accident severity from 1, property damage only, to 5, fatality;
- > Evaluate potential likelihood from 1, rare, to 5, almost certain; and
- > Sum the potential consequence and likelihood values to determine the risk score with scores up to and including 4 considered low risk, 5 to 7 medium risk, and 8 or greater high risk, in accordance with Figure 9.3.2(a) *Safety risk score matrix* from the GTIA.

Table 5 summarises the road safety risk assessment with further detail provided in the following sections. Hazards were identified through a crash factor matrix (included as Appendix C) utilising crash data from TMR in the vicinity of Ross River Road from Acheron Avenue to Nathan Street including the functional area of associated intersections. Also see Section 2.6 of this TIA for a summary of the crash data.

Table 5 - Road Safety Risk Assessment

Crash Description	DCA Code	Severity					Without development			With development			Mitigation Measures by TMR	With development & mitigation			Mitigation Measures by Developer	With development & mitigation		
		(1)	(2)	(3)	(4)	(5)	Likelihood	Consequence	Risk Score	Likelihood	Consequence	Risk Score		Likelihood	Consequence	Risk Score		Likelihood	Consequence	Risk Score
Pedestrian crossing road	001 & 003	0	0	1	6	0	3	4	M	4	4	H	Install pedestrian fencing	3	4	M				
Pedestrian Emerging from parked car	002	0	0	1	0	0	1	3	L	2	3	M	Install pedestrian fencing; ban parking on development's Ross River Road site frontage	1	3	L				
Pedestrian crossing driveway	007	0	0	2	0	0	2	3	M	3	3	M								
Vehicles travelling in same direction	300-305	0	3	15	8	0	4	4	H	5	4	H	Modify left turn slip lane	4	4	H	Construct deceleration lane	3	4	M
Bicycle Crashes	400-408	0	0	3	4	0	3	4	M	4	4	H					Improve on-road cycle infrastructure, bicycle parking, direct cyclists to Albert St	3	4	M
Off path on straight	703-708	0	1	0	2	0	2	4	M	3	4	M								

### 5.2.1.1 Without Development Road Safety Risk Assessment

To provide an objective assessment of the potential likelihood, Premise uses the average recurrence interval/frequency criteria listed in Table 6. These criteria are more conservative than those suggested by TMR’s *Guide to Traffic Impact Assessment: Frequently Asked Questions* (December 2017) but are consistent with other TMR guidelines that three (3) fatal or serious injury (potential consequence 4) accidents in five (5) years (potential likelihood 4) is high risk and should be mitigated. It was found that the highest risk scores generally resulted from consideration of the highest consequence/most severe accidents.

**Table 6 - Potential Likelihood Evaluation Criteria**

Potential Likelihood	Average Recurrence Interval	Accidents over 16 years
Almost Certain (5)	≤1 year	16 or more
Likely (4)	≤ 2 years	8 to 15
Moderate (3)	≤ 4 years	4 to 7
Unlikely (2)	≤ 8 years	2 or 3
Rare (1)	> 8 years	1

- > Seven (7) crashes resulted from pedestrians crossing the roadway and being struck on either the near side or the far side of the carriageway. This resulted in six (6) occurrences (Moderate (3) likelihood rating) of hospitalisation, equivalent to a level 4 consequence rating.
- > One (1) crash resulted from a pedestrian being hit while trying to cross a carriageway after emerging from behind a parked vehicle. It resulted in medical treatment, equivalent to a level 3 consequence rating. As it is the only crash identified of this nature and location, the average recurrence interval is >8 years, produce a Rare (1) likelihood rating.
- > Two (2) crashes resulted from a pedestrian being hit by a vehicle while entering or leaving a driveway. These resulted in medical treatment, equivalent to a level 3 consequence rating. Two (2) crashes identified with this nature and location, gives an average recurrence interval is ≤8 years, producing an Unlikely (2) likelihood rating.
- > Twenty-six (26) crashes were attributed to collisions between vehicles travelling in the same direction. Eight (8) of the crashes resulted in hospitalisation, equivalent to a level 4 consequence rating. The average recurrence interval of hospitalisation is less than 2 years, producing a Likely (4) likelihood rating.
- > Seven (7) crashes involved bicycles. Four (4) of the crashes resulted in hospitalisation, equivalent to a level 4 consequence rating. The average recurrence interval of hospitalisation is less than 4 years, producing a Moderate (3) likelihood rating.
- > Three (3) crashes resulted from vehicles veering off the carriageway, two (2) of these required hospitalisations, equivalent to a level 4 consequence rating. The average recurrence interval of hospitalisation is less than 8 years, producing an Unlikely (2) likelihood rating.

### 5.2.1.2 With Development Road Safety Risk Assessment

To provide an objective assessment of the potential likelihood increase, Premise uses the volume ratio of “with development” traffic and “without development” traffic (“with development” traffic divided by “without development” traffic) listed in Table 7.

**Table 7 - Potential Likelihood Increase Criteria**

Potential Likelihood Increase	Volume Ratio (R)
+4 bands	$8 < R$
+3 bands	$4 < R \leq 8$
+2 bands	$2 < R \leq 4$
+1 band	$1.05 < R \leq 2$
No increase	$R \leq 1.05$

The proposed development has a small traffic generation relative to existing traffic on the surrounding road network but may significantly increase some individual movements during peak periods. Therefore, the proposed development is assumed to increase the likelihood rating of each hazard by one (1) band.

### 5.2.1.3 Mitigation

Where the ‘with development’ risk assessment resulted in an increase in the risk score, a mitigation measure was identified and applied for the given hazard.

Appendix E of Austroads’ *Guide to Road Safety Part 2: Safe Roads* (AGRS02-2021) provides Crash Modification Factors, CMF, of various mitigation measures. In addition to these modification factors, Crash Reduction Factors CRF, from the TMR Safe Systems Assessment Guidelines, were also used. These factors were determined from the template *SSA eLite+ v4.xls*. The Crash Reduction Factor (CRF) is the complement of the Crash Modification Factor (CMF). These factors provide an objective assessment of the potential likelihood decrease due to proposed mitigation measures as listed in Table 8.

**Table 8 - Potential Likelihood Decrease Criteria**

Potential Likelihood Decrease	Crash Modification Factor, CMF
-1 band	$0.5 < CMF < 1$
-2 bands	$0.25 < CMF \leq 0.5$
-3 bands	$0.125 < CMF \leq 0.25$
-4 bands	$CMF \leq 0.125$

The mitigation measures described in the Road Safety Risk Assessment in Table 5 have been divided into two categories; mitigation measures by TMR, and mitigation measures by the developer.

#### 5.2.1.3.1 Mitigation Measures by TMR

As outlined in Section 2.3.3: the TMR project *Ross River Road, Mabin Street to Rolfe Street, improve safety* – includes installation of pedestrian fencing near the Ross River Road and Nathan Street intersection; and removal of the left slip lane from Nathan Street to Ross River Road, resulting in a dedicated and signalised left turn lane, and updating the associated pedestrian crossing to a signalised pedestrian crossing. Both of these proactive safety treatments decrease the likelihood of hazards occurring as described below:

- > **Installation of pedestrian fencing:** the implementation of this risk mitigation measure, described as treatment 6.10 (Fencing a median – either with direct pedestrian fencing or with guardrail) in spreadsheet *SSA eLite+ v4.xls* results in a Crash Reduction Factor CRF=0.25, equivalent to CMF=0.75 which results in a potential likelihood decrease of 1 band.
- > **Modify left turn slip lane:** the implementation of this risk mitigation measure described treatment 3.13 (Changing slip lane from low entry angle to high entry angle) in spreadsheet *SSA eLite+ v4.xls* results in a Crash Reduction Factor CRF=0.5, equivalent to CMF=0.5 which results in a potential likelihood decrease of 1 band.

#### 5.2.1.3.2 Mitigation Measures by Developer

- > **Construct deceleration lane:** the implementation of this risk mitigation measure described as Protected left turn lane in AGRS02-2021 results in a CMF of 0.9 which results in a potential likelihood decrease of 1 band.
- > **Improve on-road cycle infrastructure:** the implementation of this risk mitigation measure, described as treatment 6.16 (Treatment of auxiliary left turn lanes with TC1769 where applicable) in spreadsheet *SSA eLite+ v4.xls* results in a Crash Reduction Factor CRF=0.10, equivalent to CMF=0.90 which results in a potential likelihood decrease of 1 band. Note, treatment TC1769 has been superseded by MUTCD Q-Series W6-Q05, which is the treatment outlined in Section 5.3.3 and is the treatment shown by TMR planning enclosed in Appendix E for changes to access at 340 Ross River Road.

### 5.2.2 ROAD ENVIRONMENT SAFETY ASSESSMENT

In accordance with the Section 9.3.3 of the GTIA, Ross River Road is assessed as having a medium road environment risk rating based on having a posted speed limit of 60 km/h and an AADT of more than 8,000 vpd. Albert Street is assessed as having a low road environment risk rating based on having a posted speed limit of 60 km/h and an AADT of less than 8000 vpd.

As a Planning Act Development any changes to the road environment would not require a road safety audit but should be subject to a road safety assessment. A road safety assessment may be conducted by either an RSA or RPEQ. This requirement would be satisfied by safety reports prepared in accordance with Section 295 of the Work Health and Safety Regulation 2011 as part of the design process.

### 5.3 Access and frontage impact assessment

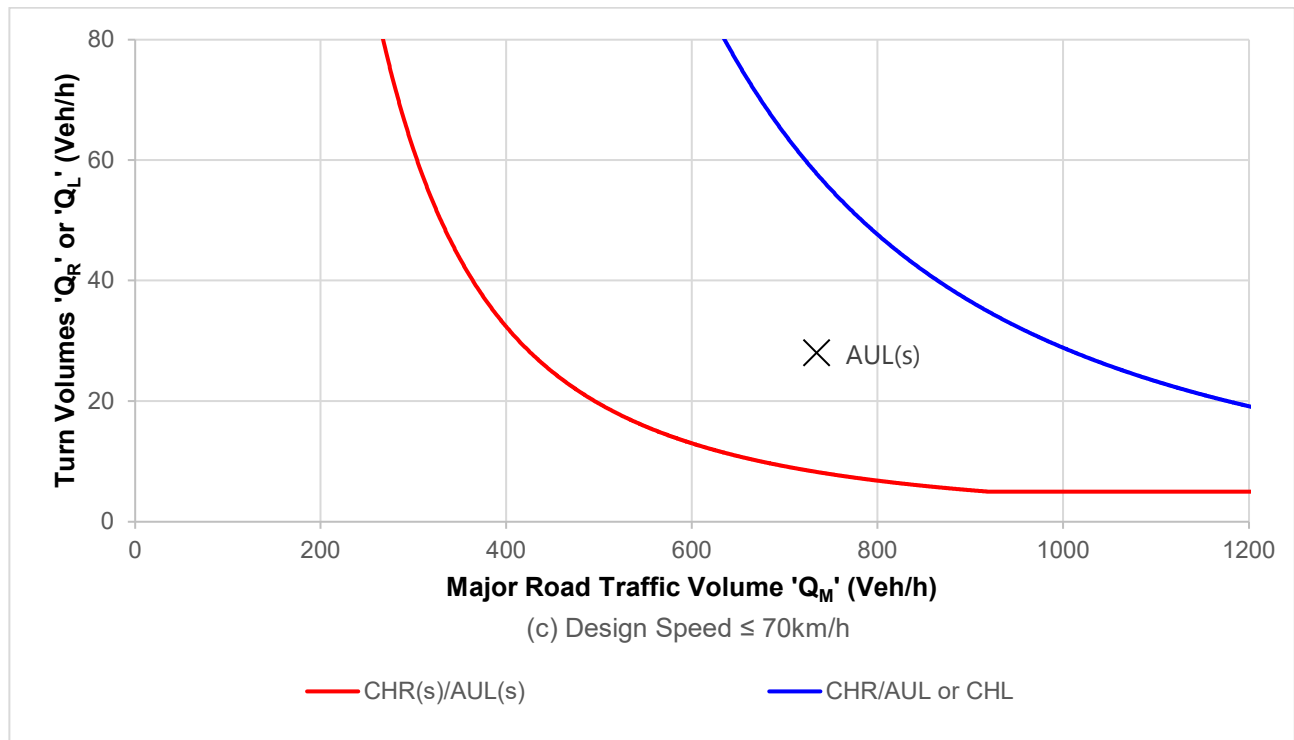
#### 5.3.1 TURN WARRANT ASSESSMENT

A turn warrant assessment was undertaken for the proposed access based on warrants contained in Austroads' "Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings" (AGTM06-20). The proposed access for the development is via a single left in entry from Ross River Road. The assessment is based on:

- > A design speed, V, of 70 km/h, being 10km/h above the posted speed limit.
- > Normal Design Domain (NDD) warrants shown by Figure 20.
- > Four (4) lane, two (2) way major road, that is, two (2) lanes on westbound side of Ross River Road in accordance with planning by TMR enclosed in Appendix E. This provides a conservative assessment of turn warrant requirements for the current Ross River Road configuration on the development site frontage which consists of three (3) westbound lanes.
- > Design year (2036) "with development" traffic volumes during the PM peak hour as shown by Figure 19. Note that for the left in entry only westbound traffic volumes in Section 5.1.1 are relevant and these are multiplied by 50% to account for the four (4) lane, two (2) way major road cross section.

As shown by Figure 20, the turn treatment warranted on Ross River Road at the site access is an Auxiliary Left-turn Treatment – Short Turn Lane AUL(s).

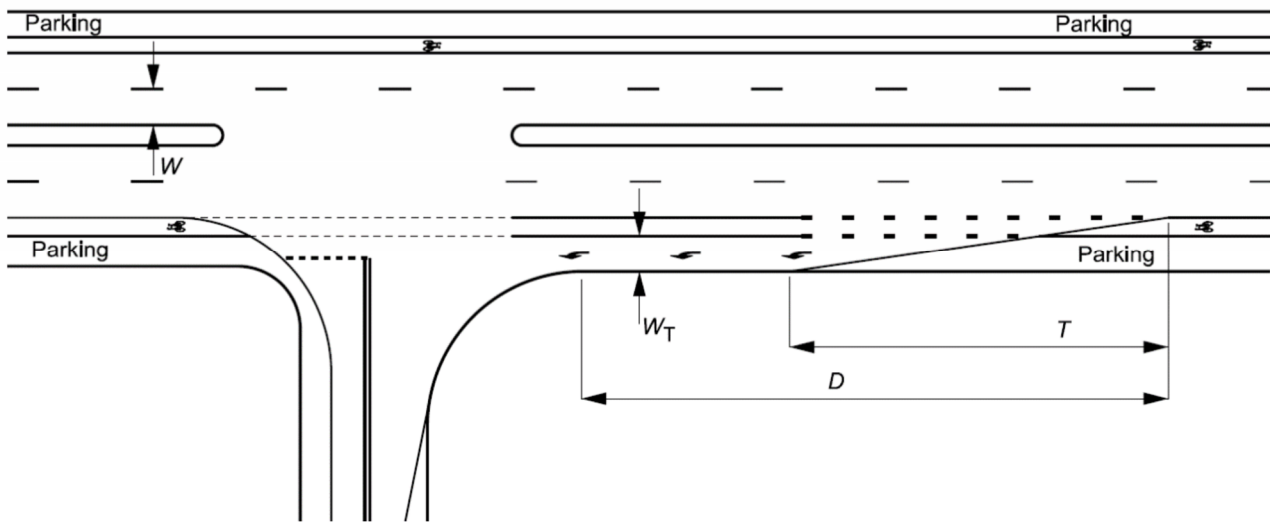
**Figure 20 - Warrant for turn treatment on major roads at unsignalised intersections (AGTM06-20)**



Austrroads "Guide to Road Design Part 4A: Unsignalised and Signalised Intersections (AGRD04A-23) indicates that the length of the AUL(S) turn treatment is that the length of turn slot is based on a left turning vehicle slowing to 80% of the design speed on the approach (i.e. a speed reduction of 20% in the through lane), prior to moving into the turn lane and decelerating. Figure 21 reproduced from AGRD04A-23 shows the layout of an AUL(S) on an urban road. Based on a design speed,  $V$ , of 70 km/h, being 10km/h above the posted speed limit the following dimensions were determined:

- > Divergence/deceleration length,  $D$ , is 35m.
- > Taper length,  $T$ , is 30m.

Figure 21 – Urban auxiliary left-turn treatment – short turn lane AUL(S) (



### 5.3.2 INTERSECTION ANALYSIS

Intersection delay impacts were assessed for the site access on Ross River Road and the Nathan Street and Albert Street intersection based on 'with development' traffic volumes (Figure 18 and Figure 19).

Intersection performance has been assessed using SIDRA Intersection 10 (SIDRA). SIDRA is an advanced analytical traffic tool for the evaluation of intersection performance, including delays, queue lengths, and Level of Service. The SIDRA network model was used to assess the impact of the development on intersection performance.

SIDRA reports intersection performance in terms of a range of parameters including:

- > **Demand Volumes (V):** The modelled number of vehicles arriving at the intersection during the assessment hour. Demand volumes are calculated by dividing the peak hour volume by the peak flow factor (PFF). SIDRA's default PFF of 95% has been adopted for the purposes of this traffic impact assessment.
- > **Degree of Saturation (DoS):** The ratio of the demand volume, V, to the theoretical capacity. A priority control intersection is considered to be operating at its practical capacity when the DoS reaches 0.80.
- > **Average Delay (D):** The mean control delay, including both queuing and geometric delays, for all vehicles arriving during the assessment period. This also accounts for any delay experienced after the end of the flow period until the departure of the last vehicle that arrived during that period. Townsville City Plan Table SC6.4.5.6 specifies desirable control delays of less than 35 seconds per vehicle for priority intersections. The GTIA states that where average peak-hour delays at priority-controlled intersections exceed 42 seconds, the intersection should be upgraded for safety reasons.
- > **Level of Service (LoS):** An index of the operational performance of traffic. This provides a quantitative stratification of delay that represents quality of service, measured on an A to F scale, with LoS A representing the best operating conditions from the traveller's perspective and LoS F the worst.
- > **95th Percentile Back of Queue Length (Q):** The maximum backward extent of the queue relative to the stop line or give-way / yield line during a signal cycle or gap acceptance cycle below which 95% of all queue lengths fall. The 95th percentile back of queue length is generally accepted as the maximum queue length for design purpose.

The SIDRA models are based the assumption that heavy vehicles make up 5% of all movements which is consistent with 2024 traffic census data for Ross River Road (refer Table 2) and conservative for the peak hour traffic generation of a residential development.

5.3.2.1 Ross River Road Access

The site access on Ross River Road was modelled as a left-in-left out access with Auxiliary Left-turn Treatment – Short Turn Lane AUL(s) as recommended in Section 5.3.1 and ‘with development’ traffic as shown by Figure 18 and Figure 19. Consistent with Figure 13 and Figure 14 it was assumed that 50% of traffic turning left out of the development will give way to all westbound traffic on Ross River Road as it accesses the right turn lane into Acheron Avenue. Associated SIDRA outputs are enclosed in Appendix H. Key findings are:

- > The access is operating well below capacity, with maximum DoS being 0.273 (<<0.8).
- > The maximum average delay to any movement is 21.7sec for vehicles exiting the site on to Ross River Road during the evening peak hour. This corresponds to a LoS C which is acceptable.
- > 95<sup>th</sup> percentile back of queue lengths are calculated as 0.8 vehicles for the exit to Ross River Road during the morning peak hour which is ideal.

5.3.2.2 Albert Street and Laneway Intersection

An intersection capacity analysis is not required for the intersection of the Laneway and Albert Street, as traffic volumes of 20 vph on the Laneway and 140 vph on Albert Street, combined with relatively low turning movements, are not expected to result in capacity constraints or operational issues. This conclusion is consistent with the guidance provided in Table 6.1 of the 2009 edition of Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis (AGTM03/09) which is reproduced as Table 9 below.

**Table 9 – Intersection Volumes Below Which Capacity Analysis is Unnecessary**

Type of road	Light cross and turning volumes maximum design hour volumes vehicles per hour (two way)		
Two-lane major road	400	500	650
Cross road	250	200	100
Four-lane major road	1000	1500	2000
Cross road	100	50	25

### 5.3.2.3 Albert Street and Nathan Street Intersection

The intersection of Albert Street and Nathan Street was modelled as a left-in-left-out intersection with 'with development' traffic as shown by Figure 18 and Figure 19. As with the Ross River Road access it was assumed that 50% of vehicles turning left out of Albert Street will give way to all northbound traffic on Nathan Street in order to access right turn lanes into Ross River Road. Associated SIDRA outputs are enclosed in Appendix H. Key findings are:

- > The intersection is operating well below capacity, with maximum DoS being 0.361 ( $<<0.8$ ) for vehicles turning left out of Albert Street during the morning peak hour.
- > The maximum average delay to any movement is 17.1sec for vehicles turning left out of Albert Street during the evening peak hour. This corresponds to LoS C which is acceptable.
- > 95<sup>th</sup> percentile back of queue lengths are calculated as 1.4 vehicles for the left turn out of Albert Street during the morning peak hour and 1.2 vehicles for vehicles for the left turn out of Albert Street during the evening peak hour which is not expected to impact on the operation of adjacent intersections or accesses.

### 5.3.3 INTERSECTION LAYOUT

Appendix G shows the proposed layout for the Ross River Road access. Keeping the left turn deceleration lane clear of driveway at 340 Ross River Road requires limiting the length of the left turn deceleration lane to 32m. Based on a deceleration rate of  $3.5\text{m/s}^2$  the length of turn slot allows a vehicle to decelerate from 54km/h to 0km/h between the start of the taper and edge of the driveway.

As indicated in Section 5.3.1, the minimum length of an AUL(S) treatment in the NDD allows a 20% speed reduction in the through lane before the start of the auxiliary lane taper. However, Appendix A of AGRD04A-23ed3.2 indicates that in the extended design domain (EDD) a 30% speed reduction in through road speed at the start of the taper is accepted. Therefore, the proposed 32m long AUL(S):

- > Complies with minimum NDD requirements for a design speed of 67km/h (more than 10% above the posted speed limit); and
- > Exceeds minimum EDD requirements for a design speed of 70km/h (10km/h above the posted speed limit).

To avoid the diverge associated with the development site access overlapping with the merge of westbound through traffic on Ross River Road from three (3) lanes to two (2) lanes as shown by the Ross River Road Safety Upgrade Project Drawings (refer Appendix E), recommended that the existing arrangement of westbound lanes on the development site frontage should be retained with the merge from three (3) lanes to two (2) lanes occurring west of Acheron Avenue. This will have the adverse impact that when the bus stop on Ross River Road at Cambrae Village is relocated to provide for a left turn deceleration lane into Ignatius Park College the relocated bus stop will be within the merge area and buses loading / unloading at the stop will block the adjacent cycle lane. The safety benefits of keeping the merge area clear of the deceleration lane into the proposed development and providing the deceleration lane into Ignatius Park College are considered greater than the risks associated with relocating the bus stop into the merge area.

### 5.3.3.1 Swept Path Analyses

Swept path analysis has been undertaken for a front-loading refuse collection vehicle accessing the site from Ross River Road. The vehicle manoeuvres into the designated waste collection area to service bins and subsequently exits the site via the unnamed laneway, turning right onto Albert Street.

The analysis confirms that the proposed access and internal circulation arrangements can accommodate the operational requirements of the waste collection vehicle. Swept path diagrams illustrating these movements are provided in Appendix I.

### 5.3.4 SIGHT DISTANCES

With respect to sight distance standards Appendix A11 of the GTIA states that:

*Approach sight distance (ASD) should be provided at every proposed intersection or driveway access. Public road intersection should have safe intersection sight distances (SISD) unless the characteristics of the road or the site totally preclude it. In those circumstances, minimum gap sight distance (MGSD) should be provided.*

The GTIA goes on to recommend adoption of a design speed (for state-controlled roads) which is 10km/h in excess of the posted speed limit. In section 9.1.1 of the TCC TIA Guidelines (TIAG) it is recommended that ASD and SISD should be achieved for a 2.0 sec reaction time:

Design Speed  $V = 70\text{km/h}$

Reaction Time  $R_T = 2.0\text{s}$

Based on the above parameters, recommended sight distances in the normal design domain (NDD) for the proposed Ross River Road Residential Development access on Ross River Road are:

- > Approach Sight Distance ASD = 92m
- > Safe Intersection Sight Distance SISD = 151m
- > Minimum Gap Sight Distance MGSD = 97m

A site inspection was undertaken on 17 September 2025. Visibility from the proposed site access point, looking east toward the Ross River Road/Nathan Street intersection, was measured at approximately 90 metres along the edge of the adjacent cycle lane. Noting that the proposed AUL(S) turn treatment at the site access provides visual cues which assist drivers in identifying and locating the access, minimum requirements for ASD are satisfied.

During the site inspection, it was observed that vehicles travelling in the kerbside lane—including those using the left-turn acceleration lane—were visible for approximately 7 seconds prior to reaching the proposed access location. This meets the critical acceptance gap of 5s for a left turn movement in accordance with Table 3.5 of AGRD04A-23ed3.2.

Based on observations made during the site inspection the proposed access on Ross River Road, a state-controlled road:

- > Exceeds minimum sight distance requirements specified in TMR's GTIA for a property access; but
- > Does not comply with conservative sight distance requirements specified in TCC's TIAG. These sight distance requirements are considered highly conservative for the assessment of the proposed access on Ross River Road where frequent traffic signals and property accesses result in alert driving conditions, and no right turns are proposed.

### 5.3.5 FRONTAGE ASSESSMENT

A frontage assessment was undertaken to evaluate the interface between the development and the adjoining road network. This included a risk assessment of proposed accesses and the identification of recommended design treatments to improve safety for all path users. The assessment was conducted in accordance with the TMR 2021 guidelines, *Treatment Options to Improve Safety of Pedestrians, Bicycle Riders and Other Path Users at Driveways*.

The frontage risk assessment comprises two key components — a geometric assessment and an exposure assessment. The geometric assessment evaluates the driveway layout to rate the level of warning and vehicle speed environment at each access, considering factors such as driveway width, alignment, gradient and available sight distance between path users and drivers. The exposure assessment considers the interaction potential between vehicles and path users based on observed and anticipated volumes, path classification and surrounding land use activity. Together, these components provide a structured method for determining the relative safety risk of each driveway and identifying appropriate mitigation treatments to improve visibility, reduce vehicle speeds and enhance safety for all path users.

The assessment is to ensure that driveway arrangements minimise potential conflicts between vehicles and vulnerable road users, while aligning with best-practice safety standards for pedestrians, cyclists, and other shared path users. Recommendations reflect the site-specific conditions and anticipated levels of activity along the frontage.

5.3.5.1 Ross River Road Access

A frontage assessment was undertaken for the Ross River Road entrance to the subject site. This proposed access is left-in-left-out access. The frontage risk assessment is included Table 10 below.

**Table 10 - Frontage Risk Assessment Ross River Road**

Adequate Warning (W)	1. Desirable	Path users travelling at comfortable speeds on principal paths: 20km/h.
Safe Vehicle Speed (S)	3. Deficient	No explicit treatments to ensure low vehicle speed at pathway
		Ramps between path and road that may not achieve desirable vertical deflection.
<b>Geometric Assessment Score (G)</b>	<b>4 = 1 + 3</b>	<b>G = W + S</b>
Exposure Factor - Vehicle Volumes (EV)	4. Very high Exposure	20+ carparking spaces
Exposure Factor - Path Users (EP)	3. High Exposure	Principal cycle route with moderate demand
Exposure Factor - Driver Compliance (EC)	1. Desirable	Visual cues provided to reinforce path priority combined with good speed control treatment
<b>Exposure Score</b>	<b>8 = 4 + 3 + 1</b>	<b>E = EV + EP + EC</b>
<b>Total Risk</b>	<b>Tolerable</b>	<b>Recommend supplementary treatments or redesign to address issue</b>
	<b>High Exposure</b>	

The frontage risk assessment indicates that supplementary treatments or redesign are recommended to address the identified issue, which is that safe vehicle speeds may not be achieved for vehicles entering and exiting the driveway. The treatments recommended to address this issue are to install a road hump across the exit driveway at the property boundary, and to maximise the gradient of the entering driveway. These treatments are both considered to have strong treatment effectiveness when used to address safe vehicle speeds as outlined in Table 6(a) and 6(b) of the TMR 2021 guidelines, *Treatment Options to Improve Safety of Pedestrians, Bicycle Riders and Other Path Users at Driveways*.

5.3.5.2 Albert Street Site Exit

A frontage assessment was undertaken at the Albert Street exit, which serves as an exit-only connection from the 4 m wide unnamed laneway. The laneway is flanked by the Cranbrae Village Retirement Community to the west and the Precinct Apartment Complex to the east, as can be seen in Figure 4.

Sight distance along the laneway is restricted by existing fencing: the eastern side has a solid fence extending to the property boundary, while the western side currently has a chain-link fence that may be replaced in the future with a solid acoustic fence, which would further limit visibility.

Sight triangles, available in Appendix H, have been prepared for this frontage and indicate that sight lines are assessed as highly deficient. The frontage risk assessment include in Table 11 below:

**Table 11 - Frontage Risk Assessment Albert Street**

Adequate Warning (W)	4. Highly Deficient	Sight lines do not provide adequate warning for drivers or path users to avoid a crash, when path users travel at minimum speeds. General use paths <10km/h
Safe Vehicle Speed (S)	4. Highly Deficient	long driveway (>20m) without speed control treatment allows vehicles to reach speeds significantly higher than 10km/h. Ramp does not provide adequate speed control. Driveway slopes up at constant gradient to path, path is level, driveway slopes up to property boundary.
<b>Geometric Assessment Score (G)</b>	<b>8 = 4 + 4</b>	<b>G = W + S</b>
Exposure Factor - Vehicle Volumes (EV)	4. Very high Exposure	20+ carparking spaces
Exposure Factor - Path Users (EP)	3. High Exposure	path servicing retirement village
Exposure Factor - Driver Compliance (EC)	3. Deficient	driveway attributes do not meet tolerable due to very high EV factor, do not meet highly deficient due to narrow driveway
<b>Exposure Score</b>	<b>10 = 4 + 3 + 3</b>	<b>E = EV + EP + EC</b>
<b>Total Risk</b>	<b>Highly Deficient Geometry</b>	<b>Require supplementary treatments or redesign to address issue.</b>
	<b>High Exposure</b>	

Based on the findings of the frontage risk assessment, the Albert Street frontage requires treatments that reinforce pedestrian and cyclist priority while moderating vehicle speeds at the site egress. The following measures are recommended to enhance safety and operational performance:

- > Install road humps or cushions at both ends of the laneway, designed in accordance with relevant standards and with consideration for stormwater management and cyclist movement.
- > Delineate a shared zone at the northern (entry) end of the laneway to formalise low-speed, mixed-use operation and clearly communicate pedestrian and cyclist priority.
- > Provide 'No Entry' signage at the Albert Street end of the laneway to reinforce the one-way operation and prevent unauthorised access.

Following commencement of site operations, the laneway and the Albert Street egress should be periodically monitored to confirm that they function safely and as intended. Should operational monitoring indicate unacceptable residual safety risks, additional measures may be considered, including:

- > Repeat signs using pavement markings on the laneway surface
- > Additional road hump midway along the laneway or regularly spaced rumble strips installed for the length of the laneway.

## 5.4 Parking

To confirm the functionality of internal access arrangements, swept path analysis was undertaken using a B99 design vehicle. The analysis demonstrates that vehicles can safely manoeuvre into and out of each ground floor car park without encroaching on adjacent bays or circulation areas. These movements include entry from and exit to both the north, Ross River Road left-in-left-out, and south, parking within the unnamed laneway.

The swept path diagrams supporting this assessment are included in Appendix I.

## 6. CONCLUSIONS AND RECOMMENDATIONS

### 6.1 Summary of Impacts and Mitigation Measures

Based on the preceding discussion and analysis the following conclusions are made:

- > The proposed development has the potential to exacerbate existing road safety issues associated with rear end collisions and vulnerable road user, pedestrian and bicycle, crashes in the study area. The design of the development entry and exits has been undertaken to minimise these risks and, in combination with planned safety improvements by TMR, the development is not expected to worsen the risk score of any existing road safety issues.
- > A road environment safety assessment concluded that changes to the road environment, that is construction of accesses do not require a road safety audit. Nonetheless, these changes should be subject to a road safety assessment. The road safety assessment may be conducted by either an accredited road safety auditor (RSA) or a registered professional engineer of Queensland (RPEQ). The requirement for a road safety assessment would be satisfied by safety reports prepared in accordance with Section 295 of the Work Health and Safety Regulation 2011 as part of the design process.
- > The TMR 2021 guidelines, *Treatment Options to Improve Safety of Pedestrians, Bicycle Riders and Other Path Users at Driveways* were used to assess risk for the 1.2m wide path on Ross River Road at the proposed left-in-left-out access and the 1.5m wide path on Albert Street at the unnamed laneway. The recommended treatments to provide acceptable safety at both pathways are:
  - At the Ross River Road left-in-left-out:
    - > Install a road hump across the exit driveway at the property boundary; and
    - > Maximise the gradient of the entering driveway.
  - At the Unnamed Laneway exit to Albert Street:
    - > Install road humps or cushions at both ends of the laneway, designed in accordance with relevant standards and with consideration for stormwater management and cyclist movement.
    - > Install shared zone signage at the northern (entry) end of the laneway to formalise low-speed, mixed-use operation and clearly communicate pedestrian and cyclist priority.
    - > Install 'No Entry' signage at the Albert Street end of the laneway to reinforce the one-way operation and prevent unauthorised access.
- > Even with full development of the subject site, traffic volumes at the intersection of Albert Street and the unnamed laneway which will provide a second exit from the site will be very low and further analysis is not required.
- > Intersection analysis was undertaken using SIDRA Intersection Version 10 (SIDRA) software for the left-in-left-out intersections associated with the proposed development's Ross River Road access and the existing Nathan Street / Albert Street intersection. It was found that even with 50% of left out movement giving way to 100% of opposing traffic to access right turn lanes at downstream traffic signals both intersections would operate well below their practical capacity with acceptable delays and queues.

- > In the normal design domain (NDD), an auxiliary left turn treatment with a short turn slot (AUL(S)) is warranted at the site entry on Ross River Road. Keeping the left turn deceleration lane clear of driveway at 340 Ross River Road requires limiting the length of the left turn deceleration lane to 32m which
  - Complies with minimum NDD requirements for a design speed of 67km/h (more than 10% above the posted speed limit); and
  - Exceeds minimum extended design domain (EDD) requirements for a design speed of 70km/h (10km/h above the posted speed limit).
- > Planning supplied by TMR proposed that westbound traffic on Ross River Road will merge from three (3) lanes to two (2) lanes on the development site frontage. To avoid the diverge associated with the development site access overlapping with the merge of westbound through traffic it is recommended that the existing arrangement of westbound lanes on the development site frontage is retained with the merge from three (3) lanes to two (2) lanes occurring west of Acheron Avenue.
- > During an inspection of the site on 17 September 2025 it was observed that the site complies with minimum requirements for approach sight distance (ASD) and minimum gap sight distance (MGSD). This exceeds minimum sight distance requirements for a property access specified in TMR's "Guide to Traffic Impact Assessment" (GTIA); but does not comply with sight distance requirements specified in TCC's "TIA Guideline" (TIAG). The sight distance requirements specified in TIAG are highly conservative for the assessment of the proposed access on Ross River Road where frequent traffic signals and property accesses result in alert driving conditions, and no right turns are proposed. As Ross River Road is a state-controlled road and noting the conservatism of TCC's TIAG, compliance with TMR's GTIA is considered acceptable.

## 6.2 Certification State and Authorisation

This report was prepared in accordance with the Department of Transport and Main Roads' (TMR's) "Guide to Traffic Impact Assessment" (GTIA) and Townsville City Plan SC6.4.5.2 Traffic Impact Assessment by Danielle Bamber under the direct supervision of Bradley Jones (RPEQ 19986). RPEQ certification in accordance with the GTIA is enclosed in Appendix J.



# **APPENDIX A**

## **PRE-LODGEMENT MEETING MINUTES**



## PRE-LODGEMENT MEETING MINUTES >>

PO BOX 1268, Townsville  
Queensland 4810

13 48 10

**COUNCIL REFERENCE >>** PLM25/0120  
**ASSESSMENT NO >>** 2636134  
**LEGAL DESCRIPTION >>** Lot 3 SP 146326  
**PROPERTY ADDRESS >>** 344-346 Ross River Road CRANBROOK QLD 4814  
350 Ross River Road CRANBROOK QLD 4814  
**PROPOSAL >>** Multiple dwelling

enquiries@townsville.qld.gov.au  
townsville.qld.gov.au

ABN: 44 741 992 072

**DATE >>** 25 June 2025  
**TIME >>** 9.00am

### ATTENDEES >>

Stephen Motti	Brazier Motti
Jarod Hurst	Hurst Qld
Kieran Dee	Hurst Qld
Estelle Trueman	Senior Planner - Planning and Development
Shelly Sharma	Development Engineer - Planning and Development
Naomi White	Planning Support Officer - Planning and Development

### MS Teams

Alex Zafiriadis	Good House Partners
Kris Robinson	Regional Housing

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## Description of the Proposal

- The proposal is for Multiple dwelling 81 units- Affordable Social Housing.
- 2 buildings, 5 storeys.
- Mix of dwelling types, including 1, 2 & 3 bedroom units, in response to housing needs.
- Applicant understands that the proposal can be assessed under Ministerial designation, but their preference to work with council.
- Will be engaging with Main Roads for access.
- Site is adjacent to major centres, close to traffic network, hospital and university.
- Improve density around centres
- End of trip facilities to be provided and bike storage.
- 120 parks currently proposed, may reduce to 1 per unit.
- Proposing bridge between two buildings, level 1 to level 4, for access.
- Development meets the criteria of the Residential Activation Fund. This can be developer reimbursement after fact or council gets reimbursement after.
- To meet the Housing Australia Future Fund requirements, 12mth timeframe on development application approval.
- Development proposal plans - attached (work in progress plans).

## Property Zoning and Overlays

344 - 346 Ross River Road CRANBROOK QLD 4814

### Lot 3 SP 146326



#### Zone:

>> Medium density residential zone

#### Priority infrastructure plan:

>> This property is within a Local Government Infrastructure Plan Area.

#### Overlay(s):

>> Airport Environs Overlay Map OM-01.1 - Operational airspace - Airspace more than 45m above ground level

>> Airport Environs Overlay Map OM-01.2 - Wildlife hazard buffer zones and Public safety areas - Distance from airport runway - 8km

>> Airport Environs Overlay Map OM-01.5 - Light intensity - 6km radius

>> Development Constraints Overlay Map OM-06.1 to OM-06.2 - Flood hazard - Low hazard area

>> Development Constraints Overlay Map OM-06.1 to OM-06.2 - Flood hazard - Medium hazard area

#### Information Purposes:

>> This site may be within 5m of an overhead powerline owned by Ergon Energy. There are strict legal and safety requirements for any buildings near an overhead powerline. Please contact Ergon Energy for safety advice on 13 74 66 or search for "safety advice" on the Ergon Energy [website](#) and make an application if structures or works are proposed or if any person, plant or equipment will come within 5m of an existing line. To avoid building delays Ergon Energy strongly advises you get in contact early.

>> Acid sulphate soils Figure 9.2 - 5-20 metres AHD

>> Infrastructure Overlay Map OM-10 - Road noise corridors - Category 2

>> Infrastructure Overlay Map OM-10 - Road noise corridors - Category 3

### 350 Ross River Road CRANBROOK QLD 4814

#### Lot 2 RP 721729



**Zone:**

>> Medium density residential zone

**Priority infrastructure plan:**

>> This property is within a Local Government Infrastructure Plan Area.

**Overlay(s):**

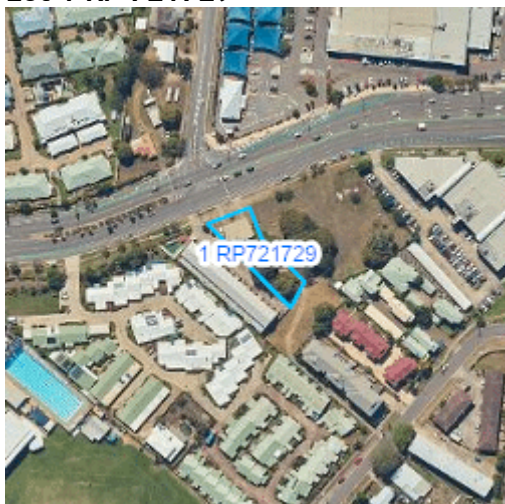
>> Airport Environs Overlay Map OM-01.1 - Operational airspace - Airspace more than 45m above ground level

>> Airport Environs Overlay Map OM-01.2 - Wildlife hazard buffer zones and Public safety areas - Distance from airport runway - 8km

>> Airport Environs Overlay Map OM-01.5 - Light intensity - 6km radius

>> Development Constraints Overlay Map OM-06.1 to OM-06.2 - Flood hazard - Low hazard area

>> Development Constraints Overlay Map OM-06.1 to OM-06.2 - Flood hazard - Medium hazard area

**Lot 1 RP 721729****Zone:**

>> Medium density residential zone

**Priority infrastructure plan:**

>> This property is within a Local Government Infrastructure Plan Area.

**Overlay(s):**

>> Airport Environs Overlay Map OM-01.1 - Operational airspace - Airspace more than 45m above ground level

>> Airport Environs Overlay Map OM-01.2 - Wildlife hazard buffer zones and Public safety areas - Distance from airport runway - 8km

>> Airport Environs Overlay Map OM-01.5 - Light intensity - 6km radius

>> Development Constraints Overlay Map OM-06.1 to OM-06.2 - Flood hazard - Low hazard area

>> Development Constraints Overlay Map OM-06.1 to OM-06.2 - Flood hazard - Medium hazard area

**Information Purposes:**

>> This site may be within 5m of an overhead powerline owned by Ergon Energy. There are strict legal and safety requirements for any buildings near an overhead powerline. Please contact Ergon Energy for safety advice on 13 74 66 or search for "safety advice" on the Ergon Energy [website](#) and make an application if structures or works are proposed or if any person, plant or equipment will come within 5m of an existing line. To avoid building delays Ergon Energy strongly advises you get in contact early.

>> Acid sulphate soils Figure 9.2 - 5-20 metres AHD

>> Infrastructure Overlay Map OM-10 - Road noise corridors - Category 2

>> Infrastructure Overlay Map OM-10 - Road noise corridors - Category 3

## Planning Scheme

The proposal is subject to assessment against the Townsville City Plan. The planning scheme can be viewed via the following link: [Current City Plan \(townsville.qld.gov.au\)](https://www.townsville.qld.gov.au)

Furthermore, Townsville Maps can be viewed via the following link: [TownsvilleMAPS Mapping Service - Townsville City Council](#)

## Meeting Discussion

- Defined Use -Multiple dwelling
- Level of assessment - Code assessable 3 storeys or less, impact assessment for more than 3 storeys
- Strategic Framework
- Medium density residential zone code
  - Well-connected site
  - Scheme encourages improving density around major centres, and council would like to see development of this site.
  - 5 storeys can be considered in response to code requirements and with good design.
  - Council will condition amalgamation of the lots.
- Transport impact, access and parking code
  - Traffic Impact assessment (TIA) required.
  - TIA to ensure sight lines are achievable (specifically proposed booter at the entry).
  - TIA to consider vehicles accessing site for waste management.
  - Parking -
    - Council will consider 120 carparks proposed. Encouraged not to consider less than 1 car park per unit.
    - Council has supported less than 1 carpark per unit where the tenure was build to rent and included onsite managers. In these situations the car park itself is managed separately to the lease of units and a car park management scheme is in place.
    - Tandem car parks may be supported where tied to a single unit and supported by a car park management plan. Justification as to the workability and appropriateness of this proposal would be required.
    - Design could consider additional parking to laneway with access and service vehicles considered in the design.
    - Design preference is units facing the street at ground level and car parking at behind, with no parking addressing the street. Where this is not possible, screening of carparks required.
  - Access -
    - Proposed Left in, left out access to Ross River Road need discussions with DTMR. Recommend engaging with main roads early for referral.
    - Use of laneway at rear was approved under previous application, where council agreed to use of laneway for access, conditioned not for exclusive use.
    - Entry way to be clearly defined for safety of pedestrians and visitors. Office to street, create sense of arrival, pedestrian friendly to create passive overlooking.
- Works code
  - Water -
    - TCC does not allow direct pumping from water mains for firefighting purposes. Design to consider location for break tanks, if required.

- Sewerage -
  - Existing sewer main through the site requires to be replaced and a condition will be included.
- Healthy waters code
  - Stormwater management plan addressing both quantity and quality is required.
  - Information for funding purposes only, as applicable - TCC does not have any ***trunk*** stormwater infrastructure (drainage).
- Landscape code
- Airport environs overlay code
- Flood hazard overlay code
  - A Flood impact assessment (FIA) is required to be submitted with the application.
- Council can attend pre-lodgement meeting with Main Roads or happy feedback to be provided following the meeting.

### **Other Applicable Information**

Upon lodgement of your development application, you will be required to pay assessment fees in accordance with Council's Planning Services Fees and Charges Schedule. For the most current schedule, please refer to: [Fees & Charges - Townsville City Council](#)

Furthermore, the development proposal will be subject to Infrastructure Charges. For a comprehensive review of Council's Infrastructure Charge Resolution, please view the following link: [Infrastructure Charges - Townsville City Council](#)

In addition, the subject site is within the City Activation and Jobs Policy Incentive Package area, as such, please refer to Council's website for further information.

Can lodge request for incentives with Ben Smith prior to lodging an application with council. Applicant is encouraged to engage with the Economic Attraction team in relation to incentives. The new policy deliberately excludes development which receives/d funding from the State or Federal Government.

### **Post Meeting Feedback**

- Water and sewer planning is required to demonstrate that the development can be appropriately serviced.
- Stormwater management plan is to include both quality and quantity.
- The applicant sought to understand Council's assessment of the proposed design. The following comments are provided as post-meeting feedback:
  - Activating Ross River Road with units on the ground floor addressing and engaging with the street would be recommended. This would include clearly identifiable individual house entries and a main pedestrian entry to the main lobby from Ross River Road. Several of the Medium Density Residential Code PO's and AO's cover this requirement highlighted below. P07, (PO8(d+f)), (PO10) covered in Figure 6.24 and 6.25 and 6.26
  - In addition, materials or textures are required to articulate and provide variation to the builtform - please demonstrate in the application materials. (PO8(b+c))
  - Roof overhangs should be included all the way around the built form. This is to respond to Townsville's tropical climate and provide additional weather protection.

- Sunshade devices should be provided to exposed windows, specifically eastern and western elevations.
- Is air conditioning going to be provided? If so where are the condenser units to be located?
- Are clothes lines proposed, if on verandahs they need to be screened. Are security screen doors proposed, to the entry doors, to ensure the opportunity for natural cross ventilation can be realised, specifically if no air conditioning is provided.
- Communal open space needs to be provided that provides amenity for the entire proposal. This may include BBQ areas, seating, shade structures, maybe a play component i.e. basketball hoop

Meeting Closed >> 9.40am

*Note: This pre-lodgement advice has been prepared based on the information provided in the meeting. A full assessment of the proposal against the planning scheme has not been carried out and this advice may be subject to change at the time of lodgement of a formal development application. An application may be subject to requests for further information not identified in the pre-lodgement meeting following a full assessment.*



# **APPENDIX B**

## **INTERSECTION LAYOUT PLANS**

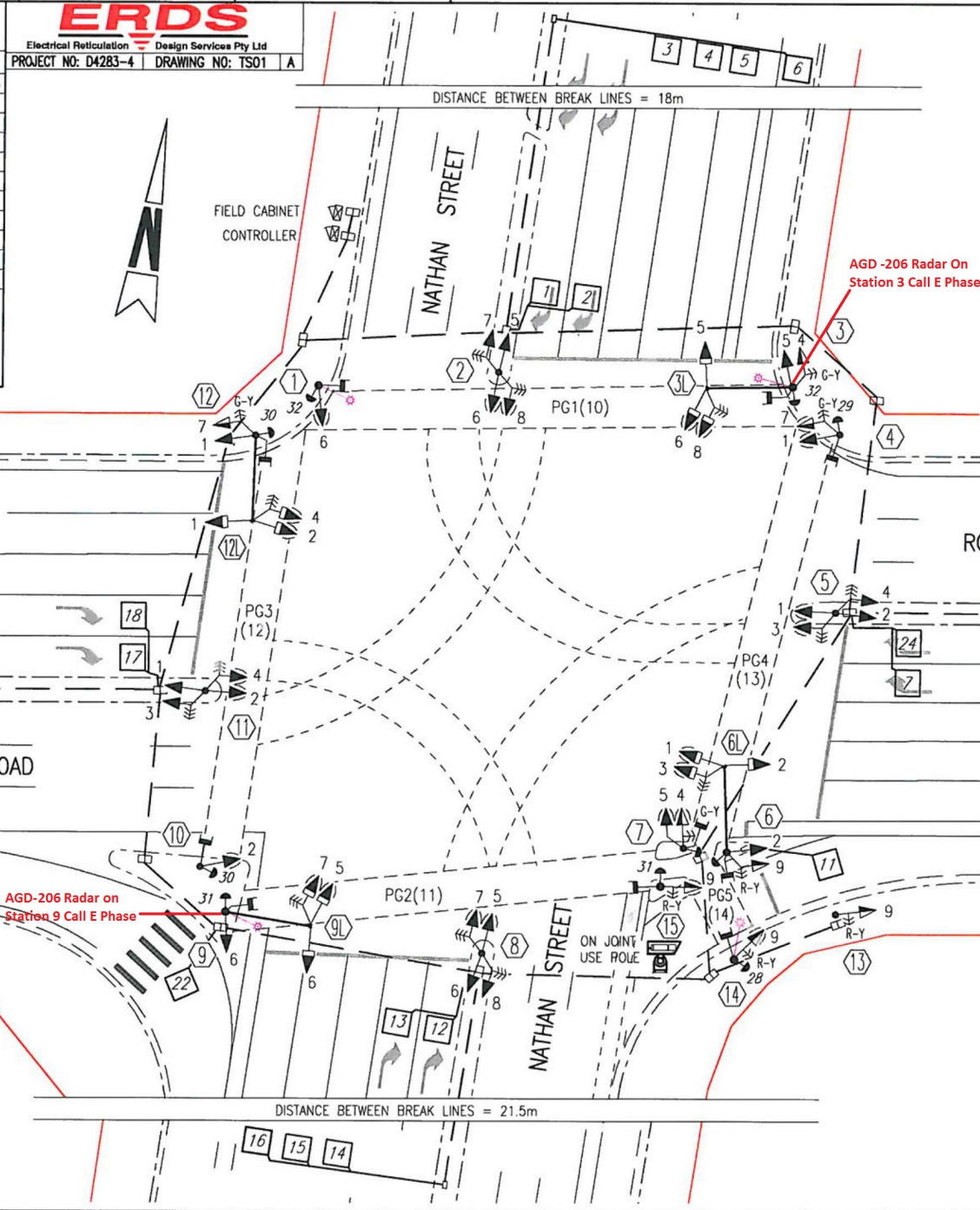
Intersection Drawing Site Number 3203 Ross River Road and Nathan Street

Intersection Drawing Site Number 3274 Ross River Road and Acheron Avenue

PHASE DIAGRAMS	A PHASE				B PHASE				C PHASE			D PHASE			D1 PHASE				D2 PHASE				E PHASE				F1 PHASE				F2 PHASE							
	1	2	10	11	1	3	10	14	2	4	11	7	8	14	5	7	13	14	6	8	12	14	5	6	12	13	14	5	7	13	14	6	8	12	14			
SIGNAL GROUPS	1	2	10	11	1	3	10	14	2	4	11	7	8	14	5	7	13	14	6	8	12	14	5	6	12	13	14	5	7	13	14	6	8	12	14			
VEHICLE/PED	VG1	VG2	PG1	PG2	VG1	VG3	PG1	PG5	VG2	VG4	PG2	VG7	VG8	PG5	VG5	VG7	PG4	PG5	VG6	VG8	PG3	PG5	VG5	VG6	PG3	PG4	PG5	VG5	VG7	PG4	PG5	VG6	VG8	PG3	PG5			
LOGICAL INPUT	19,20,21	8,9,10	32	31	17,18			28	7,24			1,2	12,13		1,2		28		12,13		28		3,4,5,6,14,15,16	30	29	28	1,2				12,13							
CALL	X	X	X	X				X				X	X		X		X		X		X		X	X	X	X					X							
EXTEND	X	X							X																		X								X			
INCREMENT	X	X										X	X		X				X																			
SPECIAL CONDITIONS					INTRODUCE B PHASE ON STREAMS SIGNAL				INTRODUCE C PHASE ON STREAMS SIGNAL			D PHASE TO D1 PHASE OR D2 PHASE PERMITTED. D1 PHASE TO D2 PHASE OR D2 PHASE TO D1 PHASE NOT PERMITTED.											INTRODUCE F1 PHASE ON STREAMS SIGNAL				INTRODUCE F2 PHASE ON STREAMS SIGNAL											

CONFLICT TABLE (X - INDICATES CONFLICT)

VEHICLE GROUPS	VEHICLE GROUPS										PED GROUPS				
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5
1		X	X	X	X							X	X		
2	X		X	X	X						X	X			
3	X	X		X	X						X	X			
4	X	X	X		X	X					X	X			
5	X	X	X	X		X	X				X	X			
6	X	X	X	X	X						X	X			
7	X	X	X	X	X						X	X			
8	X	X	X	X	X						X	X			
9														X	
10														X	



PHASE DIAGRAMS

VEHICLE/PED	VG3	VG4	PG5	VG1	VG3	PG1	PG5	VG2	VG4	PG2
LOGICAL INPUT	17,18	7,24	28	17,18		28		7,24		
CALL	X	X	X	X		X		X		
EXTEND	X	X						X		
INCREMENT										
SPECIAL CONDITIONS	G PHASE TO G1 PHASE OR G2 PHASE PERMITTED. G1 PHASE TO G2 PHASE OR G2 PHASE TO G1 PHASE NOT PERMITTED.									

PD216 DETECTOR TABLE

LOOP LABEL	CONTROLLER TERMINAL	LOGICAL INPUT	LOOP/PB CONFIGURATION	DIST TO STOP LINE
LOOP 1	P1	1	STOP LINE	4m
LOOP 2	P2	2	STOP LINE	4m
LOOP 3	P3	3	ADVANCE	35m
LOOP 4	P4	4	ADVANCE	35m
LOOP 5	P5	5	ADVANCE	35m
LOOP 6	P6	6	ADVANCE	35m
LOOP 7	P7	7	STOP LINE	4m
LOOP 8	P8	8	ADVANCE	35m
LOOP 9	Q9	9	ADVANCE	35m
LOOP 10	Q10	10	ADVANCE	35m
LOOP 11	Q11	11	STOP LINE	4m
LOOP 12	Q12	12	STOP LINE	4m
LOOP 13	Q13	13	STOP LINE	4m
LOOP 14	Q14	14	ADVANCE	35m
LOOP 15	Q15	15	ADVANCE	35m
LOOP 16	Q16	16	ADVANCE	35m
LOOP 17	R17	17	STOP LINE	4m
LOOP 18	R18	18	STOP LINE	4m
LOOP 19	R19	19	ADVANCE	35m
LOOP 20	R20	20	ADVANCE	35m
LOOP 21	R21	21	ADVANCE	35m
LOOP 22	R22	22	COUNT	-
LOOP 24	R24	24	STOP LINE	4m

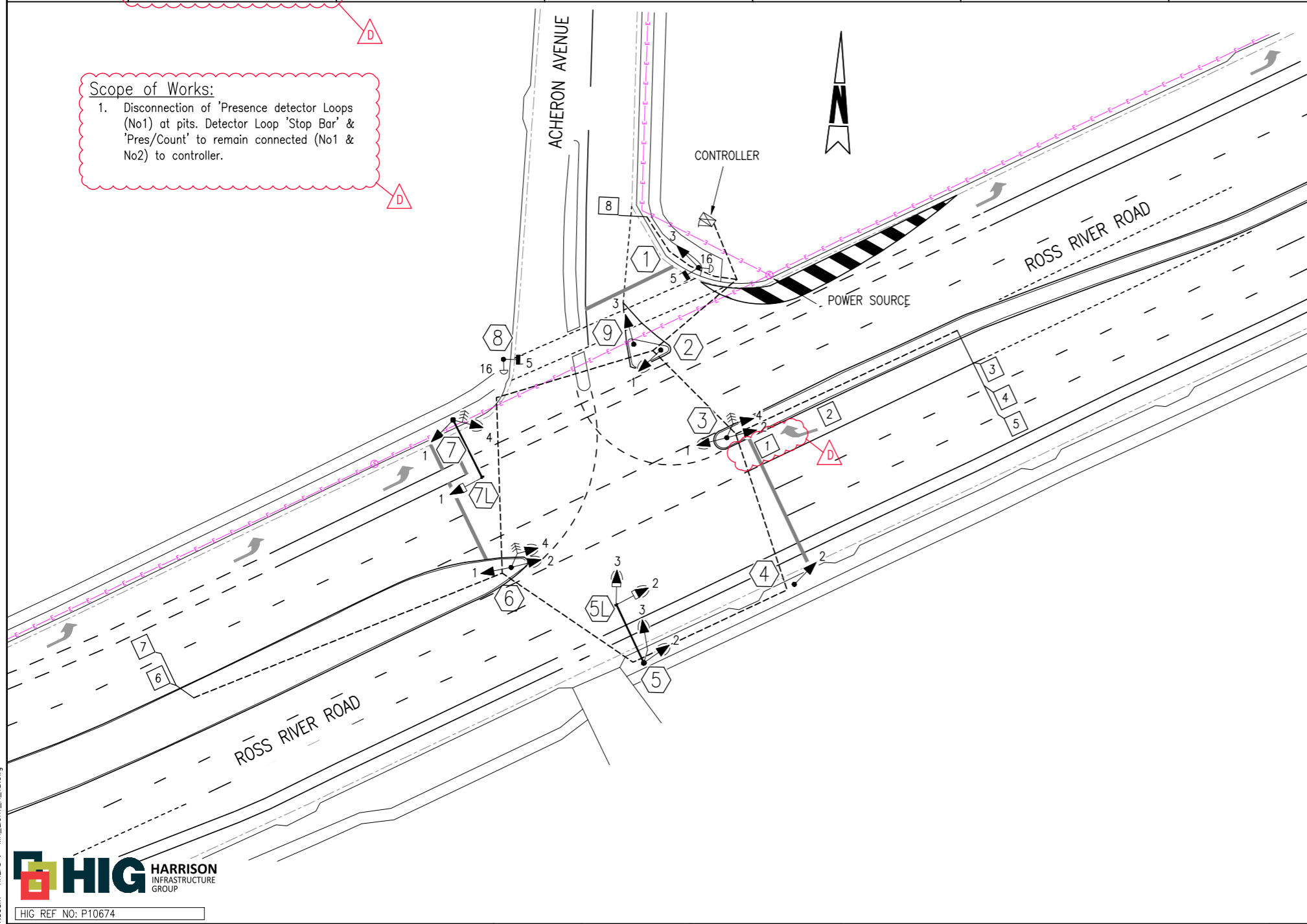
SIGNAL GROUPS	FUNCTION	CONTROLLER TERMINALS	RUN 1				RUN 2				RUN 3				RUN 4			
			CONNECTS				CONNECTS				CONNECTS				CONNECTS			
FINAL TERMINALS	FINAL TERMINALS	FINAL TERMINALS	CORES USED				CORES USED				CORES				CORES			
RED A5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
YELLOW A4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
GREEN A3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
RED A8	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
YELLOW A7	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
GREEN A6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
RED A11	19	19	7	19	19	7	19	19	7	19	19	7	19	19	7	19	19	7
YELLOW A10	20	20	8	20	20	8	20	20	8	20	20	8	20	20	8	20	20	8
GREEN A9	21	21	9	21	21	9	21	21	9	21	21	9	21	21	9	21	21	9
RED A14	22	22	22	22	7	22	22	7	22	22	7	22	22	7	22	22	7	22
YELLOW A13	23	23	23	23	8	23	23	8	23	23	8	23	23	8	23	23	8	23
GREEN A12	24	24	24	24	9	24	24	9	24	24	9	24	24	9	24	24	9	24
RED B5	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
YELLOW B4	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
GREEN B3	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
RED B8	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
YELLOW B7	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
GREEN B6	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
RED B11	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
YELLOW B10	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
GREEN B9	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
RED B14	16	16	1	16	16	1	16	16	1	16	16	1	16	16	1	16	16	1
YELLOW B13	17	17	2	17	17	2	17	17	2	17	17	2	17	17	2	17	17	2
GREEN B12	18	18	3	18	18	3	18	18	3	18	18	3	18	18	3	18	18	3
RED C5															39	13		
YELLOW C4															40	14		
RED DW C8															25	1		
PED1																		
GREEN W C6															26	2		
RED DW C11															27	3	25	1
PED2																		
GREEN W C9															28	4	26	2
RED DW C14																	27	3
PED3																		
GREEN W C12																	28	4
RED DW D5															29	5		
PED4																		
GREEN W D3															30	6		
RED DW D8															37	11		
PED5																		
GREEN W D6															38	12		
EXT6 DET 27	E10														16		8	
EXT5 DET 28	E9														41	15		
EXT4 DET 29	E8														34	10		
EXT3 DET 30	E7																31	7
EXT2 DET 31	E6														33	9	30	6
EXT1 DET 32	E5														32	8		
230V A2															31	7	29	5
DET COMMON E3															36	GY	36	GY
NEUTRAL AT,B1,C1,D1	NL	BK	BK	BK	NL	BK	BK	BK	NL	BK	BK	BK	NL	BK	NL	BK	NL	BK
SPARE CORES TO EARTH		25,26				25,26									-16		9	-16
CABLE SIZE		29	19	19		29	19	19		29	19	19		29	19	19		29
CONTROLLER TYPE:	EC1-62-16											LANTERN TYPE: LED						

Associated Job Nos	SURVEY DATA	Scales	TOWNSVILLE CITY				Drawn	RG SMITH	TRAFFIC SIGNAL INSTALLATION				Site Number	3203	Queensland Government
Auxiliary Drg Nos	Horiz. Grid	0 2 4 6 8 10m	ROSS RIVER ROAD				Checked	MJ REMME	OPERATIONS & ELECTRICAL				Job No.		
	Height Origin		ROSS RIVER RD & NATHAN ST				Designed	RG SMITH					Contract No.		
	Survey Books		Reference Points				Verified	MJ REMME					Drawing No.		
			Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP					Series Number			
												1 of 1			
			Through Chaining from								MRT_Detail (02/11)				

Last Modified: Oct 01, 2013 - 02:23PM Plot Date: 01/24/2013 - 02:24:14PM  
 Document Set ID: 27701986  
 Version: 1, Version Date: 28/10/2025

PHASE DIAGRAMS	PHASE A			PHASE B			PHASE C		
	1	2	5	2	4		3		
SIGNAL GROUPS	1	2	5	2	4		3		
VEHICLE/PED	VG1	VG2	PG1	VG1	VG4		VG3		
LOGICAL INPUT	6,7	3,4,5	16	5,6,7	1		8		
CALL	X	X	X		PRES		X		
EXTEND	X	X			X		X		
INCREMENT	X	X							
SPECIAL CONDITIONS									

**Scope of Works:**  
 1. Disconnection of 'Presence detector Loops (No1) at pits. Detector Loop 'Stop Bar' & 'Pres/Count' to remain connected (No1 & No2) to controller.



**CONFLICT TABLE (X INDICATES CONFLICT)**

VEHICLE GROUPS	VEHICLE GROUPS											PED GROUPS				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
1			X	X												
2			X													
3	X	X														
4	X		X										X			
5																
6																
7																
8																
9																
10																
11																
12																
1		X	X													
2																
3																
4																

**DETECTOR TABLE - PSC PD200 SERIES INTEGRATED DETECTOR SYSTEM**

PHYSICAL LABEL	CONTROLLER TERMINAL	LOGICAL INPUT	LOOP/PB CONFIGURATION	DIST TO STOP LINE
LOOP 1	P1	1	STOP LINE	4m
LOOP 2	P2	2	PRES/COUNT	STD DRG
LOOP 3	P3	3	ADVANCE	25m
LOOP 4	P4	4	ADVANCE	25m
LOOP 5	P5	5	ADVANCE	25m
LOOP 6	P6	6	ADVANCE	35m
LOOP 7	P7	7	ADVANCE	35m
LOOP 8	P8	8	ADVANCE	7.5m
		9		
		10		
		11		
		12		
		13		
		14		
		15		
EXT 1	E5	16	PB1-STD	
		17		
		18		
		19		
		20		
		21		
		22		
		23		
		24		
		25		
		26		
		27		
		28		
		29		
		30		
		31		
		32		

SIGNAL GROUPS	FUNCTION	CONTROLLER TERMINALS	RUN 1			RUN 2			RUN 3		
			CONNECTS	FINAL TERMINALS	CORES USED	CONNECTS	FINAL TERMINALS	CORES USED	CONNECTS	FINAL TERMINALS	CORES USED
1	RED	A5	1	1	1	1	1				
	YELLOW	A4	2	2	2	2	2				
	GREEN	A3	3	3	3	3	3				
2	RED	A8	4	4	4	4	4				
	YELLOW	A7	5	5	5	5	5				
	GREEN	A6	6	6	6	6	6				
3	RED	A11	7	7	7	7	7				
	YELLOW	A10	8	8	8	8	8				
	GREEN	A9	9	9	9	9	9				
4	RED	A14	10	10	10	10	10				
	YELLOW	A13	11	11	11	11	11				
	GREEN	A12	12	12	12	12	12				
5	RED D/WALK	B5	16	16	16	16	16				
	PED 1										
	GREEN WALK	B3	17	17	17	17	17				
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
32											
EXT 1 DET 16	E5	25	25	25	25						
240V	A2	26	26	26	26						
DET COMMON	E3	27	GY	27	GY						
NEUTRAL	AT,B1 CT,DT	NL	BK	BK	NL	BK	BK				
SPARE CORES TO EARTH		13-15 18-24		13-15 18-24							
CABLE SIZE		29	19	29	19						
CONTROLLER TYPE:		TYCO PSC-ID				LANTERN TYPE: LED					

**HIG HARRISON**  
INFRASTRUCTURE GROUP

HIG REF NO: P10674

Associated Job Nos

Survey Data

Horiz. Datum

Auxiliary Drg Nos

Horiz. Grid

Height Datum

Survey Books

Scales

0 2 4 6 8 10m

ORIGINAL SIZE A3

Dimensions shown in metres except where shown otherwise

**TOWNSVILLE CITY**

**ROSS RIVER ROAD**

**ROSS RIVER RD & ACHERON AVENUE**

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
612/2	0.18	0.10	2.73	612/3A

Through Chainage from Start of Gazetteal 4.01km to 4.11km

**TRAFFIC SIGNAL INSTALLATION ITS DESIGN**

Site Number **3274**

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	No.	DATE

Job No.

Contract No. **272602 D**

Drawing No. **272602 D**

Series Number 2 of 2



# APPENDIX C

## CRASH FACTOR MATRIX

Crash Factor Matrix

TMR Definitions for Coding Accidents



Figure B 3: Department of Transport and Main Roads Queensland

**DEFINITIONS FOR CODING ACCIDENTS**

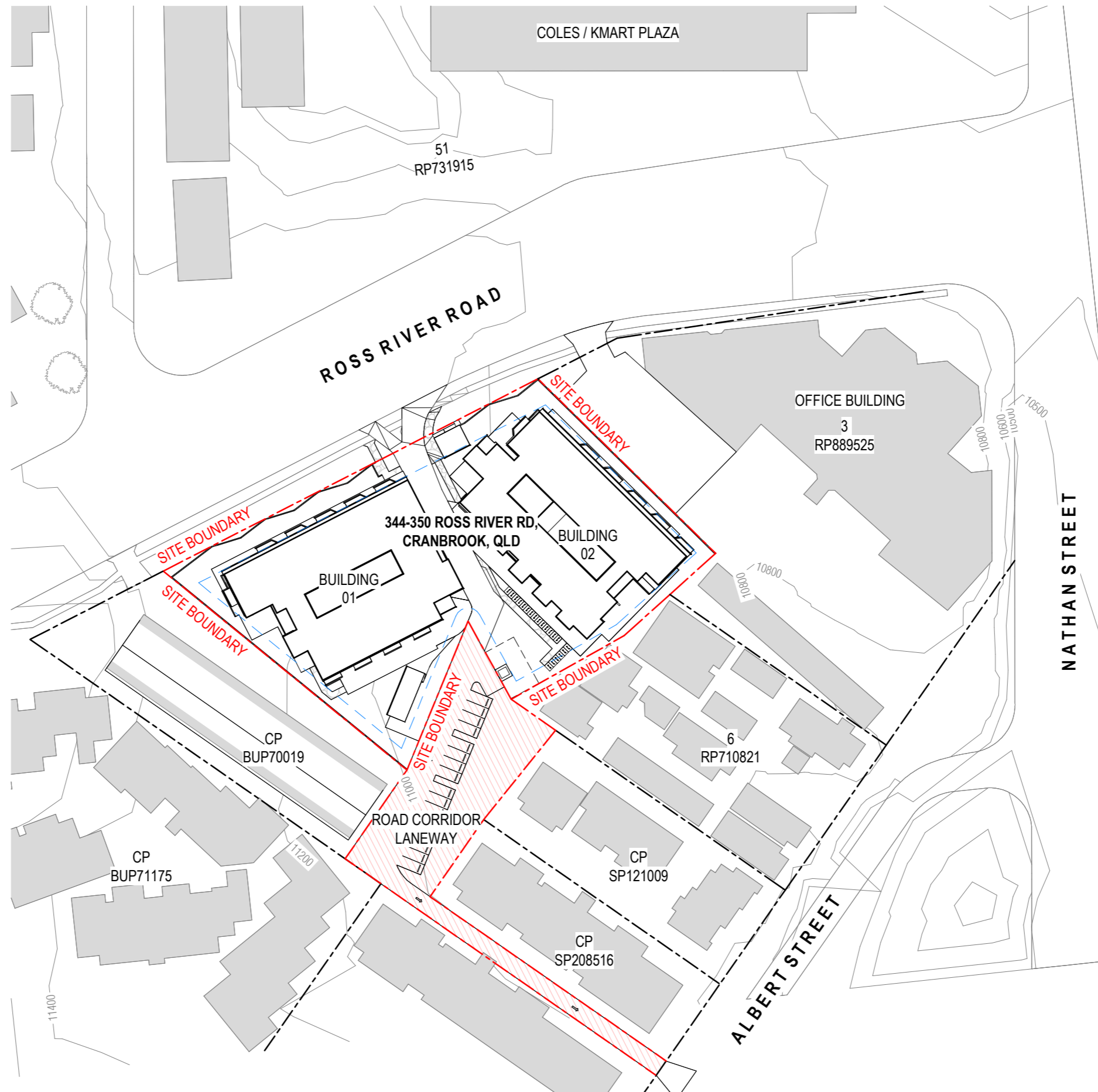
NOTE:- 1 = Key vehicle direction. ie; The direction in which the key vehicle was travelling as it approached the crash location.

	00	10	20	30	40	50	60	70	80	90
	PEDESTRIAN on foot or in toy/pram	INTERSECTION vehicles from adjacent approaches	VEHICLES from opposing directions	VEHICLES from one direction	MANOEUVRING	OVERTAKING	ON PATH	OFF PATH ON STRAIGHT	OFF PATH ON CURVE	PASSENGERS & MISCELLANEOUS
	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER
	000	100	200	300	400	500	600	700	800	900
1	NEAR SIDE 001	THRU - THRU 101	HEAD - ON 201	VEHICLES IN THE SAME LANE REAR END 301	LEAVING PARKING 401	HEAD - ON 501	PARKED 601	OFF CARRIAGEWAY TO LEFT 701	OFF CARRIAGEWAY RIGHT BEND 801	FELL IN/ FROM VEHICLE 901
2	EMERGING 002	RIGHT - THRU 102	THRU - RIGHT 202	LEFT REAR 302	PARKING 402	OUT OF CONTROL 502	DOUBLE PARKED 602	OFF CARRIAGEWAY TO RIGHT 702	OFF CARRIAGEWAY LEFT BEND 802	
3	FAR SIDE 003	LEFT - THRU 103	RIGHT - LEFT 203	RIGHT REAR 303	PARKING VEHICLES ONLY 403	PULLING OUT 503		LEFT OFF CARRIAGEWAY INTO OBJECT 703	OFF RIGHT BEND INTO OBJECT 803	HIT TRAIN 903
4	PLAYING, WORKING, LYING, STANDING ON CARRIAGEWAY 004	THRU - RIGHT 104	RIGHT 204	U TURN 304	REVERSING IN TRAFFIC 404	CUTTING IN 504	CAR DOOR 604	RIGHT OFF CARRIAGEWAY INTO OBJECT 704	OFF LEFT BEND INTO OBJECT 804	HIT RAILWAY X-ING FURNITURE 904
5	WALKING WITH TRAFFIC 005	RIGHT - RIGHT 105	THRU - LEFT 205	VEHICLES IN PARALLEL LANES LANE SIDE SWIPE 305	REVERSING INTO FIXED OBJECT 405	PULLING OUT REAR END 505	HIT PERMANENT OBSTRUCTION 605	OUT OF CONTROL ON CARRIAGEWAY 705	OUT OF CONTROL ON CARRIAGEWAY 805	HIT ANIMAL OFF CARRIAGEWAY 905
6	FACING TRAFFIC 006	LEFT - RIGHT 106	LEFT - LEFT 206	LANE CHANGE RIGHT 306	LEAVING DRIVEWAY 406	OVERTAKING RIGHT TURN 506	HIT TEMPORARY ROADWORK 606	LEFT TURN 706	LEFT TURN 806	PARKED VEHICLE RAN AWAY 906
7	DRIVEWAY 007	THRU - LEFT 107	U TURN 207	LANE CHANGE LEFT 307	FROM LOADING BAY 407		HIT TEMPORARY OBJECT ON CARRIAGEWAY 607	RIGHT TURN 707	RIGHT TURN 807	VEHICLE MOVEMENTS NOT KNOWN 907
8	ON FOOTWAY 008	RIGHT - LEFT 108		RIGHT TURN SIDE SWIPE 308	FROM FOOTWAY 408		ACCIDENT OR BROKEN DOWN 608	MOUNTS TRAFFIC ISLAND 708	MOUNTS TRAFFIC ISLAND 808	
9	STRUCK WHILE BOARDING OR ALIGHTING 009	LEFT - LEFT 109		LEFT TURN SIDE SWIPE 309			ANIMAL 609			
0				PULLING OUT 310			LOAD HITS VEHICLE 610			



# **APPENDIX D**

## **DEVELOPMENT SITE PLAN**



BUILDING CLASS 2  
TYPE A CONSTRUCTION

**1 PROPOSED SITE PLAN**  
DA-40 SCALE 1:1000

NOTE:  
LOCATION OF LEVELS, BOUNDARIES,  
SERVICES TO BE CONFIRMED BY  
SURVEYOR

PROJECT  
**ROSS RIVER ROAD RESIDENTIAL**  
344/346 & 350 ROSS RIVER RD  
CRANBROOK, QLD, 4814

CLIENT DETAILS  
**HURST CONSTRUCTIONS**

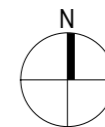
TITLE  
**PROPOSED SITE PLAN**

PROJECT NO.  
**25869**

DATE  
**10.10.25**

DRAWING No.  
**DA-15**

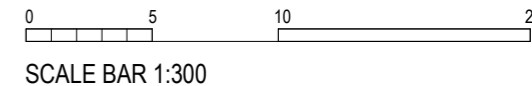
ISSUE  
**P7**



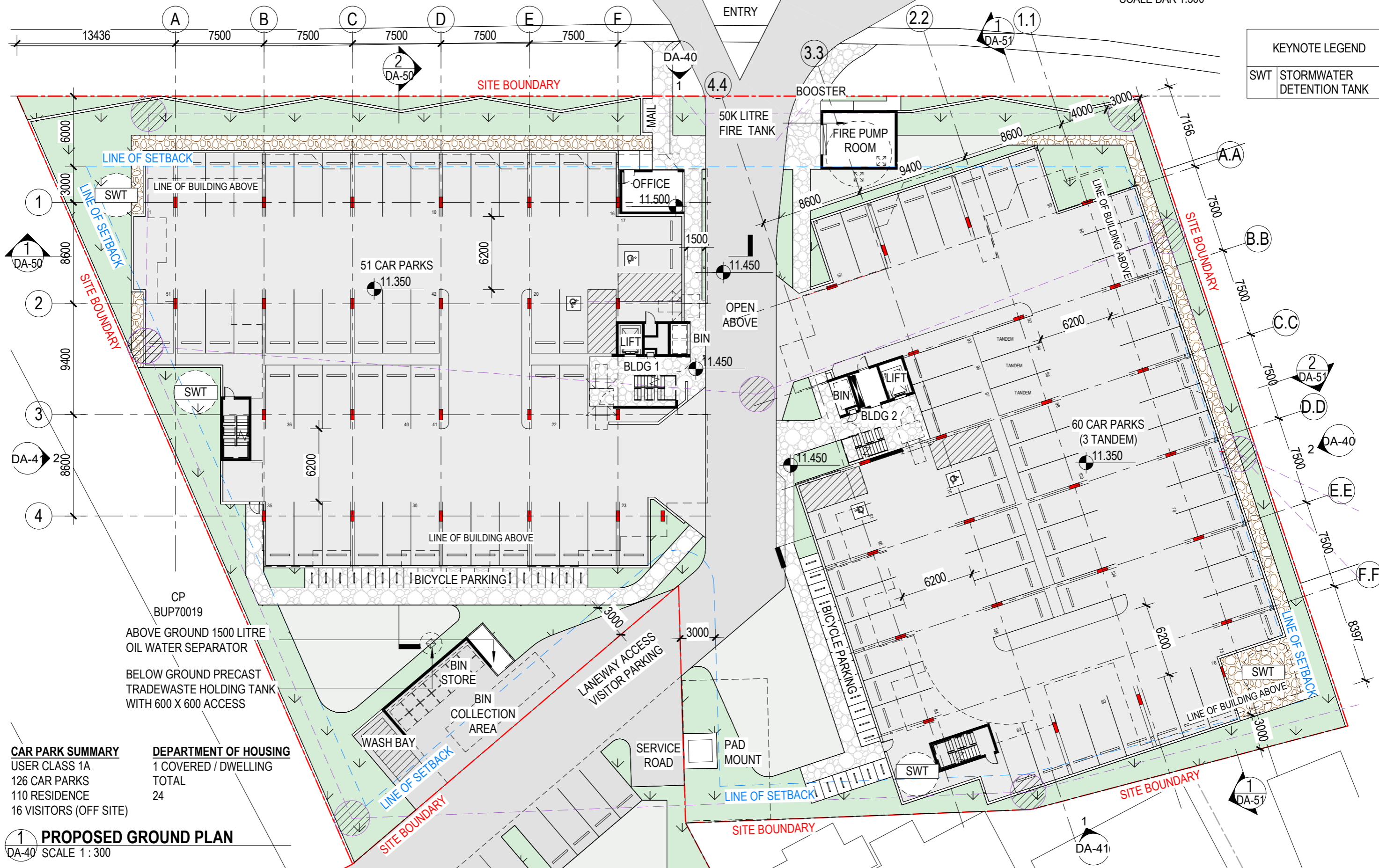
**COUNTERPOINT**

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ROSS RIVER ROAD



KEYNOTE LEGEND	
SWT	STORMWATER DETENTION TANK



**CAR PARK SUMMARY**  
 USER CLASS 1A  
 126 CAR PARKS  
 110 RESIDENCE  
 16 VISITORS (OFF SITE)

**DEPARTMENT OF HOUSING**  
 1 COVERED / DWELLING  
 TOTAL  
 24

**1 PROPOSED GROUND PLAN**  
 DA-40 SCALE 1 : 300

**PROJECT**  
 ROSS RIVER ROAD RESIDENTIAL  
 344/346 & 350 ROSS RIVER RD  
 CRANBROOK, QLD, 4814

**CLIENT DETAILS**  
 HURST CONSTRUCTIONS

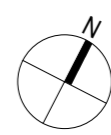
**TITLE**  
 PROPOSED FLOOR PLAN - GROUND

**PROJECT NO.**  
 25869

**DATE**  
 10.10.25

**DRAWING No.**  
 DA-20

**ISSUE**  
 P7



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# APPENDIX E

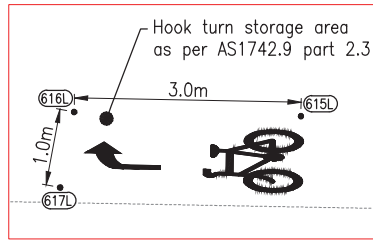
## ROSS RIVER ROAD SAFETY UPGRADE PROJECT DRAWINGS

DWG 965857

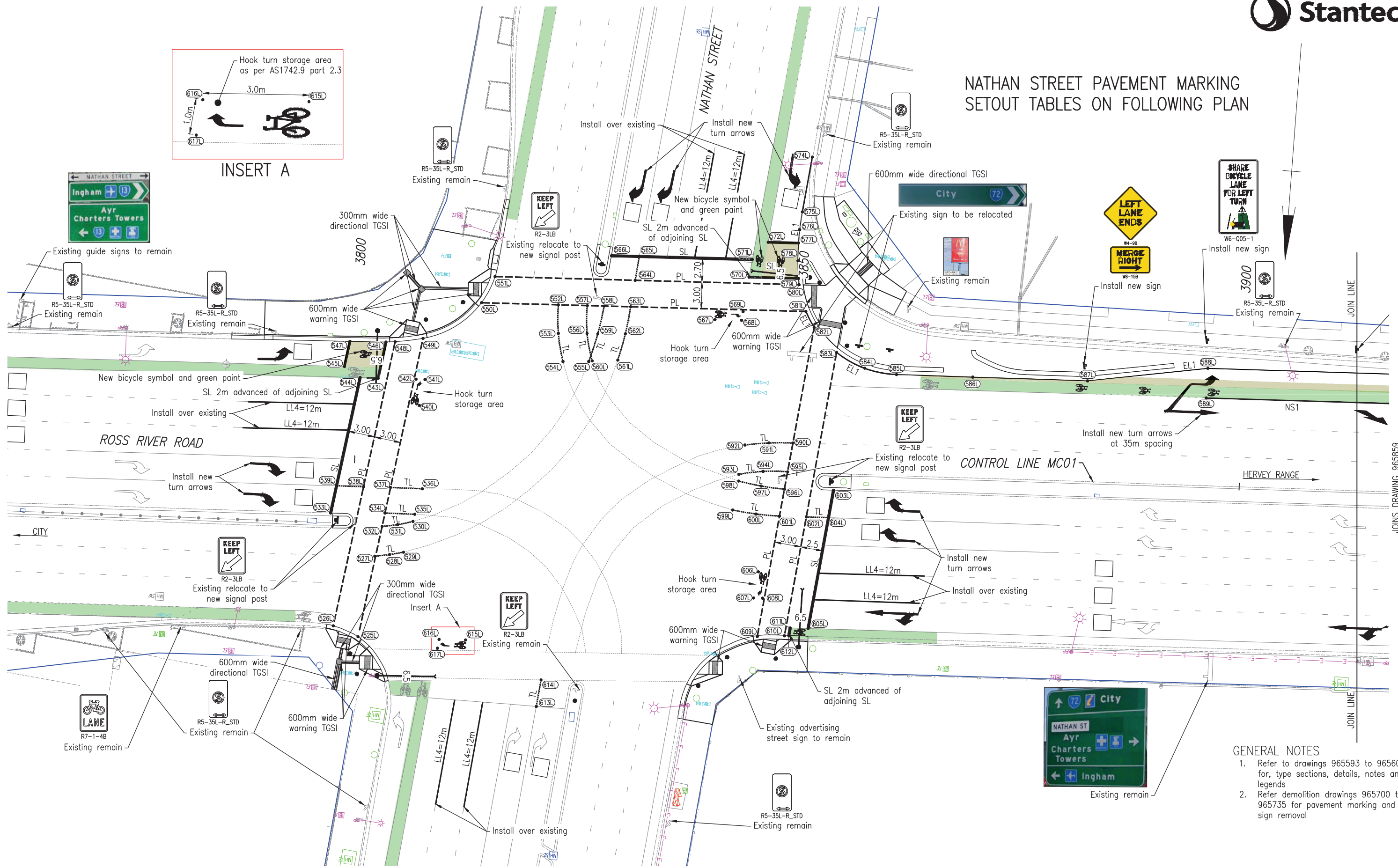
DWG 965859

DWG 965860

# NATHAN STREET PAVEMENT MARKING SETOUT TABLES ON FOLLOWING PLAN



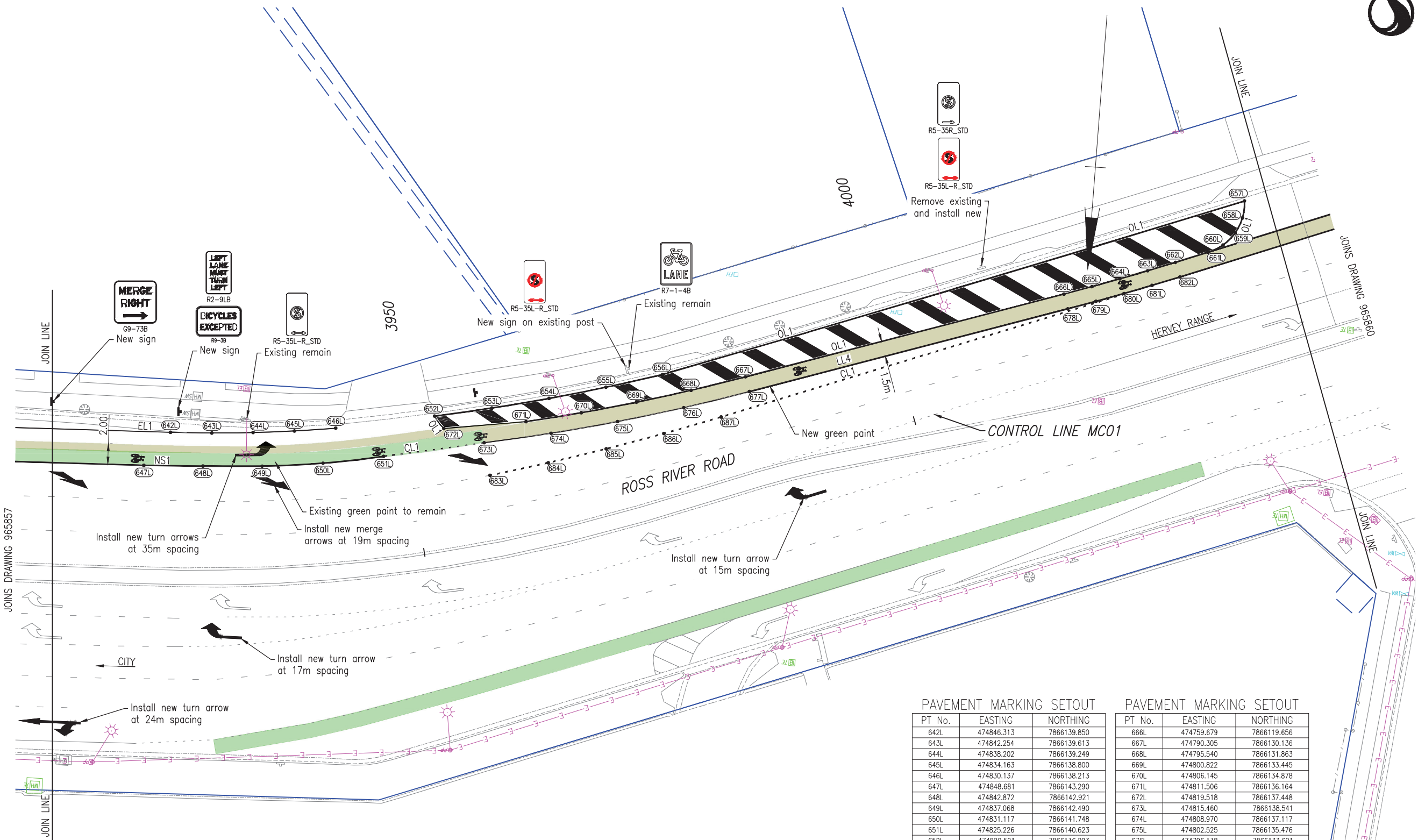
INSERT A



- GENERAL NOTES**
1. Refer to drawings 965593 to 965600 for, type sections, details, notes and legends
  2. Refer demolition drawings 965700 to 965735 for pavement marking and sign removal

May 20, 2025 11:05am XREFS: 1. X-S-EXTRA.dwg; X-D.dwg; X-S.dwg; X-S-PUP.dwg; X-D-CL.dwg; X-S-BMDY.dwg; X-D-Sigs.dwg; X-BC-Prelim.dwg; X-TB-HATCH.dwg; X-A-STAMP.dwg  
 Modified: 1. A Issued For Construction  
 Revisions/Descriptions: Signatory: - RPEQ Full Name, Eng. Area and RPEQ No. or - Full Name and Position Title Date  
 CAD FILES: I:\US\304701557\100\_xxx\drawings\working\965857-965866.dwg  
 Document Set ID: 27701966  
 Version: 1, Version Date: 28/10/2025

Associated Job Nos		Survey Data		Scales		TOWNSVILLE CITY		PAVEMENT MARKING AND SIGNS		Queensland Government	
		Horiz. Datum GDA2020		0 2 4 6 8m		ROSS RIVER ROAD (612)		NATHAN STREET INTERSECTION		Job No. 268/612/2682871	
Auxiliary Drg Nos		Horiz. Grid MGA2020 Z55		Dimensions shown in meters except where shown otherwise		CTL CHGE 3761 - 3913		SHEET 17 OF 39		Contract No. CN-21447	
965590 to 965947 & 965957 & 965958		Height Datum AHD DERIVED				Reference Points		ENGINEERING CERTIFICATION (RPEQ)		Drawing No. 965857 A	
Date		Survey Books 104354				Preceding RP Dist. to start of job (km) From start to end of job From end to Following RP		ENG. AREA SIGNATORY FULL NAME No. DATE		Series Number SL-17 of 39	
						612/1 0.233 7.69 0.182 612/4		Civil Brendan Melita 24432 5/04/2025			
						Through Chainage from INT 612/830 & QUEENS RD					

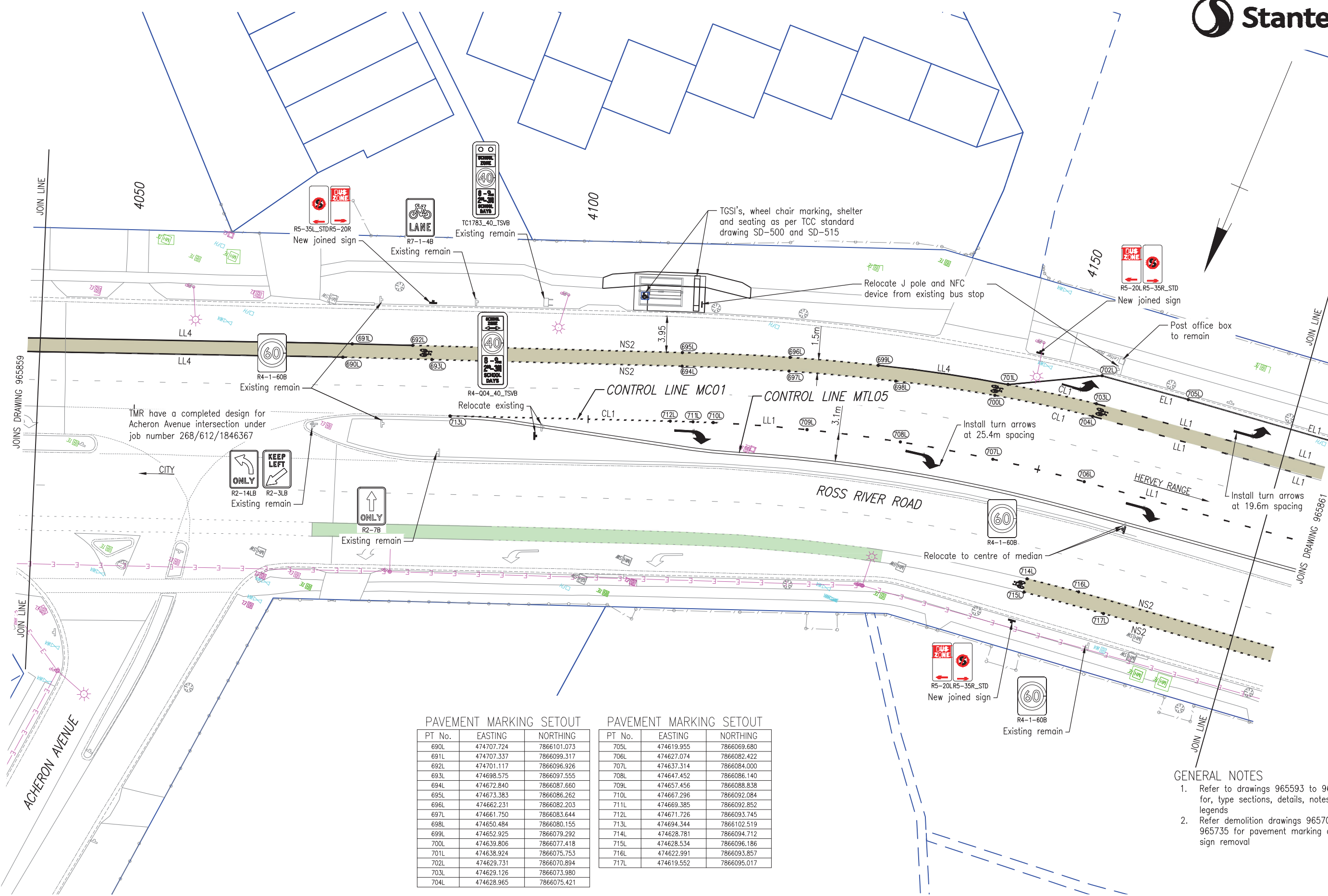


PAVEMENT MARKING SETOUT			PAVEMENT MARKING SETOUT		
PT No.	EASTING	NORTHING	PT No.	EASTING	NORTHING
642L	474846.313	7866139.850	666L	474759.679	7866119.656
643L	474842.254	7866139.613	667L	474790.305	7866130.136
644L	474838.202	7866139.249	668L	474795.540	7866131.863
645L	474834.163	7866138.800	669L	474800.822	7866133.445
646L	474830.137	7866138.213	670L	474806.145	7866134.878
647L	474848.681	7866143.290	671L	474811.506	7866136.164
648L	474842.872	7866142.921	672L	474819.518	7866137.448
649L	474837.068	7866142.490	673L	474815.460	7866138.541
650L	474831.117	7866141.748	674L	474808.970	7866137.117
651L	474825.226	7866140.623	675L	474802.525	7866135.476
652L	474820.521	7866136.293	676L	474796.138	7866133.621
653L	474814.955	7866135.084	677L	474789.817	7866131.554
654L	474809.422	7866133.715	678L	474759.194	7866121.075
655L	474803.928	7866132.199	679L	474756.486	7866120.131
656L	474798.475	7866130.538	680L	474753.790	7866119.156
657L	474742.654	7866109.180	681L	474751.105	7866118.150
658L	474742.725	7866110.848	682L	474748.431	7866117.114
659L	474743.341	7866112.399	683L	474814.647	7866114.699
660L	474744.434	7866113.661	684L	474809.022	7866140.031
661L	474745.881	7866114.494	685L	474803.437	7866138.234
662L	474748.981	7866115.719	686L	474797.894	7866136.308
663L	474751.639	7866116.749	687L	474792.398	7866134.254
664L	474754.308	7866117.748			
665L	474756.988	7866118.718			

- GENERAL NOTES**
- Refer to drawings 965593 to 965600 for, type sections, details, notes and legends
  - Refer demolition drawings 965700 to 965735 for pavement marking and sign removal

May 20, 2025 - 11:05am XREFS : X-S-EXTRA.dwg : X-D.dwg : X-S.dwg : X-S-PUP.dwg : X-D-CL.dwg : X-D-BC-Prelim.dwg : X-TB-HATCH.dwg : X-A-STAMP.dwg  
 CAD FILES : I:\A\304701557\100\_xxx\drawings\working\965857-965866.dwg  
 Document Set ID: 27701966  
 Version: 1, Version Date: 28/10/2025

Associated Job Nos 268/612/1846367		Survey Data Horiz. Datum: GDA2020 Auxiliary Drg Nos: 965590 to 965947, 965957 & 965958		Scales 0 2 4 6 8m Dimensions shown in meters except where shown otherwise		<b>TOWNSVILLE CITY</b> <b>ROSS RIVER ROAD (612)</b> <b>CTL CHGE 3913 - 4039</b>			<b>PAVEMENT MARKING AND SIGNS</b> <b>NATHAN ST TO ACHERON AVE</b> <b>SHEET 19 OF 39</b>				
A Issued For Construction		Signatory: - RPEQ Full Name, Eng. Area and RPEQ No. or Full Name and Position Title		Date		Preceding RP: 612/1 Dist. to start of job: 0.233 From start to end of job: 7.69 From end to Following RP: 0.182 Following RP: 612/4 Through Chainage from INT 612/830 & QUEENS RD			ENGINEERING CERTIFICATION (RPEQ) ENG. AREA: Civil SIGNATORY FULL NAME: Brendan Melita No.: 24432 DATE: 5/04/2025			Job No.: 268/612/2682871 Contract No.: CN-21447 Drawing No.: 965859 A Series Number: SL-19 of 39	



JOINS DRAWING 965859

JOINS DRAWING 965861

TMR have a completed design for Acheron Avenue intersection under job number 268/612/1846367

PAVEMENT MARKING SETOUT

PT No.	EASTING	NORTHING
690L	474707.724	7866101.073
691L	474707.337	7866099.317
692L	474701.117	7866096.926
693L	474698.575	7866097.555
694L	474672.840	7866087.660
695L	474673.383	7866086.262
696L	474662.231	7866082.203
697L	474661.750	7866083.644
698L	474650.484	7866080.155
699L	474652.925	7866079.292
700L	474639.806	7866077.418
701L	474638.924	7866075.753
702L	474629.731	7866070.894
703L	474629.126	7866073.980
704L	474628.965	7866075.421

PAVEMENT MARKING SETOUT

PT No.	EASTING	NORTHING
705L	474619.955	7866069.680
706L	474627.074	7866082.422
707L	474637.314	7866084.000
708L	474647.452	7866086.140
709L	474657.456	7866088.838
710L	474667.296	7866092.084
711L	474669.385	7866092.852
712L	474671.726	7866093.745
713L	474694.344	7866102.519
714L	474628.781	7866094.712
715L	474628.534	7866096.186
716L	474622.991	7866093.857
717L	474619.552	7866095.017

- GENERAL NOTES**
1. Refer to drawings 965593 to 965600 for, type sections, details, notes and legends
  2. Refer demolition drawings 965700 to 965735 for pavement marking and sign removal

May 20, 2025 - 11:06am XREFS - 1 - X-S-EXTRA.dwg : X-D.dwg : X-S.dwg : X-S-PUP.dwg : X-D-CL.dwg : X-S-BNDY.dwg : X-D-Sigs.dwg : X-BC-Prelim.dwg : X-TB-HATCH.dwg : X-A-STAMP.dwg  
 Last Modified - 1 - X-S-EXTRA.dwg : X-D.dwg : X-S.dwg : X-S-PUP.dwg : X-D-CL.dwg : X-S-BNDY.dwg : X-D-Sigs.dwg : X-BC-Prelim.dwg : X-TB-HATCH.dwg : X-A-STAMP.dwg  
 CAD FILES : I:\S\2024\2025\100\_XXX\drawings\working\965857-965866.dwg

Associated Job Nos 268/612/1846367		Survey Data Horiz. Datum: GDA2020		Scales 0 2 4 6 8m		TOWNSVILLE CITY ROSS RIVER ROAD (612)		PAVEMENT MARKING AND SIGNS LINDEMAN AVE INTERSECTION SHEET 20 OF 39		Queensland Government	
Auxiliary Drg Nos 965590 to 965947 965957 & 965958		Horiz. Grid MGA2020 Z55		Dimensions shown in meters except where shown otherwise		CTL CHGE 4039 - 4176		ENGINEERING CERTIFICATION (RPEQ)		Job No. 268/612/2682871	
Signatory: - RPEQ Full Name, Eng. Area and RPEQ No. or - Full Name and Position Title		Height Datum AHD DERIVED		Survey Books 104354		Reference Points		No. 24432		Contract No. CN-21447	
Date		Date		Date		Preceding RP 612/1		SIGNATORY FULL NAME Brendan Melita		Drawing No. 965860 A	
Revisions/Descriptions		Date		Date		Dist. to start of job (km) 0.233		DATE 5/04/2025		Series Number SL-20 of 39	
Issued For Construction		Date		Date		From start to end of job 7.69		No. 24432		Series Number SL-20 of 39	
Issued For Construction		Date		Date		From end of Following RP 0.182		No. 24432		Series Number SL-20 of 39	
Issued For Construction		Date		Date		Following RP 612/4		No. 24432		Series Number SL-20 of 39	
Issued For Construction		Date		Date		Through Chainage from INT 612/830 & QUEENS RD		No. 24432		Series Number SL-20 of 39	



# **APPENDIX F**

## **SIDRA OUTPUTS**

# SITE LAYOUT

Site: [1] Ross River (Folder1)

Ross River Rd Access

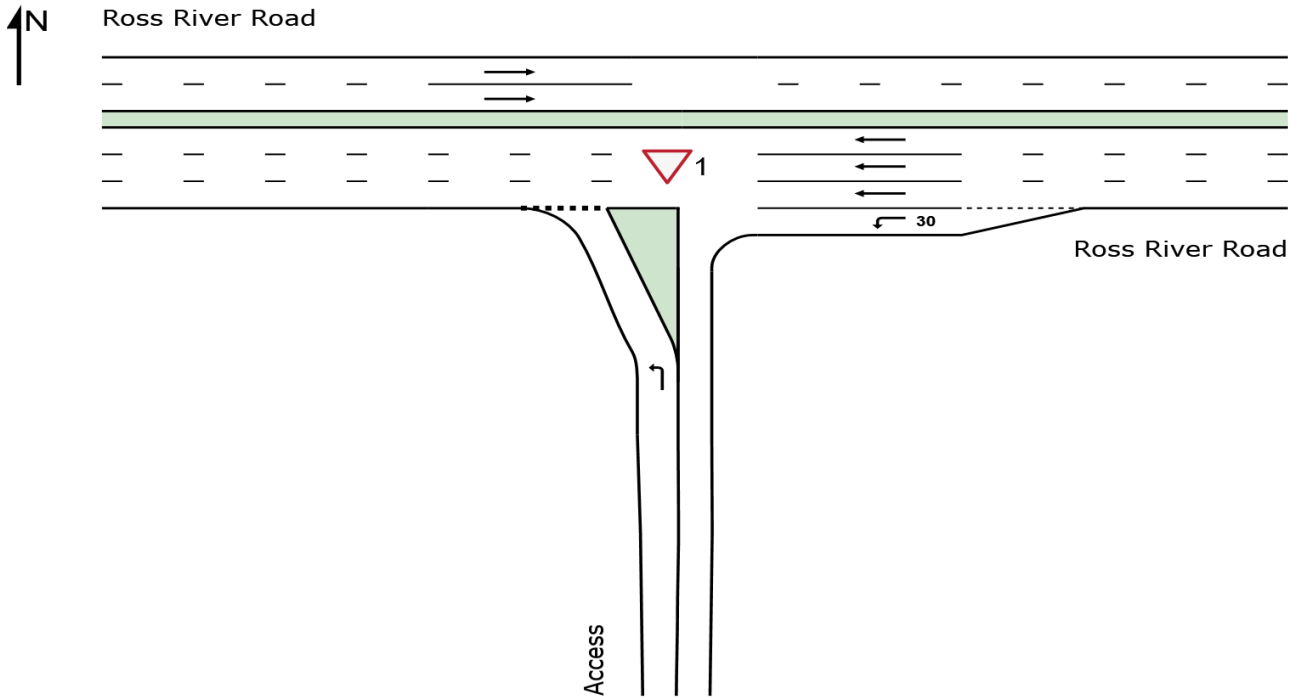
Left in Left out

Site Category: (None)

Give-Way (Two-Way)

Site Scenario: 1 | AM Peak Hour

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



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# MOVEMENT SUMMARY

Site: [1] Ross River (Folder1)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Ross River Rd Access

Left in Left out

Site Category: (None)

Give-Way (Two-Way)

Site Scenario: 1 | AM Peak Hour

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles to Depart	Aver. Speed
			[ Total HV ]	[ Total HV ]	[ Total HV ]	[ Total HV ]	v/c	sec		[ Veh. ]	[ Dist ]		Rate		km/h
			veh/h	%	veh/h	%				veh	m				
South: Access															
1	L2	All MCs	13	5.0	13	5.0	0.034	11.1	LOS B	0.1	0.8	0.71	0.85	0.71	15.5
Approach			13	5.0	13	5.0	0.034	11.1	LOS B	0.1	0.8	0.71	0.85	0.71	15.5
East: Ross River Road															
4	L2	All MCs	8	5.0	8	5.0	0.005	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	36.8
5	T1	All MCs	1077	5.0	1077	5.0	0.190	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			1085	5.0	1085	5.0	0.190	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.6
West: Ross River Road															
11	T1	All MCs	1	5.0	1	5.0	0.000	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			1	5.0	1	5.0	0.000	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
All Vehicles			1099	5.0	1099	5.0	0.190	0.2	NA	0.1	0.8	0.01	0.01	0.01	58.9

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

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

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

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

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

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# LANE SUMMARY

Site: [1] Ross River (Folder1)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Ross River Rd Access

Left in Left out

Site Category: (None)

Give-Way (Two-Way)

Site Scenario: 1 | AM Peak Hour

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue		Lane Config	Lane Length m	Cap. Prob. Adj. Block.	
	[ Total veh/h	HV %	[ Total veh/h	HV %						[ Veh	Dist ] m			%	%
South: Access															
Lane 1	13	5.0	13	5.0	370	0.034	100	11.1	LOS B	0.1	0.8	Full	20	0.0	0.0
Approach	13	5.0	13	5.0		0.034		11.1	LOS B	0.1	0.8				
East: Ross River Road															
Lane 1	8	5.0	8	5.0	1793	0.005	100	5.6	LOS A	0.0	0.0	Short	30	0.0	NA
Lane 2	359	5.0	359	5.0	1889	0.190	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Lane 3	359	5.0	359	5.0	1889	0.190	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Lane 4	359	5.0	359	5.0	1889	0.190	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Approach	1085	5.0	1085	5.0		0.190		0.1	NA	0.0	0.0				
West: Ross River Road															
Lane 1	1	5.0	1	5.0	1889	0.000	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	1	5.0	1	5.0	1889	0.000	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	1	5.0	1	5.0		0.000		0.0	NA	0.0	0.0				
All Vehicles	1099	5.0	1099	5.0		0.190		0.2	NA	0.1	0.8				

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

Lane LOS values are based on average delay per lane.

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

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

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

Approach Lane Flows (veh/h)										
South: Access										
Mov.	L2	Total	%HV		Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.		
From S				Cap. veh/h						
To Exit:	W									
Lane 1	13	13	5.0	370	0.034	100	NA	NA		
Approach	13	13	5.0		0.034					
East: Ross River Road										
Mov.	L2	T1	Total	%HV	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.		
From E					Cap. veh/h					

To Exit:	S	W		v/c	%	%	No.		
Lane 1	8	-	8	5.0	1793	0.005	100	0.0	2
Lane 2	-	359	359	5.0	1889	0.190	100	NA	NA
Lane 3	-	359	359	5.0	1889	0.190	100	NA	NA
Lane 4	-	359	359	5.0	1889	0.190	100	NA	NA
Approach	8	1077	1085	5.0		0.190			
<b>West: Ross River Road</b>									
Mov.	T1	Total	%HV		Cap.	Deg.	Lane	Prob.	Ov.
From W					veh/h	Satn	Util.	SL	Lane
To Exit:	E					v/c	%	%	No.
Lane 1	1	1	5.0		1889	0.000	100	NA	NA
Lane 2	1	1	5.0		1889	0.000	100	NA	NA
Approach	1	1	5.0			0.000			
<b>Total %HV Deg. Satn (v/c)</b>									
All Vehicles	1099	5.0				0.190			

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

<b>Merge Analysis</b>												
	Exit Lane Number	Short Lane Length	Percent Opng Lane	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow Rate	Capacity	Deg. Satn	Min. Delay	Merge Delay	Merge Queue [ Veh Dist ]
		m	%	veh/h	pcu/h	sec	veh/h	veh/h	v/c	sec	sec	m
There are no Exit Short Lanes for Merge Analysis at this Site.												

<b>Variable Demand Analysis</b>				
	Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
	veh	veh	sec	sec
<b>South: Access</b>				
Lane 1	0.0	0.0	0.0	0.0
<b>East: Ross River Road</b>				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
<b>West: Ross River Road</b>				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

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# MOVEMENT SUMMARY

Site: [1] Ross River (Folder1)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Ross River Rd Access

Left in Left out

Site Category: (None)

Give-Way (Two-Way)

Site Scenario: 2 | PM Peak Hour

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles to Depart	Aver. Speed
			[ Total HV ]	[ Total HV ]	[ Total HV ]	[ Total HV ]	v/c	sec		[ Veh.	Dist ]		Rate		km/h
			veh/h	%	veh/h	%				veh	m				
South: Access															
1	L2	All MCs	4	5.0	4	5.0	0.024	21.7	LOS C	0.1	0.5	0.86	0.93	0.86	9.5
Approach			4	5.0	4	5.0	0.024	21.7	LOS C	0.1	0.5	0.86	0.93	0.86	9.5
East: Ross River Road															
4	L2	All MCs	29	5.0	29	5.0	0.016	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	36.8
5	T1	All MCs	1544	5.0	1544	5.0	0.273	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			1574	5.0	1574	5.0	0.273	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.2
West: Ross River Road															
11	T1	All MCs	1	5.0	1	5.0	0.000	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			1	5.0	1	5.0	0.000	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
All Vehicles			1579	5.0	1579	5.0	0.273	0.2	NA	0.1	0.5	0.00	0.01	0.00	58.8

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

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

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

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

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

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# LANE SUMMARY

Site: [1] Ross River (Folder1)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Ross River Rd Access

Left in Left out

Site Category: (None)

Give-Way (Two-Way)

Site Scenario: 2 | PM Peak Hour

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue		Lane Config	Lane Length m	Cap. Prob. Adj. Block.	
	[ Total	HV ]	[ Total	HV ]						[ Veh	Dist ]			%	%
	veh/h	%	veh/h	%						m	m			%	%
South: Access															
Lane 1	4	5.0	4	5.0	174	0.024	100	21.7	LOS C	0.1	0.5	Full	20	0.0	0.0
Approach	4	5.0	4	5.0		0.024		21.7	LOS C	0.1	0.5				
East: Ross River Road															
Lane 1	29	5.0	29	5.0	1793	0.016	100	5.6	LOS A	0.0	0.0	Short	30	0.0	NA
Lane 2	515	5.0	515	5.0	1889	0.273	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Lane 3	515	5.0	515	5.0	1889	0.273	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Lane 4	515	5.0	515	5.0	1889	0.273	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Approach	1574	5.0	1574	5.0		0.273		0.1	NA	0.0	0.0				
West: Ross River Road															
Lane 1	1	5.0	1	5.0	1889	0.000	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	1	5.0	1	5.0	1889	0.000	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	1	5.0	1	5.0		0.000		0.0	NA	0.0	0.0				
All Vehicles	1579	5.0	1579	5.0		0.273		0.2	NA	0.1	0.5				

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

Lane LOS values are based on average delay per lane.

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

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

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

Approach Lane Flows (veh/h)										
South: Access										
Mov.	L2	Total	%HV		Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.		
From S				Cap. veh/h						
To Exit:	W									
Lane 1	4	4	5.0	174	0.024	100	NA	NA		
Approach	4	4	5.0		0.024					
East: Ross River Road										
Mov.	L2	T1	Total	%HV	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.		
From E					Cap. veh/h					

To Exit:	S	W		v/c	%	%	No.		
Lane 1	29	-	29	5.0	1793	0.016	100	0.0	2
Lane 2	-	515	515	5.0	1889	0.273	100	NA	NA
Lane 3	-	515	515	5.0	1889	0.273	100	NA	NA
Lane 4	-	515	515	5.0	1889	0.273	100	NA	NA
Approach	29	1544	1574	5.0					
West: Ross River Road									
Mov.	T1	Total	%HV		Cap.	Deg.	Lane	Prob.	Ov.
From W					veh/h	Satn	Util.	SL	Lane
To Exit:	E					v/c	%	%	No.
Lane 1	1	1	5.0		1889	0.000	100	NA	NA
Lane 2	1	1	5.0		1889	0.000	100	NA	NA
Approach	1	1	5.0			0.000			
Total %HV Deg. Satn (v/c)									
All Vehicles	1579	5.0				0.273			

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

Merge Analysis													
	Exit Lane Number	Short Lane Length	Percent Opng Lane	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow Rate	Capacity	Deg. Satn	Min. Delay	Merge Delay	Merge Queue [ Veh Dist ]	
		m	%	veh/h	pcu/h	sec	sec	veh/h	veh/h	v/c	sec	sec	m
There are no Exit Short Lanes for Merge Analysis at this Site.													

Variable Demand Analysis				
	Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
	veh	veh	sec	sec
South: Access				
Lane 1	0.0	0.0	0.0	0.0
East: Ross River Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
West: Ross River Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

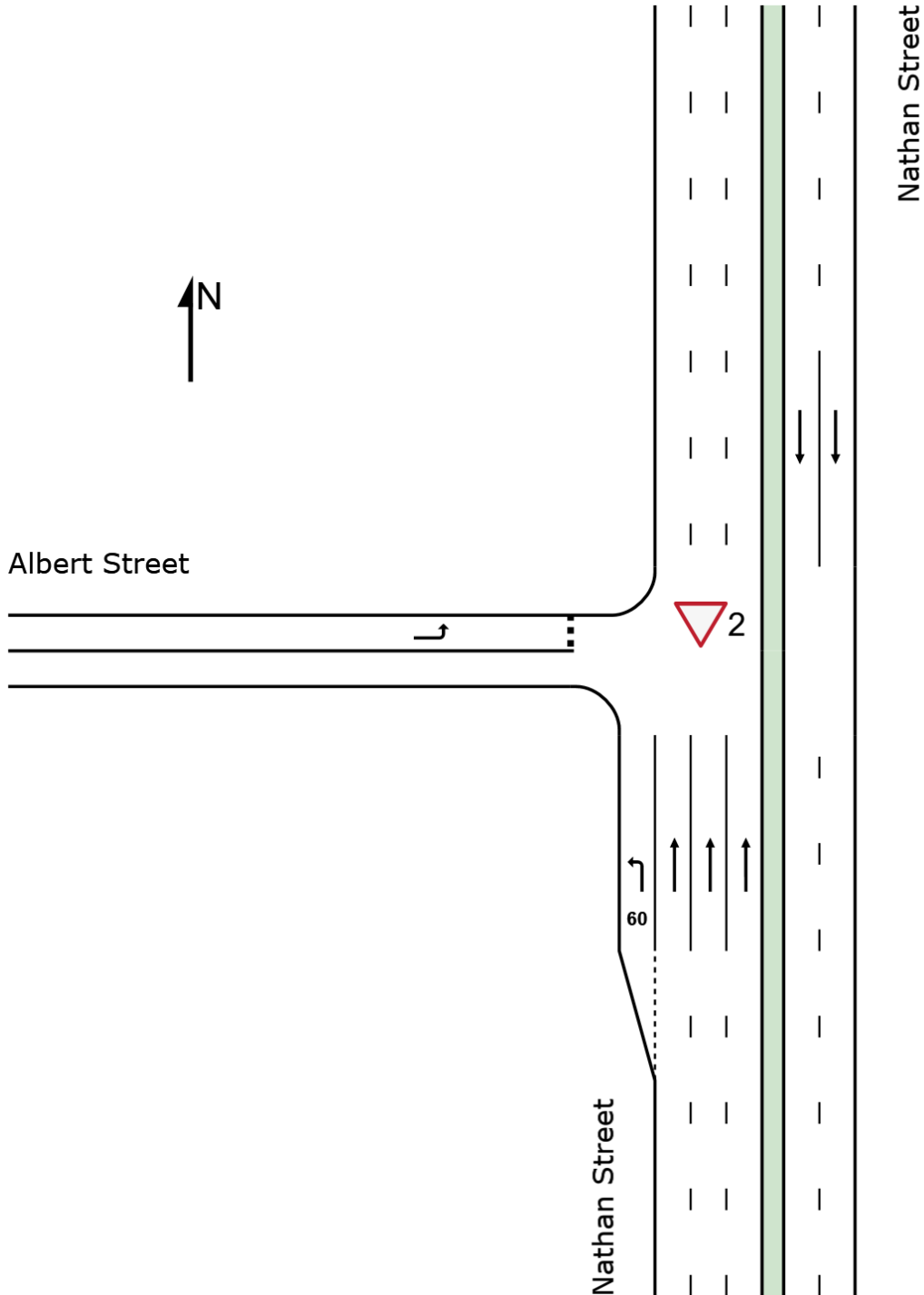
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# SITE LAYOUT

▽ Site: [2] Nathan St / Albert St (Folder1)

Nathan St/Albert St Intersection  
Left in Left out  
Site Category: (None)  
Give-Way (Two-Way)  
**Site Scenario: 1 | AM Peak Hour**

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



# MOVEMENT SUMMARY

Site: [2] Nathan St / Albert St (Folder1)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Nathan St/Albert St Intersection

Left in Left out

Site Category: (None)

Give-Way (Two-Way)

Site Scenario: 1 | AM Peak Hour

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[ Total HV ]	[ Total HV ]	[ Total HV ]	[ Total HV ]	v/c	sec		[ Veh. ]	[ Dist ]				km/h
			veh/h	%	veh/h	%				veh	m				
South: Nathan Street															
1	L2	All MCs	12	5.0	12	5.0	0.006	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	47.4
2	T1	All MCs	1435	5.0	1435	5.0	0.253	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			1446	5.0	1446	5.0	0.253	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.7
North: Nathan Street															
8	T1	All MCs	1402	0.0	1402	0.0	0.360	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			1402	0.0	1402	0.0	0.360	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.8
West: Albert Street															
10	L2	All MCs	136	5.0	136	5.0	0.361	16.4	LOS C	1.4	10.3	0.79	0.97	1.00	29.6
Approach			136	5.0	136	5.0	0.361	16.4	LOS C	1.4	10.3	0.79	0.97	1.00	29.6
All Vehicles			2984	2.7	2984	2.7	0.361	0.8	NA	1.4	10.3	0.04	0.05	0.05	58.0

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

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

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

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

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

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Project: C:\Users\danielle.bamber\OneDrive - Premise\Documents\Fee Proposal Notes\Affordable Housing\P003620R01.sipx

# LANE SUMMARY

Site: [2] Nathan St / Albert St (Folder1)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Nathan St/Albert St Intersection

Left in Left out

Site Category: (None)

Give-Way (Two-Way)

Site Scenario: 1 | AM Peak Hour

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue		Lane Config	Lane Length m	Cap. Prob. Adj. Block.	
	[ Total veh/h	HV %	[ Total veh/h	HV %						[ Veh	Dist ] m			%	%
South: Nathan Street															
Lane 1	12	5.0	12	5.0	1793	0.006	100	5.6	LOS A	0.0	0.0	Short	60	0.0	NA
Lane 2	478	5.0	478	5.0	1889	0.253	100	0.1	LOS A	0.0	0.0	Full	350	0.0	0.0
Lane 3	478	5.0	478	5.0	1889	0.253	100	0.1	LOS A	0.0	0.0	Full	350	0.0	0.0
Lane 4	478	5.0	478	5.0	1889	0.253	100	0.1	LOS A	0.0	0.0	Full	350	0.0	0.0
Approach	1446	5.0	1446	5.0		0.253		0.1	NA	0.0	0.0				
North: Nathan Street															
Lane 1	701	0.0	701	0.0	1950	0.360	100	0.0	LOS A	0.0	0.0	Full	115	0.0	0.0
Lane 2	701	0.0	701	0.0	1950	0.360	100	0.0	LOS A	0.0	0.0	Full	115	0.0	0.0
Approach	1402	0.0	1402	0.0		0.360		0.0	NA	0.0	0.0				
West: Albert Street															
Lane 1	136	5.0	136	5.0	376	0.361	100	16.4	LOS C	1.4	10.3	Full	180	0.0	0.0
Approach	136	5.0	136	5.0		0.361		16.4	LOS C	1.4	10.3				
All Vehicles	2984	2.7	2984	2.7		0.361		0.8	NA	1.4	10.3				

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

Lane LOS values are based on average delay per lane.

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

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

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

Approach Lane Flows (veh/h)										
South: Nathan Street										
Mov.	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.	
From S To Exit:	W	N								
Lane 1	12	-	12	5.0	1793	0.006	100	0.0	2	
Lane 2	-	478	478	5.0	1889	0.253	100	NA	NA	
Lane 3	-	478	478	5.0	1889	0.253	100	NA	NA	
Lane 4	-	478	478	5.0	1889	0.253	100	NA	NA	
Approach	12	1435	1446	5.0		0.253				
North: Nathan Street										

Mov.	T1	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N				veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	S				v/c	%	%	No.
Lane 1	701	701	0.0	1950	0.360	100	NA	NA
Lane 2	701	701	0.0	1950	0.360	100	NA	NA
Approach	1402	1402	0.0		0.360			
<b>West: Albert Street</b>								
Mov.	L2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W				veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	N				v/c	%	%	No.
Lane 1	136	136	5.0	376	0.361	100	NA	NA
Approach	136	136	5.0		0.361			
<b>Total %HV Deg.Satn (v/c)</b>								
All Vehicles	2984	2.7			0.361			

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

<b>Merge Analysis</b>												
Exit Lane Number	Short Lane Length	Percent Opng Lane	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Capacity Flow Rate	Deg. Satn	Min. Delay	Merge Delay	Merge Queue [ Veh ]	Queue Dist ]	
	m	%	veh/h	pcu/h	sec	sec	veh/h	v/c	sec	sec	m	
There are no Exit Short Lanes for Merge Analysis at this Site.												

<b>Variable Demand Analysis</b>				
	Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
	veh	veh	sec	sec
<b>South: Nathan Street</b>				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
<b>North: Nathan Street</b>				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
<b>West: Albert Street</b>				
Lane 1	0.0	0.0	0.0	0.0

# MOVEMENT SUMMARY

Site: [2] Nathan St / Albert St (Folder1)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Nathan St/Albert St Intersection

Left in Left out

Site Category: (None)

Give-Way (Two-Way)

Site Scenario: 2 | PM Peak Hour

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[ Total HV ]	[ Total HV ]	[ Total HV ]	[ Total HV ]	v/c	sec		[ Veh. ]	[ Dist ]				km/h
			veh/h	%	veh/h	%				veh	m				
South: Nathan Street															
1	L2	All MCs	7	0.0	7	0.0	0.004	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	48.0
2	T1	All MCs	1518	5.0	1518	5.0	0.268	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			1525	5.0	1525	5.0	0.268	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
North: Nathan Street															
8	T1	All MCs	1279	5.0	1279	5.0	0.339	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			1279	5.0	1279	5.0	0.339	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.8
West: Albert Street															
10	L2	All MCs	108	5.0	108	5.0	0.318	17.1	LOS C	1.2	8.5	0.80	0.96	0.97	29.0
Approach			108	5.0	108	5.0	0.318	17.1	LOS C	1.2	8.5	0.80	0.96	0.97	29.0
All Vehicles			2913	5.0	2913	5.0	0.339	0.7	NA	1.2	8.5	0.03	0.04	0.04	58.3

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

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

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

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

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

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Project: C:\Users\danielle.bamber\OneDrive - Premise\Documents\Fee Proposal Notes\Affordable Housing\P003620R01.sipx

# LANE SUMMARY

Site: [2] Nathan St / Albert St (Folder1)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Nathan St/Albert St Intersection

Left in Left out

Site Category: (None)

Give-Way (Two-Way)

Site Scenario: 2 | PM Peak Hour

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% Back Of Queue		Lane Config	Lane Length m	Cap. Prob. Adj. Block.	
	[ Total	HV ]	[ Total	HV ]						[ Veh	Dist ]			%	%
	veh/h	%	veh/h	%							m				
South: Nathan Street															
Lane 1	7	0.0	7	0.0	1857	0.004	100	5.5	LOS A	0.0	0.0	Short	60	0.0	NA
Lane 2	506	5.0	506	5.0	1889	0.268	100	0.1	LOS A	0.0	0.0	Full	350	0.0	0.0
Lane 3	506	5.0	506	5.0	1889	0.268	100	0.1	LOS A	0.0	0.0	Full	350	0.0	0.0
Lane 4	506	5.0	506	5.0	1889	0.268	100	0.1	LOS A	0.0	0.0	Full	350	0.0	0.0
Approach	1525	5.0	1525	5.0		0.268		0.1	NA	0.0	0.0				
North: Nathan Street															
Lane 1	639	5.0	639	5.0	1889	0.339	100	0.0	LOS A	0.0	0.0	Full	115	0.0	0.0
Lane 2	639	5.0	639	5.0	1889	0.339	100	0.0	LOS A	0.0	0.0	Full	115	0.0	0.0
Approach	1279	5.0	1279	5.0		0.339		0.0	NA	0.0	0.0				
West: Albert Street															
Lane 1	108	5.0	108	5.0	341	0.318	100	17.1	LOS C	1.2	8.5	Full	180	0.0	0.0
Approach	108	5.0	108	5.0		0.318		17.1	LOS C	1.2	8.5				
All Vehicles	2913	5.0	2913	5.0		0.339		0.7	NA	1.2	8.5				

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

Lane LOS values are based on average delay per lane.

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

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

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

Approach Lane Flows (veh/h)										
South: Nathan Street										
Mov.	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.	
From S To Exit:	W	N								
Lane 1	7	-	7	0.0	1857	0.004	100	0.0	2	
Lane 2	-	506	506	5.0	1889	0.268	100	NA	NA	
Lane 3	-	506	506	5.0	1889	0.268	100	NA	NA	
Lane 4	-	506	506	5.0	1889	0.268	100	NA	NA	
Approach	7	1518	1525	5.0		0.268				
North: Nathan Street										

Mov.	T1	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N				veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	S				v/c	%	%	No.
Lane 1	639	639	5.0	1889	0.339	100	NA	NA
Lane 2	639	639	5.0	1889	0.339	100	NA	NA
Approach	1279	1279	5.0		0.339			
<b>West: Albert Street</b>								
Mov.	L2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W				veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	N				v/c	%	%	No.
Lane 1	108	108	5.0	341	0.318	100	NA	NA
Approach	108	108	5.0		0.318			
<b>Total %HV Deg.Satn (v/c)</b>								
All Vehicles	2913	5.0		0.339				

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

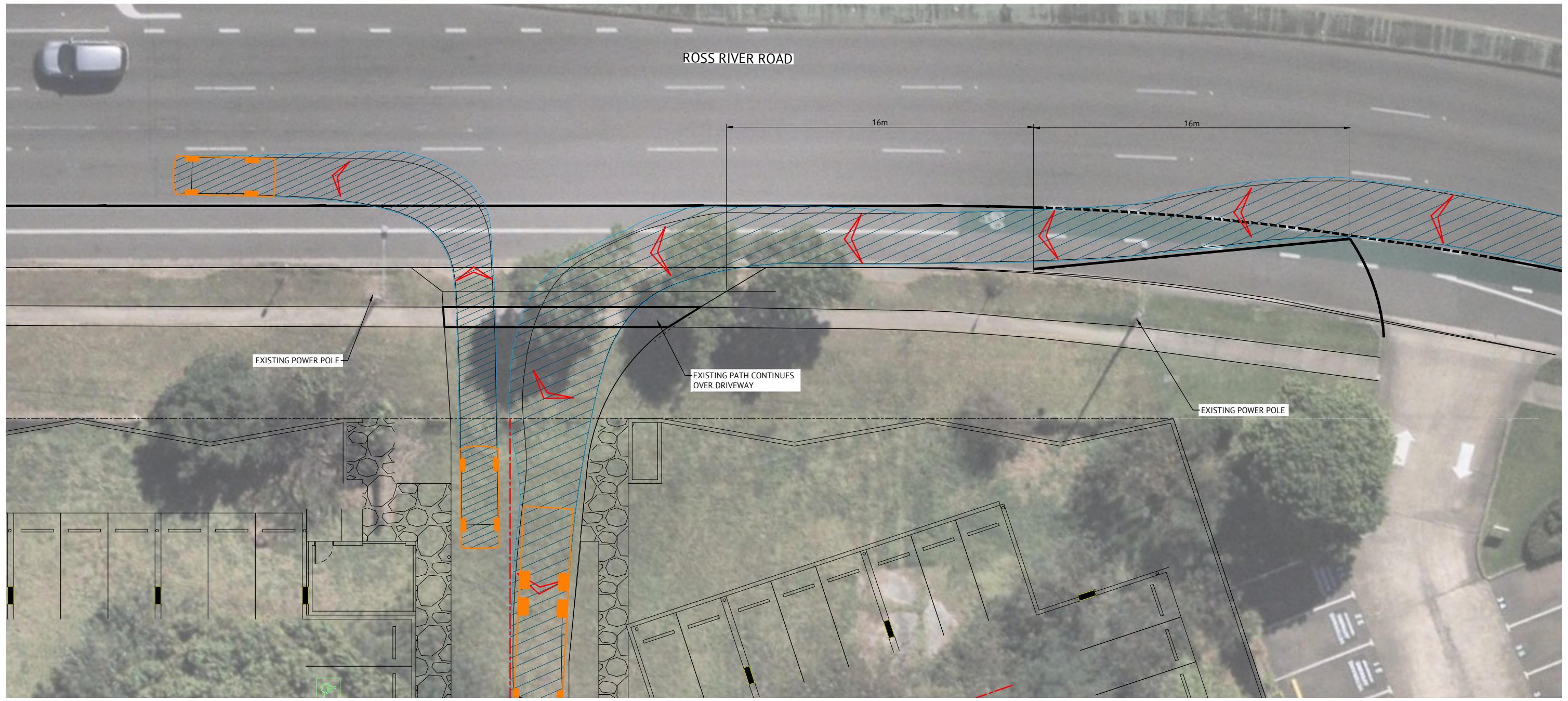
<b>Merge Analysis</b>												
Exit Lane	Short Lane	Percent Opng	Opposing Flow	Critical Gap	Follow-up Headway	Lane Capacity	Deg. Satn	Min. Delay	Merge Delay	Merge Queue [ Veh ]	Queue Dist ]	
Number	Length	Lane	Rate	sec	Rate	veh/h	v/c	sec	sec		m	
	m		% veh/h	pcu/h		veh/h						
There are no Exit Short Lanes for Merge Analysis at this Site.												

<b>Variable Demand Analysis</b>				
	Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
	veh	veh	sec	sec
<b>South: Nathan Street</b>				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
Lane 4	0.0	0.0	0.0	0.0
<b>North: Nathan Street</b>				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
<b>West: Albert Street</b>				
Lane 1	0.0	0.0	0.0	0.0



# **APPENDIX G**

## **PROPOSED ROSS RIVER ROAD ACCESS LAYOUT**



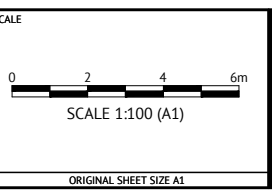
**PRELIMINARY - NOT FOR CONSTRUCTION**

DATE	REV	DESCRIPTION	RD	BI
	1	PRELIMINARY - NOT FOR CONSTRUCTION		

**Premise**

TOWNSVILLE OFFICE  
 84 DENHAM STREET  
 PO BOX 1110  
 TOWNSVILLE, QLD 4810  
 PH: (07) 4772 0666  
 WEB: www.premise.com.au

DESIGNED  
Z.RUDMAN  
 CHECKED  
C.CLARK  
 PROJECT MANAGER  
B.JONES  
 ENGINEERING CERTIFICATION  
 B.JONES RPEQ 19986



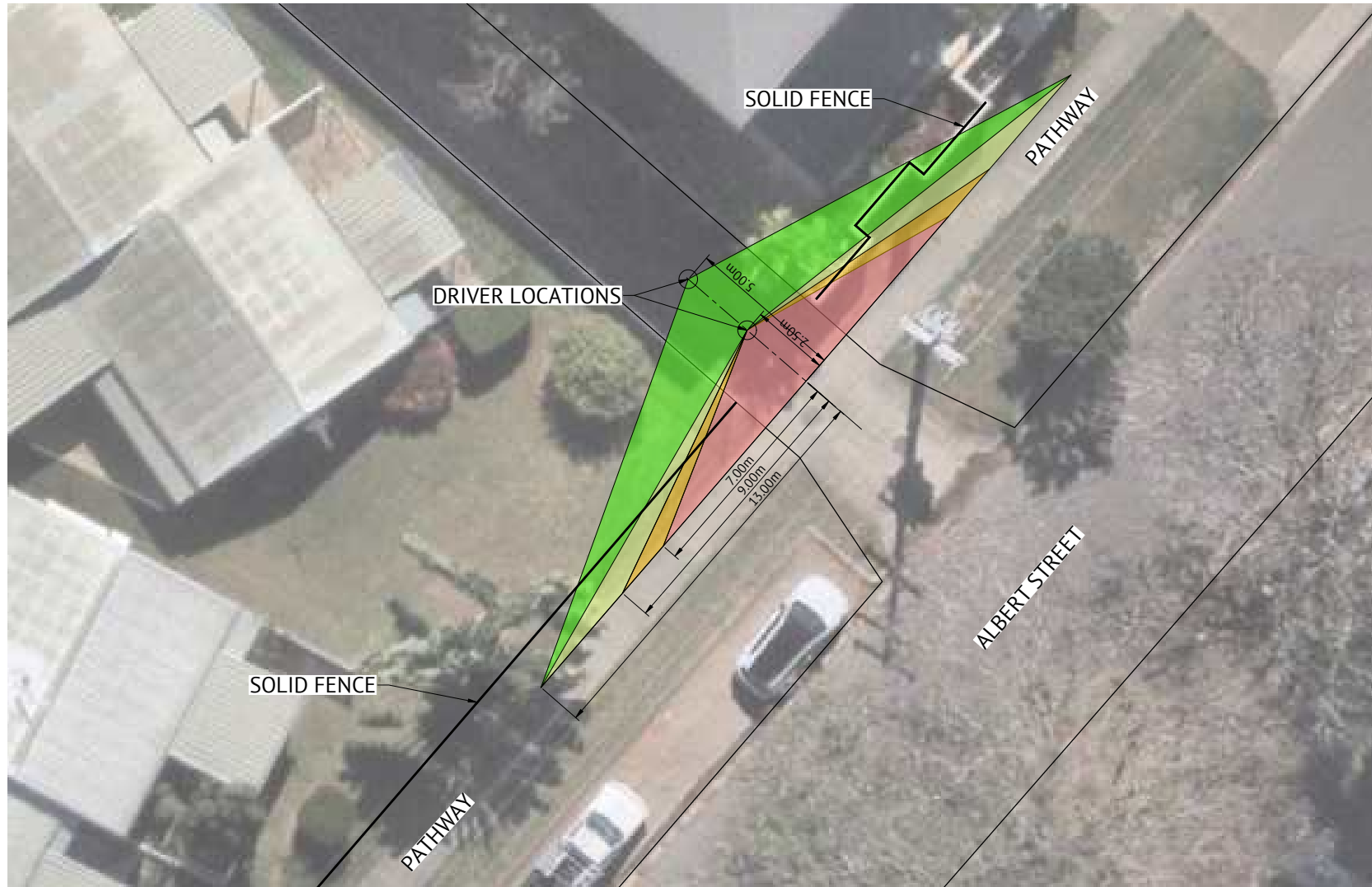
CLIENT	HURST CONSTRUCTIONS
PROJECT	ROSS RIVER ROAD RESIDENTIAL
LOCATION	344-350 ROSS RIVER ROAD, CRANBROOK
SHEET TITLE	PROPOSED ROSS RIVER ROAD ACCESS LAYOUT

JOB CODE	P003620
SHEET NUMBER	SKC051
REV	1



# **APPENDIX H**

## **FRONTAGE ASSESSMENT – SIGHT TRIANGLES**

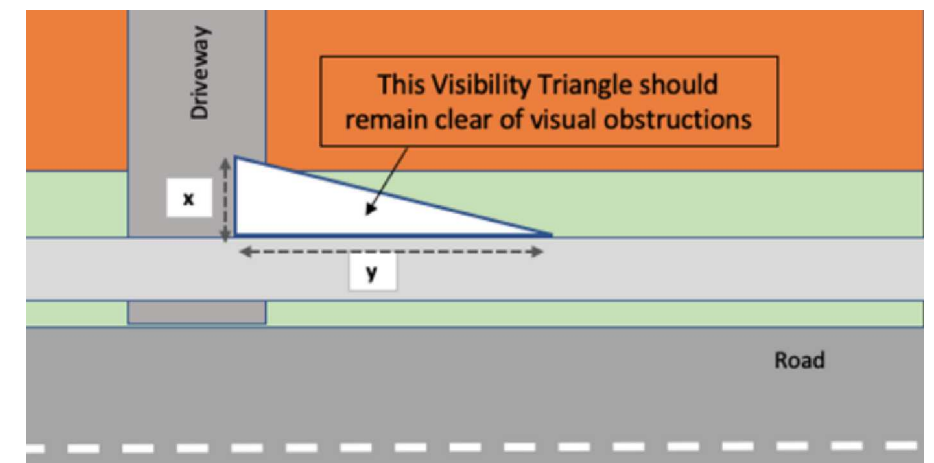


### SIGHT LINE DIMENSIONS

ASSESSMENT	DIRECTION	GENERAL USE PATHS WITH EVEN TERRAIN <sup>1</sup>	PRINCIPAL PATHS / PATHS WHERE GRADES >8%
1. DESIRABLE PATH USERS TRAVELING AT COMFORTABLE SPEEDS • GENERAL USE PATHS: 15 km/h • PRINCIPAL PATHS: 20 km/h <sup>2</sup> VEHICLE SPEED <5 km/h MINIMUM STANDARD IF REGULAR HEAVY VEHICLES USE	X (m)	≥5	≥5
	Y (m)	≥9	≥13
2. TOLERABLE PATH USERS TRAVELLING AT REDUCED SPEEDS. • GENERAL USE PATHS: 12–15 km/h • PRINCIPAL PATHS: 15–20 km/h VEHICLES MUST COME TO A COMPLETE STOP	X (m)	≥2.5	≥2.5
	Y (m)	7 ≤ Y < 9	9 ≤ Y < 13
3. DEFICIENT SIGHT LINES PROVIDE ADEQUATE WARNING FOR DRIVERS OR PATH USERS TO AVOID A CRASH, WHEN PATH USERS TRAVEL AT MINIMUM SPEEDS. • GENERAL USE PATHS: 10–12 km/h • PRINCIPAL PATHS: 12–15 km/h VEHICLES MUST COME TO A COMPLETE STOP	X (m)	≥2.5	≥2.5
	Y (m)	5 ≤ Y < 7	7 ≤ Y < 9
4. HIGHLY DEFICIENT SIGHT LINES DO NOT PROVIDE ADEQUATE WARNING FOR DRIVERS OR PATH USERS TO AVOID A CRASH, WHEN PATH USERS TRAVEL AT MINIMUM SPEEDS. • GENERAL USE PATHS: <10 km/h • PRINCIPAL PATHS: <12 km/h SIGHT LINES DO NOT PROVIDE ADEQUATE WARNING FOR DRIVERS TO AVOID A CRASH	X (m)	<2.5	<2.5
	Y (m)	<5	<7

<sup>1</sup>TABLE ASSUMES PATH APPROACH GRADIENTS (LONGITUDINAL) OF 0%  
<sup>2</sup>WHERE DESIRABLE SPEEDS EXCEED 20 KM/H, SEE TABLE 3.2.3 OF 'Guideline: Treatment options to improve safety of pedestrians, bicycle riders and other path users at driveways February 2021' FOR STOPPING DISTANCES.

GUIDELINE: TREATMENT OPTIONS TO IMPROVE SAFETY OF PEDESTRIANS, BICYCLE RIDERS AND OTHER PATH USERS AT DRIVEWAYS FEBRUARY 2021



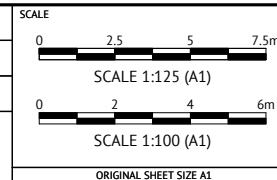
**PRELIMINARY - NOT FOR CONSTRUCTION**

DATE	REV	DESCRIPTION	CC	BI
24/09/2025	1	PRELIMINARY - NOT FOR CONSTRUCTION		



**TOWNSVILLE OFFICE**  
 84 DENHAM STREET  
 PO BOX 1110  
 TOWNSVILLE, QLD 4810  
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 WEB: www.premise.com.au

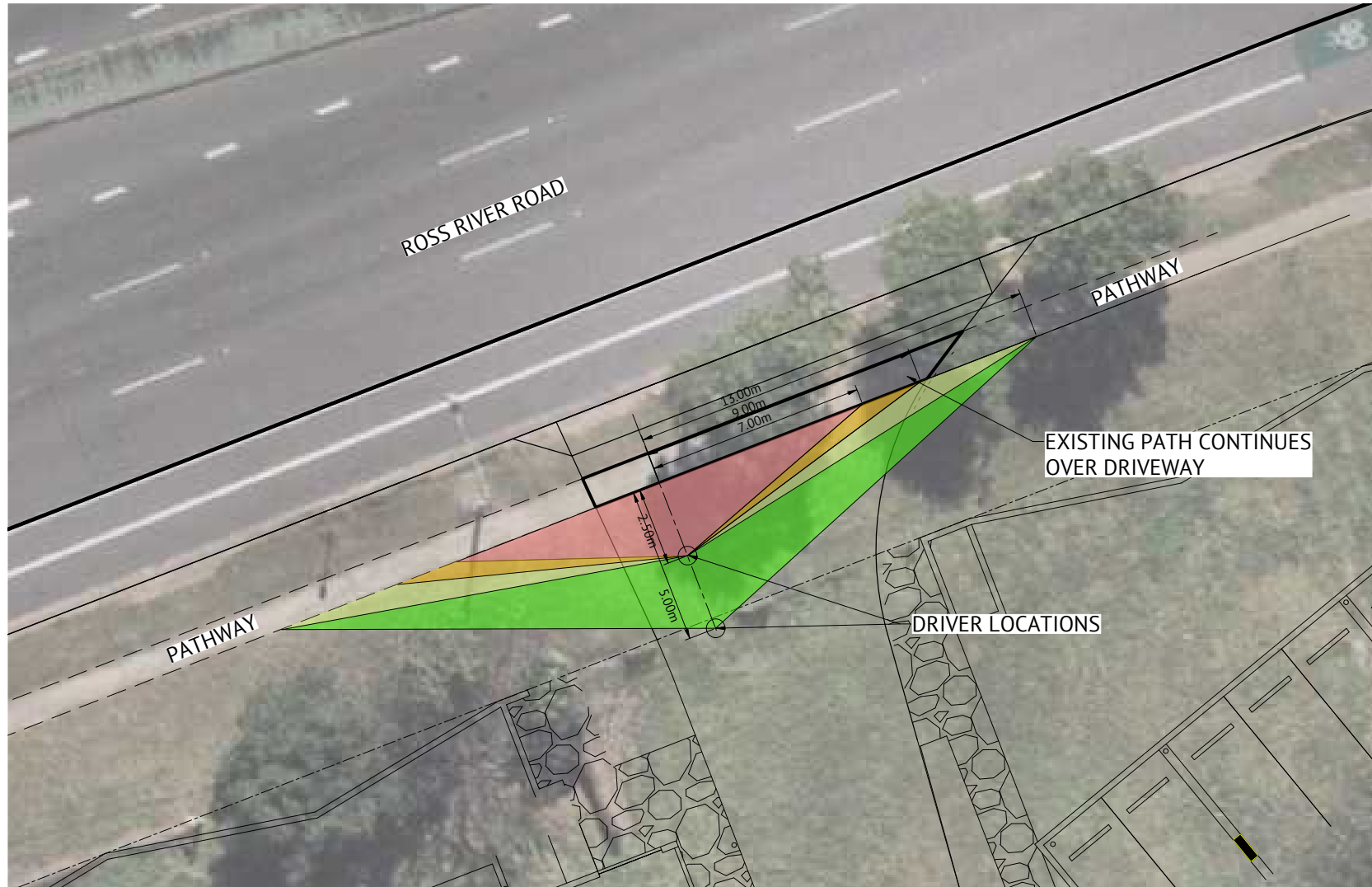
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Z.RUDMAN  
 CHECKED  
C.CLARK  
 PROJECT MANAGER  
B.JONES  
 ENGINEERING CERTIFICATION  
 B.JONES RPEQ 19986



CLIENT  
 PROJECT  
 LOCATION  
 SHEET TITLE

**HURST CONSTRUCTIONS**  
 ROSS RIVER ROAD RESIDENTIAL  
 344-350 ROSS RIVER ROAD, CRANBROOK  
 PEDESTRIAN SIGHT LINES - ALBERT STREET

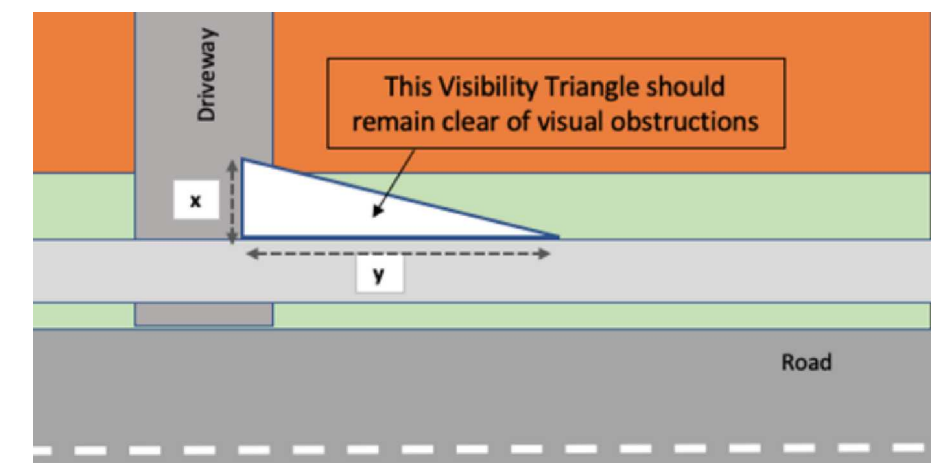
JOB CODE  
P003620  
 SHEET NUMBER  
SKC101  
 REV  
1



SIGHT LINE DIMENSIONS			
ASSESSMENT	DIRECTION	GENERAL USE PATHS WITH EVEN TERRAIN <sup>1</sup>	PRINCIPAL PATHS / PATHS WHERE GRADES >8%
1. DESIRABLE PATH USERS TRAVELING AT COMFORTABLE SPEEDS • GENERAL USE PATHS: 15 km/h • PRINCIPAL PATHS: 20 km/h <sup>2</sup> VEHICLE SPEED <5 km/h MINIMUM STANDARD IF REGULAR HEAVY VEHICLES USE	X (m)	≥5	≥5
	Y (m)	≥9	≥13
2. TOLERABLE PATH USERS TRAVELLING AT REDUCED SPEEDS. • GENERAL USE PATHS: 12–15 km/h • PRINCIPAL PATHS: 15–20 km/h VEHICLES MUST COME TO A COMPLETE STOP	X (m)	≥2.5	≥2.5
	Y (m)	7 ≤ Y < 9	9 ≤ Y < 13
3. DEFICIENT SIGHT LINES PROVIDE ADEQUATE WARNING FOR DRIVERS OR PATH USERS TO AVOID A CRASH, WHEN PATH USERS TRAVEL AT MINIMUM SPEEDS. • GENERAL USE PATHS: 10–12 km/h • PRINCIPAL PATHS: 12–15 km/h VEHICLES MUST COME TO A COMPLETE STOP	X (m)	≥2.5	≥2.5
	Y (m)	5 ≤ Y < 7	7 ≤ Y < 9
4. HIGHLY DEFICIENT SIGHT LINES DO NOT PROVIDE ADEQUATE WARNING FOR DRIVERS OR PATH USERS TO AVOID A CRASH, WHEN PATH USERS TRAVEL AT MINIMUM SPEEDS. • GENERAL USE PATHS: <10 km/h • PRINCIPAL PATHS: <12 km/h SIGHT LINES DO NOT PROVIDE ADEQUATE WARNING FOR DRIVERS TO AVOID A CRASH	X (m)	<2.5	<2.5
	Y (m)	<5	<7

<sup>1</sup>TABLE ASSUMES PATH APPROACH GRADIENTS (LONGITUDINAL) OF 0%  
<sup>2</sup>WHERE DESIRABLE SPEEDS EXCEED 20 KM/H, SEE TABLE 3.2.3 OF 'Guideline: Treatment options to improve safety of pedestrians, bicycle riders and other path users at driveways February 2021' FOR STOPPING DISTANCES.

GUIDELINE: TREATMENT OPTIONS TO IMPROVE SAFETY OF PEDESTRIANS, BICYCLE RIDERS AND OTHER PATH USERS AT DRIVEWAYS FEBRUARY 2021

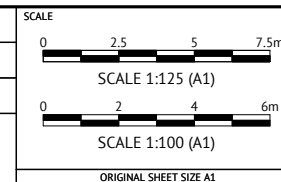


PRELIMINARY - NOT FOR CONSTRUCTION



TOWNSVILLE OFFICE  
 84 DENHAM STREET  
 PO BOX 1110  
 TOWNSVILLE, QLD 4810  
 PH: (07) 4772 0666  
 WEB: www.premise.com.au

DESIGNED  
Z.RUDMAN  
 CHECKED  
C.CLARK  
 PROJECT MANAGER  
B.JONES  
 ENGINEERING CERTIFICATION  
 B.JONES RPEQ 19986



CLIENT  
HURST CONSTRUCTIONS  
 PROJECT  
ROSS RIVER ROAD RESIDENTIAL  
 LOCATION  
344-350 ROSS RIVER ROAD, CRANBROOK  
 SHEET TITLE  
PEDESTRIAN SIGHT LINES - ROSS RIVER ROAD

JOB CODE  
P003620  
 SHEET NUMBER  
SKC102  
 REV  
1

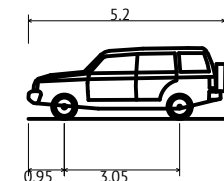
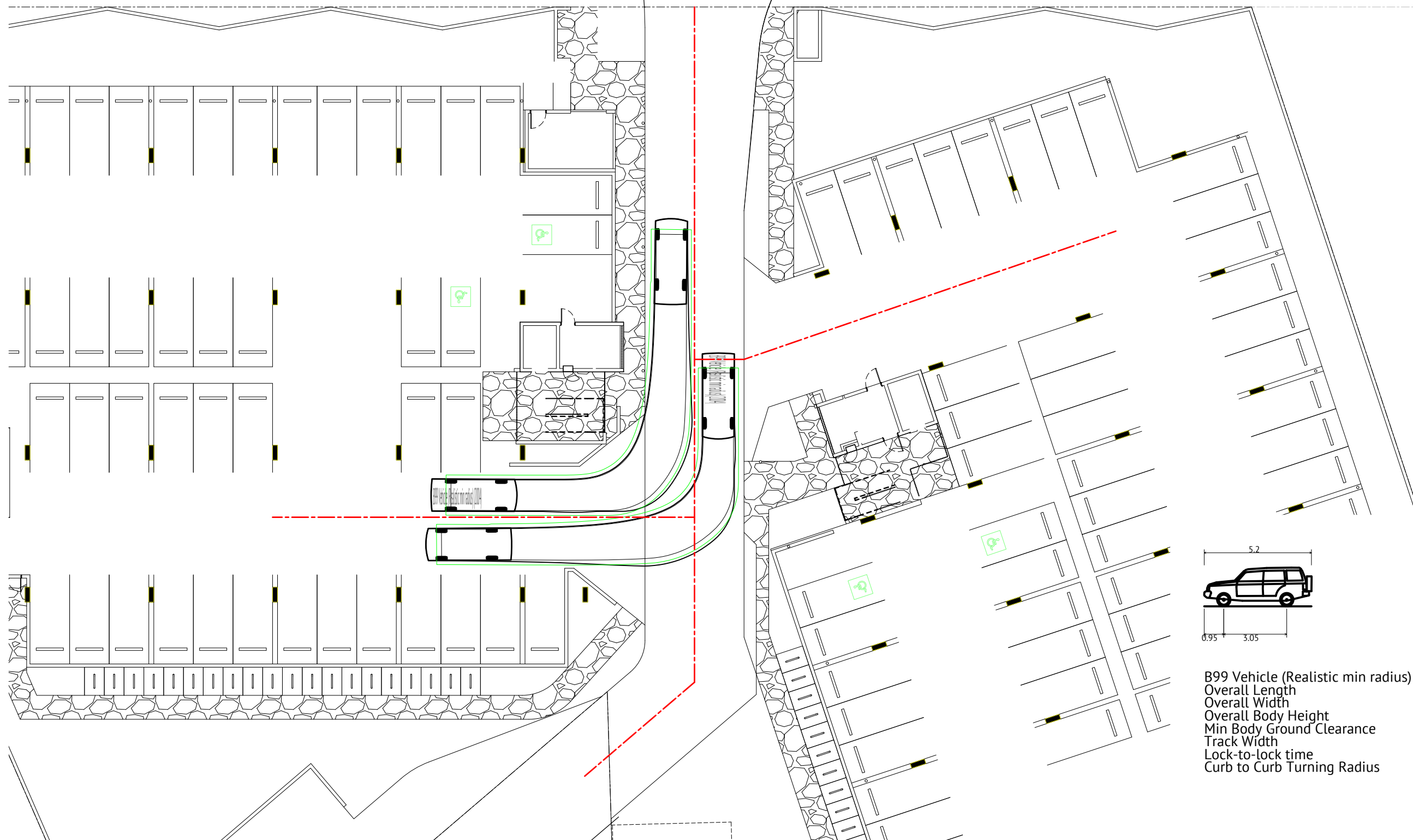
DATE	REV	DESCRIPTION	CC	BI
13/10/2025	1	PRELIMINARY - NOT FOR CONSTRUCTION		



# **APPENDIX I**

## **SWEPT PATH ANALYSES**

ROSS RIVER ROAD



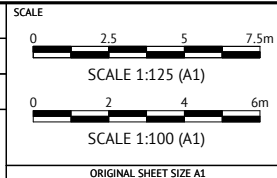
B99 Vehicle (Realistic min radius) (2004)  
 Overall Length 5.200m  
 Overall Width 1.940m  
 Overall Body Height 1.878m  
 Min Body Ground Clearance 0.272m  
 Track Width 1.840m  
 Lock-to-lock time 4.00s  
 Curb to Curb Turning Radius 6.250m

**PRELIMINARY - NOT FOR CONSTRUCTION**



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 84 DENHAM STREET  
 PO BOX 1110  
 TOWNSVILLE, QLD 4810  
 PH: (07) 4772 0666  
 WEB: www.premise.com.au

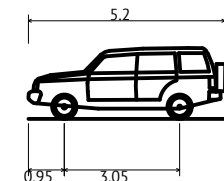
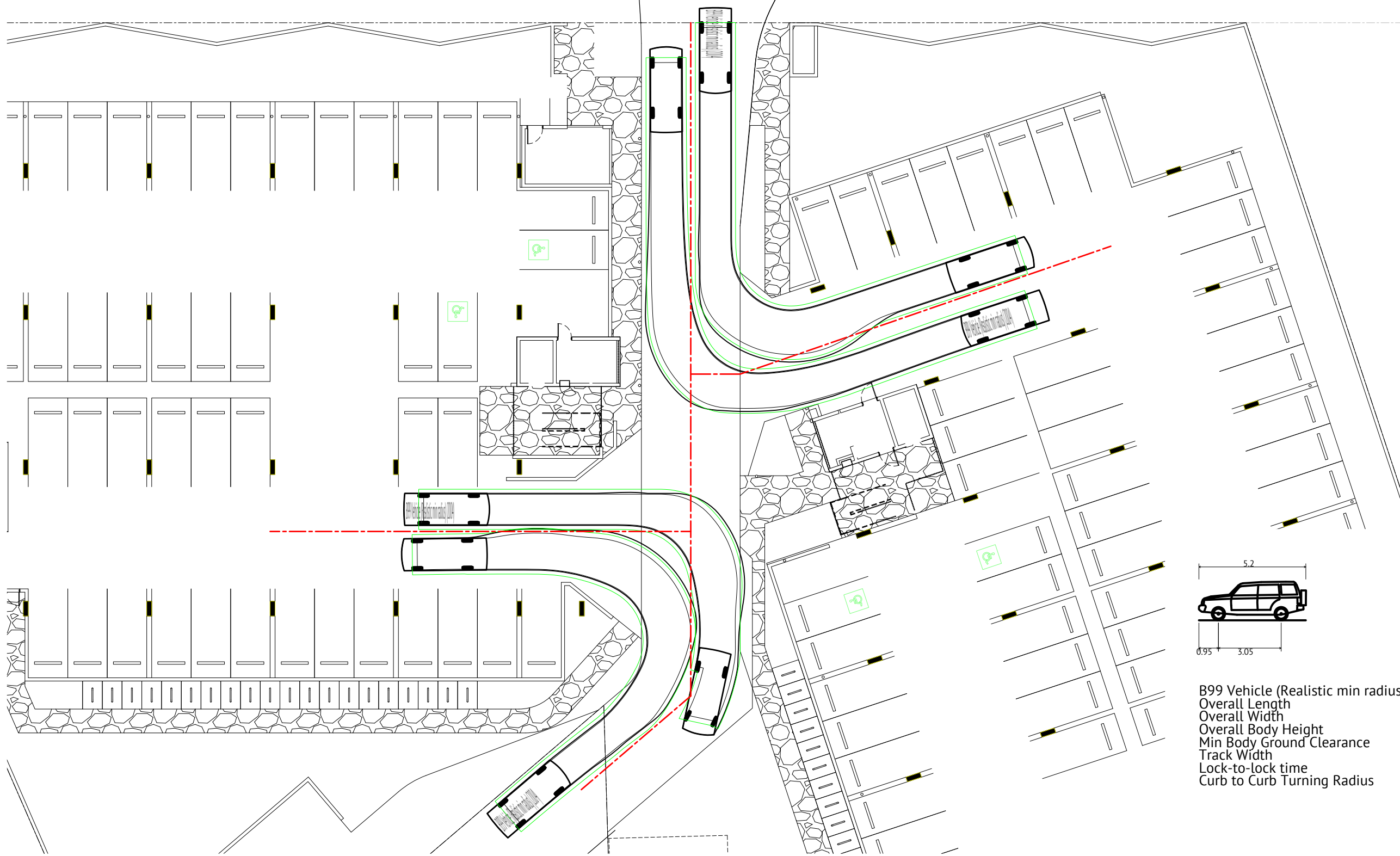
DESIGNED  
 Z.RUDMAN  
 CHECKED  
 C.CLARK  
 PROJECT MANAGER  
 B.JONES  
 ENGINEERING CERTIFICATION  
 B.JONES RPEQ 19986



CLIENT  
**HURST CONSTRUCTIONS**  
 PROJECT  
**ROSS RIVER ROAD RESIDENTIAL**  
 LOCATION  
**344-350 ROSS RIVER ROAD, CRANBROOK**  
 SHEET TITLE  
**INTERNAL ROADWAY DRAWINGS SHEET 1 OF 8**

JOB CODE  
**P003620**  
 SHEET NUMBER  
**SKC001**  
 REV  
**1**

ROSS RIVER ROAD



B99 Vehicle (Realistic min radius) (2004)  
 Overall Length 5.200m  
 Overall Width 1.940m  
 Overall Body Height 1.878m  
 Min Body Ground Clearance 0.272m  
 Track Width 1.840m  
 Lock-to-lock time 4.00s  
 Curb to Curb Turning Radius 6.250m

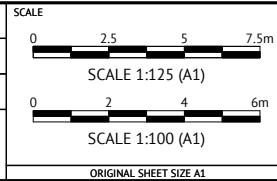
**PRELIMINARY - NOT FOR CONSTRUCTION**

DATE	REV	DESCRIPTION	CC	BI
13/10/2025	1	PRELIMINARY - NOT FOR CONSTRUCTION		



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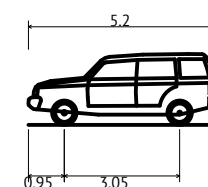
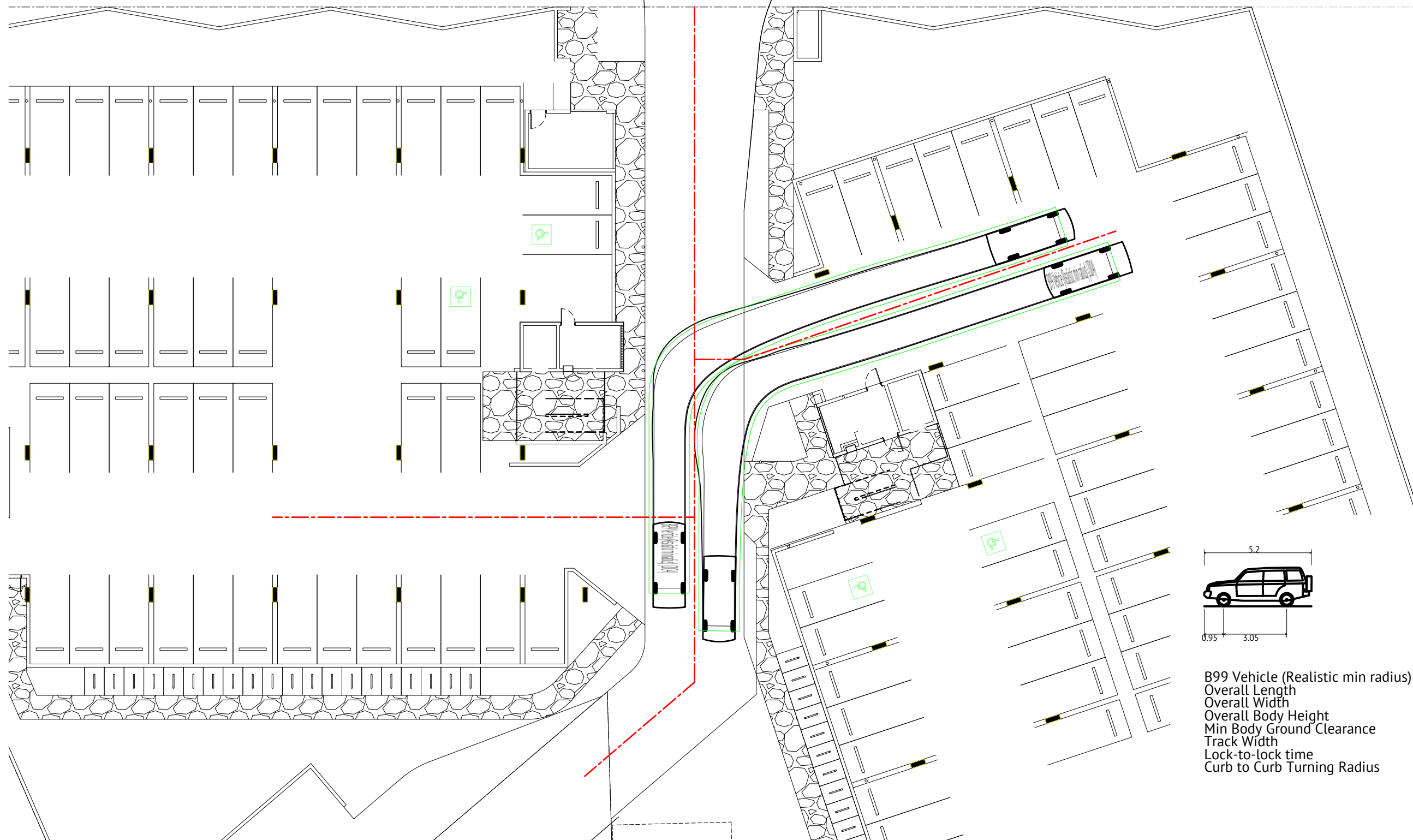
DESIGNED  
Z.RUDMAN  
 CHECKED  
C.CLARK  
 PROJECT MANAGER  
B.JONES  
 ENGINEERING CERTIFICATION  
 B.JONES RPEQ 19986



CLIENT  
**HURST CONSTRUCTIONS**  
 PROJECT  
**ROSS RIVER ROAD RESIDENTIAL**  
 LOCATION  
**344-350 ROSS RIVER ROAD, CRANBROOK**  
 SHEET TITLE  
**INTERNAL ROADWAY DRAWINGS SHEET 2 OF 8**

JOB CODE  
**P003620**  
 SHEET NUMBER  
**SKC002**  
 REV  
**1**

ROSS RIVER ROAD



B99 Vehicle (Realistic min radius) (2004)  
 Overall Length 5.200m  
 Overall Width 1.940m  
 Overall Body Height 1.878m  
 Min Body Ground Clearance 0.272m  
 Track Width 1.840m  
 Lock-to-lock time 4.00s  
 Curb to Curb Turning Radius 6.250m

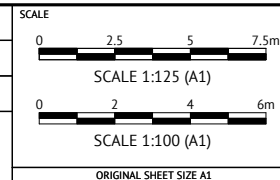
**PRELIMINARY - NOT FOR CONSTRUCTION**

DATE	REV	DESCRIPTION	CC	BI
13/10/2025	1	PRELIMINARY - NOT FOR CONSTRUCTION		



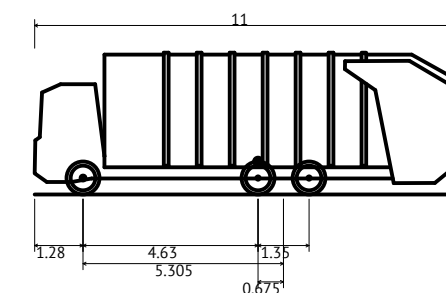
**TOWNSVILLE OFFICE**  
 84 DENHAM STREET  
 PO BOX 1110  
 TOWNSVILLE, QLD 4810  
 PH: (07) 4772 0666  
 WEB: www.premise.com.au

DESIGNED  
Z.RUDMAN  
 CHECKED  
C.CLARK  
 PROJECT MANAGER  
B.JONES  
 ENGINEERING CERTIFICATION  
 B.JONES RPEQ 19986



CLIENT  
**HURST CONSTRUCTIONS**  
 PROJECT  
**ROSS RIVER ROAD RESIDENTIAL**  
 LOCATION  
**344-350 ROSS RIVER ROAD, CRANBROOK**  
 SHEET TITLE  
**INTERNAL ROADWAY DRAWINGS SHEET 3 OF 8**

JOB CODE  
**P003620**  
 SHEET NUMBER  
**SKC003**  
 REV  
**1**



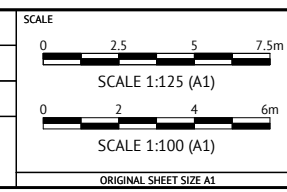
BCC Waste Collection Vehicle	
Overall Length	11.000m
Overall Width	2.490m
Overall Body Height	3.749m
Min Body Ground Clearance	0.302m
Track Width	2.490m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	10.300m

**PRELIMINARY - NOT FOR CONSTRUCTION**

DATE	REV	DESCRIPTION	CC	BI
13/10/2025	1	PRELIMINARY - NOT FOR CONSTRUCTION		

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 PH: (07) 4772 0666  
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Z.RUDMAN  
 CHECKED  
C.CLARK  
 PROJECT MANAGER  
B.JONES  
 ENGINEERING CERTIFICATION  
 B.JONES RPEQ 19986



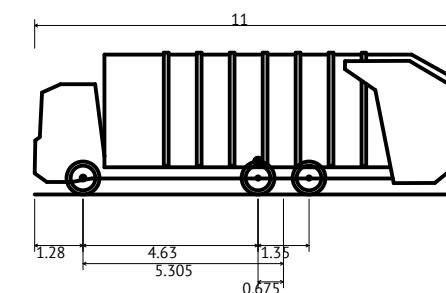
CLIENT  
**HURST CONSTRUCTIONS**

PROJECT  
**ROSS RIVER ROAD RESIDENTIAL**

LOCATION  
**344-350 ROSS RIVER ROAD, CRANBROOK**

SHEET TITLE  
**INTERNAL ROADWAY DRAWINGS SHEET 4 OF 8**

JOB CODE	P003620
SHEET NUMBER	SKC004
REV	1



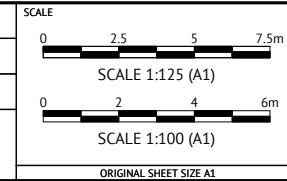
**BCC Waste Collection Vehicle**  
 Overall Length 11.000m  
 Overall Width 2.490m  
 Overall Body Height 3.749m  
 Min Body Ground Clearance 0.302m  
 Track Width 2.490m  
 Lock-to-lock time 6.00s  
 Wall to Wall Turning Radius 10.300m

**PRELIMINARY - NOT FOR CONSTRUCTION**



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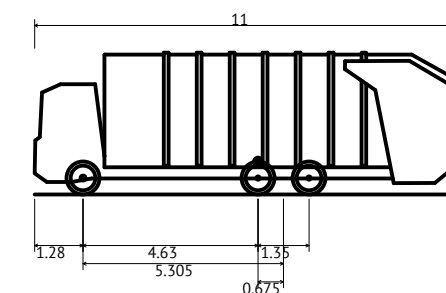
DESIGNED  
**Z.RUDMAN**  
 CHECKED  
**C.CLARK**  
 PROJECT MANAGER  
**BJONES**  
 ENGINEERING CERTIFICATION  
 BJONES RPEQ 19986



CLIENT **HURST CONSTRUCTIONS**  
 PROJECT **ROSS RIVER ROAD RESIDENTIAL**  
 LOCATION **344-350 ROSS RIVER ROAD, CRANBROOK**  
 SHEET TITLE **INTERNAL ROADWAY DRAWINGS SHEET 5 OF 8**

JOB CODE **P003620**  
 SHEET NUMBER **SKC005** REV **1**

DATE	REV	DESCRIPTION	CC	BI
13/10/2025	1	PRELIMINARY - NOT FOR CONSTRUCTION		



**BCC Waste Collection Vehicle**  
 Overall Length 11.000m  
 Overall Width 2.490m  
 Overall Body Height 3.749m  
 Min Body Ground Clearance 0.302m  
 Track Width 2.490m  
 Lock-to-lock time 6.00s  
 Wall to Wall Turning Radius 10.300m

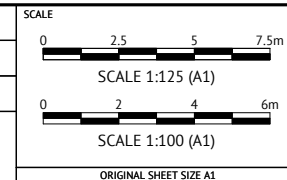
**PRELIMINARY - NOT FOR CONSTRUCTION**

DATE	REV	DESCRIPTION	CC	BI
13/10/2025	1	PRELIMINARY - NOT FOR CONSTRUCTION		



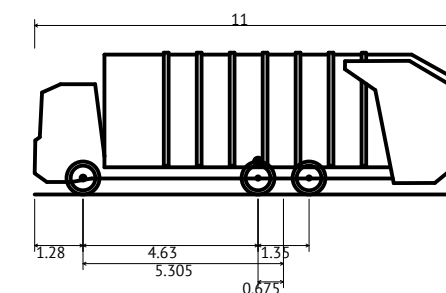
**TOWNSVILLE OFFICE**  
 84 DENHAM STREET  
 PO BOX 1110  
 TOWNSVILLE, QLD 4810  
 PH: (07) 4772 0666  
 WEB: www.premise.com.au

DESIGNED  
**Z.RUDMAN**  
 CHECKED  
**C.CLARK**  
 PROJECT MANAGER  
**B.JONES**  
 ENGINEERING CERTIFICATION  
 B.JONES RPEQ 19986



CLIENT **HURST CONSTRUCTIONS**  
 PROJECT **ROSS RIVER ROAD RESIDENTIAL**  
 LOCATION **344-350 ROSS RIVER ROAD, CRANBROOK**  
 SHEET TITLE **INTERNAL ROADWAY DRAWINGS SHEET 6 OF 8**

JOB CODE **P003620**  
 SHEET NUMBER **SKC006** REV **1**



BCC Waste Collection Vehicle

Overall Length	11.000m
Overall Width	2.490m
Overall Body Height	3.749m
Min Body Ground Clearance	0.302m
Track Width	2.490m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	10.300m

**PRELIMINARY - NOT FOR CONSTRUCTION**

DATE	REV	DESCRIPTION	CC	BI
13/10/2025	1	PRELIMINARY - NOT FOR CONSTRUCTION		



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DESIGNED  
Z.RUDMAN  
 CHECKED  
C.CLARK  
 PROJECT MANAGER  
B.JONES  
 ENGINEERING CERTIFICATION  
 B.JONES RPEQ 19986

SCALE  
 0 2.5 5 7.5m  
 SCALE 1:125 (A1)  
 0 2 4 6m  
 SCALE 1:100 (A1)  
 ORIGINAL SHEET SIZE A1

CLIENT  
**HURST CONSTRUCTIONS**

PROJECT  
**ROSS RIVER ROAD RESIDENTIAL**

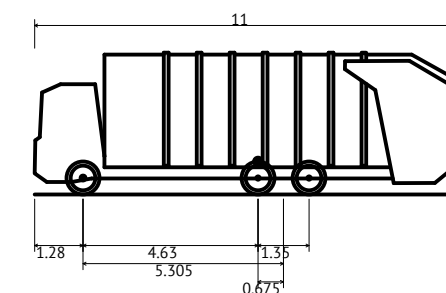
LOCATION  
**344-350 ROSS RIVER ROAD, CRANBROOK**

SHEET TITLE  
**INTERNAL ROADWAY DRAWINGS SHEET 7 OF 8**

JOB CODE  
**P003620**

SHEET NUMBER  
**SKC007**

REV  
**1**



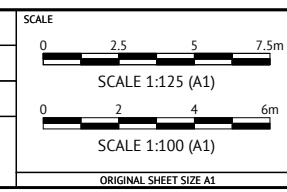
**BCC Waste Collection Vehicle**  
 Overall Length 11.000m  
 Overall Width 2.490m  
 Overall Body Height 3.749m  
 Min Body Ground Clearance 0.302m  
 Track Width 2.490m  
 Lock-to-lock time 6.00s  
 Wall to Wall Turning Radius 10.300m

**PRELIMINARY - NOT FOR CONSTRUCTION**

DATE	REV	DESCRIPTION	CC	BI
13/10/2025	1	PRELIMINARY - NOT FOR CONSTRUCTION		


**TOWNSVILLE OFFICE**  
 84 DENHAM STREET  
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 TOWNSVILLE, QLD 4810  
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DESIGNED  
 Z.RUDMAN  
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 C.CLARK  
 PROJECT MANAGER  
 B.JONES  
 ENGINEERING CERTIFICATION  
 B.JONES RPEQ 19986



CLIENT **HURST CONSTRUCTIONS**  
 PROJECT **ROSS RIVER ROAD RESIDENTIAL**  
 LOCATION **344-350 ROSS RIVER ROAD, CRANBROOK**  
 SHEET TITLE **INTERNAL ROADWAY DRAWINGS SHEET 8 OF 8**

JOB CODE		P003620
SHEET NUMBER	REV	
SKC008	1	



# **APPENDIX J**

## **TRAFFIC IMPACT ASSESSMENT CERTIFICATION**

# TRAFFIC IMPACT ASSESSMENT CERTIFICATION

## CERTIFICATION OF TRAFFIC IMPACT ASSESSMENT REPORT REGISTERED PROFESSIONAL ENGINEER QUEENSLAND

### FOR

Project Title	Ross River Road Residential: Traffic Impact Assessment
---------------	--

As a professional engineer registered by the Board of Professional Engineers of Queensland pursuant to the *Professional Engineers Act 2002* as competent in my areas of nominated expertise, I understand and recognise:

- > The significant role of engineering as a profession; and that
- > The community has a legitimate expectation that my certification affixed to this engineering work can be trusted; and that
- > I am responsible for ensuring its preparation has satisfied all necessary standards, conduct and contemporary practice.

As the responsible RPEQ, I certify:

- i. I am satisfied that all submitted components comprising this traffic impact assessment, listed in the following table, have been completed in accordance with the Guide to Traffic Impact Assessment published by the Queensland Department of Transport and Main Roads and using sound engineering principles; and
- ii. Where specialised areas of work have not been under my direct supervision, I have reviewed the outcomes of the work and consider the work and its outcomes as suitable for the purposes of this traffic impact assessment; and that
- iii. The outcomes of this traffic impact assessment are a true reflection of results of assessment; and that
- iv. I believe the strategies recommended for mitigating impacts by this traffic impact assessment, embrace contemporary practice initiatives and will deliver the desired outcomes.

<b>Name</b>	<b>Bradley Jones</b>	<b>RPEQ No.</b>	<b>19986</b>
<b>RPEQ Competencies</b>	Civil		
<b>Signature</b>		<b>Date</b>	13 October 2025
<b>Postal Address</b>	PO Box 1110, Townsville QLD 4810		
<b>Email</b>	<a href="mailto:Bradley.Jones@premise.com.au">Bradley.Jones@premise.com.au</a>		

Traffic impact assessment components to which this certification applies	<input checked="" type="checkbox"/>
<b>1. Introduction</b>	
Background	<input checked="" type="checkbox"/>
Scope and study area	<input checked="" type="checkbox"/>
Pre-lodgement meeting notes	<input checked="" type="checkbox"/>
<b>2. Existing Conditions</b>	
Land use and zoning	<input checked="" type="checkbox"/>
Adjacent land uses / approvals	<input checked="" type="checkbox"/>
Surrounding road network details	<input checked="" type="checkbox"/>
Traffic volumes	<input checked="" type="checkbox"/>
Intersection and network performance	<input checked="" type="checkbox"/>
Road safety issues	<input checked="" type="checkbox"/>
Site access	<input checked="" type="checkbox"/>
Public transport (if applicable)	<input checked="" type="checkbox"/>
Active transport (if applicable)	<input checked="" type="checkbox"/>
Parking (if applicable)	<input type="checkbox"/>
Pavement (if applicable)	<input type="checkbox"/>
Transport infrastructure (if applicable)	<input type="checkbox"/>
<b>3. Proposed Development Details</b>	
Development site plan	<input checked="" type="checkbox"/>
Operational details (including year of opening each stage and any relevant catchment / market analysis)	<input checked="" type="checkbox"/>
Proposed access and parking	<input checked="" type="checkbox"/>
<b>4. Development Traffic</b>	
Traffic generation (by development stage if relevant and considering light and heavy vehicle trips)	<input type="checkbox"/>
Trip distribution	<input type="checkbox"/>
Development traffic volumes on the network	<input type="checkbox"/>
<b>5. Impact Assessment and Mitigation</b>	
With and without development traffic volumes	<input checked="" type="checkbox"/>
Construction traffic impact assessment and mitigation (if applicable)	<input type="checkbox"/>
Road safety impact assessment and mitigation	<input checked="" type="checkbox"/>
Access and frontage impact assessment and mitigation	<input checked="" type="checkbox"/>
Intersection delay impact assessment and mitigation	<input type="checkbox"/>
Road link capacity assessment and mitigation	<input type="checkbox"/>
Pavement impact assessment and mitigation	<input type="checkbox"/>
Transport infrastructure impact assessment and mitigation	<input type="checkbox"/>
Other impacts assessment relevant to the specific development type / location (if applicable) - Parking	<input checked="" type="checkbox"/>
<b>6. Conclusions and Recommendations</b>	
Summary of impacts and mitigation measures proposed	<input checked="" type="checkbox"/>
Certification statement and authorisation	<input checked="" type="checkbox"/>

